

The effects of non-point source pollution in small urban and agricultural streams

-DATA REPORT-

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Executive Summary

The effects of agricultural and urban non-point source (NPS) pollution on aquatic ecosystems were investigated in two watersheds located in the Lower Fraser Valley, British Columbia: Elk Creek in Chilliwack and Yorkson Creek in Langley. These two watershed areas represent typical agricultural and urban activities in the valley.

The approach we used was to populate stream-side flow-through glass aquariums with hatchery raised cutthroat trout and crayfish. This near *in-situ* contained approach using hatchery organisms was chosen to minimize the effects on the natural populations of the relatively small study streams. The organisms were exposed for two months in three fall seasons (1999-2001) and one spring season (2000).

Water quality was measured continuously throughout each exposure period. Analyses included water chemistry, nutrients, bacteriological parameters, trace metals and various organic contaminants including nonylphenol, pesticides, polybrominated diphenyl ethers, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, sterols and toxaphene.

Biological effects of exposure to stream water containing NPS run-off were investigated by analysis of contaminants in cutthroat trout muscle and liver tissue and in crayfish muscle and hepatopancreas tissue. Histology of organs and analysis of mixed function oxidase and hepatopancreas biochemical indicators (e.g., metallothionein) as well as fish growth and health assessment were also investigated.

This report presents the data from this exposure study.

Sommaire exécutif

Les effets de la pollution agricole et urbaine des sources non ponctuelles (SNP) sur les écosystèmes aquatiques ont été étudiés dans deux bassins hydrographiques situés dans la vallée du bas Fraser en Colombie-Britannique : Elk Creek à Chilliwack et Yorkson Creek à Langley. Ces deux bassins sont représentatifs des activités urbaines et agricoles types de la vallée.

L'approche suivie a consisté à peupler des aquariums en verre à circulation d'eau continue placés à proximité du courant avec des écrevisses et des truites fardées élevées en éclosion. Nous avons choisi cette approche confinée presque *in situ* utilisant des organismes élevés en éclosion afin de minimiser les effets sur les populations naturelles des cours d'eau de taille relativement réduite concernés par cette étude. Les organismes ont été exposés pendant deux mois, trois fois à l'automne (1999-2001) et une fois au printemps (2000).

La qualité de l'eau a été mesurée en continu tout au long de chaque période d'exposition. Les analyses effectuées concernaient l'hydrochimie, les nutriments, les paramètres bactériologiques, les métaux-traces et plusieurs contaminants organiques comme le nonylphénol, les pesticides, les éthers diphenyliques polybromés, les diphenyles polychlorés, les hydrocarbures aromatiques polycycliques, les stérols et le toxaphène.

Les effets biologiques de l'exposition à l'eau de courant soumise à un ruissellement provenant de SNP ont été étudiés par l'analyse des contaminants présents dans les tissus musculaire et hépatique des truites fardées ainsi que dans les tissus musculaire et hépatopancréatique des écrevisses. L'histologie des organes et l'analyse de l'hydroxylase et des indicateurs biochimiques de l'hépatopancréas (par ex. la métallothionéine) ainsi que l'évaluation de la santé et de la croissance des poissons ont également été étudiées.

Ce rapport présente les données obtenues à partir de cette étude de l'exposition.

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1.0 Introduction

This study was conducted as part of the Georgia Basin Ecosystem Initiative. The Georgia Basin Ecosystem Initiative (GBEI), implemented from 1998 to 2003, was a multi-agency initiative developed to improve air quality, reduce and prevent water pollution, conserve and protect habitat and species and support community-based environmental and sustainability initiatives. The Georgia Basin encompasses Puget Sound and the Straits of Georgia and Juan de Fuca (Figure 1).

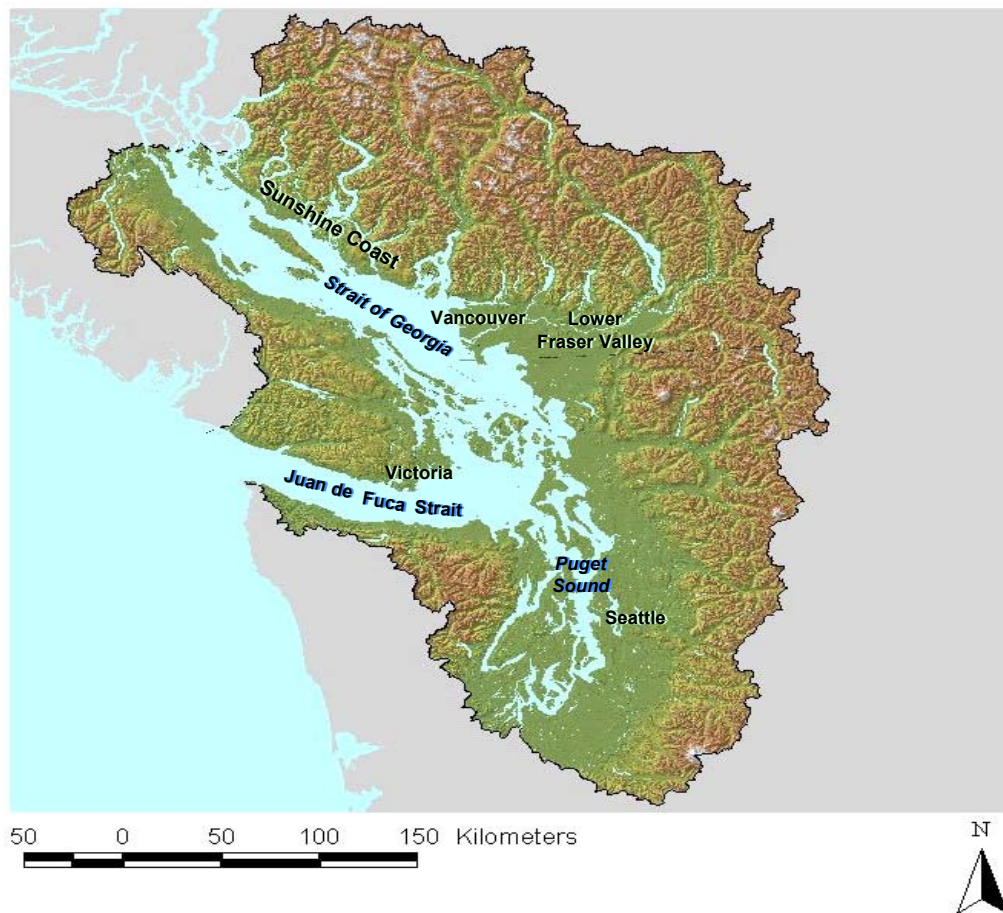


Figure 1. Map of the international Georgia Basin Ecosystem and important population centers. (moderate colour relief hillshading, 25 m, 30 m (USA))

The purpose of this study was to assess the effects of non-point source pollution on the water quality and biological health of small streams in urban and agricultural areas of the Lower Fraser Valley, B.C. We were interested in investigating the exposure via the water column of various inorganic and organic contaminants suspected to occur in the valley. Biological effects were to be investigated in two indigenous species – cutthroat trout (*Oncorhynchus clarkii*) and crayfish (*Pacifastacus leniusculus*).

Concurrent auxiliary studies were conducted in the target watersheds to further investigate the effects of agricultural and/or urban activities

2.0 Methods

2.1 Study location

Two creeks in the Lower Fraser Valley were chosen for areas of study (Figure 2). Elk Creek, located in Chilliwack, British Columbia, approximately 125 km east of Vancouver, is primarily affected by agricultural activities and Yorkson Creek, located in Langley, British Columbia, approximately 50 km east of Vancouver, is mainly affected by urban activities.

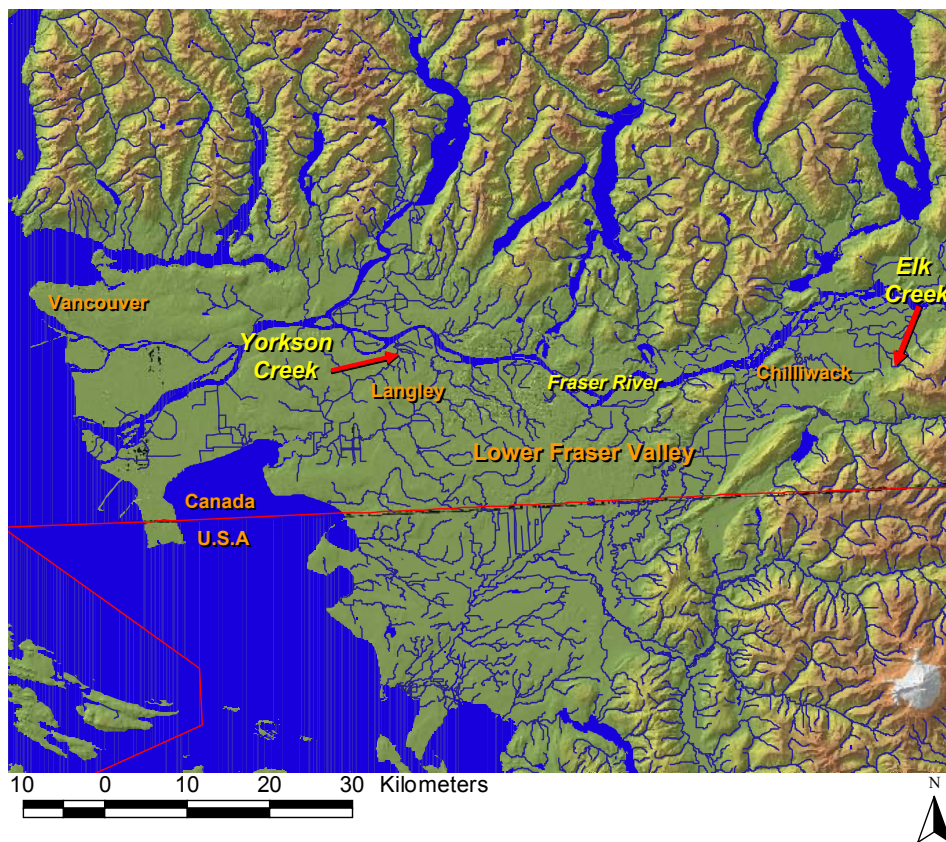


Figure 2. Map of the Lower Fraser Valley featuring Elk Creek and Yorkson Creek in relation to major population centers. (moderate colour relief hillshading, 25 m, 30 m (USA))

2.1.1 Elk Creek Watershed

Elk Creek watershed starts on Elk Mountain at 1600 m and drains through the eastern hillsides of Chilliwack and across the Fraser River floodplain into Hope Slough. It is approximately 12 km long and includes a watershed area of 28 km². The headwaters of Elk Creek include old growth coniferous forests of approximately 250 years of age (Litke, 1997). Future forest harvesting and urban development is

planned for the upper reaches of the watershed (Litke, 1997; City of Chilliwack, 1998; Ministry of Forests, 2003). In the Fraser River floodplain, a variety of agricultural activities, including dairy, pork, poultry, corn and hay production, exist as well as some residential development. The lower part of the watershed has been cleared of most of its natural vegetation and the creek has been channelized to support agricultural development (Litke, 1997).

Three study sites were established on Elk Creek. The upstream reference site (Ref) was located at the base of Elk Mountain and had limited exposure to residential or agricultural activities. Approximately 2.5 km downstream of the reference site, the mid-watershed site (mid Ag) was exposed to primarily agricultural activities (e.g., manure and pesticide application). Another 2.5 km further, the downstream site (d/s Ag) was exposed to both residential and agricultural activities (Figure 3).

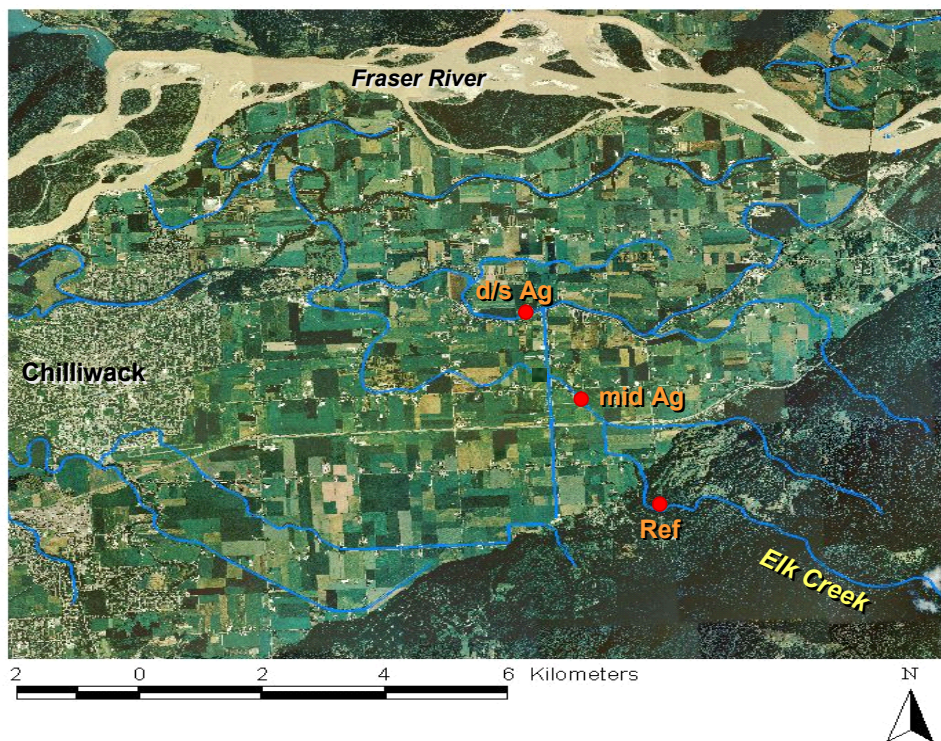


Figure 3. Orthoimagery map (1999, 0.5 m) of the Elk Creek watershed and the three field exposure locations, Chilliwack, British Columbia.

2.1.2 Yorkson Creek Watershed

Yorkson Creek originates in the northern Willoughby/Walnut Grove area. The headwaters are mainly affected by farming but there are plans for future urban development in the area (Township of Langley, 2004). The mid-watershed is largely influenced by already existing urban development and activities. The lower reaches of the watershed are affected by some agriculture but are increasingly being affected by encroaching industrial development (Nener & Wernick, 1997).

One site was located on Yorkson Creek (d/s Urban) that was downstream of all suburban, commercial and light industrial activity (Figure 4). The upper site on Elk Creek (Ref) was used as the reference site for d/s Urban.

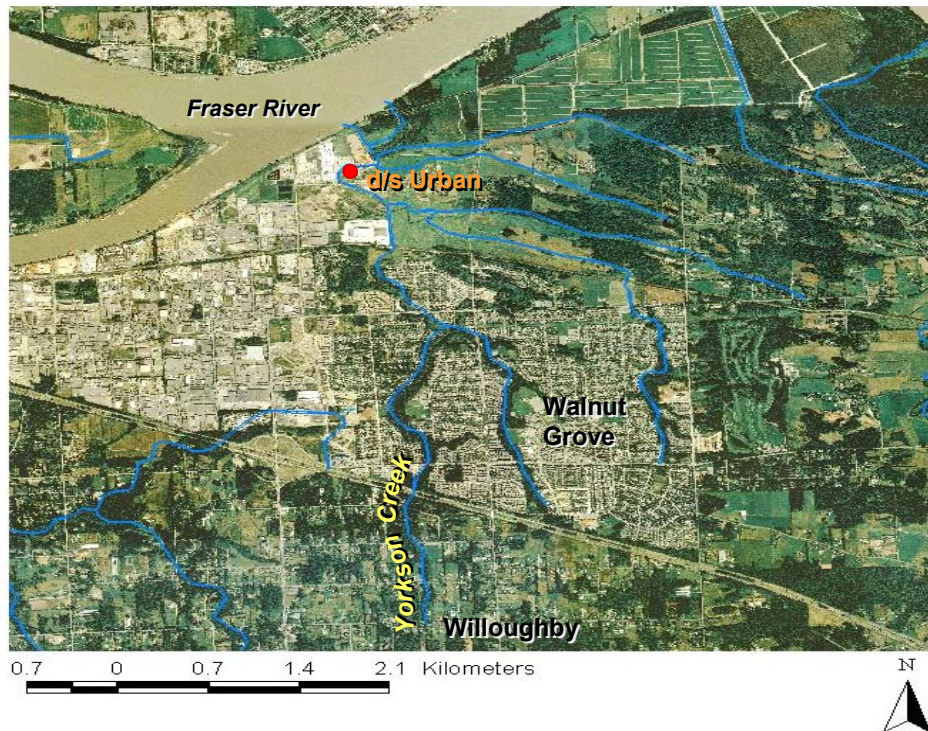


Figure 4. Orthoimagery map (1999, 0.5 m) of the Yorkson Creek watershed and the one field exposure location, Langley, British Columbia.

2.2 Study Design

Due to extreme flow fluctuations of small streams during the rainy season and potential vandalism, *in-situ* caged studies could not be conducted. Therefore, at each site, crayfish and trout were exposed for 56 days to ambient stream water in stream-side flow-through aquariums. Three exposure periods were in the fall season (October and November), during periods of heavy rain, and one was in the spring season (mid-April through to mid-June). All three agricultural sites had three fall exposures (1999, 2000 and 2001) and one spring exposure (2000). Our urban site was established six months after our agricultural sites, thus spring 2000 was the first of three exposures for d/s Urban. Trout were obtained from the Fraser Valley Trout Hatchery in Abbotsford, B.C. and the crayfish were obtained from a crayfish-rearing pond in Victoria, B.C. (Mountain Valley Trout Sales).

The glass aquariums were established at each study location in a 3.7 m x 3.7 m garden shed. Within each shed there were 24-20 L crayfish aquariums and 26-40 L trout aquariums for the exposure study. A stainless steel pump continuously delivered stream water to the shed via stainless steel piping. On either side of the interior of the shed, the water was delivered to two stainless steel troughs that

contained 200 μm mesh screens to retain debris that could plug the delivery system. Each trough contained outlets that delivered the water by gravity to all the aquariums via 1/8" I.D. stainless steel tubing. This trough delivery system allowed for equal flow to all of the aquariums at a rate of approximately 500 mL/min in the trout aquariums. Six outlets on each trough were split in two with a stainless steel Swagelok® union tee fitting to deliver water to two crayfish aquariums at a rate of approximately 250 mL/min. The tubing was directed to the bottom of each aquarium at one end and a hole was drilled near the top of the aquarium at the opposite end to allow the water to flow out. The overflow water drained onto a slanted, concave shelf and was then directed back into the creek downstream of the intake pump (Figure 5).

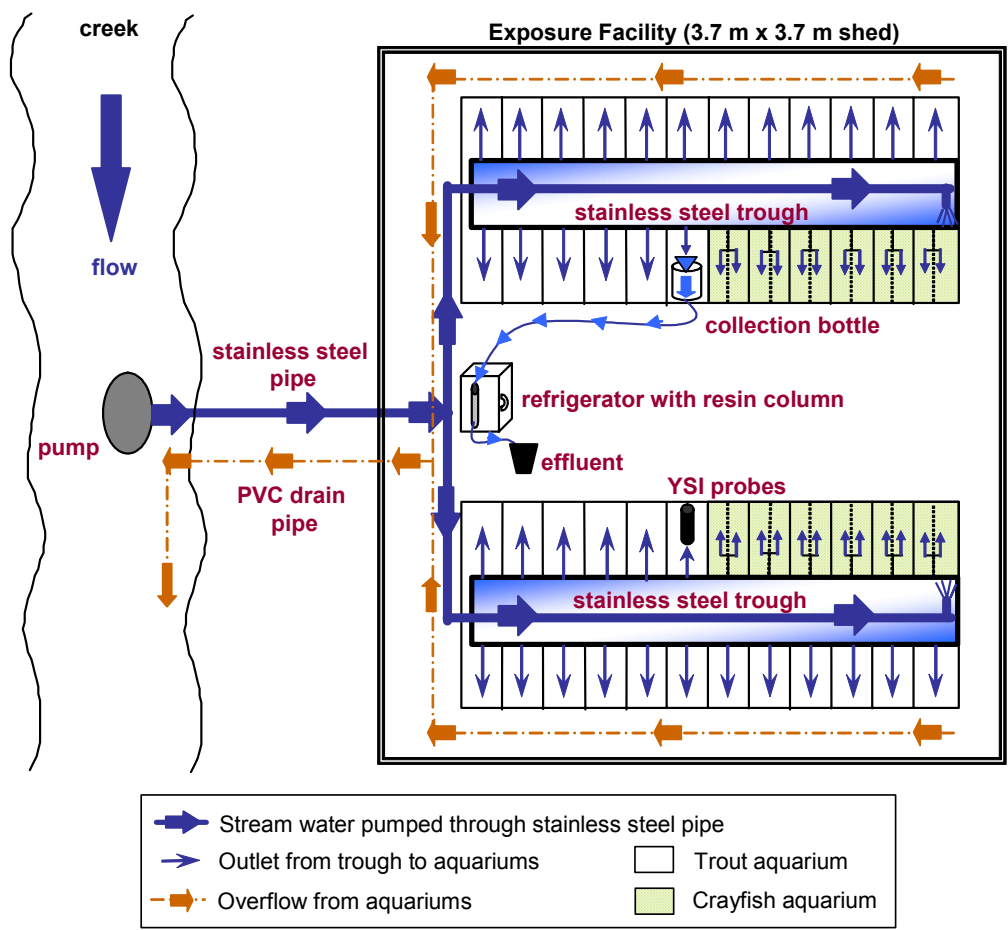


Figure 5. Study design of all four exposure facilities housing stream-side flow-through aquariums.

2.3 Exposure Facility Maintenance

The sites were visited on a daily basis to ensure that the pumps were running and water was flowing through all the aquariums. The trough screens were rinsed daily with stream water to remove debris. Sediment build up in the small tubing was blown out with a foot pump every second day to

ensure continuous flow to the aquariums. A peristaltic pump fitted with Teflon tubing was used to vacuum the troughs once a week to prevent sediment build up in the outlets for the small tubing. A light timer was used to regulate light exposure and was adjusted for daylight changes approximately once per week. Measurements of creek water levels and weather were recorded daily. Also, any human activities occurring around the site that may affect water quality were recorded.

2.4 Fish Exposure

Juvenile trout (1 year +) were transplanted to each site in a sequential fashion over a 4 or 5-day period, depending on the exposure period. For each exposure period, trout of the same age and size were selected from the same hatchery brood pond. Twenty-six trout were transplanted to each site except Ref. Due to the slightly smaller size of the reference exposure facility, fewer aquariums could be housed and therefore, only 24 trout were transplanted to this site. The fish were transported from the hatchery to the sites in large coolers. On the transplant day, fish were weighed in a water-filled weigh boat and fork length was measured in a narrow water-filled tank equipped with a ruler. Each fish was placed into a separate labeled aquarium. Five to eight fish per day were transplanted to each site. Fish pellets obtained from the hatchery were used to feed the fish. After all fish had been transplanted to the sites, a set of 24 control trout were obtained and dissected to establish background conditions before exposure to Elk and Yorkson creek watersheds.

After the fish had been in the aquarium for approximately seven days, the fish were fed. They were fed approximately 0.2 g per gram of body weight once per day. As part of the daily exposure facility maintenance, a peristaltic pump fitted with Teflon tubing was used to vacuum leftover food pellets from the day before to prevent decay before feeding again with fresh pellets. Feeding observations and other notable behaviour were recorded. Fish were exposed to ambient stream conditions for a period of 56 days.

At the end of the exposure period, fish were sequentially dissected on site according to the date they were transplanted to ensure a 56-day exposure period. At each site, over a 4 or 5-day period, five to eight fish were dissected each day. Fish were weighed and measured at the end of the study just as they were in the beginning of the study to calculate growth and condition factor. Declines in condition factor can indicate changes in energy storage, metabolism, and feeding activity due to environmental stressors. However these changes may also occur for reasons other than stress (e.g., seasonal and development changes), therefore condition factor results should be interpreted with caution (Barton et al., 2002). The fish were prepared for dissection by placing them into anesthetizing solution of 0.5 mL 2-phenoxyethanol in 1 L of water for a few minutes. When the fish was anaesthetized, it was assessed externally and internally for abnormalities using the health assessment index (HAI) developed by Adams et al. (1993). The gonads and liver were weighed to calculate two organosomatic indices: the gonadosomatic index (GSI) and the hepatosomatic index (HSI). The assumption generally made with these indices is that lower than normal values indicate a diversion of energy away from organ or tissue

growth in order to combat a stressor. Similar to condition factors, organosomatic indices may vary naturally with food availability, state of sexual maturation and life history (Barton et al., 2002; Goede & Barton, 1990). These factors should be taken into account when viewing the data.

In fall 2001, at the d/s urban site, an auxiliary exposure study was conducted using the same methods with one exception; oxygen was added to one trough such that half of the fish had a minimum of 80% oxygen saturation while the other trough was left at ambient stream conditions.

2.5 Crayfish Exposure

Equal numbers of male and female hatchery-raised crayfish were sequentially transplanted to each site. Six organisms were transplanted per day over a 4-day period. In fall 2001, twelve organisms per day were transplanted at each site over a 2-day period. Organisms were weighed and calipers were used to measure total body length and postorbital carapace length of each organism at the beginning of the study. One organism was placed in each aquarium with a stainless steel cone for shelter. A fixed number of commercial trout pellets (~0.1 g dry weight) were given to each crayfish daily. Each day leftover pellets were vacuumed out of the aquariums and a new sample of food was given. Due to the lack of feeding observed in the first three exposures studies, the crayfish were not fed in the fall of 2001. After all crayfish had been transplanted to the sites, a set of 24 control organisms were obtained and dissected to establish background conditions before exposure to Elk and Yorkson creek water.

After 56 days of exposure, crayfish were sequentially dissected on site according to the date they were transplanted. Six crayfish per site were dissected over a 4-day period except in fall 2001 when 12 crayfish were dissected per day over a 2-day period. Organisms were weighed and measured at the end of the study just as they were in the beginning of the study. The crayfish were prepared for dissection by placing them into a closed container with dry ice. When the organisms were chilled enough to slow them down but not to freeze them, they were dissected. The gonads were weighed to calculate the gonadosomatic index (GSI).

In fall 2001, at the d/s urban site, an auxiliary exposure study involving oxygen saturation was conducted as described for the trout exposure.

2.6 Water Quality

Temperature and dissolved oxygen were monitored hourly at each site by an *in-situ* multi-parameter probe. The probe was maintained in the exposure facility and measured ambient stream water received from the trough through stainless steel tubing. Pilot work comparing *in-situ* probe readings taken from the stream, from the trough and from the aquariums indicated that temperature and dissolved oxygen in the trough and the aquariums were not different from the stream.

Nutrients, major ions, trace metals and bacteriological parameters were sampled every second day for a total of approximately 30 samples at each site. Refer to Table 1 for field sampling procedures and analytical methods. Analytical precision and the effect of sample holding time were examined twice in fall

1999. The effect of sample holding time was tested because occasional delays between sample collection and analysis occurred if samples were taken over a weekend or holiday. For these combined analytical precision/holding time tests, five samples were collected at one time on a Monday. Three of the samples were submitted for analysis on the Monday, to test for analytical precision and to provide the first measurement for the holding time test. The remaining two samples were refrigerated until Thursday, at which time they were submitted for analysis to provide the second measurement for the holding time test. Additional quality assurance samples to test for analytical precision were also taken two times in spring 2000, fall 2000 and fall 2001. All samples for analytical precision/holding time were collected as splits in that one quarter of each of the bottles was filled in sequence. This was repeated until all the bottles were full. Coefficient of variation calculations were performed on the replicate analytical precision and holding time samples.

Table 1: Field sampling procedures and analytical methods for water samples analyzed for inorganic and bacteriological variables.

Parameters	Field Sampling Procedure	Analytical Method	
Alkalinity	Samples were collected in clean 1000 mL non-pigmented, low density polyethylene bottles (supplied from lab). Samples were transported to PESC in coolers. At the laboratory, samples were stored at 4°C and analyzed within 72 hrs.	Automated, Potentiometric Titration	
Conductivity		Immersion-Type Conductivity Cell, 25.0°C, Automated	
pH		Electrometric, Glass Electrode, 25.0°C, Stirred, Automated	
Ca K Mg Na Si Hardness (Ca+Mg)		Inductively Coupled Argon Plasma-Atomic Emission Spectrometry (ICP-AES) (simultaneous multi-element analysis)	
Ammonia		XCalculation	
Nitrite		Automated Berthelot Method	
Nitrite + Nitrate		Colorimetric, Automated Diazotization	
Total Nitrogen		Colorimetric, Automated, Cadmium/Copper Reduction	
Total Phosphorus		Samples were collected in clean 50 mL borosilicate glass bottles (supplied from lab). Samples were transported to PESC in coolers. At the laboratory, samples were stored at 4°C and analyzed within 72 hrs.	Colorimetric, Automated, Persulphate Digest, Molybdate-Ascorbic Acid Reduction
Total Dissolved Phosphorus			
Ortho-Phosphorus	Samples were field filtered (0.45 µm) and collected in 100 mL amber glass bottles (supplied from EPA Certified Clean). Samples were transported to PESC in coolers. At the laboratory, samples were stored at 4°C and analyzed within 72 hrs.	Low-Level Colorimetric, Automated, Molybdate-Ascorbic Acid Reduction	
<i>E. coli</i> Fecal Coliforms Total Coliforms	Samples were collected in sterilized 500 mL polyethylene bottles preserved with EDTA and sodium thiosulphate (supplied from lab). Samples were transported to Cantest Ltd., Burnaby, BC in coolers. At the laboratory, samples were refrigerated and analyzed within 24 hrs.	Multiple-Tube Fermentation Technique (MPN)	

Table 1 (cont'd): Field sampling procedures and analytical methods for water samples analyzed for inorganic and bacteriological variables.

Parameters	Field Sampling Procedure	Analytical Method
As Se	Samples were collected in acid washed 125 mL non-pigmented, low density polyethylene bottles (supplied from lab). Samples were transported to NLET in coolers. At the laboratory, samples were refrigerated until analysis.	Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES) (Acid-Digested)
Hg	Samples were collected in 100 mL amber glass bottles (supplied from EPA Certified Clean) and preserved with 2 mL sulphuric/dichromic acid. Samples were transported to NLET in coolers. At the laboratory, samples were refrigerated until analysis.	Cold-Vapour Atomic Absorption Spectrophotometry (CVAAS)
Ag Al Ba Be Cd Co Cr Cu Fe Li Mn Mo Ni Pb Sr V Zn	Samples were collected in acid washed 125 mL non-pigmented, low density polyethylene bottles (supplied from lab) and preserved with 2 mL 50% nitric acid. Samples were transported to NLET in coolers. At the laboratory, samples were refrigerated until analysis.	Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES) (Acid-Digested)

PESC – Pacific Environmental Science Center, North Vancouver, BC
 NLET – National Laboratory for Environmental Testing, Burlington, ON

Water was continuously sampled for organic contaminants. From one of the troughs water was directed to a filtering apparatus via Teflon tubing. Suspended sediment was removed by a 1 µm glass fibre filter, precleaned with dichloromethane. The filtered water then entered a collection bottle and from an outlet at the base of the bottle the filtered water was pumped, via Teflon tubing, to the XAD-2 resin column, located in a small refrigerator to maintain a constant cool temperature. In the resin column, organic contaminants were extracted from the water. The effluent water from the resin column drained into a volume calibrated collection tank. Every day the volume collected was recorded and the tank emptied. Water was drawn through the XAD-2 resin column at a rate of approximately 6 L per day using a metering pump. The filters were changed every day to ensure continuous flow into the collection bottle. At the end of the study, the column was removed and the volume extracted was calculated. The water sample was integrated over the 56-day exposure period and the column, on average, extracted 300 L of water.

XAD-2 resin columns were analyzed for various organic contaminants including: organochlorine pesticides, chlorobenzenes, organophosphate pesticides, organonitrogen pesticides, acidic herbicides, carbamates, toxaphene, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, polybrominated diphenyl ethers, nonylphenol and sterols (Table 2).

Table 2: List of organic compounds analyzed in water, cutthroat trout and crayfish muscle tissue, cutthroat trout liver and crayfish hepatopancreas.

Nonylphenol (not analyzed in fall 1999, not analyzed in tissue)			
4-Nonylphenol			
Organochlorine compounds			
1,2-Dichlorobenzene	Hexachlorobutadiene	o,p'-DDE	HCH, gamma-
1,3/1,4-Dichlorobenzene	Aldrin	p,p'-DDE	HCH, delta-
1,2,3-Trichlorobenzene	Dieldrin	o,p'-DDT	Heptachlor
1,2,4-Trichlorobenzene	Endrin	p,p'-DDT	Heptachlor Epoxide
1,3,5-Trichlorobenzene	Chlordane, alpha (cis)	Endosulphan (I), alpha-	Methoxychlor
1,2,3,4-Tetrachlorobenzene	Chlordane, gamma (trans)	Endosulphan (II), beta-	Mirex
1,2,3,5/1,2,4,5-Tetrachlorobenzene	Chlordane, oxy-	Endosulphan Sulphate	Nonachlor, cis-
Pentachlorobenzene	o,p'-DDD	HCH, alpha-	Nonachlor, trans-
Hexachlorobenzene	p,p'-DDD	HCH, beta-	
Organophosphate, Organonitrogen, Herbicide, Carbamate and Triazine compounds (not analyzed in fall 2001, * = not analyzed in tissue)			
Bromoxynil	Coumaphos	Methidathion	Vinclozolin
2,4,5-T	Demeton-O	Mevinphos	Aldicarb
2,4-D	Demeton-S	Parathion	Aldicarb Sulfone
Dicamba	Diazinon	Parathion-methyl	Aldicarb Sulfoxide
2,4-DB*	Dichlorvos/Naled	Phorate	Carbaryl
Dichloroprop	Dimethoate	Phosalone	Carbofuran
Dinoseb	Disulfoton	Phosmet	3-Hydroxycarbofuran
MCPA	Ethion	Sulfotep	Methiocarb*
Mecoprop (MCP)	Fenitrothion	Terbufos	Methomyl
Picloram	Fensulfothion	Hexazinone*	Oxamyl
Silvex (2,4,5-TP)	Fenthion	Metolachlor	Propoxur
Azinphos methyl	Fonofos	Propanil*	Atrazine*
Carbophenothion	Malathion	Trifluralin	Simazine*
Chlorpyrifos			
Polybrominated Diphenyl Ethers (only analyzed in fall 2001)			
2-MonoBDE	2,4,4'- and 2',3,4-TriBDE	2,2',3,4,4'-PentaBDE	2,2',4,4',5,5'-HexaBDE
3-MonoBDE	2,4,6-TriBDE	2,2',4,4',5-PentaBDE	2,2',4,4',5,6'-HexaBDE
4-MonoBDE	2,4',6-TriBDE	2,2',4,4',6-PentaBDE	2,2',4,4',6,6'-HexaBDE
2,4-DiBDE	3,3',4-TriBDE	2,3,3',4,4'-PentaBDE	2,2',3,4,4',5,6-HeptaBDE
2,4'- and 3,3'-DiBDE	3,4,4'-TriBDE	2,3,4,5,6-PentaBDE	2,2',3,4,4',5',6-HeptaBDE
2,6-DiBDE	2,2',4,4'-TetraBDE	2,3',4,4',6-PentaBDE	2,3,3',4,4',5,6-HeptaBDE
3,4-DiBDE	2,2',4,5'-TetraBDE	3,3',4,4',5-PentaBDE	2,2',3,3',4,4',5,5',6-NonaBDE
3,4'-DiBDE	2,3',4,4'-TetraBDE	2,2',3,4,4',5'-HexaBDE	2,2',3,3',4,4',5,6,6'-NonaBDE
4,4'-DiBDE	2,3',4',6-TetraBDE	2,3,4,4',5,6-HexaBDE	2,2',3,3',4,5,5',6,6'-NonaBDE
2,2',4-TriBDE	2,4,4',6-TetraBDE	2,2',3,4,4',6'-HexaBDE	2,2',3,3',4,4',5,5',6,6'-DecaBDE
2,3',4-TriBDE	3,3',4,4'-TetraBDE		
Polychlorinated Biphenyl (PCB) Congeners			
8/5	74/61	149/139	174/181
15	70/76	134/143	177
19	66/80	131/142	171
18	56/60	146	172/192
17	95/93	153	180
24/27	91	141	193
16/32	84/92	130	191
26	89/90/101	137	170/190

Table 2 (cont'd): List of organic compounds analyzed in water, cutthroat trout and crayfish muscle tissue, cutthroat trout liver and crayfish hepatopancreas.

Polychlorinated Biphenyl (PCB) Congeners cont'd			
16/32	84/92	130	191
26	89/90/101	137	170/190
25	99	138/163/164	189
31/28	83/108	158/160	201
33/20/21	97/86	129	197
22	87/115/116	128	198
45	85/120	156	199
46	110	157	196/203
52/73	107/109	179	195
49/43	106/118	176	194
47/48 /75	114	178	205
44	105/127	175	208
42/59	136	187/182	207
41/71/64/68	151	183	206
40	144/135	185	209
PCB Aroclors			
Aroclor 1242	Aroclor 1254	Aroclor 1260	
Polycyclic Aromatic Hydrocarbons (not analyzed in fall 1999)			
Naphthalene	Benzo(a)anthracene	Benzo(ghi)perylene	C2-Phenanthrene/Anthracene
Acenaphthylene	Chrysene	Indeno(1,2,3,cd)pyrene	C3-Phenanthrene/Anthracene
Acenaphthene	Benzofluoranthenes	C1-Naphthalene	C4-Phenanthrene/Anthracene
Fluorene	Benzo(a)pyrene	C2-Naphthalene	Retene
Phenanthrene	Benzo(e)pyrene	C3-Naphthalene	Dibenzothiophene
Anthracene	Perylene	C4-Naphthalene	C1-Dibenzothiophenes
Fluoranthene	Dibenzo(ah)anthracene	C1-Phenanthrene/Anthracene	C2-Dibenzothiophenes
Pyrene			
Sterols (not analyzed in fall 1999, not analyzed in tissue)			
Desogestrel	Testosterone	Coprostanol	Campesterol
Mestranol	17 α -Dihydroequilin	Epicoprostanol	Ergosterol
Norethindrone	Ethinylestradiol	Cholesterol	Stigmasterol
Estrone	17 α -Estradiol	Cholestanol	β -Estradiol 3-benzoate
Equilin	17 β -Estradiol	Desmosterol	β -Sitosterol
Norgestrel	α -Zearalanol		
Toxaphene & Chlorobornane compounds (only analyzed in fall 1999)			
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane		P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane		P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	
P3-GC/MS:Octachloro-Derivative		P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane		P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	
P5-GC/MS:Nonachloro-Derivative		Total Toxaphene	
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane			

Trace organic contaminant analyses were conducted by AXYS Analytical Services Ltd., Sidney, B.C. A subsample of each resin extract was sent to ASL Environmental, Vancouver, B.C. for organophosphate pesticide, organonitrogen pesticide, acidic herbicide, carbamate and triazine analyses.

Due to the high cost of XAD-2 resin columns and organic analyses no field duplicates were collected. Quality assurance was monitored solely by the analytical laboratory.

AXYS and ASL Environmental employ the batch method for quality assurance and control. Each batch progressed from sample workup through instrumentation as a unit, and on to data interpretation and final reports. Each batch includes a procedural blank, a spiked matrix and surrogate standard recoveries. Overall, the procedural blanks demonstrated non-detectable or low background levels of the target compounds. In the PAH spiked matrix, WQ-00-PAH, the recovery of 1-methylphenanthrene was 170%. Therefore, reported concentrations for C1-C4 phenanthrene/anthracene in fall/spring 2000 samples may be over reported and should be considered as maximum values. Recoveries of ¹³C-labelled 1,4-, 1,2,3- and 1,2,3,4-chlorobenzene in some samples were slightly below the lower control limit of 20%, likely due to the volatility of these compounds. Some ASL Environmental matrix spikes and surrogate standard recoveries indicate that the extraction efficiency for certain compounds and matrices are poor and outside the acceptable range of ASL's data quality objectives. Insufficient sample volume was available to repeat the analysis. Concentrations reported from AXYS were corrected based on the percent recovery of surrogate standard. The data were not blank corrected. Procedural blank, spiked matrix and surrogate recovery data can be found in the data tables under analytical quality assurance and control and should be considered when reviewing all results.

XAD-2 columns were stored at 4°C until commencement of analysis. Resin from XAD-2 columns was extracted by either soxhlet extraction procedures or by column elution extraction procedures. Both procedures use dichloromethane in the extraction process. Each extract was split into four portions. One portion was used for each analysis (see Table 3 for extract clean-up and analytical methods) and at least one portion was kept as backup. Prior to analysis, each extract portion was spiked with appropriate ¹³C-labelled surrogate standards.

Table 3: Extract clean-up and analytical methods for XAD-2 resin samples.

Parameters	Extract Clean-up	Analytical Method
PCB Congeners PCB Aroclors Chlorobenzenes Toxaphene Non-polar Chlorinated Pesticides Moderately polar Chlorinated Pesticides	Extract was cleaned up and fractionated on a Florisil column.	HRGC/LRMS or HRGC/HRMS
Most polar Chlorinated Pesticides	Extract was cleaned up and fractionated on a Florisil column.	GC/ECD
Polycyclic Aromatic Hydrocarbons	Extract separated on a silica gel column.	HRGC/LRMS
Sterols Nonylphenol	Extract separated on a silica gel column and acetylated.	HRGC/LRMS
Polybrominated Diphenyl Ethers	Samples were solvent extracted and cleaned up on a series of chromatographic columns which may include silica, Florisil, alumina and gel permeation	HRGC/HRMS
Acid Extractable Herbicides	Extract was solvent exchanged and derivatized with trimethylsilyldiazomethane.	Capillary Column GC/MS

Table 3 (cont'd): Extract clean-up and analytical methods for XAD-2 resin samples.

Parameters	Extract Clean-up	Analytical Method
Carbamates	Extract underwent HPLC separation using a C-18 reversed phase column. Carbamates are hydrolyzed and then derivatized with OPA and Thiofluor.	Fluorescence Spectrometry
Organophosphate Pesticides Organonitrogen Pesticides	Extract was solvent exchanged to acetone.	Capillary Column GC/MS

HRGC – High Resolution Gas Chromatography

GC/ECD – Gas Chromatography with Electron Capture Detection

GC/MS – Gas Chromatography with Mass Spectrometric detection

LRMS – Low Resolution Mass Spectrometry

HRMS – High Resolution Mass Spectrometry

2.7 Tissue Contaminants

At each site 26 fish and 24 crayfish were dissected. Epaxial muscle tissue was removed from each fish and abdominal muscle tissue was removed from each crayfish. In fall 2001, crayfish hepatopancreas tissue was removed as well. Muscle tissues from each fish were composited and homogenized into one tissue sample per site. The same was done with the abdominal muscle tissues and hepatopancreas tissues from each crayfish. Each homogenized tissue sample was weighed and the amounts required for trace metal and trace organic analyses were packaged and set aside. If extra tissue remained it was submitted as a blind duplicate. Tissues were analyzed for a suite of metals by the National Laboratory for Environmental Testing (NLET), Burlington, ON. Methods are described in Table 4. For analytical quality assurance three fish tissue duplicates were submitted in fall 1999 and two in spring 2000. Crayfish tissue duplicates were not possible as analyses required all of the tissue collected.

Trace organic contaminant analyses were conducted by AXYS Analytical Services Ltd., Sidney, B.C. See Table 2 for complete list of compounds analyzed. A subsample of each tissue sample was sent to ASL Environmental, Vancouver, B.C. for organophosphate pesticide, organonitrogen pesticide, acidic herbicide, and carbamate analyses.

As stated in the water quality section, AXYS and ASL Environmental employ the batch method for quality assurance and control. Each batch progressed from sample workup through instrumentation as a unit, and on to data interpretation and final reports. Each batch included a procedural blank, a spiked matrix and surrogate standard recoveries. All batches also included at least one duplicate tissue analysis in which a sample was subsampled at the lab and each portion extracted and analyzed separately. Agreement within each set of duplicates was acceptable and generally satisfied the AXYS criterion of +/- (20% + method detection limit). Some cutthroat trout samples were also split in the field and submitted as blind duplicates. For comparison, lab duplicate and field duplicate results are presented with the regular sample data. Overall, the procedural blanks demonstrated non-detectable or low background levels of the target compounds. All concentrations reported from AXYS were corrected based on the percent recovery of surrogate standard. The data were not blank corrected. Procedural blank, spiked matrix and surrogate recovery data can be found in the data tables under analytical quality assurance and control and should be considered when reviewing all results.

Immediately prior to analysis, tissue samples, stored at -20°C, were thawed, stirred thoroughly and subsampled for analysis. A separate subsample was taken for each analysis (see Table 4 for extraction procedures and analytical methods) and one for backup. A portion of the chlorinated organics extract was used for lipid determination.

Table 4: Extraction procedures and analytical methods for tissue samples.

Parameters	Extraction Procedures	Analytical Method
Ag As Ba Cd Co Cr Cu Ga La Li Mo Mn Ni Pb Rb Se Sr Sb Tl U V Zn	Samples microwave acid-digested for complete extraction.	Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)
Hg	Samples microwave acid-digested for complete extraction.	Cold-Vapour Atomic Absorption Spectrometry (CVAAS)
PCB Congeners PCB Aroclors Chlorobenzenes Non-polar Chlorinated Pesticides Moderately polar Chlorinated Pesticides	Samples were soxhlet extracted with dichloromethane. Final extracts were cleaned up and fractionated on a Florisil column.	HRGC/LRMS or HRGC/HRMS
Toxaphene	Samples were soxhlet extracted with dichloromethane. Final extracts were cleaned up and fractionated on a Florisil column.	Electron Capture Negative Ionization (ECNI) GC/MS
Most polar Chlorinated Pesticides	Samples were soxhlet extracted with dichloromethane. Final extracts were cleaned up and fractionated on a Florisil column.	GC/ECD or HRGC/HRMS
Polycyclic Aromatic Hydrocarbons	Samples were extracted by base digestion followed by solvent extraction. Extract cleaned up on a silica gel column.	HRGC/LRMS
Polybrominated Diphenyl Ethers	Samples were solvent extracted and cleaned up on a series of chromatographic columns which may include silica, Florisil, alumina and gel permeation columns.	HRGC/HRMS
Acid Extractable Herbicides	Samples were dried with anhydrous sodium sulphate and soxhlet extracted with dichloromethane. Extract was cleaned up using C-18 reversed phase chromatography.	Capillary Column GC/MS
Carbamates	Samples were dried with anhydrous sodium sulphate and soxhlet extracted with dichloromethane. Extract underwent HPLC separation using a C-18 reversed phase column. Carbamates are hydrolyzed and then derivatized with OPA and Thiofluor.	Fluorescence Spectrometry

Table 4 (cont'd): Extraction procedures and analytical methods for tissue samples.

Parameters	Extraction Procedures	Analytical Method
Organophosphate Pesticides Organonitrogen Pesticides	Samples were dried with anhydrous sodium sulphate and soxhlet extracted with dichloromethane. Extract was cleaned up using C-18 reversed phase chromatography	Capillary Column GC/MS
HRGC – High Resolution Gas Chromatography GC/ECD – Gas Chromatography with Electron Capture Detection GC/MS – Gas Chromatography with Mass Spectrometric detection		LRMS – Low Resolution Mass Spectrometry HRMS – High Resolution Mass Spectrometry

2.8 Biological Indicators

2.8.1 Histological Assessment

After the health assessment was performed on the internal organs of the trout, the head kidney, spleen, hindgut, gill and a portion of the liver (if it was large enough) were extracted, preserved in Davidson's solution, and then sent to Dawna Brand, Department of Biology, University of Victoria, Victoria, B.C. for histological analysis. Fish tissues were examined for irregularities, sex identification and interrenal cell nuclear diameter in the head kidney. Large nuclear diameters can indicate elevated environmental stress (Brand et al., 2001). Similarly, a portion of each crayfish hepatopancreas was preserved in Bouin's solution for histological analysis. This tissue was examined for gonad maturation, nuclear diameter and an increase in the size and abundance of storage vesicles (vacuolation) present in the R-cells. Increased vacuolation has been associated with exposure to toxic pollutants (Brand et al., 2001). The preserved tissues were mounted, sectioned and stained with hematoxylin and eosin as described by Brand et al. (2001). Alterations in interrenal cell nuclear diameters and R-cell vacuolation were measured using a computer program for video microscopy and measurements. Twenty cells were counted in one section from each of the crayfish.

Histological indicators were not measured in fall 2001. When trout or crayfish tissues were large enough they were split and sent as blind duplicates for a QA on lab precision. Six cutthroat trout tissue duplicates were submitted in spring 2000 and 15 in fall 2000. Due to the small size of crayfish hepatopancreas, only two tissue duplicates were submitted in spring 2000.

2.8.2 Mixed Function Oxidase (MFO) System

Each trout liver and crayfish hepatopancreas was immediately removed and rinsed with 0.1M KCl and frozen in liquid nitrogen. The larger tissues were split and sent in as blind duplicates. Glutathione-S-transferase (GST) activity, EROD activity and P450 concentrations were measured by Christopher J. Kennedy, Department of Biological Sciences, Simon Fraser University, Burnaby, B.C. according to methods described in Kennedy et al. (1991) and Kennedy (1994). The MFO system is responsible for the oxidation of many endogenous compounds (e.g., steroids, vitamins and fatty acids), but it also catalyzes the first step in the detoxification of exogenous compounds (e.g., pesticides and polycyclic

aromatic hydrocarbons) (Kennedy et al., 1991). Trout liver duplicates were submitted in three of the four exposures (spring 2000, fall 2000 and fall 2001), numbering 26 in total. Three crayfish hepatopancreas duplicates were also submitted.

2.8.3 Hepatopancreas Indicators of Exposure

In fall 2000 and fall 2001, a portion of the crayfish hepatopancreas was placed into a cryovial and then into liquid nitrogen. Tissue samples from each site were homogenized and then sent to François Gagné, River Ecosystems Research, Centre Saint-Laurent, Environment Canada, Montreal, Quebec for analysis of metallothionein (MT) proteins, lipid peroxidation, DNA strand breaks and labile zinc. It is generally admitted that these biomarkers respond to trace metal and/or organic contaminant exposure (de Lafontaine et al., 2000). The levels of MT-like proteins were measured by the silver saturation assay (Gagné & Blaise, 1993; de Lafontaine et al., 2000), lipid peroxide breakdown was evaluated with the thiobarbituric method (Wills, 1987; de Lafontaine et al., 2000), DNA strand breaks were quantified using an alkaline precipitation assay (Gagné & Blaise, 1995; de Lafontaine et al. 2000) and labile zinc levels were determined by fluorescence using a (methoxy-quinoyl) toluensulfonamide (TSQ) probe (Reyes et al., 1994; Gagné et al., 2002). Due to small tissue size, replicates were not possible.

2.9 Concurrent Auxiliary Studies

2.9.1 Egg/Alevin Survival

In fall 2000 and fall 2001, eight baskets each containing approximately 100 rainbow trout eggs were placed in each exposure facility. To ensure constant flow of stream water over the eggs, the overflow from the trough was directed to each of the baskets using 5 mm Tygon® tubing. Every day the baskets were monitored for dead eggs by the appearance of a white colour. The dead eggs were removed from the baskets and their numbers recorded. The eggs were also monitored each day for the number of hatched alevins. In fall 2001, alevins were collected every two days using a predetermined sampling schedule. The alevins were immediately placed into RNA lysis solution and then sent to Joy Bruno, Environmental Toxicology, Pacific Environmental Science Center, Environment Canada, North Vancouver, B.C. for analysis of gene expression/regulation. Analysis was conducted according to methods described in Booth et al. (2002).

2.9.2 Oxygen Enhancement

In fall 2001, oxygen was added to one of the troughs inside the d/s Urban exposure facility. The oxygen was added at a rate so as to maintain a minimum of 80% saturation in the trough, which was similar to oxygen levels at the other exposure sites. This provided 13 trout and 12 crayfish with approximately twice the amount of oxygen as the organisms receiving ambient stream water from the other trough at this site. The same indicators were measured on these organisms.

2.9.3 Water Quality Gradient in Yorkson Creek

In fall 2001, four sites upstream of the study location on Yorkson Creek (Figure 6) were monitored weekly for eight weeks to investigate the gradient of water quality in this small stream. These sites were monitored for temperature, dissolved oxygen, water chemistry, nutrients, major ions, bacteriological parameters and trace metals. A sampling device that secures several water sample bottles was used to collect the samples by dropping the device into the stream to fill the bottles simultaneously.

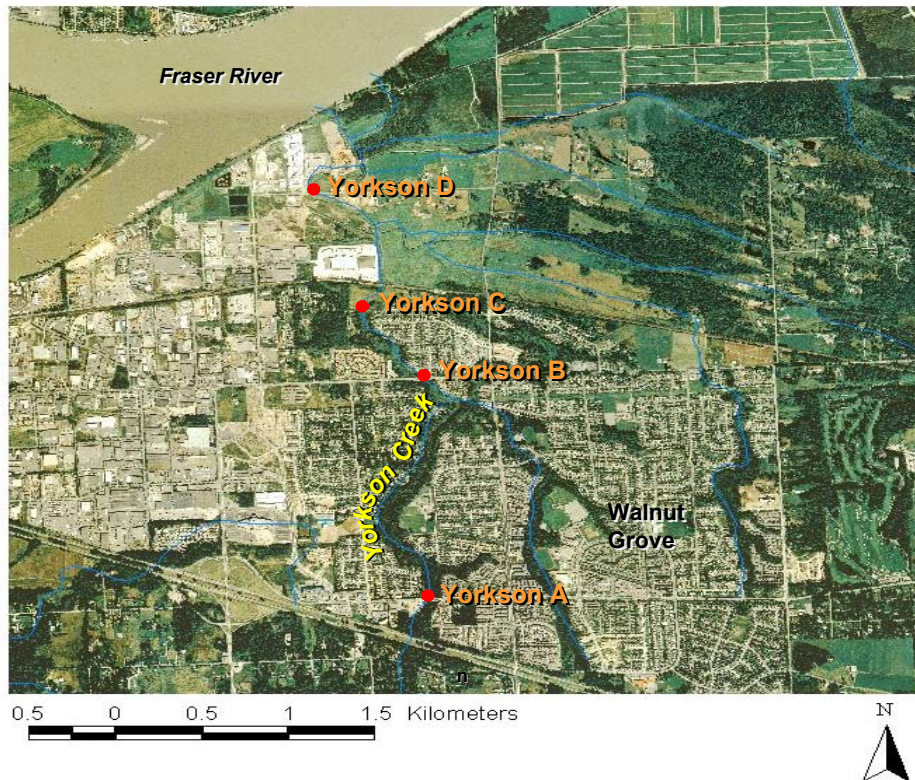


Figure 6. Orthoimagery map (1999, 0.5 m) of the Yorkson Creek watershed and the four sampling locations, Langley, British Columbia.

2.10 Data Reporting

Tables in the data section are divided into three chapters: the Agricultural Study, the Urban Study and Analytical Quality Assurance and Control. Within each chapter, the report is organized into three sections: water quality, tissue contaminants and biological indicators, each of which is further divided into several smaller sections. Three auxiliary studies are also included in this data report. Egg/alevin survival is presented in both study chapters. Oxygen enhancement and ambient water quality gradient in Yorkson Creek are only relevant to the urban study chapter.

No formal statistical analysis is presented in this report but due to the large sample size of several parameters (water chemistry, nutrients, trace metals, fish growth, MFO, etc.), some tables have statistical summaries (mean, SD, min. and max.). All data results, including individual samples not presented in summary tables, are available in the Microsoft Access database on the accompanying CD.

Analysis and interpretation of data from this report can be found in the government publication Sekela et al. (in prep.).

3.0 References

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4.0 Data Tables - Agricultural Study

4.1 Water Quality

4.1.1 Water Chemistry

Table 5: Summary of daily temperature and dissolved oxygen (DO) levels in Elk Creek during each exposure period.

Exposure Period	Site	Statistic	Temperature (°C)	DO (% saturation)	DO (mg/L)
Fall 1999	Ref	mean	6.89	100.93	-
		(SD)	1.41	8.16	-
		min	4.4	81.4	-
		max	9.4	125.6	-
	mid Ag	mean	7.75	109.10	-
		(SD)	1.26	8.44	-
		min	5.6	86.5	-
		max	10.8	125.0	-
	d/s Ag	mean	8.71	81.43	-
		(SD)	1.29	7.17	-
		min	5.9	57.3	-
		max	11.3	97.8	-
Spring 2000	Ref	mean	6.80	100.39	12.31
		(SD)	0.87	13.67	1.44
		min	5.2	82.8	10.4
		max	8.9	131.4	16.0
	mid Ag	mean	7.87	94.54	12.01
		(SD)	0.88	14.78	0.91
		min	5.6	67.3	10.6
		max	10.0	119.3	14.2
	d/s Ag	mean	10.03	91.36	10.45
		(SD)	1.17	7.14	0.72
		min	6.4	68.0	8.8
		max	13.0	104.6	11.9
Fall 2000	Ref	mean	6.53	107.14	13.64
		(SD)	1.66	4.82	0.98
		min	3.6	95.5	11.3
		max	9.2	111.3	14.9
	mid Ag	mean	7.21	97.87	11.85
		(SD)	1.97	5.80	0.93
		min	3.5	79.4	9.6
		max	10.5	107.5	13.2
	d/s Ag	mean	8.14	71.80	8.47
		(SD)	2.13	15.07	1.92
		min	3.1	27.4	3.2
		max	11.4	94.5	12.0
Fall 2001	Ref	mean	6.49	97.02	11.92
		(SD)	1.47	3.85	0.57
		min	3.9	88.7	10.4
		max	9.1	104.8	13.1
	mid Ag	mean	7.55	93.24	11.23
		(SD)	1.57	6.39	0.66
		min	4.6	75.1	8.7
		max	12.0	115.4	12.7
	d/s Ag	mean	8.72	67.24	7.85
		(SD)	1.33	5.04	0.58
		min	6.5	55.5	6.3
		max	12.1	82.5	9.0
All exposures	Ref	mean	6.68	101.37	12.62
	mid Ag	mean	7.60	98.69	11.70
	d/s Ag	mean	8.90	77.96	8.92

NOTE: Sample size varies among site and exposure period for each parameter due to recalibration and repairs of YSI probes.

Seasonal mean below BC criteria for freshwater aquatic life (see Appendix A).

Table 6: Summary of water chemistry and major ion concentrations (mg/L) in Elk Creek during each exposure period.

Exposure Period	Site	Statistic	Alkalinity	Conductivity (μ S/cm)	pH (relative units)	Hardness (Ca + Mg)	Calcium (Ca)
Fall 1999	Ref	mean	62.56	180.6	7.753	86.38	30.96
		(SD)	20.39	58.3	0.251	30.78	11.01
		min	21.9	58	7.29	25.0	8.9
		max	98.0	277	8.20	139.0	49.8
	mid Ag	mean	70.05	212.9	7.592	100.28	35.58
		(SD)	18.66	48.0	0.314	26.75	9.56
		min	28.8	90	7.12	36.9	12.9
		max	100.0	284	8.13	141.0	50.1
	d/s Ag	mean	98.70	267.0	7.554	126.26	41.05
		(SD)	26.60	50.8	0.213	30.99	9.79
		min	43.0	137	7.17	53.9	17.6
		max	138.0	330	7.95	167.0	52.6
Spring 2000	Ref	mean	44.30	131.2	7.675	58.57	21.01
		(SD)	7.34	23.7	0.179	10.60	3.80
		min	30.7	87	7.08	39.7	14.3
		max	56.6	168	7.92	74.9	26.8
	mid Ag	mean	56.54	169.6	7.664	76.42	27.12
		(SD)	7.68	23.3	0.189	11.34	4.04
		min	41.8	127	7.15	56.1	20.0
		max	68.2	207	7.94	93.3	33.1
	d/s Ag	mean	93.40	244.3	7.753	114.57	37.64
		(SD)	10.37	27.6	0.210	13.19	4.32
		min	59.9	171	7.27	73.0	24.0
		max	107.0	282	8.09	129.0	42.2
Fall 2000	Ref	mean	77.45	216.5	7.813	108.27	38.50
		(SD)	14.38	40.5	0.308	21.75	7.68
		min	33.4	89	7.01	43.1	15.4
		max	93.1	258	8.17	134.0	47.6
	mid Ag	mean	82.92	240.6	7.659	118.35	41.73
		(SD)	14.17	37.4	0.309	19.89	6.99
		min	37.2	109	6.86	52.1	18.5
		max	96.2	273	8.05	139.0	49.2
	d/s Ag	mean	120.56	304.4	7.750	152.80	48.79
		(SD)	17.71	31.0	0.261	18.53	5.50
		min	62.2	179	7.10	85.0	28.7
		max	137.0	332	8.13	169.8	54.2
Fall 2001	Ref	mean	65.32	189.5	7.808	86.28	30.77
		(SD)	23.98	63.8	0.196	32.33	11.47
		min	16.1	69	7.30	34.8	12.6
		max	108.0	308	8.13	154.2	55.0
	mid Ag	mean	69.70	216.8	7.662	97.88	34.58
		(SD)	18.73	50.3	0.301	27.48	9.89
		min	33.0	100	7.02	43.5	15.2
		max	108.0	311	8.19	154.6	55.0
	d/s Ag	mean	103.34	277.9	7.711	126.42	40.86
		(SD)	25.34	44.1	0.277	26.24	8.75
		min	50.4	161	7.10	64.6	19.9
		max	144.0	341	8.10	172.5	55.2
All exposures	Ref	mean	62.41	179.5	7.762	84.88	30.31
	mid Ag	mean	69.80	210.0	7.644	98.23	34.75
	d/s Ag	mean	104.00	273.4	7.692	130.01	42.09
Detection limit (all exposures)			0.5	2	0.01	0.4	0.1

NOTE: Sample size (n) per site per exposure period is 31 except in Fall 1999 (n=28).

Table 6 (cont'd): Summary of water chemistry and major ion concentrations (mg/L) in Elk Creek during each exposure period.

Exposure Period	Site	Statistic	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Silicon (Si)
Fall 1999	Ref	mean	2.23	0.39	2.20	3.657
		(SD)	0.82	0.07	0.64	0.408
		min	0.7	0.3	0.9	2.82
		max	3.7	0.5	3.3	4.36
	mid Ag	mean	2.79	0.56	2.88	4.197
		(SD)	0.70	0.14	0.63	0.317
		min	1.1	0.4	1.2	3.31
		max	3.9	1.0	3.7	4.52
	d/s Ag	mean	5.79	2.37	3.75	6.185
		(SD)	1.62	0.88	0.65	0.812
		min	2.4	1.3	1.9	4.23
		max	8.6	4.9	4.4	7.28
Spring 2000	Ref	mean	1.48	0.23	1.68	3.142
		(SD)	0.27	0.05	0.24	0.237
		min	1.0	0.1	1.2	2.70
		max	1.9	0.3	2.0	3.51
	mid Ag	mean	2.12	0.32	2.29	3.569
		(SD)	0.32	0.08	0.30	0.244
		min	1.5	0.1	1.8	3.09
		max	2.6	0.5	2.8	4.06
	d/s Ag	mean	5.00	1.13	3.42	5.133
		(SD)	0.62	0.54	0.28	0.425
		min	3.1	0.7	2.7	3.82
		max	5.8	3.0	3.8	5.73
Fall 2000	Ref	mean	2.93	0.40	2.56	3.856
		(SD)	0.61	0.10	0.46	0.366
		min	1.1	0.2	1.3	2.58
		max	3.6	0.6	3.2	4.24
	mid Ag	mean	3.43	0.51	3.10	4.341
		(SD)	0.60	0.14	0.73	0.387
		min	1.4	0.2	0.3	2.89
		max	4.0	0.9	4.0	4.90
	d/s Ag	mean	7.52	1.84	4.30	6.992
		(SD)	1.19	0.63	0.48	0.748
		min	3.2	1.3	2.9	3.97
		max	8.6	4.2	5.0	7.70
Fall 2001	Ref	mean	2.30	0.31	2.34	3.437
		(SD)	0.91	0.09	0.68	0.483
		min	0.8	0.2	1.1	2.22
		max	4.2	0.5	3.7	4.33
	mid Ag	mean	2.81	0.52	2.96	3.819
		(SD)	0.69	0.34	0.51	0.451
		min	1.3	0.3	1.6	2.26
		max	4.3	2.2	3.9	4.57
	d/s Ag	mean	5.93	2.59	4.98	5.790
		(SD)	1.26	1.17	4.28	0.828
		min	3.0	1.3	2.9	3.28
		max	8.4	5.9	27.9	7.03
All exposures	Ref	mean	2.24	0.33	2.20	3.523
	mid Ag	mean	2.79	0.48	2.81	3.982
	d/s Ag	mean	6.06	1.98	4.11	6.025
Detection limit (all exposures)			0.1	0.1	0.1	0.05

NOTE: Sample size (n) per site per exposure period is 31 except in Fall 1999 (n=28).

4.1.2 Nutrients

Table 7: Summary of nutrient concentrations (mg/L) in Elk Creek during each exposure period.

Exposure Period	Site	Statistic	Ammonia	Nitrite	Nitrite and Nitrate	Total Nitrogen	Ortho - Phosphate	Total Phosphorus	Total Dissolved Phosphorus
Fall 1999	Ref	mean	0.0010	0.0027	0.3264	0.413	0.0013	0.0124	0.0056
		SD	0.0029	0.0029	0.0842	0.063	0.0015	0.0146	0.0024
		min	ND	ND	0.146	0.30	ND	0.004	ND
		max	0.013	0.009	0.489	0.52	0.008	0.083	0.011
	mid Ag	mean	0.0159	0.0037	0.4929	0.659	0.0032	0.0214	0.0101
		SD	0.0058	0.0028	0.1168	0.178	0.0037	0.0187	0.0053
		min	ND	ND	0.290	0.37	ND	0.007	ND
		max	0.031	0.010	0.837	1.10	0.018	0.079	0.028
	d/s Ag	mean	0.0875	0.0253	1.2017	1.695	0.0350	0.0758	0.0475
		SD	0.0528	0.0094	0.4436	0.702	0.0347	0.0541	0.0368
		min	0.022	ND	0.192	0.86	0.009	0.026	0.016
		max	0.227	0.051	2.730	3.90	0.142	0.216	0.135
Spring 2000	Ref	mean	0.0039	ND	0.2102	0.286	0.0005	0.0083	0.0039
		SD	0.0080	ND	0.0461	0.046	0.0009	0.0045	0.0023
		min	ND	ND	0.132	0.19	ND	ND	ND
		max	0.032	ND	0.294	0.41	0.004	0.023	0.007
	mid Ag	mean	0.0094	ND	0.3066	0.411	0.0010	0.0160	0.0055
		SD	0.0050	ND	0.0589	0.067	0.0012	0.0163	0.0026
		min	ND	ND	0.200	0.29	ND	0.003	ND
		max	0.020	ND	0.410	0.57	0.004	0.096	0.010
	d/s Ag	mean	0.0671	0.0109	0.6690	1.022	0.0154	0.0552	0.0252
		SD	0.0680	0.0040	0.1224	0.344	0.0222	0.0538	0.0282
		min	ND	ND	0.354	0.70	0.002	0.016	0.007
		max	0.319	0.020	1.010	2.13	0.108	0.243	0.130
Fall 2000	Ref	mean	0.0013	ND	0.3260	0.406	0.0008	0.0123	0.0076
		SD	0.0031	ND	0.0742	0.083	0.0018	0.0152	0.0017
		min	ND	ND	0.122	0.26	ND	0.004	0.003
		max	0.012	ND	0.418	0.59	0.010	0.093	0.011
	mid Ag	mean	0.0153	0.0007	0.4123	0.540	0.0016	0.0157	0.0096
		SD	0.0088	0.0015	0.1384	0.180	0.0013	0.0098	0.0025
		min	ND	ND	0.258	0.40	ND	0.006	0.004
		max	0.045	0.006	1.060	1.40	0.006	0.058	0.015
	d/s Ag	mean	0.0701	0.0182	1.0128	1.326	0.0130	0.0705	0.0262
		SD	0.0366	0.0053	0.4708	0.559	0.0088	0.0403	0.0107
		min	0.013	0.013	0.055	0.60	0.005	0.033	0.012
		max	0.180	0.032	3.000	3.70	0.048	0.228	0.061
Fall 2001	Ref	mean	0.0035	ND	0.2805	0.415	0.0005	0.0079	0.0015
		SD	0.0048	ND	0.0944	0.293	0.0008	0.0124	0.0018
		min	ND	ND	0.119	0.22	ND	ND	ND
		max	0.018	ND	0.473	1.90	0.002	0.056	0.006
	mid Ag	mean	0.0490	0.0016	0.5945	0.790	0.0143	0.0325	0.0189
		SD	0.1283	0.0020	0.2657	0.520	0.0499	0.0941	0.0575
		min	ND	ND	0.236	0.28	ND	0.004	ND
		max	0.710	0.009	1.160	2.90	0.277	0.530	0.320
	d/s Ag	mean	0.1564	0.0301	1.4447	1.788	0.0421	0.0964	0.0556
		SD	0.1784	0.0196	0.7519	0.960	0.0717	0.1206	0.0825
		min	0.020	0.006	0.507	0.62	0.009	0.031	0.009
		max	0.910	0.076*	2.940	4.30	0.376	0.640	0.430
All exposures	Ref	mean	0.0024	0.0007	0.2858	0.380	0.0008	0.0102	0.0047
	mid Ag	mean	0.0224	0.0020	0.4516	0.600	0.0050	0.0214	0.0110
	d/s Ag	mean	0.0953	0.0211	1.0821	1.458	0.0264	0.0745	0.0386
Detection limit (all exposures)			0.005	0.002	0.002	0.02	0.001	0.002	0.002

NOTE: Sample size (n) per site per exposure period is 31 except in Fall 1999 (n=28).

Exceeds guideline for freshwater aquatic life (see Appendix A).

* = Total number of exceedances is 3.

ND = Not detected. Considered a zero value for statistical calculations.

4.1.3 Bacteriological Parameters

Table 8: Summary of bacteriological counts (MPN/100mL) in Elk Creek during each exposure period.

Exposure Period	Site	Statistic	<i>E.coli</i>	Fecal Coliforms	Total Coliforms
Fall 1999	Ref	geometric mean	6	6	138
		min	0	0	2
		max	79	79	2400
	mid Ag	geometric mean	20	28	2575
		min	0	0	48
		max	330	330	54000
	d/s Ag	geometric mean	252	348	10269
		min	3	20	920
		max	5400	7000	110000
Spring 2000	Ref	geometric mean	1	2	34
		min	0	0	0
		max	33	33	920
	mid Ag	geometric mean	11	18	661
		min	0	0	24
		max	920	4800	35000
	d/s Ag	geometric mean	273	511	8543
		min	17	33	720
		max	3500	160000	350000
Fall 2000	Ref	geometric mean	3	4	85
		min	0	0	2
		max	79	79	2200
	mid Ag	geometric mean	27	50	1794
		min	2	5	220
		max	540	2400	35000
	d/s Ag	geometric mean	158	319	4754
		min	27	49	350
		max	7000	16000	540000
Fall 2001	Ref	geometric mean	2	2	10
		min	0	0	0
		max	45	45	490
	mid Ag	geometric mean	42	54	197
		min	2	3	7
		max	5000	5600	40000
	d/s Ag	geometric mean	213	257	835
		min	0	2	38
		max	11000	33000	49000
All exposures	Ref	mean	3.0	3.5	66.8
	mid Ag	mean	25.0	37.5	1306.8
	d/s Ag	mean	224.0	358.8	6100.3

NOTE: Sample size (n) per site per exposure period is 31 except in Fall 1999 (n=28) and in Fall 2001 at our d/s Ag site (n=26). Five out of 31 samples taken at d/s Ag were reported as too numerable to count due to different analytical methods.

Exceeds guideline for irrigation (see Appendix A).
Exceeds BC criteria for recreation (see Appendix A).
Exceeds guideline for irrigation and recreation (see Appendix A).

4.1.4 Trace Metals

Table 9: Summary of metal concentrations (mg/L) and guideline exceedances in Elk Creek during each exposure period. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Statistic	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)
Fall 1999	Ref	mean	0.1781	0.00010	0.01977	ND	0.00005	0.00012	0.00015
		SD	0.4307	0.00003	0.00473	ND	0.00016	0.00040	0.00032
		min	0.017	ND	0.0138	ND	ND	ND	ND
		max	2.280	0.0002	0.0287	ND	0.0008	0.0021	0.0017
		# exceedances	6	0	0	0	1	1	0
	mid Ag	mean	0.2214	0.00016	0.02404	ND	0.00011	0.00020	0.00069
		SD	0.2724	0.00005	0.00259	ND	0.00012	0.00028	0.00044
		min	0.024	0.0001	0.0188	ND	ND	ND	0.0001
		max	1.340	0.0002	0.0292	ND	0.0005	0.0012	0.0015
		# exceedances	19	0	0	0	1	0	0
	d/s Ag	mean	0.2195	0.00036	0.03895	0.002	0.00013	0.00039	0.00054
		SD	0.2672	0.00010	0.00440	0.011	0.00010	0.00047	0.00027
		min	0.033	0.0002	0.0283	ND	ND	ND	0.0002
		max	1.330	0.0006	0.0451	0.06	0.0005	0.0019	0.0012
		# exceedances	15	0	0	0	0	0	0
Spring 2000	Ref	mean	0.1133	0.00005	0.01471	ND	0.00001	0.00023	0.00009
		SD	0.0813	0.00006	0.00181	ND	0.00003	0.00020	0.00007
		min	0.038	ND	0.0124	ND	ND	ND	ND
		max	0.351	0.0002	0.0200	ND	0.0001	0.0006	0.0002
		# exceedances	13	0	0	0	0	0	0
	mid Ag	mean	0.1726	0.00007	0.01893	ND	0.00004	0.00035	0.00031
		SD	0.0897	0.00005	0.00200	ND	0.00005	0.00056	0.00018
		min	0.069	ND	0.0154	ND	ND	ND	ND
		max	0.450	0.0002	0.0230	ND	0.0001	0.0029	0.0008
		# exceedances	25	0	0	0	0	1	0
	d/s Ag	mean	0.1660	0.00019	0.03519	ND	0.00009	0.00051	0.00045
		SD	0.2064	0.00009	0.00361	ND	0.00007	0.00035	0.00029
		min	0.048	ND	0.0286	ND	ND	ND	0.0001
		max	0.900	0.0004	0.0461	ND	0.0003	0.0015	0.0015
		# exceedances	11	0	0	0	0	0	0
Fall 2000	Ref	mean	0.0435	0.00007	0.02145	ND	0.00001	0.00004	0.00005
		SD	0.0897	0.00005	0.00318	ND	0.00002	0.00011	0.00007
		min	0.013	ND	0.0128	ND	ND	ND	ND
		max	0.497	0.0002	0.0280	ND	0.0001	0.0004	0.0003
		# exceedances	2	0	0	0	0	0	0
	mid Ag	mean	0.1018	0.00010	0.02555	ND	0.00003	0.00010	0.00042
		SD	0.1870	0.00005	0.00442	ND	0.00005	0.00020	0.00041
		min	0.020	ND	0.0199	ND	ND	ND	ND
		max	0.994	0.0002	0.0454	ND	0.0002	0.0010	0.0018
		# exceedances	4	0	0	0	0	0	0
	d/s Ag	mean	0.2121	0.00027	0.04404	0.004	0.00012	0.00043	0.00050
		SD	0.3646	0.00007	0.00479	0.015	0.00012	0.00050	0.00042
		min	0.019	0.0001	0.0263	ND	ND	ND	ND
		max	2.070	0.0004	0.0516	0.07	0.0006	0.0027	0.0022
		# exceedances	17	0	0	0	0	1	0
Fall 2001	Ref	mean	0.0998	0.00007	0.01840	ND	0.00001	0.00363	0.00007
		SD	0.1999	0.00005	0.00524	ND	0.00004	0.01026	0.00013
		min	0.014	ND	0.0122	ND	ND	ND	ND
		max	1.120	0.0001	0.0314	ND	0.0002	0.0508	0.0007
		# exceedances	5	0	0	0	0	6	0
	mid Ag	mean	0.1823	0.00006	0.02296	ND	0.00006	0.00067	0.00055
		SD	0.3691	0.00006	0.00310	ND	0.00008	0.00089	0.00044
		min	0.029	ND	0.0182	ND	ND	ND	ND
		max	2.130	0.0002	0.0313	ND	0.0004	0.0033	0.0020
		# exceedances	17	0	0	0	1	3	0
	d/s Ag	mean	0.1835	0.00029	0.04043	ND	0.00007	0.00072	0.00049
		SD	0.2480	0.00008	0.00299	ND	0.00007	0.00072	0.00029
		min	0.038	0.0001	0.0349	ND	ND	ND	0.0002
		max	1.120	0.0005	0.0455	ND	0.0003	0.0021	0.0014
		# exceedances	12	0	0	0	0	1	0
All exposures	Ref	mean	0.1087	0.00007	0.01858	ND	0.00002	0.00100	0.00009
	mid Ag	mean	0.1695	0.00010	0.02287	ND	0.00006	0.00033	0.00049
	d/s Ag	mean	0.1952	0.00028	0.03965	0.001	0.00010	0.00051	0.00049
Detection limit (all exposures)			0.002	0.0001	0.0002	0.05	0.0001	0.0002	0.0001

NOTE: Sample size (n) per site per exposure period is 31 except in Fall 1999 (n=28).

Mean exceeds guideline for freshwater aquatic life (see Appendix A).

ND = Not detected. Considered a zero value for statistical calculations.

Table 9 (cont'd): Summary of metal concentrations (mg/L) and guideline exceedances in Elk Creek during each exposure period. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Statistic	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)
Fall 1999	Ref	mean	0.00057	0.27058	0.00016	0.00117	0.00871	0.0038	0.00093
		SD	0.00106	0.72615	0.00038	0.00043	0.01902	0.0048	0.00040
		min	ND	0.0178	ND	0.0007	0.0016	ND	0.0004
		max	0.0056	3.8500	0.0019	0.0029	0.1010	0.014	0.0017
		# exceedances	1	5	1	no guideline	0	0	0
	mid Ag	mean	0.00139	0.48236	0.00024	0.00146	0.03235	0.0043	0.00109
		SD	0.00140	0.42982	0.00033	0.00017	0.01061	0.0064	0.00036
		min	ND	0.1730	ND	0.0012	0.0200	ND	0.0004
		max	0.0061	2.2600	0.0012	0.0020	0.0639	0.024	0.0020
		# exceedances	6	18	1	no guideline	0	0	0
	d/s Ag	mean	0.00197	0.69932	0.00029	0.00135	0.10131	0.0043	0.00115
		SD	0.00165	0.41307	0.00034	0.00025	0.03150	0.0044	0.00030
		min	ND	0.3350	ND	0.0010	0.0502	ND	0.0001
		max	0.0060	2.3800	0.0012	0.0020	0.1600	0.013	0.0017
		# exceedances	10	28	1	no guideline	0	0	0
Spring 2000	Ref	mean	0.00044	0.14006	0.00005	0.00095	0.00524	0.0017	0.00067
		SD	0.00020	0.11264	0.00011	0.00014	0.00464	0.0030	0.00015
		min	0.0002	0.0429	ND	0.0007	0.0023	ND	0.0004
		max	0.0010	0.4930	0.0004	0.0014	0.0244	0.009	0.0009
		# exceedances	0	3	0	no guideline	0	0	0
	mid Ag	mean	0.00082	0.33742	0.00011	0.00132	0.01580	0.0015	0.00096
		SD	0.00048	0.14835	0.00018	0.00015	0.00584	0.0029	0.00017
		min	0.0004	0.1950	ND	0.0010	0.0091	ND	0.0007
		max	0.0023	0.7840	0.0006	0.0016	0.0334	0.009	0.0012
		# exceedances	2	15	0	no guideline	0	0	0
	d/s Ag	mean	0.00160	0.74294	0.00011	0.00136	0.11768	0.0022	0.00114
		SD	0.00186	0.50149	0.00019	0.00019	0.02357	0.0035	0.00015
		min	0.0004	0.4300	ND	0.0011	0.0845	ND	0.0008
		max	0.0084	2.8100	0.0005	0.0020	0.1860	0.009	0.0014
		# exceedances	5	31	0	no guideline	0	0	0
Fall 2000	Ref	mean	0.00014	0.05675	0.00007	0.00118	0.00377	0.0007	0.00112
		SD	0.00026	0.11666	0.00019	0.00050	0.00457	0.0033	0.00025
		min	ND	0.0183	ND	0.0003	0.0018	ND	0.0004
		max	0.0013	0.6530	0.0009	0.0021	0.0274	0.017	0.0015
		# exceedances	0	1	0	no guideline	0	0	0
	mid Ag	mean	0.00059	0.28829	0.00006	0.00138	0.03056	0.0006	0.00129
		SD	0.00070	0.26233	0.00012	0.00036	0.02526	0.0022	0.00021
		min	ND	0.1360	ND	0.0008	0.0125	ND	0.0007
		max	0.0033	1.5100	0.0004	0.0021	0.1490	0.010	0.0016
		# exceedances	2	7	0	no guideline	0	0	0
	d/s Ag	mean	0.00111	0.94584	0.00034	0.00126	0.14613	0.0004	0.00115
		SD	0.00144	0.89969	0.00068	0.00062	0.04758	0.0019	0.00026
		min	ND	0.1410	ND	ND	0.0152	ND	0.0001
		max	0.0071	5.5300	0.0030	0.0031	0.2670	0.010	0.0015
		# exceedances	3	30	1	no guideline	0	0	0
Fall 2001	Ref	mean	0.00052	0.12836	0.00003	0.00125	0.00592	0.0012	0.00118
		SD	0.00048	0.27585	0.00009	0.00045	0.00968	0.0025	0.00052
		min	ND	0.0224	ND	0.0008	0.0017	ND	0.0004
		max	0.0026	1.5500	0.0004	0.0024	0.0555	0.008	0.0026
		# exceedances	1	2	0	no guideline	0	0	0
	mid Ag	mean	0.00154	0.34155	0.00009	0.00156	0.02219	0.0005	0.00133
		SD	0.00238	0.61777	0.00028	0.00038	0.02093	0.0023	0.00040
		min	0.0002	0.1080	ND	0.0012	0.0086	ND	0.0006
		max	0.0137	3.6300	0.0014	0.0032	0.1300	0.012	0.0021
		# exceedances	4	5	1	no guideline	0	0	0
	d/s Ag	mean	0.00237	0.60987	0.00008	0.00158	0.08219	0.0009	0.00133
		SD	0.00257	0.36896	0.00020	0.00016	0.01329	0.0024	0.00033
		min	0.0003	0.3790	ND	0.0013	0.0623	ND	0.0009
		max	0.0134	2.0900	0.0009	0.0019	0.1140	0.008	0.0021
		# exceedances	9	31	0	no guideline	0	0	0
All exposures	Ref	mean	0.00042	0.14894	0.00008	0.00113	0.00591	0.0018	0.00098
	mid Ag	mean	0.00108	0.36240	0.00012	0.00143	0.02523	0.0017	0.00117
	d/s Ag	mean	0.00176	0.74949	0.00021	0.00139	0.11183	0.0019	0.00119
Detection limit (all exposures)			0.0002	0.0004	0.0002	0.0001	0.0001	0.005	0.0001

NOTE: Sample size (n) per site per exposure period is 31 except in Fall 1999 (n=28).

Mean exceeds guideline for freshwater aquatic life (see Appendix A).

ND = Not detected. Considered a zero value for statistical calculations.

Table 9 (cont'd): Summary of metal concentrations (mg/L) and guideline exceedances in Elk Creek during each exposure period. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Statistic	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Vanadium (V)	Zinc (Zn)
Fall 1999	Ref	mean	0.00022	0.00099	0.00009	0.23899	0.00041	0.00134
		SD	0.00044	0.00035	0.00011	0.09037	0.00091	0.00288
		min	ND	0.0003	ND	0.0708	0.0001	0.0002
		max	0.0023	0.0016	0.0005	0.4030	0.0049	0.0152
		# exceedances	0	15	5	no guideline	no guideline	0
	mid Ag	mean	0.00113	0.00123	0.00007	0.26862	0.00049	0.00445
		SD	0.00082	0.00023	0.00006	0.07664	0.00055	0.00334
		min	ND	0.0005	ND	0.0993	ND	0.0005
		max	0.0025	0.0015	0.0002	0.4010	0.0027	0.0130
		# exceedances	0	21	2	no guideline	no guideline	0
	d/s Ag	mean	0.00172	0.00084	0.00011	0.26629	0.00064	0.00574
		SD	0.00102	0.00024	0.00013	0.06061	0.00063	0.00432
		min	0.0005	0.0006	ND	0.1210	0.0001	0.0007
		max	0.0034	0.0015	0.0006	0.3450	0.0031	0.0161
		# exceedances	0	4	9	no guideline	no guideline	0
Spring 2000	Ref	mean	0.00011	0.00063	0.00003	0.16571	0.00033	0.00068
		SD	0.00015	0.00020	0.00008	0.03291	0.00020	0.00048
		min	ND	ND	ND	0.1070	0.0001	0.0002
		max	0.0005	0.0009	0.0004	0.2170	0.0009	0.0022
		# exceedances	0	0	1	no guideline	no guideline	0
	mid Ag	mean	0.00047	0.00089	0.00003	0.21155	0.00050	0.00180
		SD	0.00038	0.00022	0.00005	0.03438	0.00023	0.00111
		min	ND	ND	ND	0.1470	0.0002	0.0008
		max	0.0015	0.0012	0.0001	0.2610	0.0012	0.0049
		# exceedances	0	6	0	no guideline	no guideline	0
	d/s Ag	mean	0.00103	0.00070	0.00005	0.25652	0.00059	0.00333
		SD	0.00072	0.00006	0.00007	0.03137	0.00053	0.00338
		min	0.0005	0.0006	ND	0.1680	0.0003	0.0009
		max	0.0033	0.0008	0.0003	0.2950	0.0024	0.0151
		# exceedances	0	0	1	no guideline	no guideline	0
Fall 2000	Ref	mean	0.00008	0.00108	0.00001	0.28523	0.00021	0.00047
		SD	0.00017	0.00024	0.00002	0.06028	0.00021	0.00063
		min	ND	0.0004	ND	0.1120	ND	ND
		max	0.0006	0.0014	0.0001	0.3790	0.0012	0.0031
		# exceedances	0	20	0	no guideline	no guideline	0
	mid Ag	mean	0.00062	0.00122	0.00002	0.29897	0.00030	0.00236
		SD	0.00075	0.00021	0.00004	0.05276	0.00046	0.00251
		min	ND	0.0007	ND	0.1300	ND	0.0003
		max	0.0032	0.0019	0.0001	0.3680	0.0025	0.0100
		# exceedances	0	28	0	no guideline	no guideline	0
	d/s Ag	mean	0.00128	0.00071	0.00003	0.29523	0.00081	0.00414
		SD	0.00089	0.00022	0.00004	0.03266	0.00096	0.00449
		min	ND	0.0005	ND	0.1840	0.0002	0.0003
		max	0.0039	0.0014	0.0001	0.3470	0.0056	0.0246
		# exceedances	0	4	0	no guideline	no guideline	0
Fall 2001	Ref	mean	0.00008	0.00094	0.00003	0.24883	0.00034	0.00064
		SD	0.00028	0.00035	0.00005	0.10625	0.00043	0.00121
		min	ND	0.0003	ND	0.0846	ND	ND
		max	0.0014	0.0016	0.0002	0.4730	0.0024	0.0067
		# exceedances	0	12	1	no guideline	no guideline	0
	mid Ag	mean	0.00100	0.00117	0.00005	0.26819	0.00055	0.00366
		SD	0.00084	0.00022	0.00007	0.08024	0.00094	0.00383
		min	ND	0.0005	ND	0.1030	0.0001	0.0003
		max	0.0032	0.0015	0.0002	0.4390	0.0055	0.0208
		# exceedances	0	23	3	no guideline	no guideline	0
	d/s Ag	mean	0.00159	0.00088	0.00007	0.27152	0.00067	0.00569
		SD	0.00104	0.00037	0.00007	0.04835	0.00063	0.00484
		min	0.0004	0.0005	ND	0.1320	0.0002	0.0008
		max	0.0040	0.0022	0.0002	0.3450	0.0032	0.0206
		# exceedances	0	6	3	no guideline	no guideline	0
All exposures	Ref	mean	0.00012	0.00091	0.00004	0.23469	0.00032	0.00078
	mid Ag	mean	0.00080	0.00113	0.00004	0.26183	0.00046	0.00307
	d/s Ag	mean	0.00140	0.00078	0.00006	0.27239	0.00068	0.00473
Detection limit (all exposures)			0.0002	0.0001	0.0001	0.0001	0.0001	0.0002

NOTE: Sample size (n) per site per exposure period is 31 except in Fall 1999 (n=28).

Mean exceeds guideline for freshwater aquatic life (see Appendix A).

ND = Not detected. Considered a zero value for statistical calculations.

4.1.5 Polychlorinated Biphenyls

4.1.5.1 PCB Aroclors

Table 10: Polychlorinated biphenyl (PCB) aroclor concentrations (ng/L) in Elk Creek during each exposure period.

PCB Aroclors	Fall 1999						Spring 2000					
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	0.031	0.002	0.0058	0.0033	0.03	0.0024	ND	0.0058	ND	0.0094	ND	0.0086
Aroclor 1254	0.011	0.0035	0.0056	0.0025	0.017	0.0028	ND	0.0088	ND	0.0095	ND	0.014
Aroclor 1260	ND	0.0042	ND	0.0042	ND	0.0043	ND	0.0057	ND	0.0093	ND	0.0069
Total PCB Aroclor concentration**	0.042		0.011		0.047		ND		ND		ND	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-99-ARO		WQ-99-ARO		WQ-99-ARO		WQ-00-ARO		WQ-00-ARO		WQ-00-ARO	

PCB Aroclors	Fall 2000						Fall 2001					
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	ND	0.0074	ND	0.0096	0.016	0.0085	ND	0.0441	ND	0.0346	ND	0.0148
Aroclor 1254	ND	0.01	ND	0.013	ND	0.013	ND	0.0330	ND	0.0765	ND	0.0465
Aroclor 1260	ND	0.0074	ND	0.0079	ND	0.0096	ND	0.0263	ND	0.0341	ND	0.0320
Total PCB Aroclor concentration**	ND		ND		0.016		ND		ND		ND	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-ARO		WQ-00-ARO		WQ-00-ARO		WQ-01-ARO		WQ-01-ARO		WQ-01-ARO	

PCB Aroclors	Mean of 4 exposure periods		
	Ref	mid Ag	d/s Ag
	Conc.	Conc.	Conc.
Aroclor 1242	0.00775	0.00145	0.01150
Aroclor 1254	0.00275	0.00140	0.00425
Aroclor 1260	ND	ND	ND
Total PCB Aroclor concentration**	0.01050	0.00285	0.01575
Corresponding Lab Blank & Spiked Matrix (see Water QA)	-	-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

4.1.5.2 PCB Congeners

Table 11: Polychlorinated biphenyl (PCB) congener concentrations (ng/L) in Elk Creek during each exposure period.

PCB Congeners	Fall 1999						Spring 2000					
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	0.0018	0.00088	ND	0.00098	0.0022	0.00081	ND	0.011	ND	0.013	ND	0.015
15	ND	0.00250	ND	0.00280	0.0032	0.00235	ND	0.011	ND	0.013	ND	0.015
19	0.00018	0.00015	ND	0.00025	0.00029	0.00018	ND	0.00029	ND	0.00059	ND	0.00054
18	0.0025	0.00015	0.00041*	0.00025	0.0025	0.00019	ND	0.00029	0.0009*	0.00059	0.0008*	0.00054
17	0.0011	0.00016	ND	0.00025	0.001	0.00018	ND	0.00029	ND	0.00059	ND	0.00054
24/27	0.00016	0.00016	ND	0.00025	0.00022	0.00019	ND	0.00029	ND	0.00059	ND	0.00054
16/32	0.0019	0.00015	0.00042	0.00025	0.0022	0.00019	ND	0.00025	0.00082	0.0004	0.00037	0.00034
26	0.00036	0.00011	ND	0.00017	0.00035	0.00013	ND	0.00025	ND	0.0004	ND	0.00034
25	0.0002	0.00011	ND	0.00017	0.00018	0.00013	ND	0.00025	ND	0.0004	ND	0.00034
31/28	0.0045	0.00010	0.00097*	0.00017	0.004	0.00013	0.00022	0.00018	0.00177*	0.0004	0.00142	0.00034
33/20/21	0.0016	0.00010	0.00046*	0.00017	0.0016	0.00013	ND	0.00025	0.00065	0.0004	0.00047*	0.00034
22	0.001	0.00010	ND	0.00017	0.00097	0.00013	ND	0.00025	0.00044*	0.0004	0.00045	0.00034
45	0.00035*	0.00015	ND	0.00017	0.00021*	0.00010	ND	0.0002	ND	0.00029	ND	0.00016
46	0.00015*	0.00015	ND	0.00017	0.00011*	0.00011	ND	0.0002	ND	0.00029	ND	0.00016
52/73	0.0014	0.00015	0.00073*	0.00017	0.0018	0.00010	0.00039*	0.0002	0.001	0.00029	0.00062	0.00016
49/43	0.0011	0.00016	0.0002*	0.00018	0.0011	0.00012	ND	0.00021	ND	0.0003	0.00051	0.00016
47/48 /75	0.001	0.00017	0.00048*	0.00018	0.00079	0.00012	ND	0.0002	ND	0.00029	ND	0.00016
44	0.0011*	0.00016	0.00037	0.00018	0.0016	0.00012	0.00029*	0.00022	0.00041*	0.00031	0.00061	0.00017
42/59	0.00046	0.00016	ND	0.00018	0.00056	0.00011	ND	0.00022	ND	0.00031	ND	0.00017
41/71/64/68	0.0016	0.00016	0.00056	0.00018	0.0016	0.00011	0.00017*	0.00015	0.00026	0.00022	0.00089*	0.00012
40	0.00032*	0.00024	ND	0.00026	0.00054	0.00016	ND	0.00015	ND	0.00022	ND	0.00012
74/61	0.00096*	0.00024	0.00056	0.00026	0.0013	0.00017	ND	0.00015	ND	0.00022	0.00038	0.00012
70/76	0.0025	0.00023	0.00072*	0.00026	0.003	0.00016	ND	0.00015	ND	0.00022	ND	0.00012
66/80	0.00075*	0.00011	0.00036	0.00012	0.0011	0.00008	0.00018*	0.00015	0.00039*	0.00022	0.00056	0.00012
56/60	0.0011	0.00011	0.00024	0.00012	0.001	0.00007	0.00024*	0.00011	0.00057	0.00021	0.00036	0.00021
95/93	0.00066	0.00010	0.00042	0.00007	0.0013	0.00008	ND	0.00023	ND	0.00029	0.00067*	0.00029
91	0.00014*	0.00011	ND	0.00007	0.0002	0.00008	ND	0.00023	ND	0.00029	ND	0.00029
84/92	0.0003*	0.00011	0.00023*	0.00007	0.00076	0.00008	ND	0.00025	ND	0.00027	ND	0.00039
89/90/101	0.00072	0.00010	0.00063	0.00007	0.0017	0.00008	ND	0.00025	0.00057	0.00027	0.0015	0.00039
99	0.00038*	0.00011	0.00018*	0.00007	0.00053*	0.00008	ND	0.00025	ND	0.00027	0.00071	0.00039
83/108	ND	0.00014	ND	0.00010	0.00012	0.00010	ND	0.00022	ND	0.00024	ND	0.00035
97/86	0.00027*	0.00014	0.00016*	0.00010	0.0005	0.00011	ND	0.00022	ND	0.00024	0.00037*	0.00035
87/115/116	0.00054	0.00014	0.00026	0.00010	0.00076	0.00011	ND	0.00022	ND	0.00024	0.00048	0.00035
85/120	0.00037*	0.00014	ND	0.00010	0.00028*	0.00011	ND	0.00022	0.00028*	0.00024	ND	0.00035
110	0.0015	0.00013	0.00089	0.00010	0.0024	0.00011	0.00028	0.00022	0.00032	0.00024	0.0019	0.00035
107/109	ND	0.00014	ND	0.00010	ND	0.00011	ND	0.00037	ND	0.00045	ND	0.00046
106/118	0.0007	0.00009	0.00035*	0.00006	0.001	0.00007	ND	0.00025	0.00043	0.0003	0.002	0.00031
114	ND	0.00014	ND	0.00010	ND	0.00011	ND	0.00037	ND	0.00045	ND	0.00046
105/127	0.00027	0.00010	0.00018*	0.00006	0.0005	0.00008	ND	0.00025	ND	0.00029	0.00056	0.00034
136	0.00026	0.00016	ND	0.00025	0.00048	0.00013	ND	0.00015	ND	0.00021	ND	0.00021
151	0.00038	0.00016	ND	0.00025	0.0006*	0.00013	ND	0.00026	ND	0.00027	0.0003*	0.00026
144/135	0.0002*	0.00016	ND	0.00025	0.0005	0.00013	ND	0.00026	ND	0.00027	ND	0.00026
149/139	0.0013	0.00016	0.00071	0.00025	0.0022	0.00013	0.00044	0.00026	0.00034	0.00027	0.0008*	0.00026
134/143	ND	0.00016	ND	0.00025	ND	0.00013	ND	0.00026	ND	0.00027	ND	0.00026
131/142	ND	0.00016	ND	0.00025	ND	0.00013	ND	0.00026	ND	0.00027	ND	0.00026

Table 11 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/L) in Elk Creek during each exposure period.

PCB Congeners	Fall 1999						Spring 2000					
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
146	ND	0.00009	ND	0.00014	0.00017*	0.00008	ND	0.00029	ND	0.00031	ND	0.00029
153	0.00094	0.00013	0.00052	0.00018	0.0015	0.00010	0.00032*	0.00029	0.00064*	0.00031	0.00086*	0.00029
141	0.00028	0.00017	ND	0.00024	0.00033*	0.00014	ND	0.00038	ND	0.00039	ND	0.00038
130	ND	0.00016	ND	0.00022	ND	0.00013	ND	0.00037	ND	0.00039	ND	0.00037
137	ND	0.00016	ND	0.00022	ND	0.00013	ND	0.00037	ND	0.00039	ND	0.00037
138/163/164	0.00092	0.00016	0.00059	0.00022	0.0016	0.00013	ND	0.00037	0.00047*	0.00039	0.0011*	0.00037
158/160	ND	0.00016	ND	0.00022	0.00023*	0.00013	ND	0.00037	ND	0.00039	0.00062	0.00037
129	ND	0.00016	ND	0.00022	ND	0.00013	ND	0.00037	ND	0.00039	ND	0.00037
128	0.00019*	0.00019	ND	0.00027	0.00031*	0.00016	ND	0.00037	ND	0.00039	ND	0.00037
156	ND	0.00023	ND	0.00032	0.00023	0.00019	ND	0.00037	ND	0.00039	ND	0.00037
157	ND	0.00023	ND	0.00032	ND	0.00019	ND	0.00037	ND	0.00039	ND	0.00037
179	0.00025	0.00025	ND	0.00025	0.00029	0.00026	ND	0.00028	ND	0.00046	ND	0.00034
176	ND	0.00025	ND	0.00025	ND	0.00026	ND	0.00028	ND	0.00046	ND	0.00034
178	ND	0.00025	ND	0.00025	ND	0.00026	ND	0.00028	ND	0.00046	ND	0.00034
175	ND	0.00025	ND	0.00025	ND	0.00026	ND	0.00028	ND	0.00046	ND	0.00034
187/182	0.00055	0.00025	ND	0.00025	0.00084	0.00026	ND	0.00028	ND	0.00046	ND	0.00034
183	ND	0.00026	ND	0.00026	ND	0.00026	ND	0.00029	ND	0.00047	ND	0.00035
185	ND	0.00026	ND	0.00026	ND	0.00026	ND	0.00029	ND	0.00047	ND	0.00035
174/181	ND	0.00026	ND	0.00026	0.00052	0.00027	ND	0.00029	ND	0.00047	ND	0.00035
177	0.00028*	0.00026	ND	0.00026	ND	0.00026	ND	0.00029	ND	0.00047	ND	0.00035
171	ND	0.00031	ND	0.00031	ND	0.00032	ND	0.00026	ND	0.00042	ND	0.00031
172/192	ND	0.00026	ND	0.00026	ND	0.00027	ND	0.00026	ND	0.00042	ND	0.00031
180	0.0004*	0.00027	0.00038*	0.00027	0.0007	0.00027	ND	0.00026	ND	0.00042	ND	0.00031
193	ND	0.00026	ND	0.00026	ND	0.00027	ND	0.00026	ND	0.00042	ND	0.00031
191	ND	0.00026	ND	0.00026	ND	0.00027	ND	0.00026	ND	0.00042	ND	0.00031
170/190	ND	0.00034	ND	0.00034	ND	0.00035	ND	0.00031	ND	0.0005	ND	0.00037
189	ND	0.00034	ND	0.00034	ND	0.00035	ND	0.00031	ND	0.0005	ND	0.00037
201	ND	0.00016	ND	0.00019	ND	0.00021	ND	0.00032	ND	0.00044	ND	0.00036
197	ND	0.00024	ND	0.00028	ND	0.00031	ND	0.00032	ND	0.00044	ND	0.00036
198	ND	0.00024	ND	0.00028	ND	0.00031	ND	0.00032	ND	0.00044	ND	0.00036
199	ND	0.00024	ND	0.00028	0.00039*	0.00031	ND	0.00032	ND	0.00044	ND	0.00036
196/203	ND	0.00022	ND	0.00026	0.00041*	0.00029	ND	0.00032	ND	0.00044	ND	0.00036
195	ND	0.00022	ND	0.00026	ND	0.00029	ND	0.00049	ND	0.00079	ND	0.00054
194	ND	0.00019	ND	0.00022	ND	0.00025	ND	0.00049	ND	0.00079	ND	0.00054
205	ND	0.00019	ND	0.00022	ND	0.00025	ND	0.00049	ND	0.00079	ND	0.00054
208	ND	0.00009	ND	0.00009	ND	0.00009	ND	0.00027	ND	0.00052	ND	0.00028
207	ND	0.00009	ND	0.00009	ND	0.00009	ND	0.00027	ND	0.00052	ND	0.00028
206	ND	0.00009	ND	0.00009	ND	0.00009	ND	0.00027	ND	0.00052	ND	0.00028
209	0.0001	0.00010	ND	0.00009	ND	0.00009	ND	0.00028	ND	0.00073	0.00068	0.00036
Total PCB concentration**	0.0389		0.0120		0.0541		0.0011		0.0086		0.0186	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-99-PCB		WQ-99-PCB		WQ-99-PCB		WQ-00-PCB		WQ-00-PCB		WQ-00-PCB	

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected.

Table 11 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/L) in Elk Creek during each exposure period.

PCB Congeners	Fall 2000						Fall 2001						Mean of 4 exposure periods		
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag		Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
8/5	ND	0.016	ND	0.017	ND	0.021	0.000298	0.000079	0.000272	0.000091	0.000801	0.000135	0.000525	0.000068	0.000750
15	ND	0.016	ND	0.017	ND	0.021	0.00018	0.000069	0.000145	0.000080	0.000266	0.000117	0.000045	0.000036	0.000867
19	ND	0.00046	ND	0.0006	0.0015*	0.00053	0.00004	0.000036	ND	0.000038	0.000097*	0.000062	0.000055	ND	0.000472
18	ND	0.00046	ND	0.0006	0.0014	0.00053	0.000199	0.000036	0.000259	0.000038	0.000722	0.000062	0.000675	0.000392	0.001356
17	ND	0.00046	ND	0.0006	0.0019*	0.00053	0.000084	0.000036	0.000098	0.000038	0.000297	0.000062	0.000296	0.000025	0.000799
24/27	ND	0.00046	ND	0.0006	ND	0.00053	ND	0.000036	ND	0.000038	0.000062*	0.000062	0.000040	ND	0.000071
16/32	ND	0.00031	ND	0.00034	0.0015*	0.00024	0.000099*	0.000028	0.000117	0.000043	0.000293	0.000059	0.000500	0.000339	0.001091
26	ND	0.00031	ND	0.00034	0.00026*	0.00024	ND	0.000028	ND	0.000043	0.00008*	0.000059	0.000090	ND	0.000173
25	ND	0.00031	ND	0.00034	ND	0.00024	ND	0.000028	ND	0.000043	ND	0.000059	0.000050	ND	0.000045
31/28	0.00033*	0.00031	0.00041	0.00034	0.0029	0.00024	0.000324	0.000028	0.000452	0.000043	0.000998	0.000059	0.001344	0.000901	0.002330
33/20/21	ND	0.00031	ND	0.00034	0.0011*	0.00024	0.000096	0.000028	0.000152	0.000043	0.000325	0.000059	0.000424	0.000316	0.000874
22	ND	0.00031	ND	0.00034	0.00081	0.00024	0.000064*	0.000028	0.000094*	0.000043	0.00018	0.000059	0.000266	0.000134	0.000603
45	ND	0.00038	ND	0.00037	0.00038*	0.00026	0.00002*	0.000009	0.000037*	0.000011	0.000061	0.000018	0.000093	0.000009	0.000163
46	ND	0.00038	ND	0.00037	ND	0.00026	ND	0.000009	0.000012	0.000011	ND	0.000018	0.000038	0.000003	0.000028
52/73	ND	0.00038	ND	0.00037	0.0016	0.00026	0.000163	0.000009	0.000215*	0.000011	0.000487	0.000018	0.000488	0.000486	0.001127
49/43	ND	0.00039	ND	0.00038	0.0012*	0.00027	0.000078	0.000009	0.000138	0.000011	0.000218*	0.000018	0.000295	0.000085	0.000757
47/48 /75	ND	0.00038	ND	0.00037	0.0019*	0.00026	0.000065	0.000009	0.000083*	0.000011	0.000214	0.000018	0.000266	0.000141	0.000726
44	ND	0.0004	ND	0.00039	0.0014*	0.00028	0.000103*	0.000009	0.000119	0.000011	0.000225*	0.000018	0.000373	0.000225	0.000959
42/59	ND	0.0004	ND	0.00039	0.00047*	0.00028	0.000038*	0.000009	0.000058	0.000011	0.000127*	0.000018	0.000125	0.000015	0.000289
41/71/64/68	ND	0.00028	ND	0.00028	0.001	0.0002	0.000118	0.000009	0.000177	0.000011	0.000264*	0.000018	0.000472	0.000249	0.000939
40	ND	0.00028	ND	0.00028	ND	0.0002	ND	0.000009	ND	0.000011	ND	0.000018	0.000080	ND	0.000135
74/61	ND	0.00028	ND	0.00028	0.00065	0.0002	0.000089	0.000009	0.000139*	0.000011	0.000224*	0.000018	0.000262	0.000175	0.000639
70/76	ND	0.00028	ND	0.00028	0.0015	0.0002	0.000146	0.000009	0.000219	0.000011	0.000421	0.000018	0.000662	0.000235	0.001230
66/80	ND	0.00028	ND	0.00028	0.00078	0.0002	0.000104	0.000009	0.000149*	0.000011	0.00027	0.000018	0.000259	0.000225	0.000678
56/60	0.00027*	0.00015	0.00019*	0.00016	0.00059	0.00018	0.000121	0.000018	0.000111	0.000022	0.000222	0.000036	0.000433	0.000278	0.000543
95/93	ND	0.00026	ND	0.00029	0.0006	0.00026	0.000079	0.000013	0.000085*	0.000015	0.000186	0.000023	0.000185	0.000126	0.000689
91	ND	0.00026	ND	0.00029	ND	0.00026	ND	0.000013	ND	0.000015	0.000034*	0.000023	0.000035	ND	0.000059
84/92	0.00029*	0.00029	ND	0.00037	ND	0.00035	ND	0.000037	ND	0.000059	0.000178*	0.000070	0.000148	0.000058	0.000235
89/90/101	0.00042*	0.00029	ND	0.00037	0.0012*	0.00035	0.000139	0.000037	0.000214*	0.000059	0.000463	0.000070	0.000320	0.000354	0.001216
99	ND	0.00029	ND	0.00037	0.00039*	0.00035	0.000062	0.000037	0.00017*	0.000059	0.000189	0.000070	0.000111	0.000088	0.000455
83/108	ND	0.00025	ND	0.00033	ND	0.00031	ND	0.000037	ND	0.000059	ND	0.000070	ND	ND	0.000030
97/86	ND	0.00025	ND	0.00033	ND	0.00031	ND	0.000037	ND	0.000059	0.000129*	0.000070	0.000068	0.000040	0.000250
87/115/116	ND	0.00025	ND	0.00033	0.00037*	0.00031	0.000069*	0.000037	0.000077*	0.000059	0.000168	0.000070	0.000152	0.000084	0.000445
85/120	ND	0.00025	ND	0.00033	ND	0.00031	ND	0.000037	ND	0.000059	ND	0.000070	0.000093	0.000070	0.000070
110	ND	0.00025	ND	0.00033	0.00098*	0.00031	0.000156	0.000037	0.000245	0.000059	0.000474	0.000070	0.000484	0.000364	0.001439
107/109	ND	0.00036	ND	0.00041	ND	0.00042	ND	0.000027	ND	0.000036	ND	0.000054	ND	ND	ND
106/118	ND	0.00023	0.00033*	0.00028	0.0007*	0.00029	0.000117	0.000023	0.000223	0.000030	0.000355*	0.000046	0.000204	0.000333	0.001014
114	ND	0.00036	ND	0.00041	ND	0.00042	ND	0.000025	ND	0.000032	ND	0.000049	ND	ND	ND
105/127	ND	0.00024	ND	0.00028	ND	0.00029	0.000072	0.000025	0.000096*	0.000033	0.000179*	0.000050	0.000086	0.000069	0.000310
136	ND	0.00026	ND	0.00019	ND	0.00024	ND	0.000020	0.000031*	0.000018	ND	0.000041	0.000065	0.000008	0.000120
151	ND	0.0003	ND	0.00022	ND	0.00038	0.000034	0.000019	0.000066*	0.000027	0.000076*	0.000039	0.000104	0.000017	0.000244
144/135	ND	0.0003	ND	0.00022	ND	0.00038	0.000036	0.000019	0.000038*	0.000027	0.000057	0.000039	0.000059	0.000010	0.000139
149/139	ND	0.0003	ND	0.00022	0.0011	0.00038	0.000124	0.000019	0.000177*	0.000027	0.000296	0.000039	0.000466	0.000307	0.001099
134/143	ND	0.0003	ND	0.00022	ND	0.00038	ND	0.000019	ND	0.000027	ND	0.000039	ND	ND	ND
131/142	ND	0.0003	ND	0.00022	ND	0.00038	ND	0.000019	ND	0.000027	ND	0.000039	ND	ND	ND

Table 11 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/L) in Elk Creek during each exposure period.

PCB Congeners	Fall 2000						Fall 2001						Mean of 4 exposure periods		
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag		Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
146	ND	0.00036	ND	0.00025	ND	0.00046	0.00003*	0.000019	0.00004	0.000027	0.000062*	0.000039	0.000008	0.000010	0.000058
153	ND	0.00036	0.00033*	0.00025	0.0013*	0.00046	0.000133	0.000019	0.000204	0.000027	0.000313	0.000039	0.000348	0.000424	0.000993
141	ND	0.00046	ND	0.00033	ND	0.0006	ND	0.000019	0.000028*	0.000027	0.000122*	0.000039	0.000070	0.000007	0.000113
130	ND	0.00045	ND	0.00032	ND	0.00059	ND	0.000019	ND	0.000027	ND	0.000039	ND	ND	ND
137	ND	0.00045	ND	0.00032	ND	0.00059	ND	0.000019	ND	0.000027	ND	0.000039	ND	ND	ND
138/163/164	0.00063*	0.00045	0.00057*	0.00032	0.0011	0.00059	0.000118	0.000019	0.000252	0.000027	0.000448	0.000039	0.000417	0.000471	0.001062
158/160	ND	0.00045	ND	0.00032	ND	0.00059	ND	0.000019	ND	0.000027	0.000044	0.000039	ND	ND	0.000224
129	ND	0.00045	ND	0.00032	ND	0.00059	ND	0.000019	ND	0.000027	ND	0.000039	ND	ND	ND
128	ND	0.00045	ND	0.00032	ND	0.00059	ND	0.000019	ND	0.000027	ND	0.000039	0.000048	ND	0.000078
156	ND	0.00045	ND	0.00032	ND	0.00059	0.000031*	0.000019	0.000032*	0.000027	0.00005*	0.000040	0.000008	0.000008	0.000070
157	ND	0.00045	ND	0.00032	ND	0.00059	ND	0.000020	ND	0.000028	ND	0.000041	ND	ND	ND
179	ND	0.00037	ND	0.00039	ND	0.00048	ND	0.000018	ND	0.000023	ND	0.000028	0.000063	ND	0.000073
176	ND	0.00037	ND	0.00039	ND	0.00048	ND	0.000018	ND	0.000023	ND	0.000028	ND	ND	ND
178	ND	0.00037	ND	0.00039	ND	0.00048	ND	0.000018	ND	0.000023	ND	0.000028	ND	ND	ND
175	ND	0.00037	ND	0.00039	ND	0.00048	ND	0.000018	ND	0.000023	ND	0.000028	ND	ND	ND
187/182	ND	0.00037	ND	0.00039	ND	0.00048	0.000067*	0.000018	0.000103	0.000023	0.000185	0.000028	0.000154	0.000026	0.000256
183	ND	0.00038	ND	0.0004	ND	0.00049	0.000031	0.000018	0.000049*	0.000023	0.000069*	0.000028	0.000008	0.000012	0.000017
185	ND	0.00038	ND	0.0004	ND	0.00049	ND	0.000018	ND	0.000023	ND	0.000028	ND	ND	ND
174/181	ND	0.00038	0.00061*	0.0004	ND	0.00049	ND	0.000018	ND	0.000023	ND	0.000028	ND	0.000153	0.000130
177	ND	0.00038	ND	0.0004	ND	0.00049	ND	0.000018	ND	0.000023	0.00004*	0.000028	0.000070	ND	0.000010
171	ND	0.00033	ND	0.00036	ND	0.00043	ND	0.000018	ND	0.000023	ND	0.000028	ND	ND	ND
172/192	ND	0.00033	ND	0.00036	ND	0.00043	ND	0.000018	ND	0.000023	ND	0.000028	ND	ND	ND
180	ND	0.00033	0.0004*	0.00036	0.00047*	0.00043	0.000091*	0.000020	0.000164	0.000026	0.000227*	0.000032	0.000123	0.000236	0.000349
193	ND	0.00033	ND	0.00036	ND	0.00043	ND	0.000018	ND	0.000023	ND	0.000028	ND	ND	ND
191	ND	0.00033	ND	0.00036	ND	0.00043	ND	0.000018	ND	0.000023	ND	0.000028	ND	ND	ND
170/190	ND	0.0004	ND	0.00043	ND	0.00051	ND	0.000025	ND	0.000032	0.000096*	0.000039	ND	ND	0.000024
189	ND	0.0004	ND	0.00043	ND	0.00051	ND	0.000019	0.000026*	0.000024	0.000034*	0.000029	ND	0.000007	0.000009
201	ND	0.00052	ND	0.00035	ND	0.00066	ND	0.000017	ND	0.000024	ND	0.000034	ND	ND	ND
197	ND	0.00052	ND	0.00035	ND	0.00066	ND	0.000017	ND	0.000024	ND	0.000034	ND	ND	ND
198	ND	0.00052	ND	0.00035	ND	0.00066	ND	0.000017	ND	0.000024	ND	0.000034	ND	ND	ND
199	ND	0.00052	ND	0.00035	ND	0.00066	ND	0.000017	ND	0.000024	ND	0.000034	ND	ND	0.000098
196/203	ND	0.00052	ND	0.00035	ND	0.00066	ND	0.000017	ND	0.000024	ND	0.000034	ND	ND	0.000103
195	ND	0.00073	ND	0.00073	ND	0.00069	ND	0.000018	ND	0.000024	ND	0.000038	ND	ND	ND
194	ND	0.00073	ND	0.00073	ND	0.00069	ND	0.000018	ND	0.000024	0.000039*	0.000038	ND	ND	0.000010
205	ND	0.00073	ND	0.00073	ND	0.00069	0.000021*	0.000013	ND	0.000017	ND	0.000027	0.000005	ND	ND
208	ND	0.00045	ND	0.00038	ND	0.00049	ND	0.000012	ND	0.000016	ND	0.000030	ND	ND	ND
207	ND	0.00045	ND	0.00038	ND	0.00049	ND	0.000014	ND	0.000018	ND	0.000034	ND	ND	ND
206	ND	0.00045	ND	0.00038	ND	0.00049	0.000017*	0.000017	0.000024*	0.000021	ND	0.000040	0.000004	0.000006	ND
209	ND	0.00042	ND	0.00048	ND	0.00036	0.000115	0.000018	0.000163	0.000021	0.000191	0.000032	0.000054	0.000041	0.000218
Total PCB concentration**	0.0013		0.0015		0.0308		0.0036		0.0054		0.0116		0.01122	0.00687	0.02877
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-PCB		WQ-00-PCB		WQ-00-PCB		WQ-01-PCB		WQ-01-PCB		WQ-01-PCB		-	-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

4.1.6 Pesticides

4.1.6.1 Organochlorines

Table 12: Organochlorine concentrations (ng/L) in Elk Creek during each exposure period.

Organochlorine compounds	Fall 1999						Spring 2000					
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	NQ	-	NQ	-	NQ	-	0.016	0.00026	0.05	0.00095	0.028	0.0006
1,3/1,4-Dichlorobenzene	NQ	-	NQ	-	NQ	-	0.079	0.00022	0.5	0.0008	0.2	0.00051
1,2,3-Trichlorobenzene	NQ	-	NQ	-	NQ	-	0.036	0.00036	0.13	0.00061	0.054	0.00045
1,2,4-Trichlorobenzene	NQ	-	NQ	-	NQ	-	0.15	0.00033	0.58	0.00056	0.24	0.00042
1,3,5-Trichlorobenzene	NQ	-	NQ	-	NQ	-	0.0006*	0.00034	0.0026	0.00059	0.0017	0.00044
1,2,3,4-Tetrachlorobenzene	0.0057	0.0024	0.011	0.0022	0.0095*	0.0023	0.0052	0.00039	0.011	0.00068	0.0055	0.0005
1,2,3,5/1,2,4,5-Tetrachlorobenzene	ND	0.0023	0.0081*	0.0021	0.0085*	0.0021	0.003	0.00038	0.011	0.00066	0.0052	0.00048
Pentachlorobenzene	0.0086	0.0017	0.11	0.0027	0.039	0.0023	0.0033	0.00029	0.04	0.00078	0.012	0.0005
Hexachlorobenzene	0.01	0.0022	0.0065	0.0031	0.0088	0.0022	0.011	0.00035	0.016	0.00075	0.012	0.00058
Hexachlorobutadiene	ND	0.0024	ND	0.0022	ND	0.0023	ND	0.00034	ND	0.00049	ND	0.00046
Aldrin	0.016*	0.0068	ND	0.0067	0.02*	0.0088	ND	0.00067	ND	0.001	ND	0.00094
Dieldrin	0.014	0.0096	0.034	0.0058	ND***	0.021	0.0022	0.00011	0.0024	0.00039	0.0024	0.00019
Endrin	ND	0.025	ND	0.015	ND	0.05	ND	0.0003	ND	0.001	ND	0.00051
Chlordane, alpha (cis)	0.0015	0.0011	ND	0.0022	ND	0.003	ND	0.0012	0.0019*	0.0017	ND	0.0023
Chlordane, gamma (trans)	0.0017*	0.0012	ND	0.0024	ND	0.0033	ND	0.001	ND	0.0015	ND	0.0021
Chlordane, oxy-	ND	0.041	0.15*	0.023	ND	0.044	ND	0.0021	ND	0.0033	ND	0.003
o,p'-DDD	ND	0.011	0.0039*	0.0022	0.011*	0.0087	ND	0.0015	ND	0.0027	ND	0.0033
p,p'-DDD	ND	0.0051	ND	0.0023	0.024*	0.0092	ND	0.0017	ND	0.0029	0.012	0.0036
o,p'-DDE	ND	0.013	ND	0.003	ND	0.014	ND	0.0054	ND	0.0062	ND	0.0054
p,p'-DDE	ND	0.012	0.0048*	0.0026	0.022*	0.012	ND	0.0073	ND	0.0084	ND	0.0073
o,p'-DDT	ND	0.0086	ND	0.0026	ND	0.01	ND	0.0016	ND	0.0027	ND	0.0035
p,p'-DDT	ND	0.011	0.0032	0.0032	ND	0.013	ND	0.0021	ND	0.0036	ND	0.0046
Endosulphan (I), alpha-	0.024	0.013	0.012	0.0082	0.13	0.017	0.021	0.00044	0.02	0.0016	0.064	0.0009
Endosulphan (II), beta-	0.039	0.014	0.027	0.0092	0.17	0.025	0.0065*	0.00097	0.012*	0.0026	0.069	0.0013
Endosulphan Sulphate	0.12***	0.0077	0.1	0.0095	0.55***	0.048	0.037	0.00009	0.049	0.00014	0.14	0.000096
HCH, alpha-	0.028	0.014	0.031	0.0074	0.052	0.013	0.022	0.001	0.025	0.0022	0.016	0.0021
HCH, beta-	ND	0.018	ND	0.0095	ND	0.017	ND	0.0016	ND	0.0034	ND	0.0033
HCH, gamma-	0.043	0.024	0.038	0.013	0.071	0.022	0.013	0.0011	0.014	0.0023	0.04	0.0023
HCH, delta-	ND	0.011	ND	0.007	ND	0.017	ND	0.00011	ND	0.00022	ND	0.00011
Heptachlor	ND	0.0086	ND	0.0091	ND	0.01	ND	0.00075	ND	0.0007	ND	0.00078
Heptachlor Epoxide	ND***	0.0033	ND	0.006	ND	0.015	0.0014*	0.000086	0.0015	0.0013	0.00091*	0.000094
Methoxychlor	ND	0.099	ND	0.017	ND	0.056	0.00034	0.00018	0.00044	0.00033	0.0005	0.00027
Mirex	ND	0.0028	ND	0.0014	ND	0.0026	ND	0.00027	ND	0.00029	ND	0.00033
Nonachlor, cis-	ND	0.0004	ND	0.0004	ND	0.0008	ND	0.0014	ND	0.0015	ND	0.0012
Nonachlor, trans-	0.0014*	0.0006	0.0008	0.0006	0.0014*	0.0012	ND	0.001	ND	0.0015	ND	0.0021
Total Chlorobenzene**	0.0243		0.1356		0.0658		0.3035		1.3406		0.5584	
Total Chlordane**	ND		0.1500		ND		ND		ND		ND	
Total DDD/DDE/DDT**	ND		ND		0.0570		ND		ND		0.0120	
Total Endosulphan**	0.1830		0.1270		0.8500		0.0645		0.0810		0.2730	
Total HCH**	0.0710		0.0690		0.1230		0.0350		0.0390		0.0560	
Total Organochlorine concentration**	0.296		0.516		1.117		0.407		1.465		0.902	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-99-OC-1 & 2		WQ-99-OC-1 & 2		WQ-99-OC-1 & 2		WQ-00-OC		WQ-00-OC		WQ-00-OC	

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

*** = Results reported from re-injection data.

NQ = Not quantifiable; high background levels in lab blank.

ND = Not detected.

Table 12 (cont'd): Organochlorine concentrations (ng/L) in Elk Creek during each exposure period.

Organochlorine compounds	Fall 2000						Fall 2001						Mean of 4 exposure periods		
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag		Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
1,2-Dichlorobenzene	0.036	0.0011	0.032	0.00077	0.033	0.00086	ND	0.0331	ND	0.0200	0.0179	0.0083	0.0173	0.0273	0.0263
1,3/1,4-Dichlorobenzene	0.15	0.0009	0.26	0.00065	0.23	0.00073	0.909	0.0359	0.336	0.0217	0.3948	0.0089	0.3793	0.3653	0.2749
1,2,3-Trichlorobenzene	0.039	0.002	0.027	0.00078	0.022	0.0009	0.0044	0.0021	ND	0.0094	ND	0.0076	0.0265	0.0523	0.0253
1,2,4-Trichlorobenzene	0.19	0.0018	0.12	0.00072	0.11	0.00084	0.0529	0.0021	0.0439	0.0094	0.0727	0.0076	0.1310	0.2480	0.1409
1,3,5-Trichlorobenzene	ND	0.0019	0.002*	0.00076	0.0027*	0.00087	0.0026*	0.0021	ND	0.0094	ND	0.0076	0.0011	0.0015	0.0015
1,2,3,4-Tetrachlorobenzene	0.0058	0.00084	0.0056	0.00063	0.0077	0.00049	ND	0.0050	ND	0.0065	ND	0.0048	0.0042	0.0069	0.0057
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.0048	0.00082	0.0057	0.00061	0.0084	0.00047	ND	0.0048	ND	0.0063	ND	0.0047	0.0020	0.0062	0.0055
Pentachlorobenzene	0.0058	0.00078	0.025	0.00038	0.017	0.00037	ND	0.0027	0.0719	0.0051	0.0305	0.0045	0.0044	0.0617	0.0246
Hexachlorobenzene	0.013	0.00086	0.012	0.00072	0.018	0.00049	0.0073	0.0056	0.0112	0.0070	0.0101	0.0036	0.0103	0.0114	0.0122
Hexachlorobutadiene	ND	0.0012	ND	0.00095	0.0006*	0.00048	ND	0.0025	ND	0.0058	ND	0.0030	ND	ND	0.0002
Aldrin	ND	0.00099	ND	0.00094	ND	0.00046	ND	0.0062	ND	0.0165	ND	0.0082	0.0040	ND	0.0050
Dieldrin	0.0014	0.000078	0.0015*	0.00018	0.0023*	0.00027	ND	0.0052	ND	0.0034	ND	0.0139	0.0044	0.0095	0.0012
Endrin	0.00031*	0.00021	ND	0.00047	ND	0.00072	ND	0.0084	ND	0.0055	ND	0.0223	0.0001	ND	ND
Chlordane, alpha (cis)	ND	0.0016	ND	0.0016	ND	0.002	ND	0.0021	ND	0.0066	ND	0.0057	0.0004	0.0005	ND
Chlordane, gamma (trans)	ND	0.0014	ND	0.0014	ND	0.0018	ND	0.0018	ND	0.0057	ND	0.0049	0.0004	ND	ND
Chlordane, oxy-	ND	0.0031	ND	0.003	ND	0.0015	ND	0.0197	ND	0.0232	ND	0.0260	ND	0.0375	ND
o,p'-DDD	ND	0.0037	ND	0.0027	ND	0.0023	ND	0.0034	ND	0.0054	ND	0.0074	ND	0.0010	0.0028
p,p'-DDD	ND	0.004	ND	0.0029	0.012	0.0026	ND	0.0044	ND	0.0070	0.0138	0.0097	ND	ND	0.0155
o,p'-DDE	ND	0.0069	ND	0.0062	ND	0.0061	ND	0.0026	ND	0.0058	ND	0.0061	ND	ND	ND
p,p'-DDE	ND	0.0094	ND	0.0083	0.0093	0.0082	0.0140	0.0034	ND	0.0076	0.0121	0.0080	0.0035	0.0012	0.0109
o,p'-DDT	ND	0.0043	ND	0.0032	ND	0.0027	ND	0.0043	ND	0.0068	ND	0.0093	ND	ND	ND
p,p'-DDT	ND	0.0057	ND	0.0043	ND	0.0035	ND	0.0046	ND	0.0073	ND	0.0102	ND	0.0008	ND
Endosulphan (I), alpha-	0.0027*	0.0003	0.0032	0.00072	0.025	0.001	ND	0.0050	0.0106	0.0041	0.520	0.0093	0.0119	0.0115	0.1848
Endosulphan (II), beta-	0.0032	0.0012	0.0062	0.002	0.058	0.0018	ND	0.0076	0.0165	0.0104	0.752	0.0210	0.0122	0.0154	0.2623
Endosulphan Sulphate	0.022	0.00013	0.03	0.00025	0.25	0.00024	0.0409	0.0110	0.0961	0.0151	2.00	0.0304	0.0435	0.0688	0.6925
HCH, alpha-	0.0093	0.0019	0.012	0.0021	0.016	0.0016	0.0130	0.0086	0.0203	0.0130	0.0244	0.0191	0.0181	0.0221	0.0271
HCH, beta-	ND	0.003	ND	0.0032	ND	0.0025	ND	0.0145	ND	0.0206	ND	0.0243	ND	ND	ND
HCH, gamma-	0.0066	0.002	0.0066	0.0022	0.015	0.0017	ND	0.0105	ND	0.0157	ND	0.0230	0.0157	0.0147	0.0315
HCH, delta-	ND	0.00015	ND	0.00023	ND	0.00023	0.0149	0.0049	0.0088	0.0061	0.0270	0.0113	0.0037	0.0022	0.0068
Heptachlor	ND	0.0011	ND	0.00056	ND	0.0011	ND	0.0096	ND	0.0316	ND	0.0316	ND	ND	ND
Heptachlor Epoxide	0.00058*	0.000085	0.00067	0.00025	0.0008*	0.00026	ND	0.0055	ND	0.0036	ND	0.0146	0.0005	0.0005	0.0004
Methoxychlor	ND	0.00031	0.00029*	0.00028	ND	0.00048	ND	0.0364	ND	0.0239	ND	0.0971	0.0001	0.0002	0.0001
Mirex	ND	0.00032	ND	0.00037	ND	0.00039	ND	0.0023	ND	0.0078	ND	0.0075	ND	ND	ND
Nonachlor, cis-	ND	0.002	ND	0.0025	ND	0.0024	ND	0.0027	ND	0.0024	ND	0.0035	ND	ND	ND
Nonachlor, trans-	ND	0.0014	ND	0.0014	ND	0.0018	ND	0.0024	ND	0.0022	ND	0.0032	0.0004	0.0002	0.0004
Total Chlorobenzene**	0.4444		0.4893		0.4488		0.9692		0.4630		0.5081		0.4354	0.6071	0.3953
Total Chlordane**	ND		ND		ND		ND		ND		ND		ND	0.0375	ND
Total DDD/DDE/DDT**	ND		ND		0.0120		0.0140		ND		0.0121		0.0035	ND	0.0233
Total Endosulphan**	0.0279		0.0394		0.3330		0.0409		0.1067		3.2720		0.0676	0.0885	1.1395
Total HCH**	0.0159		0.0186		0.0310		ND		ND		0.0244		0.0305	0.0317	0.0586
Total Organochlorine concentration**	0.490		0.549		0.828		1.024		0.570		3.817		0.5426	0.7748	1.6234
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-OC		WQ-00-OC		WQ-00-OC		WQ-01-OC		WQ-01-OC		WQ-01-OC		-	-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

Table 13: Toxaphene and chlorobornane concentrations (ng/L) in Elk Creek during one exposure period.

Toxaphene & Chlorobornane compounds	Fall 1999					
	Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane	ND	0.15	ND	0.19	ND	0.14
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane	ND	0.13	ND	0.15	ND	0.14
P3-GC/MS:Octachloro-Derivative	ND	0.015	ND	0.025	ND	0.017
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane	0.35	0.18	ND	0.3	ND	0.18
P5-GC/MS:Nonachloro-Derivative	ND	0.045	ND	0.093	ND	0.093
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.071	ND	0.24	ND	0.14
P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.026	ND	0.084	ND	0.042
P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.16	ND	0.18	ND	0.29
P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.24	ND	0.59	ND	0.42
P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	ND	0.18	ND	0.28	ND	0.28
Total Toxaphene	1.7	0.67	ND	1.0	ND	0.54
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-99-TOX		WQ-99-TOX		WQ-99-TOX	

NOTE: Single integrated water sample (~300L) per site per exposure period.

ND = Not detected.

4.1.6.2 Carbamates, Herbicides, Organophosphates, Organonitrogens and Triazines

Table 14: Various pesticides analyzed for in Elk Creek and their corresponding detection limits.

Carbamates	DL (µg/sample) -Fall 1999-	DL (µg/L) Spring/Fall 2000-	Organophosphate pesticides	DL (µg/sample) -Fall 1999-	DL (µg/L) Spring/Fall 2000-	Organonitrogen pesticides	DL (µg/sample) -Fall 1999-	DL (µg/L) -Spring/Fall 2000-
Aldicarb*		0.01	Azinphos methyl	0.01	0.01	Hexazinone	0.01	0.02
Aldicarb Sulfone*		0.01	Carbophenothion*		0.01	Metolachlor	0.01	0.01
Aldicarb Sulfoxide*		0.01	Chlorpyrifos	0.01	0.01	Propanil	0.01	0.03
Carbaryl	0.2	0.01	Coumaphos*		0.01	Trifluralin	0.01	0.01
Carbofuran	0.2	0.01	Demeton-O	0.01	0.02	Vinclozolin	0.01	0.01
3-Hydroxycarbofuran*		0.01	Demeton-S	0.01	0.01			
Methiocarb	0.2	0.01	Diazinon	0.01	0.01			
Methomyl*		0.01	Dichlorvos/Naled	0.01	0.02	Triazines	DL (µg/L)	DL (µg/L)
Oxamyl	0.2	0.01	Dimethoate	0.01	0.01		-Fall 1999-	-Spring/Fall 2000-
Propoxur*		0.01	Disulfoton*		0.01	Atrazine	0.01	0.02
			Ethion	0.01	0.01	Simazine	0.01	0.02
			Fenitrothion	0.01	0.01			
Herbicides	DL (µg/sample)	DL (µg/L)	Fensulfothion	0.01	0.01			
	-Fall 1999-	Spring/Fall 2000-	Fenthion	0.01	0.01			
Bromoxynil	0.2	0.1	Fonofos	0.01	0.02			
2,4,5-T	0.01	0.02	Malathion	0.01	0.01			
2,4-D	0.01	0.05	Methidathion	0.01	0.02			
Dicamba	0.01	0.2	Mevinphos	0.01	0.02			
2,4-DB*		0.8	Parathion	0.01	0.01			
Dichloroprop	0.01	0.1	Parathion-methyl	0.01	0.01			
Dinoseb	0.01	0.2	Phorate	0.01	0.01			
MCPA	0.01	0.1	Phosalone*		0.01			
Mecoprop (MCP)*		0.05	Phosmet*		0.01			
Picloram	0.01	0.3	Sulfotep	0.01	0.01			
Silvex (2,4,5-TP)	0.01	0.1	Terbufos	0.01	0.01			

Detected in Elk Creek during at least one exposure period (All concentrations found (shown in bold) were at detection limit (DL) of Fall 1999 or Spring/Fall 2000 analysis).

Corresponding Lab Blanks and Spiked Matrix are: WQ-99-PEST for Fall 1999 samples and WQ-00-PEST for Spring/Fall 2000 samples.

* = Compounds not analyzed for in Fall 1999.

4.1.7 Nonylphenol

Table 15: 4-Nonylphenol concentration (ng/L) in Elk Creek during three exposure periods.

Compound	Spring 2000						Fall 2000					
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
4-Nonylphenol	ND	0.22	ND	0.2	4.6	0.094	ND	0.2	ND	0.2	6.9	0.12
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-NP		WQ-00-NP		WQ-00-NP		WQ-00-NP		WQ-00-NP		WQ-00-NP	

Compound	Fall 2001						Mean of 3 exposure periods		
	Ref		mid Ag		d/s Ag		Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
4-Nonylphenol	3.58	0.0485	3.56	0.136	11.3	0.0588	1.193	1.187	7.600
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-01-NP		WQ-01-NP		WQ-01-NP		-	-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

4.1.8 Polycyclic Aromatic Hydrocarbons

Table 16: Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/L) in Elk Creek during three exposure periods.

Polycyclic aromatic hydrocarbons	Spring 2000						Fall 2000					
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	0.95	0.0019	2.3	0.005	2.7	0.0041	1.2	0.015	2.8	0.0031	4.7	0.0042
Acenaphthylene ^{1P}	0.038	0.0009	0.082	0.0012	0.077	0.0017	0.054	0.0011	0.14	0.0015	0.25	0.0018
Acenaphthene ^{1P}	0.039	0.001	0.38	0.001	1.5	0.0027	0.027	0.0023	0.26	0.0007	2.1	0.0073
Fluorene ^{1P}	0.085	0.0024	0.3	0.0021	0.74	0.0024	0.055	0.0027	0.34	0.0025	1	0.0051
Phenanthrene ^{1P}	0.19	0.0025	0.72	0.0028	1.5	0.0084	0.16	0.0017	0.64	0.0027	2.4	0.0033
Anthracene ^{1P}	0.015	0.0009	0.033	0.0036	0.078	0.0049	0.021	0.0023	0.033	0.0017	0.11	0.0059
Fluoranthene ^{2P}	0.044	0.0019	0.27	0.0029	0.79	0.0012	0.036	0.0018	0.17	0.002	1.2	0.0053
Pyrene ^{2P}	0.037	0.0012	0.22	0.0023	0.61	0.0026	0.031	0.0009	0.17	0.0021	1	0.0051
Benz(a)anthracene ^{2P}	ND	0.0022	0.016	0.0032	0.025	0.0028	0.0028*	0.0013	0.0086	0.0041	0.035	0.0045
Chrysene ^{2P}	0.011	0.0029	0.032	0.0029	0.061	0.0021	0.0095	0.003	0.023	0.0025	0.069	0.0044
Benzofluoranthenes ^{2P}	0.0079	0.0021	0.022	0.0025	0.028	0.0035	0.0049	0.0011	0.013	0.0022	0.03	0.0035
Benzo(a)pyrene ^{2P}	ND	0.0025	ND	0.0019	ND	0.0039	ND	0.0033	ND	0.0014	ND	0.0051
Benzo(e)pyrene ^{2P}	ND	0.0018	0.005	0.0028	0.0067	0.0023	ND	0.0025	0.0029*	0.0015	0.0067*	0.0038
Perylene ^{2P}	0.087	0.0029	0.2	0.0061	0.18	0.0071	0.099	0.0021	0.12	0.0029	0.18	0.004
Dibenz(ah)anthracene ^{2P}	ND	0.0073	ND	0.0075	ND	0.0053	ND	0.0082	ND	0.0023	ND	0.0089
Benzo(ghi)perylene ^{2P}	0.0077	0.004	0.012	0.0042	ND	0.0062	ND	0.0057	ND	0.0046	ND	0.0074
Indeno(1,2,3,cd)pyrene ^{2P}	0.0055*	0.0009	0.0079*	0.0028	0.0056*	0.0021	ND	0.0013	0.0055*	0.0017	0.0065*	0.0011
C1-Naphthalene ^A	0.34	0.0028	1.2	0.0029	1.5	0.0045	0.36	0.0025	1.5	0.0025	2	0.0036
C2-Naphthalene ^A	0.23	0.066	0.51	0.22	0.76	0.0052	0.27	0.0043	1.3	0.0042	1.2	0.0023
C3-Naphthalene ^A	0.1	0.0012	0.23	0.0018	0.51	0.0082	0.12	0.0023	1	0.0023	0.93	0.0049
C4-Naphthalene ^A	ND	0.0025	0.031	0.008	0.12	0.0048	0.019	0.002	0.1	0.003	0.11	0.0032
C1-Phenanthrene/Anthracene ^A	0.11	0.0038	0.26	0.0038	0.62	0.005	0.13	0.0044	0.71	0.0032	0.96	0.0093
C2-Phenanthrene/Anthracene ^A	0.052	0.0018	0.12	0.002	0.3	0.0052	0.059	0.0043	0.33	0.0024	0.45	0.0034
C3-Phenanthrene/Anthracene ^A	0.017	0.002	0.053	0.0029	0.13	0.0034	0.02	0.0016	0.12	0.001	0.2	0.0023
C4-Phenanthrene/Anthracene ^A	0.019	0.002	0.065	0.0028	0.1	0.0038	0.026	0.0021	0.064	0.0026	0.16	0.0037
Retene	0.029	0.0055	0.1	0.0058	0.23	0.011	0.046	0.0056	0.1	0.0083	0.32	0.015
Dibenzothiophene	0.014	0.0015	0.048	0.0022	0.15	0.002	0.0061*	0.0025	0.029*	0.0021	0.21	0.0043
C1-Dibenzothiophenes	0.012	0.0029	0.024	0.0027	0.099	0.0061	0.011	0.006	0.052	0.0024	0.14	0.0052
C2-Dibenzothiophenes	0.039	0.0043	0.049	0.0041	0.14	0.0084	0.036	0.0032	0.1	0.01	0.22	0.0066
Total Parent ^(P) LPAH**	1.317		3.815		6.595		1.517		4.213		10.560	
Total Parent ^(P) HPAH**	0.192		0.785		1.706		0.180		0.505		2.521	
Total Alkylated ^{(A)**}	0.868		2.469		4.040		1.004		5.124		6.010	
Total Dibenzothiophene**	0.051		0.121		0.389		0.036		0.181		0.570	
Total PAH concentration**	2.46		7.29		12.96		2.78		10.12		19.98	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-PAH		WQ-00-PAH		WQ-00-PAH		WQ-00-PAH		WQ-00-PAH		WQ-00-PAH	

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

Table 16 (cont'd): Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/L) in Elk Creek during three exposure periods.

	Fall 2001						Mean of 3 exposure periods		
	Ref		mid Ag		d/s Ag		Ref	mid Ag	d/s Ag
Polycyclic aromatic hydrocarbons	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
Naphthalene ^{1P}	0.631	0.0238	2.00	0.0258	3.22	0.0375	0.927	2.367	3.540
Acenaphthylene ^{1P}	0.0441*	0.0239	0.136*	0.0328	0.200	0.0538	0.045	0.119	0.176
Acenaphthene ^{1P}	0.0359	0.0212	0.374	0.0536	2.15	0.0713	0.034	0.338	1.917
Fluorene ^{1P}	ND	0.0370	0.144	0.0380	0.488	0.0527	0.047	0.261	0.743
Phenanthrene ^{1P}	0.110	0.0218	0.567	0.0256	1.63	0.0420	0.153	0.642	1.843
Anthracene ^{1P}	ND	0.0236	0.0428	0.0277	ND	0.0454	0.012	0.036	0.063
Fluoranthene ^{2P}	0.0398	0.0115	0.258	0.0259	0.932	0.0296	0.040	0.233	0.974
Pyrene ^{2P}	0.0308	0.0113	0.201	0.0253	0.893	0.0289	0.033	0.197	0.834
Benz(a)anthracene ^{2P}	ND	0.0129	0.0233*	0.0214	0.0342*	0.0247	0.001	0.016	0.031
Chrysene ^{2P}	ND	0.0141	ND	0.0239	0.0633	0.0293	0.007	0.018	0.064
Benzofluoranthenes ^{2P}	ND	0.0407	ND	0.0720	ND	0.0612	0.004	0.012	0.019
Benzo(a)pyrene ^{2P}	ND	0.0293	ND	0.163	ND	0.0457	ND	ND	ND
Benzo(e)pyrene ^{2P}	ND	0.0267	ND	0.149	ND	0.0416	ND	0.003	0.004
Perylene ^{2P}	ND	0.0308	ND	0.285	ND	0.0476	0.062	0.107	0.120
Dibenz(ah)anthracene ^{2P}	ND	0.0351	ND	0.0395	ND	0.0520	ND	ND	ND
Benzo(ghi)perylene ^{2P}	ND	0.0220	ND	0.0514	ND	0.0434	0.003	0.004	ND
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.0247	ND	0.0537	ND	0.0485	0.002	0.004	0.004
C1-Naphthalene ^A	0.233	0.0573	1.37	0.0968	1.58	0.207	0.311	1.357	1.693
C2-Naphthalene ^A	0.140	0.0368	0.811	0.0637	0.497	0.0944	0.213	0.874	0.819
C3-Naphthalene ^A	ND	0.0355	0.442	0.0528	1.10	0.0735	0.073	0.557	0.847
C4-Naphthalene ^A	ND	0.0396	ND	0.0547	0.487	0.0985	0.006	0.044	0.239
C1-Phenanthrene/Anthracene ^A	ND	0.0299	0.230	0.0367	0.589	0.0704	0.080	0.400	0.723
C2-Phenanthrene/Anthracene ^A	ND	0.0216	0.129	0.0377	0.354	0.0554	0.037	0.193	0.368
C3-Phenanthrene/Anthracene ^A	ND	0.0202	ND	0.0520	0.206	0.0299	0.012	0.058	0.179
C4-Phenanthrene/Anthracene ^A	ND	0.0356	0.0880	0.0568	0.273	0.0599	0.015	0.072	0.178
Retene	ND	0.0356	0.0880	0.0568	0.273	0.0599	0.025	0.096	0.274
Dibenzothiophene	ND	0.0273	ND	0.0323	0.0947	0.0430	0.007	0.026	0.152
C1-Dibenzothiophenes	ND	0.0227	ND	0.0383	ND	0.0371	0.008	0.025	0.080
C2-Dibenzothiophenes	ND	0.0470	ND	0.0638	0.0971	0.0401	0.025	0.050	0.152
Total Parent ^(P) LPAH**	0.741		3.221		7.688		1.192	3.750	8.281
Total Parent ^(P) HPAH**	0.071		0.459		1.923		0.148	0.583	2.050
Total Alkylated ^{(A)**}	0.373		3.070		5.086		0.748	3.554	5.045
Total Dibenzothiophene**	ND		ND		0.095		0.029	0.101	0.351
Total PAH concentration**	1.18		6.84		15.06		2.142	8.084	16.002
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-01-PAH		WQ-01-PAH		WQ-01-PAH		-	-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected. Considered a zero value for statistical calculations.

4.1.9 Sterols

Table 17: Sterol concentrations (ng/L) in Elk Creek during three exposure periods.

Sterols	Spring 2000						Fall 2000					
	Ref		mid Ag		d/s Ag		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Desogestrel ^A	ND	0.61	ND	0.86	ND	0.9	ND	0.85	0.93*	0.72	ND	1.70
Mestranol ^A	ND	0.067	ND	0.072	ND	0.11	ND	0.10	ND	0.07	ND	0.10
Norethindrone ^A	ND	0.21	ND	0.44	ND	0.45	ND	0.38	ND	0.65	ND	0.38
Estrone ^A	0.014*	0.011	ND	0.017	0.14*	0.021	ND	0.03	ND	0.03	ND	0.04
Equilin ^A	ND	0.026	ND	0.035	ND	0.041	ND	0.04	ND	0.04	ND	0.06
Norgestrel ^A	ND	0.17	ND	0.25	ND	0.42	ND	0.26	ND	0.35	ND	0.29
Testosterone ^A	0.089*	0.063	0.31*	0.13	0.4*	0.038	0.40*	0.08	0.26*	0.08	0.38*	0.16
17a-Dihydroequilin ^A	ND	0.035	ND	0.021	ND	0.063	ND	0.03	ND	0.06	ND	0.07
Ethinylestradiol ^A	ND	0.099	ND	0.13	ND	0.12	ND	0.11	ND	0.11	ND	0.08
17a-Estradiol ^A	ND	0.027	ND	0.014	0.059*	0.021	ND	0.03	ND	0.02	0.10*	0.03
17b-Estradiol ^A	0.06*	0.021	0.02*	0.011	0.047*	0.016	ND	0.02	ND	0.01	ND	0.02
a-Zearalanol ^A	ND	0.046	ND	0.066	ND	0.047	ND	0.04	ND	0.05	ND	0.06
Coprostanol ^A	ND	0.088	0.077	0.053	1.4	0.12	ND	0.14	ND	0.13	1.80	0.12
Epicoprostanol ^A	ND	0.052	0.031*	0.031	0.52	0.069	ND	0.08	ND	0.08	0.58	0.07
Cholesterol ^A	4.6	0.076	8.5	0.082	11	0.072	6.60	0.10	6.90	0.05	13.00	0.10
Cholestanol ^A	0.25*	0.038	0.51*	0.073	0.89*	0.076	0.20*	0.09	0.26*	0.04	0.95	0.14
Desmosterol ^A	0.29*	0.2	0.64*	0.16	0.4*	0.14	0.36*	0.09	0.30*	0.15	0.76*	0.15
Campesterol ^P	ND	0.13	ND	0.11	ND	0.08	ND	0.29	ND	0.14	ND	0.10
Ergosterol ^P	0.86*	0.16	2	0.18	1.9	0.12	0.71*	0.23	1.20	0.12	4.10	0.19
Stigmasterol ^P	ND	0.34	1.1	0.31	1.7*	0.28	0.57	0.32	0.44	0.26	1.80*	0.23
b-Estradiol 3-benzoate ^A	0.11*	0.02	0.086*	0.032	ND	0.033	ND	0.04	ND	0.03	ND	0.03
b-Sitosterol ^P	3	0.094	7.2	0.11	9.9	0.049	5.50	0.11	4.10	0.13	7.60	0.08
Total Animal ^(A) Sterols**	5.31		10.05		14.86		7.56		7.72		17.57	
Total Plant ^(P) Sterols**	3.86		10.30		13.50		6.78		5.74		13.50	
Total Sterol concentration**	9.17		20.35		28.36		14.34		13.46		31.07	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-STER		WQ-00-STER		WQ-00-STER		WQ-00-STER		WQ-00-STER		WQ-00-STER	

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

ND = Not detected.

Table 17 (cont'd): Sterol concentrations (ng/L) in Elk Creek during three exposure periods.

Sterols	Fall 2001						Mean of 3 exposure periods		
	Ref		mid Ag		d/s Ag		Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
Desogestrel ^A	ND	0.900	2.10*	1.200	ND	1.70	ND	1.010	ND
Mestranol ^A	ND	0.120	ND	0.080	ND	0.096	ND	ND	ND
Norethindrone ^A	ND	0.750	ND	0.530	ND	0.580	ND	ND	ND
Estrone ^A	ND	0.036	ND	0.055	0.170*	0.048	0.005	ND	0.103
Equilin ^A	ND	0.180	ND	0.240	ND	0.120	ND	ND	ND
Norgestrel ^A	ND	0.930	ND	0.320	ND	0.740	ND	ND	ND
Testosterone ^A	ND	0.160	0.180	0.160	ND	0.140	0.163	0.250	0.260
17a-Dihydroequilin ^A	ND	0.088	ND	0.098	ND	0.053	ND	ND	ND
Ethynylestradiol ^A	ND	0.330	ND	0.210	ND	0.140	ND	ND	ND
17a-Estradiol ^A	ND	0.052	ND	0.031	ND	0.045	ND	ND	0.053
17b-Estradiol ^A	ND	0.034	ND	0.021	ND	0.030	0.020	0.007	0.016
a-Zearalanol ^A	ND	0.860	ND	0.930	ND	0.560	ND	ND	ND
Coprostanol ^A	ND	0.130	0.720	0.390	1.80	0.160	ND	0.266	1.667
Epicoprostanol ^A	ND	0.095	ND	0.270	0.860	0.110	ND	0.010	0.653
Cholesterol ^A	4.90	0.060	19.0	0.079	8.80	0.078	5.367	11.467	10.933
Cholestanol ^A	0.240	0.220	1.80	0.240	0.940	0.210	0.230	0.857	0.927
Desmosterol ^A	0.990	0.170	2.50*	0.160	1.40*	0.140	0.547	1.147	0.853
Campesterol ^P	ND	0.140	ND	0.330	ND	0.170	ND	ND	ND
Ergosterol ^P	1.60	0.110	10.0*	0.170	2.90*	0.100	1.057	4.400	2.967
Stigmasterol ^P	1.20	0.990	4.60	0.610	ND	1.10	0.590	2.047	1.167
b-Estradiol 3-benzoate ^A	ND	0.190	ND	0.061	ND	0.140	0.037	0.029	ND
b-Sitosterol ^P	7.90	0.083	31.0	0.130	6.90	0.068	5.467	14.100	8.133
Total Animal ^(A) Sterols**	6.13		26.30		13.97		6.333	14.690	15.467
Total Plant ^(P) Sterols**	10.70		45.60		9.80		7.113	20.547	12.267
Total Sterol concentration**	16.83		71.90		23.77		13.447	35.235	27.732
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-01-STER		WQ-01-STER		WQ-01-STER		-	-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

4.1.10 Polybrominated Diphenyl Ethers

Table 18: Polybrominated diphenyl ether (PBDE) concentrations (pg/L) in Elk Creek during one exposure period.

Polybrominated diphenyl ethers	Fall 2001					
	Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	0.430	ND	0.490	ND	0.640
3-MonoBDE (2)	ND	0.430	ND	0.490	ND	0.640
4-MonoBDE (3)	ND	0.430	ND	0.490	ND	0.640
2,4-DiBDE (7)	ND	0.0179	ND	0.0287	ND	0.0477
2,4'/3,3'-DiBDE (8/11)	0.019*	0.0179	0.042*	0.0287	ND	0.0477
2,6-DiBDE (10)	ND	0.0179	ND	0.0287	ND	0.0477
3,4-DiBDE (12)	0.061	0.0179	0.059*	0.0287	0.102*	0.0477
3,4'-DiBDE (13)	ND	0.0179	ND	0.0287	ND	0.0477
4,4'-DiBDE (15)	0.030*	0.0179	0.173	0.0287	0.096*	0.0477
2,2',4-TriBDE (17)	ND	0.0471	1.64	0.0499	0.472	0.0721
2,3',4-TriBDE (25)	ND	0.0445	ND	0.0471	ND	0.0681
2,4,4'/2',3,4-TriBDE (28/33)	0.330*	0.0422	4.48	0.0447	1.41*	0.0646
2,4,6-TriBDE (30)	ND	0.0445	ND	0.0471	ND	0.0681
2,4',6-TriBDE (32)	ND	0.0445	ND	0.0471	ND	0.0681
3,3',4-TriBDE (35)	ND	0.0445	ND	0.0471	ND	0.0681
3,4,4'-TriBDE (37)	ND	0.0445	0.084*	0.0471	ND	0.0681
2,2',4,4'-TetraBDE (47)	3.43	0.0735	149	0.0722	26.9	0.108
2,2',4,5'-TetraBDE (49)	ND	0.0920	3.81	0.0909	0.797	0.136
2,3',4,4'-TetraBDE (66)	ND	0.122	2.63	0.121	0.493*	0.181
2,3',4',6-TetraBDE (71)	ND	0.0920	0.435	0.0909	ND	0.136
2,4,4',6-TetraBDE (75)	ND	0.0918	0.204	0.0907	ND	0.135
3,3',4,4'-TetraBDE (77)	ND	0.0920	ND	0.0909	ND	0.136
2,2',3,4,4'-PentaBDE (85)	0.282*	0.0504	2.00	0.0913	0.748*	0.0908
2,2',4,4',5'-PentaBDE (99)	2.76	0.0401	66.0	0.0738	12.5	0.0743
2,2',4,4',6-PentaBDE (100)	0.546	0.0263	12.1	0.0491	2.40	0.0470
2,3,3',4,4'-PentaBDE (105)	ND	0.0367	ND	0.0674	ND	0.0663
2,3,4,5,6-PentaBDE (116)	ND	0.0367	ND	0.0674	ND	0.0663
2,3',4,4',6-PentaBDE (119)	ND	0.0367	0.102*	0.0674	ND	0.0663
3,3',4,4',5-PentaBDE (126)	ND	0.0367	ND	0.0674	ND	0.0663
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	0.078*	0.0579	0.196	0.0706	0.093*	0.0895
2,2',3,4,4',6'-HexaBDE (140)	ND	0.0513	0.072*	0.0625	ND	0.0794
2,2',4,4',5,5'-HexaBDE (153)	0.318	0.0601	2.42	0.0738	0.785	0.0916
2,2',4,4',5,6'-HexaBDE (154)	0.224*	0.0408	1.95	0.0494	0.540	0.0636
2,2',4,4',6,6'-HexaBDE (155)	0.089*	0.0513	0.186*	0.0625	0.123*	0.0794
2,2',3,4,4',5,6-HeptaBDE (181)	ND	0.0813	ND	0.0713	ND	0.113
2,2',3,4,4',5',6-HeptaBDE (183)	0.830	0.0638	0.456	0.0559	1.20	0.0887
2,3,3',4,4',5,6-HeptaBDE (190)	0.139*	0.112	ND	0.0983	ND	0.156
2,2',3,3',4,4',5,5',6-NonaBDE (206)	11.2	1.26	4.53	0.769	7.45	1.03
2,2',3,3',4,4',5,5',6'-NonaBDE (207)	7.24	1.26	3.63	0.769	6.20	1.03
2,2',3,3',4,4',5,5',6'-NonaBDE (208)	6.47	1.26	2.89	0.769	5.04	1.03
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	534	0.521	237	0.336	360	0.465
Total MonoBDE**	ND		ND		ND	
Total DiBDE**	0.061		0.232		0.198	
Total TriBDE**	0.33		6.20		1.88	
Total TetraBDE**	3.43		156.08		28.19	
Total PentaBDE**	3.588		80.202		15.648	
Total HexaBDE**	0.631		4.752		1.541	
Total HeptaBDE**	0.830		0.456		1.200	
Total NonaBDE**	24.91		11.05		18.69	
Total DecaBDE**	534		237		360	
Total PBDE concentration**	567.78		495.98		427.35	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-01-PBDE		WQ-01-PBDE		WQ-01-PBDE	

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit.

ND = Not detected.

4.2 Tissue Contaminants

4.2.1 Trace Metals

Cutthroat Trout

Table 19: Metal concentrations (mg/kg) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Gallium (Ga)	Lanthanum (La)	Lead (Pb)	Lithium (Li)	Manganese (Mn)
Fall 1999	Food	0.011	3.25	3.420	0.126	1.44	0.503	16.90	0.086	0.054	0.180	0.301	55.800
	Control	ND	1.15	0.011	0.001	0.24	0.023	0.69	0.008	ND	0.009	ND	0.218
	Ref	ND	1.07	0.038	0.005	0.14	0.179	0.94	0.010	0.001	0.033	ND	0.249
	Ref (replicate)	ND	1.00	0.032	0.001	0.16	0.190	1.16	0.010	0.001	0.036	ND	0.267
	mid Ag	ND	1.04	0.017	ND	0.14	0.154	0.70	0.009	ND	0.008	ND	0.218
	mid Ag (replicate)	0.001	1.06	0.019	ND	0.24	0.172	0.67	0.009	ND	0.011	ND	0.238
	d/s Ag	ND	1.14	0.016	ND	0.12	0.252	0.99	0.009	ND	0.012	ND	0.243
	d/s Ag (replicate)	ND	1.18	0.029	ND	0.23	0.272	1.51	0.010	ND	0.042	ND	0.298
Spring 2000	Food	0.016	2.38	3.420	0.166	1.06	0.439	19.30	0.211	0.056	0.583	0.331	52.400
	Control	ND	0.96	0.010	0.001	ND	0.018	0.71	0.021	ND	0.003	ND	0.204
	Ref	0.001	0.83	0.010	0.001	ND	0.008	0.94	0.023	0.001	0.004	ND	0.226
	Ref (replicate)	0.001	0.78	0.012	0.001	ND	0.006	0.92	0.021	0.001	0.003	ND	0.183
	mid Ag	0.001	0.92	0.023	ND	ND	0.011	0.73	0.021	0.001	0.018	ND	0.202
	mid Ag (replicate)	0.001	0.92	0.064	0.002	ND	0.013	0.75	0.022	ND	0.017	ND	0.171
	d/s Ag	ND	0.96	0.008	0.002	ND	0.012	0.69	0.020	ND	0.002	ND	0.211
Fall 2000	Food	0.011	2.53	3.140	0.287	0.550	0.420	12.90	0.173	0.026	0.164	0.402	48.200
	Control	ND	0.75	0.015	0.002	ND	0.223	0.58	0.025	ND	0.004	ND	0.334
	Ref	ND	0.88	0.010	ND	ND	0.069	0.86	0.022	ND	0.007	ND	0.174
	mid Ag	ND	0.85	0.012	0.001	ND	0.080	0.62	0.023	ND	0.002	ND	0.216
	d/s Ag	ND	0.85	0.007	0.001	ND	0.026	0.70	0.020	ND	0.004	ND	0.144
Fall 2001	Food	0.011	3.04	2.200	0.553	0.270	0.062	6.55	0.148	0.009	0.168	0.384	28.200
	Control	ND	0.70	0.015	0.001	0.10	0.241	0.89	0.018	ND	0.008	ND	0.320
	Ref	ND	0.63	0.019	0.001	ND	0.050	0.50	0.015	ND	0.002	ND	0.231
	mid Ag	ND	0.71	0.012	0.001	ND	0.069	0.60	0.017	ND	0.003	ND	0.244
	d/s Ag	ND	0.65	0.012	ND	ND	0.024	0.60	0.017	ND	0.003	ND	0.260
All exposures (mean)	Food	0.0122	2.800	3.0450	0.2830	0.830	0.3560	13.912	0.1545	0.0363	0.2738	0.3545	46.1500
	Control	ND	0.890	0.0127	0.0013	0.085	0.1263	0.717	0.0180	ND	0.0060	ND	0.2690
	Ref	0.0003	0.853	0.0192	0.0017	0.035	0.0765	0.810	0.0175	0.0005	0.0115	ND	0.2200
	mid Ag	0.0003	0.880	0.0160	0.0005	0.035	0.0785	0.662	0.0175	0.0003	0.0078	ND	0.2200
	d/s Ag	ND	0.900	0.0108	0.0008	0.030	0.0785	0.745	0.0165	ND	0.0053	ND	0.2145
Detection limit (all exposures)		0.001	0.01	0.005	0.001	0.05	0.001	0.01	0.001	0.001	0.002	0.005	0.001

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

ND = Not detected. Considered a zero value for statistical calculations.

Table 19 (cont'd): Metal concentrations (mg/kg) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Rubidium (Rb)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)
Fall 1999	Food	0.087	0.530	0.57	0.801	2.01	0.028	96.400	0.032	0.055	0.421	161.00
	Control	0.056	0.014	0.09	0.426	0.26	ND	0.571	0.005	ND	0.012	7.80
	Ref	0.058	ND	0.06	0.402	0.26	0.001	0.941	0.006	ND	0.015	8.56
	Ref (replicate)	0.063	0.004	0.15	0.382	0.27	0.001	1.200	0.006	ND	0.016	8.95
	mid Ag	0.061	0.005	0.38	0.380	0.28	0.001	0.769	0.006	ND	0.016	8.21
	mid Ag (replicate)	0.070	0.006	0.15	0.404	0.28	ND	0.857	0.006	ND	0.017	8.53
	d/s Ag	0.063	ND	0.06	0.411	0.27	0.001	0.881	0.005	ND	0.013	8.30
	d/s Ag (replicate)	0.073	ND	0.05	0.427	0.30	0.001	1.190	0.005	ND	0.018	9.10
Spring 2000	Food	0.126	0.460	1.32	3.570	2.25	0.016	123.000	0.026	0.034	0.478	186.00
	Control	0.066	0.004	0.06	2.540	0.35	ND	0.478	0.005	ND	ND	5.61
	Ref	0.074	0.006	0.05	2.510	0.36	0.001	0.854	0.005	ND	0.002	6.63
	Ref (replicate)	0.075	0.005	0.05	2.360	0.43	ND	0.775	0.005	ND	ND	6.43
	mid Ag	0.071	ND	0.05	2.360	0.35	ND	1.080	0.005	ND	ND	7.11
	mid Ag (replicate)	0.074	0.005	0.04	2.390	0.39	ND	0.675	0.005	ND	ND	6.69
	d/s Ag	0.069	ND	0.06	2.340	0.37	0.001	0.764	0.003	ND	ND	6.48
Fall 2000	Food	0.130	0.314	0.51	3.130	3.73	0.016	86.100	0.028	0.028	0.458	154.00
	Control	0.096	0.005	0.03	1.750	0.31	ND	1.800	0.004	ND	ND	8.21
	Ref	0.091	0.005	0.02	1.690	0.36	ND	0.661	0.005	ND	ND	8.42
	mid Ag	0.088	0.004	0.03	1.630	0.35	ND	0.973	0.006	ND	ND	8.01
	d/s Ag	0.082	0.005	0.02	1.670	0.31	0.001	0.465	0.004	ND	ND	7.23
	Food	0.041	0.193	0.45	2.040	2.20	0.005	59.200	0.013	0.017	1.840	84.50
Fall 2001	Control	0.082	0.019	0.08	1.060	0.31	ND	1.040	0.003	ND	0.027	8.36
	Ref	0.037	0.005	0.01	0.922	0.22	ND	0.670	0.003	ND	0.014	7.25
	mid Ag	0.037	0.005	0.02	1.020	0.23	ND	0.986	0.004	ND	0.011	8.01
	d/s Ag	0.039	0.010	0.04	0.997	0.25	ND	0.825	0.003	ND	0.015	7.61
	Food	0.041	0.193	0.45	2.040	2.20	0.005	59.200	0.013	0.017	1.840	84.50
All exposures (mean)	Food	0.0960	0.3742	0.712	2.3852	2.547	0.0163	91.1750	0.0248	0.0335	0.7993	146.375
	Control	0.0750	0.0105	0.065	1.4440	0.307	ND	0.9722	0.0042	ND	0.0098	7.495
	Ref	0.0650	0.0040	0.035	1.3810	0.300	0.0005	0.7815	0.0048	ND	0.0077	7.715
	mid Ag	0.0643	0.0035	0.120	1.3475	0.303	0.0003	0.9520	0.0053	ND	0.0068	7.835
	d/s Ag	0.0633	0.0038	0.045	1.3545	0.300	0.0008	0.7337	0.0037	ND	0.0070	7.405
Detection limit (all exposures)		0.002	0.004	0.01	0.001	0.05	0.001	0.005	0.001	0.001	0.002	0.01

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

ND = Not detected. Considered and zero value for statistical calculations.

Crayfish

Table 20: Metal concentrations (mg/kg) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Gallium (Ga)	Lanthanum (La)	Lead (Pb)	Lithium (Li)	Manganese (Mn)
Fall 1999	Control	0.003	0.13	0.038	0.002	0.16	0.013	5.38	0.007	0.001	0.018	ND	0.539
	Ref	0.001	0.18	0.224	0.001	0.07	0.147	5.86	0.012	0.003	0.008	0.013	0.833
	mid Ag	ND	0.19	0.384	0.004	0.27	0.048	5.60	0.014	0.006	0.010	0.019	1.460
	d/s Ag	ND	0.19	0.165	0.001	0.40	0.055	5.23	0.010	0.004	0.017	0.007	2.200
Spring 2000	Control	0.006	0.20	0.023	0.002	ND	0.081	7.60	0.024	0.001	0.035	ND	0.848
	Ref	0.001	0.18	0.337	0.004	0.10	0.034	5.39	0.026	0.006	0.013	0.018	2.060
	mid Ag	0.003	0.16	0.587	0.006	0.32	0.084	5.27	0.031	0.012	0.013	0.032	2.110
	d/s Ag	0.001	0.17	0.230	0.005	0.09	0.158	5.94	0.026	0.003	0.013	0.011	3.660
Fall 2000	Control	0.001	0.19	0.022	0.002	ND	0.126	6.61	0.019	ND	0.011	ND	0.318
	Ref	0.002	0.24	0.088	0.003	ND	0.094	8.10	0.019	0.002	0.008	0.007	0.616
	mid Ag	0.002	0.30	0.250	0.004	0.06	0.036	11.50	0.029	0.006	0.010	0.017	1.010
	d/s Ag	0.002	0.22	0.282	0.003	ND	0.038	8.41	0.028	0.004	0.010	0.012	4.070
Fall 2001	Control	0.001	0.17	0.014	0.003	0.06	0.019	10.70	0.015	0.001	0.003	ND	0.447
	Ref	0.001	0.28	0.152	0.001	ND	0.013	8.04	0.016	0.003	0.007	0.012	0.728
	mid Ag	0.001	0.25	0.188	0.003	ND	0.052	8.81	0.016	0.004	0.006	0.012	0.615
	d/s Ag	0.001	0.33	0.132	0.001	0.07	0.136	9.29	0.021	0.004	0.292	0.007	1.690
All exposures (mean)	Control	0.0028	0.173	0.0243	0.0023	0.055	0.0598	7.573	0.0163	0.0008	0.0168	ND	0.5380
	Ref	0.0013	0.220	0.2003	0.0023	0.043	0.0720	6.848	0.0183	0.0035	0.0090	0.0125	1.0593
	mid Ag	0.0015	0.225	0.3523	0.0043	0.163	0.0550	7.795	0.0225	0.0070	0.0098	0.0200	1.2988
	d/s Ag	0.0010	0.228	0.2023	0.0025	0.140	0.0968	7.218	0.0213	0.0038	0.0830	0.0093	2.9050
Detection limit (all exposures)		0.001	0.01	0.005	0.001	0.05	0.001	0.01	0.001	0.001	0.002	0.005	0.001

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

ND = Not detected. Considered a zero value for statistical calculations.

Table 20 (cont'd): Metal concentrations (mg/kg) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Rubidium (Rb)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)
Fall 1999	Control	0.110	0.015	0.12	0.512	0.19	0.007	0.210	ND	ND	0.019	12.00
	Ref	0.063	0.005	0.04	0.538	0.19	0.011	0.264	0.002	ND	0.050	14.20
	mid Ag	0.085	0.028	0.16	0.488	0.21	0.008	0.360	0.003	0.001	0.081	12.70
	d/s Ag	0.056	0.053	0.29	0.457	0.24	0.008	0.205	0.001	ND	0.033	12.20
Spring 2000	Control	0.089	0.014	0.13	3.220	0.26	0.008	0.220	0.001	ND	0.003	15.40
	Ref	0.064	0.020	0.08	2.930	0.18	0.040	0.407	0.002	0.001	0.053	15.00
	mid Ag	0.073	0.064	0.27	2.860	0.23	0.012	0.440	0.004	0.001	0.097	15.50
	d/s Ag	0.067	0.029	0.26	2.700	0.33	0.012	0.365	0.002	ND	0.032	17.20
Fall 2000	Control	0.049	0.012	0.06	2.780	0.23	0.007	0.321	0.001	ND	ND	12.70
	Ref	0.043	0.013	0.06	2.540	0.30	0.009	0.244	0.001	ND	0.016	11.80
	mid Ag	0.066	0.015	0.07	3.010	0.33	0.011	0.344	0.003	0.001	0.043	16.20
	d/s Ag	0.057	0.012	0.05	3.180	0.29	0.011	0.337	0.001	ND	0.037	15.60
Fall 2001	Control	0.058	0.030	0.05	2.290	0.27	0.014	0.147	ND	ND	0.024	12.90
	Ref	0.119	0.012	0.01	2.400	0.22	0.008	0.203	0.001	ND	0.043	13.40
	mid Ag	0.089	0.012	0.03	2.360	0.21	0.008	0.227	0.002	ND	0.038	14.20
	d/s Ag	0.091	0.018	0.15	2.380	0.15	0.008	0.179	0.001	ND	0.018	14.00
All exposures (mean)	Control	0.0765	0.0178	0.090	2.2005	0.238	0.0090	0.2245	0.0005	ND	0.0115	13.250
	Ref	0.0723	0.0125	0.048	2.1020	0.223	0.0170	0.2795	0.0015	0.0003	0.0405	13.600
	mid Ag	0.0783	0.0298	0.133	2.1795	0.245	0.0098	0.3428	0.0030	0.0008	0.0648	14.650
	d/s Ag	0.0678	0.0280	0.188	2.1793	0.253	0.0098	0.2715	0.0013	ND	0.0300	14.750
Detection limit (all exposures)		0.002	0.004	0.01	0.001	0.05	0.001	0.005	0.001	0.001	0.002	0.01

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 21: Metal concentrations (mg/kg) in crayfish hepatopancreas exposed to Elk Creek water during one exposure period.

Exposure Period	Site	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Gallium (Ga)	Lanthanum (La)	Lead (Pb)	Lithium (Li)	Manganese (Mn)
Fall 2001	Control	0.001	0.63	2.63	0.154	ND	0.545	77.3	0.015	0.033	0.092	ND	9.02
	Ref	0.007	0.44	26.9	0.267	1.27	2.53	93.6	0.017	0.031	1.02	0.011	27
	mid Ag	0.004	0.39	0.443	0.255	0.05	0.854	110	0.017	0.028	0.033	0.015	30.6
	d/s Ag	0.003	0.43	0.601	0.245	ND	0.711	95.1	0.016	0.023	0.029	0.006	87
Detection limit (all exposures)		0.001	0.01	0.005	0.001	0.05	0.001	0.01	0.001	0.001	0.002	0.005	0.001
Exposure Period	Site	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Rubidium (Rb)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)	
Fall 2001	Control	0.007	0.498	0.2	2.08	1.81	0.178	0.919	0.003	0.009	0.021	30.2	
	Ref	0.032	0.64	1.15	1.98	1.82	0.252	1.35	0.009	0.011	0.011	55	
	mid Ag	0.013	0.533	0.39	1.96	2.16	0.339	1.14	0.01	0.013	0.049	37	
	d/s Ag	0.021	0.516	0.44	1.68	1.97	0.428	0.842	0.004	0.011	0.006	40	
Detection limit (all exposures)		0.002	0.004	0.01	0.001	0.05	0.001	0.005	0.001	0.001	0.002	0.01	

NOTE: Sample per site is a composite of hepatopancreas tissue from 24 crayfish.

ND = Not detected. Considered a zero value for statistical calculations.

4.2.2 Polychlorinated Biphenyls

4.2.2.1 PCB Aroclors

Cutthroat Trout

Table 22: Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Aroclors	Fall 1999															
	Food		Control		Ref		Ref (replicate)		Ref (lab split)		mid Ag		d/s Ag		d/s Ag (replicate)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	2.8	0.32	4.4	0.45	3.3	0.47	3.2	0.47	2.9	0.58	3	0.27	2.5	0.47	2.5	0.44
Aroclor 1254	19	0.41	4.1	0.79	5.1	0.85	5.3	1.4	4.5	0.96	5.4	0.82	4.8	0.64	5	0.62
Aroclor 1260	13	0.35	3	0.55	2.8	0.44	3.2	0.62	2.9	0.37	3.1	0.28	3	0.67	3.2	0.43
Total PCB Aroclor concentration**	34.8		11.5		11.2		11.7		10.3		11.5		10.3		10.7	
Mammalian TEQ (ng/kg ww)	n/a		0.022		0.017		0.016		0.015		0.015		0.013		0.013	
Aroclor 1242	n/a		0.022		0.017		0.016		0.015		0.015		0.013		0.013	
Aroclor 1254	n/a		0.123		0.154		0.160		0.135		0.163		0.144		0.151	
Aroclor 1260	n/a		0.034		0.032		0.036		0.033		0.035		0.034		0.036	
Avian TEQ (ng/kg ww)	n/a		1.032		0.774		0.751		0.680		0.704		0.587		0.587	
Aroclor 1242	n/a		1.032		0.774		0.751		0.680		0.704		0.587		0.587	
Aroclor 1254	n/a		0.182		0.227		0.236		0.200		0.240		0.214		0.223	
Aroclor 1260	n/a		0.077		0.071		0.082		0.074		0.079		0.077		0.082	
% Lipid	19.0		2.5		2.4		2.4		2.4		2.4		2.4		2.9	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-ARO-1		TC-99-ARO-1		TC-99-ARO-1		TC-99-ARO-1		TC-99-ARO-1		TC-99-ARO-1		TC-99-ARO-1		TC-99-ARO-1	

PCB Aroclors	Spring 2000																	
	Food		Control		Control (replicate)		Ref		Ref (lab split)		mid Ag		mid Ag (lab split)		d/s Ag		d/s Ag (lab split)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	1.6	0.038	15	0.22	17	0.35	5	0.096	5.2	0.085	6.2	0.15	6.3	0.15	5	0.12	4.9	0.15
Aroclor 1254	13	0.27	3.3	0.19	3.6	0.35	3.8	0.2	3.7	0.19	4.4	0.23	4.6	0.17	3.7	0.21	3.7	0.18
Aroclor 1260	7.1	0.076	2.1	0.17	2.5	0.1	2.4	0.13	2.4	0.13	2.7	0.068	2.6	0.083	2.3	0.21	2.2	0.23
Total PCB Aroclor concentration**	21.7		20.4		23.1		11.2		11.3		13.3		13.5		11.0		10.8	
Mammalian TEQ (ng/kg ww)	n/a		0.077		0.087		0.026		0.027		0.032		0.032		0.026		0.025	
Aroclor 1242	n/a		0.077		0.087		0.026		0.027		0.032		0.032		0.026		0.025	
Aroclor 1254	n/a		0.099		0.108		0.114		0.111		0.132		0.138		0.111		0.111	
Aroclor 1260	n/a		0.024		0.028		0.027		0.027		0.031		0.029		0.026		0.025	
Avian TEQ (ng/kg ww)	n/a		3.519		3.988		1.173		1.220		1.455		1.478		1.173		1.150	
Aroclor 1242	n/a		3.519		3.988		1.173		1.220		1.455		1.478		1.173		1.150	
Aroclor 1254	n/a		0.147		0.160		0.169		0.165		0.196		0.205		0.165		0.165	
Aroclor 1260	n/a		0.054		0.064		0.061		0.061		0.069		0.066		0.059		0.056	
% Lipid	18.0		3.4		3.5		3.7		3.7		4.0		4.0		3.6		3.6	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-ARO-1		TC-00-ARO-1		TC-00-ARO-2		TC-00-ARO-1		TC-00-ARO-1		TC-00-ARO-2		TC-00-ARO-2		TC-00-ARO-3		TC-00-ARO-3	

Exceeds tissue residue guidelines for avian consumption (see Appendix A).

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

** = Total standardized to highest detection limit per exposure period (Food not included).

Table 22 (cont'd): Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Aroclors	Fall 2000											
	Food		Control		Control (replicate)		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	2.1	0.059	2.4	0.1	2.6	0.11	1.7	0.094	1.5	0.069	1.4	0.064
Aroclor 1254	20	0.23	5.4	0.35	6.2	0.37	5.5	0.26	5.7	0.25	6.1	0.22
Aroclor 1260	9.6	0.12	3.4	0.074	3.4	0.084	2.8	0.24	3	0.21	3	0.19
Total PCB Aroclor concentration**	31.7		11.2		12.2		10.0		10.2		10.5	
Mammalian TEQ (ng/kg ww)												
Aroclor 1242	n/a		0.012		0.013		0.009		0.008		0.007	
Aroclor 1254	n/a		0.163		0.187		0.166		0.172		0.184	
Aroclor 1260	n/a		0.038		0.038		0.032		0.034		0.034	
Avian TEQ (ng/kg ww)												
Aroclor 1242	n/a		0.563		0.610		0.399		0.352		0.328	
Aroclor 1254	n/a		0.240		0.276		0.245		0.254		0.271	
Aroclor 1260	n/a		0.087		0.087		0.071		0.077		0.077	
% Lipid	17.03		3.1		3.0		3.0		3.0		3.3	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-ARO-1		TC-00-ARO-2		TC-00-ARO-2		TC-00-ARO-1		TC-00-ARO-1		TC-00-ARO-1	

PCB Aroclors	Fall 2001												Mean of 4 exposure periods				
	Food		Control		Ref		mid Ag		d/s Ag		d/s Ag (lab split)		Food	Control	Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.	Conc.
Aroclor 1242	ND	0.893	0.247	0.138	0.23	0.219	0.172	0.127	0.195	0.161	0.188	0.157	1.625	5.512	2.558	2.718	2.274
Aroclor 1254	3.41	0.395	2.48	0.459	2.19	0.285	1.79	0.273	2.18	0.285	1.71	0.387	13.853	3.820	4.148	4.323	4.195
Aroclor 1260	2.28	0.0781	1.15	0.183	1.01	0.104	0.676	0.189	0.853	0.151	0.815	0.18	7.995	2.413	2.253	2.369	2.288
Total PCB Aroclor concentration**	5.69		3.88		3.43		2.47		3.03		2.53		23.47	11.74	8.96	9.37	8.71
Mammalian TEQ (ng/kg ww)																	
Aroclor 1242	n/a		0.001		0.001		0.001		0.001		0.001		n/a	0.028	0.013	0.014	0.012
Aroclor 1254	n/a		0.075		0.066		0.054		0.066		0.051		n/a	0.115	0.125	0.130	0.126
Aroclor 1260	n/a		0.013		0.011		0.008		0.010		0.009		n/a	0.027	0.025	0.027	0.026
Avian TEQ (ng/kg ww)																	
Aroclor 1242	n/a		0.058		0.054		0.040		0.046		0.044		n/a	1.293	0.600	0.638	0.533
Aroclor 1254	n/a		0.110		0.097		0.080		0.097		0.076		n/a	0.170	0.185	0.192	0.187
Aroclor 1260	n/a		0.029		0.026		0.017		0.022		0.021		n/a	0.062	0.057	0.060	0.058
% Lipid	26.0		3.0		3.6		3.0		3.1		3.1		20.00	3.00	3.18	3.10	3.10
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-ARO-2		TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1		-	-	-	-	-

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 23: Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

PCB Aroclors	Fall 1999								Spring 2000							
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	ND	1.5	ND	0.71	ND	0.72	ND	0.8	ND	0.16	ND	0.18	ND	0.17	ND	0.0061
Aroclor 1254	ND	2.4	ND	2.1	ND	1.4	ND	1.3	ND	0.39	ND	0.29	ND	0.22	ND	0.013
Aroclor 1260	ND	1.9	ND	1.3	ND	0.88	ND	0.94	ND	0.47	ND	0.18	ND	0.12	ND	0.0058
Total PCB Aroclor concentration**	ND		ND		ND		ND		ND		ND		ND		ND	
Mammalian TEQ (ng/kg ww)																
Aroclor 1242	0		0		0		0		0		0		0		0	
Aroclor 1254	0		0		0		0		0		0		0		0	
Aroclor 1260	0		0		0		0		0		0		0		0	
Avian TEQ (ng/kg ww)																
Aroclor 1242	0		0		0		0		0		0		0		0	
Aroclor 1254	0		0		0		0		0		0		0		0	
Aroclor 1260	0		0		0		0		0		0		0		0	
% Lipid	0.7		0.7		0.6		0.7		0.4		0.6		0.4		0.5	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-ARO-2		TC-99-ARO-2		TC-99-ARO-2		TC-99-ARO-2		TC-00-ARO-3		TC-00-ARO-2		TC-00-ARO-2		TC-00-ARO-4	

PCB Aroclors	Fall 2000								Fall 2001							
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	ND	0.19	ND	0.25	ND	0.29	ND	0.29	0.0707	0.0692	ND	0.0844	ND	0.0692	ND	0.0669
Aroclor 1254	ND	0.48	ND	0.6	ND	0.47	ND	0.65	0.782	0.116	0.129	0.108	0.14	0.126	0.149	0.0705
Aroclor 1260	ND	0.49	ND	0.68	ND	0.62	ND	0.81	0.599	0.0533	0.0824	0.0667	0.212	0.0717	0.124	0.0611
Total PCB Aroclor concentration**	ND		ND		ND		ND		1.381		0.211		0.352		0.273	
Mammalian TEQ (ng/kg ww)																
Aroclor 1242	0		0		0		0		0.0004		0		0		0	
Aroclor 1254	0		0		0		0		0.024		0.004		0.004		0.004	
Aroclor 1260	0		0		0		0		0.007		0.001		0.002		0.001	
Avian TEQ (ng/kg ww)																
Aroclor 1242	0		0		0		0		0.017		0		0		0	
Aroclor 1254	0		0		0		0		0.035		0.006		0.006		0.007	
Aroclor 1260	0		0		0		0		0.015		0.002		0.005		0.003	
% Lipid	0.6		0.5		0.4		0.5		1.1		0.4		0.5		0.7	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-ARO-3		TC-00-ARO-3		TC-00-ARO-3		TC-00-ARO-3		TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected.

Table 23 (cont'd): Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

	Mean of 4 exposure periods			
	Control	Ref	mid Ag	d/s Ag
PCB Aroclors	Conc.	Conc.	Conc.	Conc.
Aroclor 1242	0.0177	ND	ND	ND
Aroclor 1254	0.1955	0.0323	0.035	0.0373
Aroclor 1260	0.1498	0.0206	0.053	0.031
Total PCB Aroclor concentration**	0.363	0.0529	0.0880	0.0683
Mammalian TEQ (ng/kg ww)				
Aroclor 1242	0.00009	0	0	0
Aroclor 1254	0.0059	0.00097	0.0011	0.0011
Aroclor 1260	0.0017	0.00023	0.0006	0.00035
Avian TEQ (ng/kg ww)				
Aroclor 1242	0.0041	0	0	0
Aroclor 1254	0.0087	0.0014	0.0016	0.0017
Aroclor 1260	0.0038	0.00053	0.0014	0.00079
% Lipid	0.71	0.55	0.48	0.60
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	-	-	-	-

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 24: Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in crayfish hepatopancreas exposed to Elk Creek water during one exposure period.

	Fall 2001							
	Control		Ref		mid Ag		d/s Ag	
PCB Aroclors	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	2.82	0.733	1.55	0.752	1.66	0.866	1.66	0.642
Aroclor 1254	41.1	1.1	24	0.983	21.3	1.49	24.1	1.16
Aroclor 1260	38.7	0.679	36.5	1.06	38.7	1.1	33.4	0.471
Total PCB Aroclor concentration**	82.62		62.05		61.66		59.16	
Mammalian TEQ (ng/kg ww)								
Aroclor 1242	0.014		0.008		0.008		0.008	
Aroclor 1254	1.237		0.722		0.641		0.725	
Aroclor 1260	0.437		0.412		0.437		0.377	
Avian TEQ (ng/kg ww)								
Aroclor 1242	0.662		0.364		0.389		0.389	
Aroclor 1254	1.829		1.068		0.948		1.072	
Aroclor 1260	0.987		0.931		0.987		0.852	
% Lipid	53.0		30.0		26.0		32.0	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1	

Exceeds tissue residue guidelines for mammalian consumption (see Appendix A).

NOTE: Sample per site per exposure period is a composite of hepatopancreas tissue from 24 crayfish.

** = Total standardized to highest detection limit.

ND = Not detected.

4.2.2.2 PCB Congeners

Cutthroat Trout

Table 25: Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 1999															
	Food		Control		Ref		Ref (replicate)		Ref (lab split)		mid Ag		d/s Ag		d/s Ag (replicate)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	0.059	0.012	0.14	0.015	0.065	0.014	0.062	0.024	0.057	0.023	0.054	0.021	0.035	0.01	0.046	0.018
15	ND	0.01	0.034*	0.013	0.013*	0.012	ND	0.02	ND	0.02	ND	0.018	ND	0.0087	ND	0.016
19	ND	0.022	ND	0.031	ND	0.033	ND	0.033	ND	0.041	ND	0.019	ND	0.033	ND	0.031
18	0.15	0.022	0.21	0.031	0.15*	0.033	0.13	0.033	0.13	0.041	0.1	0.019	0.095	0.033	0.098	0.031
17	0.083	0.022	0.11	0.031	0.079	0.033	0.071	0.033	0.065	0.041	0.075	0.019	0.064	0.033	0.062	0.031
24/27	ND	0.022	ND	0.031	ND	0.033	ND	0.033	ND	0.041	ND	0.019	ND	0.033	ND	0.031
16/32	0.13	0.022	0.16	0.031	0.12	0.033	0.12	0.033	0.096	0.041	0.097	0.019	0.069	0.033	0.08	0.031
26	0.033	0.013	0.06	0.018	0.049*	0.019	0.043	0.019	0.037	0.023	0.052	0.011	0.031	0.019	0.041	0.018
25	0.015	0.013	ND	0.018	0.022*	0.019	ND	0.019	ND	0.023	0.016	0.011	ND	0.019	ND	0.018
31/28	0.45	0.013	0.76	0.018	0.58	0.019	0.57	0.019	0.53	0.023	0.57	0.011	0.46	0.019	0.46	0.018
33/20/21	0.09	0.013	0.13	0.018	0.074	0.019	0.074	0.019	0.056	0.023	0.059	0.011	0.043	0.019	0.05	0.018
22	0.06	0.013	0.07	0.018	0.019	0.019	0.034	0.019	ND	0.023	0.026	0.011	ND	0.019	0.02	0.018
45	ND	0.034	ND	0.045	ND	0.032	ND	0.054	ND	0.055	ND	0.033	ND	0.033	ND	0.033
46	ND	0.034	ND	0.045	ND	0.032	ND	0.054	ND	0.055	ND	0.033	ND	0.033	ND	0.033
52/73	0.85	0.034	0.44	0.045	0.41	0.032	0.43	0.054	0.37	0.055	0.43	0.033	0.37	0.033	0.35	0.033
49/43	0.67	0.036	0.29	0.047	0.23	0.034	0.26	0.058	0.24	0.058	0.26	0.035	0.22	0.035	0.25	0.035
47/48 /75	0.48	0.034	0.24	0.045	0.21	0.032	0.24	0.054	0.16	0.055	0.2	0.033	0.2	0.033	0.19	0.033
44	0.36	0.034	0.25	0.045	0.16	0.032	0.22	0.055	0.18	0.056	0.17	0.033	0.17	0.033	0.14	0.033
42/59	0.24	0.034	0.12	0.045	0.092	0.032	0.1	0.055	0.077	0.056	0.1	0.033	0.097	0.033	0.069	0.033
41/71/64/68	0.55	0.034	0.35	0.045	0.3	0.032	0.33	0.055	0.29	0.056	0.34	0.033	0.26	0.033	0.29	0.033
40	0.06	0.029	ND	0.038	ND	0.028	ND	0.047	ND	0.047	ND	0.028	ND	0.028	0.031	0.028
74/61	0.31	0.029	0.16	0.038	0.13	0.028	0.098	0.047	0.12	0.047	0.13	0.028	0.12	0.028	0.12	0.028
70/76	0.58	0.029	0.23	0.038	0.21	0.028	0.22	0.047	0.19	0.047	0.25	0.028	0.18	0.028	0.21	0.028
66/80	0.57	0.027	0.17	0.036	0.15	0.026	0.18	0.044	0.16	0.045	0.19	0.027	0.15	0.027	0.16	0.027
56/60	0.22	0.027	ND	0.036	0.048	0.026	ND	0.044	ND	0.045	ND	0.027	0.043	0.027	0.035	0.027
95/93	0.95	0.019	0.26	0.036	0.29	0.039	0.3	0.062	0.27	0.044	0.27	0.038	0.26	0.029	0.26	0.028
91	0.29	0.019	0.082	0.036	0.061	0.039	0.09	0.062	0.072	0.044	0.081	0.038	0.056	0.029	0.082	0.028
92	0.37	0.019	0.1	0.036	0.093	0.039	0.12	0.062	0.13	0.044	0.12	0.038	0.094	0.029	0.12	0.028
84	0.22	0.019	0.039	0.036	ND	0.039	ND	0.062	ND	0.044	0.038	0.038	ND	0.029	ND	0.028
89/90/101	1.9	0.019	0.51	0.036	0.52	0.039	0.53	0.062	0.5	0.044	0.58	0.038	0.53	0.029	0.53	0.028
99	1.3	0.019	0.27	0.036	0.31	0.039	0.34	0.062	0.28	0.044	0.32	0.038	0.3	0.029	0.31	0.028
83/108	0.05	0.011	ND	0.02	ND	0.022	ND	0.035	ND	0.025	ND	0.021	ND	0.016	ND	0.016
97/86	0.3	0.011	0.061	0.02	0.1	0.022	0.081	0.035	0.08	0.025	0.091	0.021	0.095	0.016	0.079	0.016
87/115/116	0.42	0.011	0.099	0.02	0.11	0.022	0.13*	0.035	0.11	0.025	0.14	0.021	0.11	0.016	0.13	0.016
85/120	0.31	0.011	0.084	0.02	0.084*	0.022	0.094	0.035	0.068	0.025	0.081	0.021	0.078	0.016	0.073	0.016
110	1.4	0.011	0.32	0.02	0.35	0.022	0.36	0.035	0.33	0.025	0.39	0.021	0.34	0.016	0.36	0.016
107/109	0.21	0.011	0.05	0.02	0.053	0.022	0.062	0.035	0.057	0.025	0.069	0.021	0.06	0.016	0.048	0.016
106/118	1.5	0.013	0.37	0.02	0.39	0.021	0.43	0.039	0.41	0.026	0.42	0.022	0.39	0.017	0.41	0.016
114	0.047	0.011	ND	0.02	ND	0.022	ND	0.035	ND	0.025	ND	0.021	ND	0.016	ND	0.016
105/127	0.46	0.012	0.13	0.019	0.13	0.021	0.13	0.037	0.13	0.026	0.16	0.021	0.14	0.017	0.14	0.017
136	0.28	0.027	0.054	0.039	0.066	0.028	0.061	0.026	0.051	0.036	0.095	0.027	0.064	0.037	0.06	0.027
151	0.51	0.027	0.14	0.039	0.13	0.028	0.15	0.026	0.13	0.036	0.18	0.027	0.14	0.037	0.15	0.027
144/135	0.45	0.027	0.093	0.039	0.12	0.028	0.082	0.026	0.097	0.036	0.097	0.027	0.096	0.037	0.11	0.027
149/139	1.9	0.027	0.45	0.039	0.48	0.028	0.52	0.026	0.46	0.036	0.52	0.027	0.47	0.037	0.52	0.027
134/143	ND	0.027	ND	0.039	ND	0.028	ND	0.026	ND	0.036	ND	0.027	ND	0.037	ND	0.027
131/142	ND	0.027	ND	0.039	ND	0.028	ND	0.026	ND	0.036	ND	0.027	ND	0.037	ND	0.027

Table 25 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 1999															
	Food		Control		Ref		Ref (replicate)		Ref (lab split)		mid Ag		d/s Ag		d/s Ag (replicate)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
146	0.78	0.027	0.2	0.04	0.22	0.029	0.22	0.027	0.18	0.037	0.24	0.028	0.21	0.038	0.22	0.027
153	4.3	0.031	0.87	0.034	0.93	0.025	0.93	0.025	0.89	0.033	0.98	0.026	0.97	0.038	0.99	0.025
141	0.35	0.038	0.089	0.042	0.078	0.03	0.094	0.031	0.1	0.041	0.12	0.032	0.11	0.047	0.097	0.031
130	0.18	0.035	ND	0.038	ND	0.028	ND	0.028	ND	0.037	0.044	0.029	0.046	0.042	ND	0.028
137	0.095	0.035	ND	0.038	ND	0.028	ND	0.028	ND	0.037	ND	0.029	ND	0.042	ND	0.028
138/163/164	3.4	0.035	0.7	0.038	0.76	0.028	0.77	0.028	0.73	0.037	0.84	0.029	0.73	0.042	0.78	0.028
158/160	0.29	0.035	ND	0.038	0.061	0.028	0.056	0.028	0.052	0.037	ND	0.029	0.059	0.042	0.038	0.028
129	0.11	0.035	ND	0.038	ND	0.028	ND	0.028	ND	0.037	ND	0.029	ND	0.042	ND	0.028
128	0.54	0.035	0.098	0.038	0.13	0.028	0.12	0.028	0.12	0.037	0.13	0.029	0.11	0.042	0.12	0.028
156	0.23	0.035	0.061	0.038	0.074	0.028	0.077	0.028	0.06	0.037	0.086	0.029	0.057	0.042	0.084	0.028
157	0.1	0.035	ND	0.038	0.028	0.028	0.037	0.028	ND	0.037	0.033	0.029	ND	0.042	ND	0.028
179	0.3	0.021	0.057	0.033	0.053	0.026	0.063	0.037	0.061	0.022	0.057	0.017	0.054	0.04	0.056	0.026
176	0.068	0.021	ND	0.033	ND	0.026	ND	0.037	ND	0.022	ND	0.017	ND	0.04	ND	0.026
178	0.28	0.021	0.05	0.033	0.071	0.026	0.051	0.037	0.067	0.022	0.054	0.017	0.063	0.04	0.053	0.026
175	0.051	0.021	ND	0.033	ND	0.026	ND	0.037	ND	0.022	ND	0.017	ND	0.04	ND	0.026
187/182	1.5	0.021	0.29	0.033	0.31	0.026	0.33	0.037	0.31	0.022	0.31	0.017	0.31	0.04	0.32	0.026
183	0.47	0.022	0.11	0.036	0.11	0.028	0.12	0.04	0.082	0.024	0.11	0.018	0.12	0.043	0.12	0.028
185	0.071	0.022	ND	0.036	ND	0.028	ND	0.04	ND	0.024	ND	0.018	ND	0.043	ND	0.028
174/181	0.46	0.022	0.091	0.036	0.095	0.028	0.11	0.04	0.12	0.024	0.1	0.018	0.11	0.043	0.11	0.028
177	0.38	0.022	0.087	0.036	0.083	0.028	0.081	0.04	0.08	0.024	0.097	0.018	0.11	0.043	0.1	0.028
171	0.15	0.018	0.033	0.028	ND	0.022	ND	0.032	0.021	0.019	0.034	0.015	0.044	0.034	0.034	0.022
172/192	0.11	0.018	ND	0.028	ND	0.022	0.035	0.032	0.019*	0.019	ND	0.015	ND	0.034	0.026*	0.022
180	1.1	0.018	0.27	0.028	0.24	0.022	0.28	0.032	0.28	0.019	0.29	0.015	0.28	0.034	0.29	0.022
193	0.12	0.018	0.033	0.028	0.033	0.022	ND	0.032	0.032	0.019	0.017	0.015	0.035	0.034	0.029	0.022
191	0.036	0.018	ND	0.028	ND	0.022	ND	0.032	ND	0.019	ND	0.015	ND	0.034	ND	0.022
170/190	0.54	0.021	0.11	0.034	0.12	0.026	0.14*	0.038	0.12	0.022	0.12	0.017	0.11	0.041	0.12	0.026
189	ND	0.021	ND	0.034	ND	0.026	ND	0.038	ND	0.022	ND	0.017	ND	0.041	ND	0.026
201	0.077	0.045	ND	0.029	ND	0.048	ND	0.048	ND	0.049	ND	0.1	0.03	0.027	ND	0.039
197	ND	0.045	ND	0.029	ND	0.048	ND	0.048	ND	0.049	ND	0.1	ND	0.027	ND	0.039
198	ND	0.045	ND	0.029	ND	0.048	ND	0.048	ND	0.049	ND	0.1	ND	0.027	ND	0.039
199	0.33	0.045	0.067	0.029	0.066	0.048	0.073	0.048	0.073	0.049	ND	0.1	0.069	0.027	0.072	0.039
196/203	0.27	0.045	0.062	0.029	0.062	0.048	0.093	0.048	0.053	0.049	ND	0.1	0.069	0.027	0.08	0.039
195	0.07	0.045	ND	0.029	ND	0.048	ND	0.048	ND	0.049	ND	0.1	ND	0.027	ND	0.039
194	0.17	0.045	0.04	0.029	ND	0.048	ND	0.048	ND	0.049	ND	0.1	0.037	0.027	0.054	0.039
205	ND	0.045	ND	0.029	ND	0.048	ND	0.048	ND	0.049	ND	0.1	ND	0.027	ND	0.039
208	0.081	0.043	ND	0.043	ND	0.053	ND	0.05	ND	0.022	ND	0.044	ND	0.035	ND	0.04
207	ND	0.043	ND	0.043	ND	0.053	ND	0.05	ND	0.022	ND	0.044	ND	0.035	ND	0.04
206	0.13	0.043	ND	0.043	ND	0.053	ND	0.05	0.032	0.022	ND	0.044	ND	0.035	ND	0.04
209	0.21	0.053	ND	0.065	0.065	0.058	0.083*	0.072	ND	0.057	ND	0.062	0.064*	0.055	0.057	0.035
Total PCB concentration**	36.18		10.08		9.62		10.22		9.19		10.33		9.26		9.49	
TEQ-Mammalian (ng/kg ww)	n/a		0.081		0.103		0.113		0.084		0.118		0.082		0.097	
TEQ-Avian (ng/kg ww)	n/a		0.023		0.027		0.029		0.023		0.032		0.024		0.027	
% Lipid	19.0		2.5		2.4		2.4		2.4		2.4		2.4		2.9	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-PCB-1		TC-99-PCB-1		TC-99-PCB-1		TC-99-PCB-1		TC-99-PCB-1		TC-99-PCB-1		TC-99-PCB-1		TC-99-PCB-1	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 25 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Spring 2000																	
	Food		Control		Control (replicate)		Ref		Ref (lab split)		mid Ag		mid Ag (lab split)		d/s Ag		d/s Ag (lab split)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	0.034	0.012	0.48	0.022	0.69	0.1	0.12	0.019	0.13	0.021	0.17	0.098	0.17	0.09	0.13	0.033	0.12	0.034
15	ND	0.012	0.06	0.022	ND	0.1	ND	0.019	ND	0.021	ND	0.098	ND	0.09	ND	0.033	ND	0.034
19	0.0044*	0.0019	0.056	0.003	0.08	0.0079	0.013	0.0032	0.016	0.0032	0.017	0.0036	0.017	0.0064	0.014	0.0051	0.015	0.0056
18	0.082	0.0019	0.86	0.003	1.2	0.0079	0.27	0.0032	0.29	0.0032	0.35	0.0036	0.36	0.0064	0.28	0.0051	0.27	0.0056
17	0.032	0.0019	0.41	0.003	0.51	0.0079	0.13	0.0032	0.14	0.0032	0.2	0.0036	0.17	0.0064	0.14	0.0051	0.14	0.0056
24/27	0.011	0.0019	0.091	0.003	0.13	0.0079	0.029	0.0032	0.032	0.0032	0.04	0.0036	0.035	0.0064	0.029	0.0051	0.027	0.0056
16/32	0.036	0.0018	0.49	0.01	0.52	0.015	0.15	0.0045	0.16	0.004	0.18	0.0066	0.18	0.0064	0.14	0.0058	0.14	0.0071
26	0.027	0.0018	0.25	0.01	0.27	0.015	0.088	0.0045	0.091	0.004	0.11	0.0066	0.1	0.0064	0.086	0.0058	0.087	0.0071
25	0.011	0.0018	0.11	0.01	0.11	0.015	0.032	0.0045	0.035	0.004	0.039*	0.0066	0.038	0.0064	0.029	0.0058	0.03	0.0071
31/28	0.32	0.0018	2.56	0.01	2.8	0.015	0.92	0.0045	0.94	0.004	1.08	0.0066	1.14	0.0064	0.93	0.0058	0.9	0.0071
33/20/21	0.058	0.0018	0.67	0.01	0.69	0.015	0.18	0.0045	0.19	0.004	0.2	0.0066	0.21	0.0064	0.15	0.0058	0.15	0.0071
22	0.039	0.0018	0.3	0.01	0.3	0.015	0.075	0.0045	0.078	0.004	0.093	0.0066	0.092	0.0064	0.071	0.0058	0.071	0.0071
45	0.019	0.0019	0.14	0.0047	0.15	0.003	0.048	0.0035	0.047	0.0042	0.057	0.0021	0.051	0.0034	0.045	0.0059	0.041	0.0066
46	0.0063	0.0019	0.033	0.0047	0.04	0.003	0.0086	0.0035	0.01	0.0042	0.013	0.0021	0.007*	0.0034	0.0084	0.0059	0.0076	0.0066
52/73	0.57	0.0019	0.92	0.0047	0.98	0.003	0.43	0.0035	0.43	0.0042	0.48	0.0021	0.5	0.0034	0.42	0.0059	0.42	0.0066
49/43	0.29	0.0018	0.71	0.0047	0.81	0.0032	0.29	0.0035	0.29	0.0042	0.34	0.0023	0.37	0.0036	0.28	0.0059	0.28	0.0066
47/48 /75	0.21	0.0019	0.62	0.0047	0.65	0.003	0.25	0.0035	0.25	0.0042	0.29	0.0021	0.28	0.0034	0.24	0.0059	0.25	0.0066
44	0.2	0.0019	0.62	0.0048	0.68	0.0033	0.23	0.0035	0.23	0.0043	0.28	0.0023	0.26	0.0036	0.21	0.006	0.22	0.0067
42/59	0.1	0.0019	0.35	0.0048	0.37	0.0033	0.12	0.0035	0.12	0.0043	0.15	0.0023	0.16	0.0036	0.12	0.006	0.12	0.0067
41/71/64/68	0.25	0.0014	0.76	0.0036	0.81	0.0024	0.29	0.0026	0.29	0.0032	0.34	0.0017	0.35	0.0026	0.27	0.0044	0.28	0.005
40	0.018	0.0014	0.057	0.0036	0.053	0.0024	0.015	0.0026	0.015	0.0032	0.022	0.0017	0.021*	0.0026	0.014	0.0044	0.015	0.005
74/61	0.26	0.0014	0.21	0.0036	0.23	0.0024	0.11	0.0026	0.11	0.0032	0.14	0.0017	0.15	0.0026	0.11	0.0044	0.11	0.005
70/76	0.41	0.0014	0.35	0.0036	0.4	0.0024	0.19	0.0026	0.19	0.0032	0.24	0.0017	0.24	0.0026	0.19	0.0044	0.19	0.005
66/80	0.38	0.0014	0.24	0.0036	0.28	0.0024	0.15	0.0026	0.15	0.0032	0.2	0.0017	0.19	0.0026	0.15	0.0044	0.15	0.005
56/60	0.14	0.0019	0.031	0.003	0.032	0.0054	0.025	0.0022	0.027	0.0023	0.032	0.0029	0.033	0.0028	0.026	0.0039	0.027	0.0038
95/93	0.38	0.0015	0.17	0.0035	0.17	0.0025	0.13	0.0024	0.14	0.0034	0.17	0.0026	0.17	0.002	0.15	0.0051	0.14	0.0054
91	0.079	0.0015	0.038	0.0035	0.038	0.0025	0.028	0.0024	0.029	0.0034	0.039	0.0026	0.03	0.002	0.029	0.0051	0.032	0.0054
92	0.22	0.0078	0.057	0.0055	0.06	0.0099	0.06	0.0059	0.065	0.0054	0.078	0.0065	0.06	0.0048	0.06	0.0061	0.063	0.0052
84	0.078	0.0078	0.024	0.0055	0.028	0.0099	0.018	0.0059	0.019	0.0054	0.024	0.0065	0.022	0.0048	0.019	0.0061	0.018	0.0052
89/90/101	1.3	0.0078	0.33	0.0055	0.39	0.0099	0.38	0.0059	0.39	0.0054	0.42	0.0065	0.42	0.0048	0.38	0.0061	0.38	0.0052
99	0.8	0.0078	0.21	0.0055	0.23	0.0099	0.24	0.0059	0.24	0.0054	0.27	0.0065	0.29	0.0048	0.23	0.0061	0.24	0.0052
83/108	0.027	0.0068	0.0077	0.0048	ND	0.0087	0.0077	0.0051	0.0057	0.0047	0.008*	0.0057	0.009	0.0042	0.0071	0.0053	0.0069	0.0044
97/86	0.16	0.0068	0.037	0.0048	0.041	0.0087	0.044	0.0051	0.042	0.0047	0.055	0.0057	0.053	0.0042	0.042	0.0053	0.042	0.0044
87/115/116	0.29	0.0068	0.075	0.0048	0.072	0.0087	0.082	0.0051	0.082	0.0047	0.089	0.0057	0.1	0.0042	0.085	0.0053	0.082	0.0044
85/120	0.18	0.0068	0.046	0.0048	0.058	0.0087	0.057	0.0051	0.052	0.0047	0.064	0.0057	0.068	0.0042	0.054	0.0053	0.054	0.0044
110	0.82	0.0068	0.22	0.0048	0.25	0.0087	0.25	0.0051	0.25	0.0047	0.26	0.0057	0.31	0.0042	0.26	0.0053	0.26	0.0044
107/109	0.13	0.0048	0.031	0.0046	0.054	0.0074	0.043	0.0033	0.041	0.004	0.063	0.0097	0.067	0.0073	0.036	0.0057	0.038	0.005
106/118	1.2	0.0055	0.3	0.0053	0.33	0.0054	0.36	0.0036	0.37	0.0045	0.41	0.0074	0.4	0.0049	0.37	0.007	0.37	0.0059
114	0.025	0.0048	0.0047	0.0046	0.019	0.0074	0.006	0.0033	0.0086	0.004	0.01	0.0097	0.011	0.0073	0.0069	0.0057	0.01	0.005
105/127	0.41	0.0059	0.096	0.0055	0.11	0.0053	0.12	0.0038	0.11	0.0048	0.14	0.0073	0.14	0.0048	0.12	0.0073	0.11	0.0057
136	0.079	0.0021	0.02*	0.0038	0.021*	0.0025	0.024	0.0029	0.022	0.0035	0.03*	0.0015	0.032	0.0019	0.024	0.0054	0.023	0.0054
151	0.29	0.0035	0.08	0.0047	0.086	0.0057	0.1	0.0037	0.091	0.0049	0.1	0.0031	0.12	0.0034	0.09	0.0058	0.092	0.0061
144/135	0.18	0.0035	0.056	0.0047	0.056	0.0057	0.063	0.0037	0.054	0.0049	0.07	0.0031	0.083	0.0034	0.057	0.0058	0.062	0.0061
149/139	0.96	0.0035	0.29	0.0047	0.34	0.0057	0.33	0.0037	0.33	0.0049	0.36	0.0031	0.37	0.0034	0.32	0.0058	0.32	0.0061
134/143	0.03	0.0035	0.0069	0.0047	0.008*	0.0057	0.011	0.0037	0.0082	0.0049	0.008*	0.0031	0.013	0.0034	0.0086	0.0058	ND	0.0061
131/142	ND	0.0035	ND	0.0047	ND	0.0057	ND	0.0037	ND	0.0049	ND	0.0031	ND	0.0034	ND	0.0058	ND	0.0061
146	0.42	0.0043	0.12	0.0057	0.14	0.0067	0.13	0.004	0.13	0.0058	0.14	0.0035	0.17	0.0037	0.13	0.0069	0.12	0.0065

Table 25 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Spring 2000																	
	Food		Control		Control (replicate)		Ref		Ref (lab split)		mid Ag		mid Ag (lab split)		d/s Ag		d/s Ag (lab split)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
153	2.8	0.0043	0.75	0.0057	0.83	0.0067	0.82	0.004	0.84	0.0058	0.91	0.0035	1	0.0037	0.82	0.0069	0.79	0.0065
141	0.22	0.0054	0.061	0.0072	0.068	0.0089	0.063	0.005	0.067	0.0073	0.089	0.0047	0.083*	0.0049	0.073	0.0088	0.065	0.0083
130	0.09	0.0054	0.026	0.0071	0.035	0.0091	0.031	0.0049	0.026	0.0072	0.035	0.0048	0.037	0.005	0.029	0.0088	0.023	0.0082
137	0.08	0.0054	0.024	0.0071	0.029	0.0091	0.025	0.0049	0.022	0.0072	0.026	0.0048	0.028*	0.005	0.022	0.0088	0.02	0.0082
138/163/164	2.4	0.0054	0.65	0.0071	0.76	0.0091	0.75	0.0049	0.76	0.0072	0.82	0.0048	0.89	0.005	0.73	0.0088	0.7	0.0082
158/160	0.17	0.0054	0.048	0.0071	0.044*	0.0091	0.052	0.0049	0.058	0.0072	0.061	0.0048	0.075	0.005	0.055	0.0088	0.051	0.0082
129	0.026	0.0054	ND	0.0071	ND	0.0091	0.0053*	0.0049	ND	0.0072	0.006*	0.0048	0.011	0.005	0.011	0.0088	ND	0.0082
128	0.24	0.0054	0.069	0.0071	0.077*	0.0091	0.074	0.0049	0.071	0.0072	0.083	0.0048	0.1	0.005	0.083	0.0088	0.071	0.0082
156	0.13	0.0054	0.032	0.0071	0.046	0.0091	0.038	0.0049	0.038	0.0072	0.056	0.0048	0.047	0.005	0.045	0.0088	0.037	0.0082
157	0.037	0.0054	0.0075*	0.0071	0.016*	0.0091	0.012	0.0049	0.0081	0.0072	0.015*	0.0048	0.014*	0.005	0.011	0.0088	0.012	0.0082
179	0.17	0.0036	0.053	0.0081	0.057	0.0049	0.059	0.006	0.058	0.0062	0.069*	0.0033	0.078	0.004	0.056	0.0094	0.051*	0.01
176	0.043	0.0036	0.011	0.0081	0.024*	0.0049	0.01	0.006	0.011	0.0062	0.016	0.0033	0.015*	0.004	0.014	0.0094	0.01	0.01
178	0.11	0.0036	0.034	0.0081	0.055*	0.0049	0.039	0.006	0.04	0.0062	0.047*	0.0033	0.054*	0.004	0.031*	0.0094	0.035	0.01
175	0.017	0.0036	ND	0.0081	0.009*	0.0049	0.0063	0.006	ND	0.0062	0.008*	0.0033	0.007	0.004	ND	0.0094	ND	0.01
187/182	0.73	0.0036	0.24	0.0081	0.23	0.0049	0.26	0.006	0.24	0.0062	0.26	0.0033	0.32	0.004	0.23	0.0094	0.24	0.01
183	0.25	0.0037	0.073	0.0084	0.1	0.0051	0.083	0.0062	0.08	0.0065	0.1	0.0034	0.1	0.0042	0.083	0.0097	0.073	0.011
185	0.026	0.0037	0.0092	0.0084	0.006*	0.0051	ND	0.0062	0.0088	0.0065	0.008*	0.0034	0.008	0.0042	ND	0.0097	ND	0.011
174/181	0.19	0.0037	0.054	0.0084	0.085	0.0051	0.06	0.0062	0.063	0.0065	0.071	0.0034	0.071	0.0042	0.062	0.0097	0.053	0.011
177	0.15	0.0037	0.049	0.0084	0.055	0.0051	0.054	0.0062	0.051	0.0065	0.072	0.0034	0.058*	0.0042	0.057	0.0097	0.048	0.011
171	0.067	0.0034	0.023	0.0076	0.021	0.0044	0.023	0.0056	0.025	0.0059	0.025*	0.003	0.025	0.0036	0.024	0.0089	0.024	0.0098
172/192	0.05	0.0034	0.014	0.0076	0.021*	0.0044	0.017	0.0056	0.019	0.0059	0.015	0.003	0.02*	0.0036	0.012	0.0089	0.015	0.0098
180	0.66	0.0034	0.19	0.0076	0.21	0.0044	0.22	0.0056	0.21	0.0059	0.25	0.003	0.23	0.0036	0.21	0.0089	0.2	0.0098
193	0.057	0.0034	0.015	0.0076	0.028*	0.0044	0.022	0.0056	0.018	0.0059	0.021	0.003	0.019*	0.0036	0.018	0.0089	0.019	0.0098
191	0.012	0.0034	ND	0.0076	0.009*	0.0044	ND	0.0056	ND	0.0059	0.004*	0.003	ND	0.0036	ND	0.0089	ND	0.0098
170/190	0.26	0.0041	0.088	0.0092	0.1	0.0055	0.094	0.0068	0.098	0.0071	0.1	0.0036	0.1	0.0045	0.099	0.011	0.082	0.012
189	0.0093	0.0041	ND	0.0092	0.008*	0.0055	ND	0.0068	ND	0.0071	0.006	0.0036	0.005*	0.0045	ND	0.011	ND	0.012
201	0.035	0.0043	0.011*	0.01	0.016	0.0062	0.01	0.0078	0.011	0.0095	0.016*	0.003	0.017*	0.0046	ND	0.016	ND	0.014
197	0.01	0.0043	ND	0.01	ND	0.0062	ND	0.0078	ND	0.0095	0.003	0.003	ND	0.0046	ND	0.016	ND	0.014
198	0.0057	0.0043	ND	0.01	ND	0.0062	ND	0.0078	ND	0.0095	0.003*	0.003	0.005*	0.0046	ND	0.016	ND	0.014
199	0.13	0.0043	0.043	0.01	0.044	0.0062	0.054	0.0078	0.052	0.0095	0.052*	0.003	0.053	0.0046	0.04	0.016	0.047	0.014
196/203	0.12	0.0043	0.043	0.01	0.058	0.0062	0.045	0.0078	0.043	0.0095	0.075	0.003	0.051*	0.0046	0.053	0.016	0.046	0.014
195	0.053	0.0047	0.018	0.012	0.029	0.01	0.017	0.0097	0.017	0.01	0.03	0.0065	0.034	0.006	0.018*	0.014	0.021	0.014
194	0.15	0.0047	0.056	0.012	0.062	0.01	0.056	0.0097	0.054	0.01	0.063	0.0065	0.075	0.006	0.05	0.014	0.056	0.014
205	0.0088	0.0047	ND	0.012	ND	0.01	ND	0.0097	ND	0.01	ND	0.0065	ND	0.006	ND	0.014	ND	0.014
208	0.05	0.0044	0.025	0.012	0.025	0.0051	0.029	0.0073	0.027*	0.011	0.026*	0.0031	0.025*	0.0035	0.024	0.014	0.022	0.014
207	0.024	0.0044	ND	0.012	0.008	0.0051	0.012*	0.0073	ND	0.011	0.011*	0.0031	0.011	0.0035	ND	0.014	0.014	0.014
206	0.072	0.0044	0.033	0.012	0.026	0.0051	0.038	0.0073	0.035	0.011	0.027	0.0031	0.026*	0.0035	0.038	0.014	0.03	0.014
209	0.057	0.0042	0.029	0.013	0.024*	0.0055	0.03	0.008	0.029	0.013	0.025	0.0033	0.019	0.0035	0.031*	0.013	0.03	0.015
Total PCB concentration**	21.27		16.28		18.46		9.71		9.78		11.32		11.74		9.58		9.40	
TEQ-Mammalian (ng/kg ww)	n/a		0.062		0.085		0.076		0.075		0.096		0.091		0.080		0.078	
TEQ-Avian (ng/kg ww)	n/a		0.017		0.022		0.021		0.020		0.026		0.025		0.022		0.021	
% Lipid	18.0		3.4		3.5		3.7		3.7		4.0		4.0		3.6		3.6	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PCB-1		TC-00-PCB-1		TC-00-PCB-2		TC-00-PCB-1		TC-00-PCB-1		TC-00-PCB-2		TC-00-PCB-2		TC-00-PCB-3		TC-00-PCB-3	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 25 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 2000											
	Food		Control		Control (replicate)		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	0.029	0.017	ND	0.06	ND	0.1	ND	0.024	ND	0.019	ND	0.024
15	ND	0.017	ND	0.06	ND	0.1	ND	0.024	ND	0.019	ND	0.024
19	0.0039	0.0026	0.005*	0.0044	ND	0.0068	ND	0.0045	ND	0.0033	ND	0.0036
18	0.1	0.0026	0.13	0.0044	0.14	0.0068	0.068	0.0045	0.06	0.0033	0.055	0.0036
17	0.025	0.0026	0.06	0.0044	0.055	0.0068	0.033	0.0045	0.03	0.0033	0.027	0.0036
24/27	0.013	0.0026	0.012*	0.0044	0.014	0.0068	0.0066	0.0045	0.0066	0.0033	0.006	0.0036
16/32	0.045	0.0028	0.063	0.0044	0.062	0.0048	0.036	0.0044	0.03	0.0032	0.027	0.003
26	0.046	0.0028	0.044	0.0044	0.048	0.0048	0.034	0.0044	0.029	0.0032	0.027	0.003
25	0.013	0.0028	0.015*	0.0044	0.017	0.0048	0.0079	0.0044	0.0071	0.0032	0.0066	0.003
31/28	0.46	0.0028	0.47	0.0044	0.52	0.0048	0.36	0.0044	0.33	0.0032	0.32	0.003
33/20/21	0.082	0.0028	0.065	0.0044	0.064	0.0048	0.035	0.0044	0.031	0.0032	0.03	0.003
22	0.056	0.0028	0.033	0.0044	0.034*	0.0048	0.014	0.0044	0.012	0.0032	0.014	0.003
45	0.016	0.0033	0.018*	0.0031	0.02*	0.0061	0.014	0.0051	0.012	0.004	0.012	0.0041
46	0.006	0.0033	ND	0.0031	ND	0.0061	ND	0.0051	ND	0.004	ND	0.0041
52/73	0.83	0.0033	0.4	0.0031	0.38	0.0061	0.34	0.0051	0.33	0.004	0.33	0.0041
49/43	0.33	0.0033	0.22	0.0033	0.21	0.0065	0.18	0.0051	0.17	0.004	0.16	0.0041
47/48 /75	0.3	0.0033	0.19	0.0031	0.17	0.0061	0.14	0.0051	0.14	0.004	0.14	0.0041
44	0.28	0.0033	0.18	0.0033	0.16	0.0066	0.12	0.0051	0.13	0.004	0.12	0.0042
42/59	0.11	0.0033	0.092	0.0033	0.074	0.0066	0.059	0.0051	0.059	0.004	0.056	0.0042
41/71/64/68	0.33	0.0025	0.22	0.0024	0.21	0.0047	0.16	0.0038	0.17	0.003	0.17	0.0031
40	0.026	0.0025	0.011*	0.0024	0.013*	0.0047	0.0066	0.0038	0.0072	0.003	0.0054	0.0031
74/61	0.38	0.0025	0.14	0.0024	0.15	0.0047	0.12	0.0038	0.13	0.003	0.14	0.0031
70/76	0.65	0.0025	0.26	0.0024	0.25	0.0047	0.22	0.0038	0.22	0.003	0.23	0.0031
66/80	0.54	0.0025	0.21	0.0024	0.21	0.0047	0.18	0.0038	0.18	0.003	0.19	0.0031
56/60	0.21	0.0023	0.049	0.0038	0.055	0.0031	0.041	0.0031	0.04	0.0033	0.045	0.0037
95/93	0.55	0.0027	0.2	0.0023	0.22	0.0038	0.18	0.0044	0.18	0.0042	0.17	0.0035
91	0.095	0.0027	0.03	0.0023	0.033*	0.0038	0.029	0.0044	0.03	0.0042	0.03	0.0035
92	0.31	0.0067	0.093	0.01	0.1	0.011	0.095	0.0074	0.092	0.0072	0.1	0.0063
84	0.1	0.0067	0.026*	0.01	0.024*	0.011	0.022	0.0074	0.019	0.0072	0.023	0.0063
89/90/101	1.9	0.0067	0.6	0.01	0.59	0.011	0.58	0.0074	0.56	0.0072	0.61	0.0063
99	1.2	0.0067	0.35	0.01	0.35	0.011	0.33	0.0074	0.34	0.0072	0.37	0.0063
83/108	0.037	0.0059	ND	0.0089	0.01	0.0093	0.011	0.0064	0.0084	0.0063	0.008	0.0055
97/86	0.24	0.0059	0.071*	0.0089	0.077	0.0093	0.069	0.0064	0.065	0.0063	0.072	0.0055
87/115/116	0.47	0.0059	0.16	0.0089	0.15	0.0093	0.13	0.0064	0.14	0.0063	0.15	0.0055
85/120	0.31	0.0059	0.1	0.0089	0.098	0.0093	0.083	0.0064	0.091	0.0063	0.089	0.0055
110	1.3	0.0059	0.4	0.0089	0.4	0.0093	0.36	0.0064	0.37	0.0063	0.4	0.0055
107/109	0.21	0.007	0.099	0.009	0.077	0.011	0.053	0.006	0.058	0.0067	0.066	0.0061
106/118	2.1	0.0077	0.6	0.0062	0.58	0.0078	0.57	0.0068	0.57	0.0078	0.6	0.0066
114	0.048	0.007	0.021	0.009	0.028*	0.011	0.013	0.006	0.012	0.0067	0.014	0.0061
105/127	0.78	0.008	0.22	0.0062	0.18	0.0072	0.2	0.0072	0.2	0.0079	0.22	0.0071
136	0.1	0.0027	0.027	0.0022	0.03	0.0039	0.025	0.0051	0.031	0.0046	0.03	0.0049
151	0.42	0.0049	0.15	0.0077	0.13	0.0043	0.12	0.007	0.13	0.0058	0.14	0.0057
144/135	0.27	0.0049	0.082	0.0077	0.098	0.0043	0.076	0.007	0.085	0.0058	0.085	0.0057
149/139	1.4	0.0049	0.48	0.0077	0.46	0.0043	0.42	0.007	0.41	0.0058	0.46	0.0057
134/143	0.048	0.0049	0.015*	0.0077	0.012*	0.0043	0.013	0.007	0.013*	0.0058	0.016	0.0057
131/142	0.008	0.0049	ND	0.0077	ND	0.0043	ND	0.007	ND	0.0058	ND	0.0057
146	0.55	0.0054	0.17	0.0086	0.17	0.0046	0.17	0.0084	0.18	0.0077	0.19	0.0068

Table 25 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 2000											
	Food		Control		Control (replicate)		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
153	3.8	0.0054	1.2	0.0086	1.2	0.0046	1.1	0.0084	1.2	0.0077	1.2	0.0068
141	0.34	0.0068	0.11	0.012	0.13	0.0061	0.097	0.011	0.11	0.0097	0.11	0.0085
130	0.14	0.0068	0.052*	0.012	0.048	0.0062	0.038	0.01	0.037	0.0096	0.042	0.0084
137	0.12	0.0068	0.043	0.012	0.045	0.0062	0.032	0.01	0.037	0.0096	0.035	0.0084
138/163/164	3.6	0.0068	1.2	0.012	1.1	0.0062	1	0.01	1.1	0.0096	1.1	0.0084
158/160	0.27	0.0068	0.085*	0.012	0.077*	0.0062	0.076	0.01	0.079	0.0096	0.082	0.0084
129	0.055	0.0068	ND	0.012	0.011*	0.0062	ND	0.01	ND	0.0096	0.0089*	0.0084
128	0.38	0.0068	0.13	0.012	0.12	0.0062	0.1	0.01	0.11	0.0096	0.11	0.0084
156	0.21	0.0068	0.065	0.012	0.074*	0.0062	0.053	0.01	0.053	0.0096	0.057	0.0084
157	0.059	0.0068	0.014*	0.012	0.017*	0.0062	0.013	0.01	0.016	0.0096	0.014	0.0084
179	0.2	0.0059	0.089	0.0036	0.081	0.0041	0.063	0.011	0.07	0.0098	0.073	0.0088
176	0.055	0.0059	0.018*	0.0036	0.024	0.0041	0.014	0.011	0.015	0.0098	0.012	0.0088
178	0.16	0.0059	0.048	0.0036	0.041	0.0041	0.043	0.011	0.054*	0.0098	0.051	0.0088
175	0.024	0.0059	0.004*	0.0036	ND	0.0041	ND	0.011	ND	0.0098	ND	0.0088
187/182	0.98	0.0059	0.31	0.0036	0.33	0.0041	0.3	0.011	0.33	0.0098	0.32	0.0088
183	0.34	0.0061	0.11	0.0037	0.13	0.0043	0.1	0.012	0.11	0.01	0.1	0.0091
185	0.032	0.0061	0.009*	0.0037	0.017*	0.0043	ND	0.012	0.014	0.01	ND	0.0091
174/181	0.27	0.0061	0.073*	0.0037	0.079*	0.0043	0.071	0.012	0.08	0.01	0.082	0.0091
177	0.21	0.0061	0.066*	0.0037	0.072	0.0043	0.061	0.012	0.062	0.01	0.073	0.0091
171	0.093	0.0055	0.036*	0.0032	0.034*	0.0037	0.026	0.011	0.03	0.0092	0.033	0.0083
172/192	0.068	0.0055	0.017*	0.0032	0.024	0.0037	0.018*	0.011	0.016*	0.0092	0.022	0.0083
180	0.87	0.0055	0.32	0.0032	0.31	0.0037	0.25	0.011	0.27	0.0092	0.29	0.0083
193	0.082	0.0055	0.029	0.0032	0.03*	0.0037	0.021	0.011	0.024	0.0092	0.025	0.0083
191	0.019	0.0055	ND	0.0032	ND	0.0037	ND	0.011	ND	0.0092	ND	0.0083
170/190	0.38	0.0067	0.12	0.0039	0.13	0.0045	0.11	0.013	0.12	0.011	0.11	0.01
189	0.017	0.0067	0.006*	0.0039	0.006	0.0045	ND	0.013	ND	0.011	ND	0.01
201	0.05	0.008	0.014*	0.0044	0.016*	0.0074	ND	0.016	0.016	0.013	0.013	0.012
197	0.016	0.008	0.006	0.0044	ND	0.0074	ND	0.016	ND	0.013	ND	0.012
198	ND	0.008	ND	0.0044	ND	0.0074	ND	0.016	ND	0.013	ND	0.012
199	0.16	0.008	0.051	0.0044	0.053	0.0074	0.059	0.016	0.054	0.013	0.063	0.012
196/203	0.16	0.008	0.06	0.0044	0.071	0.0074	0.051	0.016	0.054	0.013	0.05	0.012
195	0.067	0.0076	0.025	0.0068	0.021*	0.0071	0.019	0.015	0.021	0.013	0.025	0.01
194	0.19	0.0076	0.079	0.0068	0.081*	0.0071	0.065	0.015	0.054	0.013	0.065	0.01
205	0.014	0.0076	0.007*	0.0068	ND	0.0071	ND	0.015	ND	0.013	ND	0.01
208	0.061	0.0069	0.02	0.004	0.023	0.005	0.021	0.015	0.021	0.0092	0.022*	0.0094
207	0.031	0.0069	ND	0.004	0.012*	0.005	ND	0.015	0.011	0.0092	ND	0.0094
206	0.08	0.0069	0.022	0.004	0.028*	0.005	0.027	0.015	0.026	0.0092	0.027	0.0094
209	0.063	0.0072	0.017	0.0038	0.015	0.0046	0.024	0.014	0.02	0.011	0.023	0.01
Total PCB concentration**	30.99		11.19		11.08		9.57		9.90		10.16	
TEQ-Mammalian (ng/kg ww)	n/a		0.133		0.136		0.117		0.118		0.125	
TEQ-Avian (ng/kg ww)	n/a		0.038		0.036		0.034		0.034		0.037	
% Lipid	17.03		3.1		3.0		3.0		3.0		3.3	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PCB-1		TC-00-PCB-2		TC-00-PCB-2		TC-00-PCB-1		TC-00-PCB-1		TC-00-PCB-1	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 25 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 2001											Mean of 4 exposure periods					
	Food		Control		Ref		mid Ag		d/s Ag		d/s Ag (lab split)		Food	Control	Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.	Conc.
8/5	ND	0.235	0.0183*	0.0179	ND	0.0575	ND	0.0335	ND	0.0298	ND	0.0270	0.0305	0.1596	0.0463	0.0560	0.0413
15	ND	0.139	ND	0.0107	ND	0.0344	ND	0.0200	ND	0.0178	ND	0.0162	ND	0.0235	0.0033	ND	ND
19	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0215	ND	0.0424	ND	0.0413	0.0021	0.0153	0.0033	0.0043	0.0035
18	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0215	ND	0.0424	ND	0.0413	0.0830	0.3000	0.1220	0.1275	0.1075
17	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0215	ND	0.0424	ND	0.0413	0.0350	0.1450	0.0605	0.0763	0.0578
24/27	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0215	ND	0.0424	ND	0.0413	0.0060	0.0258	0.0089	0.0117	0.0088
16/32	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0215	ND	0.0424	ND	0.0413	0.0528	0.1783	0.0765	0.0768	0.0590
26	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0215	ND	0.0424	ND	0.0413	0.0265	0.0885	0.0428	0.0478	0.0360
25	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0215	ND	0.0424	ND	0.0413	0.0098	0.0313	0.0155	0.0155	0.0089
31/28	0.0486*	0.0457	0.1294*	0.0229	0.1152*	0.021	0.109*	0.0135	0.1101*	0.0267	0.103*	0.026	0.3197	0.9799	0.4938	0.5223	0.4550
33/20/21	0.210*	0.0457	0.0231*	0.0229	ND	0.0210	0.0175*	0.0135	ND	0.0267	ND	0.0260	0.1100	0.2220	0.0723	0.0769	0.0558
22	ND	0.0457	ND	0.0229	ND	0.0210	ND	0.0135	ND	0.0267	ND	0.0260	0.0388	0.1008	0.0270	0.0328	0.0213
45	ND	0.0865	ND	0.0139	ND	0.0175	ND	0.0184	ND	0.0339	ND	0.0187	0.0088	0.0395	0.0155	0.0173	0.0143
46	ND	0.0865	ND	0.0139	ND	0.0175	ND	0.0184	ND	0.0339	ND	0.0187	0.0031	0.0083	0.0022	0.0033	0.0021
52/73	ND	0.0865	0.108	0.0139	0.105	0.0175	0.0876	0.0184	0.0978	0.0339	0.0872	0.0187	0.5625	0.4670	0.3213	0.3319	0.3045
49/43	ND	0.0865	0.0534	0.0139	0.0582	0.0175	0.0410	0.0184	0.0485	0.0339	0.0440	0.0187	0.3225	0.3184	0.1896	0.2028	0.1771
47/48 /75	ND	0.0865	0.0427	0.0139	0.0393	0.0175	0.0345	0.0184	0.0384	0.0339	0.0326	0.0187	0.2475	0.2732	0.1598	0.1661	0.1546
44	ND	0.0865	0.0483	0.0139	0.0411	0.0175	0.0319	0.0184	0.0396	0.0339	0.0344	0.0187	0.2100	0.2746	0.1378	0.1530	0.1349
42/59	ND	0.0865	0.0284	0.0139	0.0306	0.0175	0.0206	0.0184	ND	0.0339	ND	0.0187	0.1125	0.1476	0.0754	0.0824	0.0683
41/71/64/68	0.141*	0.0865	0.0630	0.0139	0.0594	0.0175	0.0463	0.0184	0.0524	0.0339	0.0513	0.0187	0.3178	0.3483	0.2024	0.2241	0.1881
40	ND	0.0865	ND	0.0139	ND	0.0175	ND	0.0184	ND	0.0339	ND	0.0187	0.0260	0.0170	0.0054	0.0073	0.0049
74/61	0.254*	0.0865	0.0828	0.0139	0.0939	0.0175	0.0674	0.0184	0.0716	0.0339	0.0741	0.0187	0.3010	0.1482	0.1135	0.1169	0.1104
70/76	ND	0.0865	0.0952	0.0139	0.0831	0.0175	0.0721	0.0184	0.0819	0.0339	0.0724	0.0187	0.4100	0.2338	0.1758	0.1955	0.1705
66/80	ND	0.0865	0.0806	0.0139	0.0772	0.0175	0.0647	0.0184	0.0745	0.0339	0.0728	0.0187	0.3725	0.1752	0.1393	0.1587	0.1411
56/60	ND	0.0865	ND	0.0139	ND	0.0175	ND	0.0184	ND	0.0339	ND	0.0187	0.1425	0.0200	0.0285	0.0180	0.0285
95/93	ND	0.0263	0.0743	0.0300	0.0724	0.0186	0.0514	0.0179	0.0522	0.0187	0.0638	0.0254	0.4700	0.1761	0.1681	0.1679	0.1581
91	ND	0.0263	ND	0.0300	ND	0.0186	ND	0.0179	ND	0.0187	ND	0.0254	0.1160	0.0375	0.0295	0.0375	0.0288
92	ND	0.0263	ND	0.0300	0.0249	0.0186	0.0204*	0.0179	0.0203	0.0187	ND	0.0254	0.2250	0.0625	0.0682	0.0776	0.0686
84	ND	0.0263	ND	0.0300	ND	0.0186	ND	0.0179	ND	0.0187	ND	0.0254	0.0995	0.0223	0.0100	0.0203	0.0105
89/90/101	0.245	0.0263	0.150	0.0300	0.142	0.0186	0.126	0.0179	0.126	0.0187	0.127	0.0254	1.3363	0.3975	0.4055	0.4215	0.4115
99	0.139	0.0263	0.0902	0.0300	0.0796	0.0186	0.0649	0.0179	0.0787	0.0187	0.0700	0.0254	0.8598	0.2301	0.2399	0.2487	0.2447
83/108	ND	0.0262	ND	0.0306	ND	0.0190	ND	0.0182	ND	0.0190	ND	0.0258	0.0285	0.0019	0.0047	0.0041	0.0038
97/86	0.0430*	0.0262	0.0318	0.0306	0.0270	0.0190	0.0247	0.0182	0.0224	0.0190	ND	0.0258	0.1858	0.0502	0.0600	0.0589	0.0579
87/115/116	0.0882	0.0262	0.0434	0.0306	0.0392	0.0190	0.0297	0.0182	0.0440	0.0190	0.0440	0.0258	0.3171	0.0944	0.0903	0.0997	0.0973
85/120	0.0514*	0.0262	ND	0.0306	0.0304	0.0190	0.0250	0.0182	0.0249	0.0190	0.0286	0.0258	0.2129	0.0575	0.0636	0.0653	0.0615
110	0.171	0.0262	ND	0.0306	0.103	0.0190	0.0863	0.0182	0.0887	0.0190	0.100	0.0258	0.9228	0.2350	0.2658	0.2766	0.2722
107/109	0.0388*	0.0262	ND	0.0306	0.0211	0.0190	0.0188	0.0182	0.0192	0.0190	ND	0.0258	0.1472	0.0450	0.0425	0.0522	0.0453
106/118	0.336	0.0262	0.184	0.0306	0.165	0.0190	0.148	0.0182	0.152	0.0190	0.156	0.0258	1.2840	0.3635	0.3713	0.3870	0.3780
114	ND	0.0263	ND	0.0307	ND	0.0191	ND	0.0183	ND	0.0191	ND	0.0260	0.0300	0.0064	0.0048	0.0055	0.0052
105/127	0.170	0.0272	0.0680	0.0319	0.0599	0.0198	0.0492	0.0190	0.0688	0.0198	0.0587	0.0270	0.4550	0.1285	0.1275	0.1373	0.1372
136	ND	0.0446	ND	0.0110	0.0102	0.0078	ND	0.0107	ND	0.0133	ND	0.0139	0.1148	0.0253	0.0313	0.0390	0.0295
151	0.0474	0.0446	not analyzed		not analyzed		not analyzed		not analyzed		not analyzed		0.3169	0.1233	0.1167	0.1367	0.1233
144/135	ND	0.0446	0.0185	0.0110	0.0195	0.0078	0.0131	0.0107	0.0149	0.0133	0.0171	0.0139	0.2250	0.0624	0.0696	0.0663	0.0632
149/139	0.171	0.0446	0.0928	0.0110	0.0851	0.0078	0.0768	0.0107	0.0679	0.0133	0.0785	0.0139	1.1078	0.3282	0.3288	0.3417	0.3295
134/143	ND	0.0446	ND	0.0110	ND	0.0078	ND	0.0107	ND	0.0133	ND	0.0139	0.0195	0.0055	0.0060	0.0053	0.0062
131/142	ND	0.0446	ND	0.0110	ND	0.0078	ND	0.0107	ND	0.0133	ND	0.0139	0.0020	ND	ND	ND	ND
146	0.0665	0.0446	0.0401	0.0110	0.0297	0.0078	0.0297	0.0107	0.0310	0.0133	0.0286	0.0139	0.4541	0.1325	0.1374	0.1474	0.1403

Table 25 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 2001												Mean of 4 exposure periods				
	Food		Control		Ref		mid Ag		d/s Ag		d/s Ag (lab split)		Food	Control	Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.	Conc.
153	0.478	0.0514	0.266	0.0137	0.238	0.0097	0.217	0.0132	0.212	0.0166	0.220	0.0172	2.8445	0.7715	0.7720	0.8268	0.8005
141	ND	0.0514	0.0300	0.0137	0.0266	0.0097	0.0231	0.0132	0.0207*	0.0166	0.0214	0.0172	0.2275	0.0725	0.0662	0.0855	0.0784
130	ND	0.0514	ND	0.0137	0.0112	0.0097	ND	0.0132	ND	0.0166	ND	0.0172	0.1025	0.0195	0.0201	0.0290	0.0293
137	ND	0.0514	ND	0.0137	ND	0.0097	ND	0.0132	ND	0.0166	ND	0.0172	0.0738	0.0168	0.0143	0.0158	0.0143
138/163/164	0.456	0.0514	0.248	0.0137	0.226	0.0097	0.194	0.0132	0.200	0.0166	0.202	0.0172	2.4640	0.6995	0.6840	0.7385	0.6900
158/160	ND	0.0514	ND	0.0137	0.0190	0.0097	0.0140	0.0132	ND	0.0166	ND	0.0172	0.1825	0.0333	0.0520	0.0385	0.0490
129	ND	0.0514	ND	0.0137	ND	0.0097	ND	0.0132	ND	0.0166	ND	0.0172	0.0478	ND	0.0013	0.0015	0.0037
128	ND	0.0514	0.0275	0.0137	0.0252	0.0097	0.0238	0.0132	0.0193	0.0166	0.0207	0.0172	0.2900	0.0811	0.0823	0.0867	0.0806
156	ND	0.0514	0.0181	0.0137	0.0126	0.0097	0.0160	0.0132	ND	0.0166	ND	0.0172	0.1425	0.0440	0.0444	0.0528	0.0398
157	ND	0.0525	ND	0.0138	ND	0.0099	ND	0.0134	ND	0.0168	ND	0.0175	0.0490	0.0054	0.0133	0.0160	0.0063
179	0.0157	0.0069	0.0178*	0.0167	0.0115	0.0095	ND	0.0172	ND	0.0138	ND	0.0165	0.1714	0.0542	0.0466	0.0490	0.0458
176	ND	0.0069	ND	0.0167	ND	0.0095	ND	0.0172	ND	0.0138	ND	0.0165	0.0415	0.0073	0.0060	0.0078	0.0065
178	0.0141	0.0091	ND	0.0222	0.0142	0.0127	ND	0.0229	ND	0.0183	ND	0.0219	0.1410	0.0330	0.0418	0.0388	0.0363
175	ND	0.0091	ND	0.0222	ND	0.0127	ND	0.0229	ND	0.0183	ND	0.0219	0.0230	0.0010	0.0016	0.0020	ND
187/182	0.108	0.0091	0.0892	0.0222	0.0740	0.0127	0.0574	0.0229	0.0546	0.0183	0.0644	0.0219	0.8295	0.2323	0.2360	0.2394	0.2287
183	0.0476	0.0091	0.0318	0.0222	0.0245	0.0127	0.0256	0.0229	0.0208	0.0183	ND	0.0219	0.2769	0.0812	0.0794	0.0864	0.0810
185	ND	0.0091	ND	0.0222	ND	0.0127	ND	0.0229	ND	0.0183	ND	0.0219	0.0323	0.0046	ND	0.0055	ND
174/181	0.0414	0.0091	0.0272	0.0222	0.0221	0.0127	ND	0.0229	0.0202	0.0183	ND	0.0219	0.2404	0.0613	0.0620	0.0628	0.0686
177	0.0343	0.0096	ND	0.0230	0.0167	0.0131	ND	0.0237	ND	0.0190	ND	0.0226	0.1936	0.0505	0.0537	0.0578	0.0600
171	0.0168	0.0096	ND	0.0230	ND	0.0131	ND	0.0237	ND	0.0190	ND	0.0226	0.0817	0.0230	0.0123	0.0223	0.0253
172/192	ND	0.0096	ND	0.0230	ND	0.0131	ND	0.0237	ND	0.0190	ND	0.0226	0.0570	0.0078	0.0088	0.0078	0.0085
180	0.177	0.0096	0.0876	0.0230	0.0823	0.0131	0.0696	0.0237	0.0642	0.0190	0.0737	0.0226	0.7018	0.2169	0.1981	0.2199	0.2111
193	0.0152	0.0096	ND	0.0230	ND	0.0131	ND	0.0237	ND	0.0190	ND	0.0226	0.0686	0.0193	0.0190	0.0155	0.0195
191	ND	0.0096	ND	0.0230	ND	0.0131	ND	0.0237	ND	0.0190	ND	0.0226	0.0168	ND	ND	0.0010	ND
170/190	0.0960	0.0110	0.0422	0.0258	0.0359	0.0147	0.0320*	0.0266	0.0352	0.0213	0.0411	0.0254	0.3190	0.0901	0.0900	0.0930	0.0886
189	ND	0.0082	ND	0.0181	ND	0.0103	ND	0.0187	ND	0.0150	ND	0.0179	0.0066	0.0015	ND	0.0015	ND
201	ND	0.0094	ND	0.0195	ND	0.0108	ND	0.0210	ND	0.0185	ND	0.0134	0.0405	0.0063	0.0025	0.0080	0.0108
197	ND	0.0094	ND	0.0195	ND	0.0108	ND	0.0210	ND	0.0185	ND	0.0134	0.0065	0.0015	ND	0.0008	ND
198	ND	0.0094	ND	0.0195	ND	0.0108	ND	0.0210	ND	0.0185	ND	0.0134	0.0014	ND	ND	0.0008	ND
199	0.0206*	0.0094	ND	0.0195	ND	0.0108	ND	0.0210	ND	0.0185	ND	0.0134	0.1602	0.0403	0.0448	0.0265	0.0430
196/203	0.0218*	0.0094	ND	0.0195	ND	0.0108	ND	0.0210	ND	0.0185	ND	0.0134	0.1430	0.0413	0.0395	0.0323	0.0430
195	ND	0.0094	ND	0.0195	ND	0.0108	ND	0.0210	ND	0.0185	ND	0.0134	0.0475	0.0108	0.0090	0.0128	0.0108
194	0.0199*	0.0094	ND	0.0195	ND	0.0108	ND	0.0210	ND	0.0185	ND	0.0134	0.1325	0.0438	0.0303	0.0293	0.0380
205	ND	0.0098	ND	0.0197	ND	0.0110	ND	0.0213	ND	0.0188	ND	0.0136	0.0057	0.0018	ND	ND	ND
208	ND	0.0116	ND	0.0225	ND	0.0136	ND	0.0248	ND	0.0226	ND	0.0155	0.0480	0.0113	0.0125	0.0118	0.0115
207	ND	0.0116	ND	0.0225	ND	0.0136	ND	0.0248	ND	0.0226	ND	0.0155	0.0138	ND	0.0030	0.0055	ND
206	ND	0.0140	ND	0.0267	ND	0.0161	ND	0.0294	ND	0.0268	ND	0.0184	0.0705	0.0138	0.0163	0.0133	0.0163
209	ND	0.0110	ND	0.0182	ND	0.0102	ND	0.0187	ND	0.0117	ND	0.0141	0.0825	0.0115	0.0298	0.0113	0.0295
Total PCB concentration**	3.78		2.38		2.22		1.80		1.95		1.93		23.056	9.981	7.779	8.335	7.734
TEQ-Mammalian (ng/kg ww)	n/a		0.034		0.029		0.028		0.022		0.021		n/a	0.0773	0.0811	0.0897	0.0771
TEQ-Avian (ng/kg ww)	n/a		0.010		0.009		0.008		0.008		0.007		n/a	0.0221	0.0227	0.0250	0.0226
% Lipid	26.0		3.0		3.6		3.0		3.1		3.1		20.00	3.00	3.18	3.10	3.10
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PCB-2		TC-01-PCB-1		TC-01-PCB-1		TC-01-PCB-1		TC-01-PCB-1		TC-01-PCB-1		-	-	-	-	-

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 26: Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 1999								Spring 2000							
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	ND	0.055	ND	0.027	ND	0.022	ND	0.016	ND	0.055	ND	0.2	ND	0.18	ND	0.066
15	ND	0.05	ND	0.024	ND	0.02	ND	0.014	ND	0.055	ND	0.2	ND	0.18	ND	0.066
19	ND	0.1	ND	0.049	ND	0.05	ND	0.055	ND	0.01	ND	0.011	ND	0.01	0.0016*	0.0004
18	ND	0.1	ND	0.049	ND	0.05	ND	0.055	ND	0.01	ND	0.011	ND	0.01	ND	0.0004
17	ND	0.1	ND	0.049	ND	0.05	ND	0.055	ND	0.01	ND	0.011	ND	0.01	ND	0.0004
24/27	ND	0.1	ND	0.049	ND	0.05	ND	0.055	ND	0.01	ND	0.011	ND	0.01	ND	0.0004
16/32	ND	0.1	ND	0.049	ND	0.05	ND	0.055	ND	0.0076	ND	0.0054	ND	0.004	ND	0.0001
26	ND	0.063	ND	0.03	ND	0.03	ND	0.033	ND	0.0076	ND	0.0054	ND	0.004	ND	0.0001
25	ND	0.063	ND	0.03	ND	0.03	ND	0.033	ND	0.0076	ND	0.0054	ND	0.004	ND	0.0001
31/28	ND	0.063	ND	0.03	ND	0.03	ND	0.033	0.0077	0.0076	0.018*	0.0054	0.014*	0.004	0.0117*	0.0001
33/20/21	ND	0.063	ND	0.03	ND	0.03	ND	0.033	ND	0.0076	ND	0.0054	ND	0.004	ND	0.0001
22	ND	0.063	ND	0.03	ND	0.03	ND	0.033	ND	0.0076	ND	0.0054	ND	0.004	ND	0.0001
45	ND	0.11	ND	0.051	ND	0.044	ND	0.062	ND	0.012	ND	0.008	ND	0.0045	ND	0.0002
46	ND	0.11	ND	0.051	ND	0.044	ND	0.062	ND	0.012	ND	0.008	ND	0.0045	ND	0.0002
52/73	ND	0.11	ND	0.051	ND	0.044	ND	0.062	ND	0.012	ND	0.008	ND	0.0045	ND	0.0002
49/43	ND	0.11	ND	0.055	ND	0.047	ND	0.067	ND	0.012	ND	0.0085	ND	0.0048	ND	0.0003
47/48 /75	ND	0.11	ND	0.051	ND	0.044	ND	0.062	0.017	0.012	ND	0.008	0.008*	0.0045	0.0024*	0.0002
44	ND	0.11	ND	0.052	ND	0.045	ND	0.063	ND	0.013	ND	0.0086	ND	0.0049	ND	0.0003
42/59	ND	0.11	ND	0.052	ND	0.045	ND	0.063	ND	0.013	ND	0.0086	ND	0.0049	ND	0.0003
41/71/64/68	ND	0.11	ND	0.052	ND	0.045	ND	0.063	ND	0.0093	0.007*	0.0062	ND	0.0035	ND	0.0002
40	ND	0.093	ND	0.045	ND	0.039	ND	0.055	ND	0.0093	ND	0.0062	ND	0.0035	ND	0.0002
74/61	ND	0.093	ND	0.045	ND	0.039	ND	0.055	0.014	0.0093	0.015*	0.0062	0.015*	0.0035	0.0083	0.0002
70/76	ND	0.093	ND	0.045	ND	0.039	ND	0.055	ND	0.0093	ND	0.0062	ND	0.0035	ND	0.0002
66/80	ND	0.095	ND	0.046	ND	0.04	ND	0.056	0.018	0.0093	0.02*	0.0062	0.005*	0.0035	0.015*	0.0002
56/60	ND	0.095	ND	0.046	ND	0.04	ND	0.056	ND	0.007	0.004*	0.0039	ND	0.0026	ND	0.0002
95/93	ND	0.1	ND	0.088	ND	0.059	ND	0.055	ND	0.012	ND	0.0087	ND	0.0037	ND	0.0003
91	ND	0.1	ND	0.088	ND	0.059	ND	0.055	ND	0.012	ND	0.0087	ND	0.0037	ND	0.0003
92	ND	0.1	ND	0.088	ND	0.059	ND	0.055	ND	0.011	ND	0.0083	ND	0.0063	ND	0.0003
84	ND	0.1	ND	0.088	ND	0.059	ND	0.055	ND	0.011	ND	0.0083	ND	0.0063	ND	0.0003
89/90/101	ND	0.1	ND	0.088	ND	0.059	ND	0.055	ND	0.011	0.014*	0.0083	0.007	0.0063	ND	0.0003
99	ND	0.1	ND	0.088	ND	0.059	ND	0.055	0.014	0.011	0.018*	0.0083	0.019*	0.0063	0.011*	0.0003
83/108	ND	0.061	ND	0.054	ND	0.036	ND	0.034	ND	0.0099	ND	0.0074	ND	0.0055	0.0009	0.0003
97/86	ND	0.061	ND	0.054	ND	0.036	ND	0.034	ND	0.0099	ND	0.0074	ND	0.0055	ND	0.0003
87/115/116	ND	0.061	ND	0.054	ND	0.036	ND	0.034	ND	0.0099	ND	0.0074	ND	0.0055	ND	0.0003
85/120	ND	0.061	ND	0.054	ND	0.036	ND	0.034	ND	0.0099	0.008*	0.0074	ND	0.0055	ND	0.0003
110	ND	0.061	ND	0.054	ND	0.036	ND	0.034	ND	0.0099	ND	0.0074	ND	0.0055	0.0035*	0.0003
107/109	ND	0.061	ND	0.054	ND	0.036	ND	0.034	ND	0.0088	ND	0.012	ND	0.008	ND	0.0004
106/118	0.072	0.064	0.097	0.06	0.081	0.035	0.09	0.038	0.064	0.011	0.068	0.0081	0.044*	0.0059	0.037	0.0003
114	ND	0.061	ND	0.054	ND	0.036	ND	0.034	ND	0.0088	ND	0.012	ND	0.008	ND	0.0004
105/127	ND	0.07	ND	0.062	ND	0.035	ND	0.035	ND	0.011	ND	0.0089	0.007*	0.0059	0.0063*	0.0004
136	ND	0.1	ND	0.055	ND	0.032	ND	0.065	ND	0.011	ND	0.0036	ND	0.0033	ND	0.0003
151	ND	0.1	ND	0.055	ND	0.032	ND	0.065	ND	0.011	ND	0.0045	ND	0.0044	ND	0.0004
144/135	ND	0.1	ND	0.055	ND	0.032	ND	0.065	ND	0.011	0.005*	0.0045	ND	0.0044	ND	0.0004
149/139	ND	0.1	ND	0.055	ND	0.032	ND	0.065	ND	0.011	0.006*	0.0045	0.008	0.0044	ND	0.0004
134/143	ND	0.1	ND	0.055	ND	0.032	ND	0.065	ND	0.011	ND	0.0045	ND	0.0044	0.0059*	0.0004
131/142	ND	0.1	ND	0.055	ND	0.032	ND	0.065	ND	0.011	ND	0.0045	ND	0.0044	ND	0.0004
146	ND	0.11	ND	0.058	ND	0.034	ND	0.068	0.019*	0.013	ND	0.005	0.017*	0.0052	0.011	0.0003

Table 26 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 1999								Spring 2000							
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
153	0.12	0.12	0.14	0.064	0.13	0.025	0.13	0.062	0.11	0.013	0.11	0.005	0.084	0.0052	0.078*	0.0003
141	ND	0.15	ND	0.083	ND	0.033	ND	0.081	ND	0.016	ND	0.0067	ND	0.0069	ND	0.0005
130	ND	0.13	ND	0.07	ND	0.028	ND	0.068	ND	0.016	ND	0.0068	ND	0.007	ND	0.0005
137	ND	0.13	ND	0.07	ND	0.028	ND	0.068	ND	0.016	ND	0.0068	ND	0.007	ND	0.0005
138/163/164	ND	0.13	0.072	0.07	0.052	0.028	ND	0.068	0.064	0.016	0.082	0.0068	0.055*	0.007	0.042	0.0005
158/160	ND	0.13	ND	0.07	ND	0.028	ND	0.068	ND	0.016	ND	0.0068	ND	0.007	ND	0.0005
129	ND	0.13	ND	0.07	ND	0.028	ND	0.068	ND	0.016	ND	0.0068	ND	0.007	ND	0.0005
128	ND	0.13	ND	0.07	ND	0.028	ND	0.068	ND	0.016	ND	0.0068	ND	0.007	ND	0.0005
156	ND	0.13	ND	0.07	ND	0.028	ND	0.068	ND	0.016	0.011	0.0068	0.009*	0.007	0.018*	0.0005
157	ND	0.13	ND	0.07	ND	0.028	ND	0.068	ND	0.016	ND	0.0068	ND	0.007	ND	0.0005
179	ND	0.11	ND	0.081	ND	0.053	ND	0.056	ND	0.021	ND	0.0086	ND	0.006	ND	0.0003
176	ND	0.11	ND	0.081	ND	0.053	ND	0.056	ND	0.021	ND	0.0086	ND	0.006	ND	0.0003
178	ND	0.11	ND	0.081	ND	0.053	ND	0.056	ND	0.021	ND	0.0086	ND	0.006	ND	0.0003
175	ND	0.11	ND	0.081	ND	0.053	ND	0.056	ND	0.021	ND	0.0086	ND	0.006	ND	0.0003
187/182	ND	0.11	0.084*	0.081	0.066	0.053	0.064	0.056	0.06	0.021	0.066	0.0086	0.058*	0.006	0.053	0.0003
183	ND	0.13	ND	0.09	ND	0.059	ND	0.063	ND	0.022	0.009*	0.009	ND	0.0063	ND	0.0003
185	ND	0.13	ND	0.09	ND	0.059	ND	0.063	ND	0.022	ND	0.009	ND	0.0063	ND	0.0003
174/181	ND	0.13	ND	0.09	ND	0.059	ND	0.063	ND	0.022	ND	0.009	ND	0.0063	ND	0.0003
177	ND	0.13	ND	0.09	ND	0.059	ND	0.063	ND	0.022	ND	0.009	ND	0.0063	ND	0.0003
171	ND	0.096	ND	0.069	ND	0.045	ND	0.048	ND	0.02	0.008*	0.0077	ND	0.0054	ND	0.0002
172/192	ND	0.096	ND	0.069	ND	0.045	ND	0.048	ND	0.02	ND	0.0077	ND	0.0054	ND	0.0002
180	ND	0.096	ND	0.069	ND	0.045	ND	0.048	ND	0.02	0.032*	0.0077	0.019	0.0054	ND	0.0002
193	ND	0.096	ND	0.069	ND	0.045	ND	0.048	ND	0.02	ND	0.0077	0.019*	0.0054	ND	0.0002
191	ND	0.096	ND	0.069	ND	0.045	ND	0.048	ND	0.02	ND	0.0077	ND	0.0054	ND	0.0002
170/190	ND	0.11	ND	0.082	ND	0.053	ND	0.057	ND	0.025	ND	0.0095	ND	0.0067	ND	0.0003
189	ND	0.11	ND	0.082	ND	0.053	ND	0.057	ND	0.025	ND	0.0095	ND	0.0067	ND	0.0003
201	ND	0.16	ND	0.05	ND	0.05	ND	0.056	ND	0.027	ND	0.009	ND	0.0085	ND	0.0005
197	ND	0.16	ND	0.05	ND	0.05	ND	0.056	ND	0.027	ND	0.009	ND	0.0085	ND	0.0005
198	ND	0.16	ND	0.05	ND	0.05	ND	0.056	ND	0.027	ND	0.009	ND	0.0085	ND	0.0005
199	ND	0.16	ND	0.05	ND	0.05	ND	0.056	ND	0.027	ND	0.009	ND	0.0085	ND	0.0005
196/203	ND	0.16	ND	0.05	ND	0.05	ND	0.056	ND	0.027	ND	0.009	ND	0.0085	ND	0.0005
195	ND	0.16	ND	0.05	ND	0.05	ND	0.056	ND	0.03	ND	0.017	ND	0.011	ND	0.0007
194	ND	0.16	ND	0.05	ND	0.05	ND	0.056	ND	0.03	ND	0.017	ND	0.011	ND	0.0007
205	ND	0.16	ND	0.05	ND	0.05	ND	0.056	ND	0.03	ND	0.017	ND	0.011	ND	0.0007
208	ND	0.11	ND	0.061	ND	0.034	ND	0.059	ND	0.023	ND	0.0077	ND	0.0072	ND	0.0004
207	ND	0.11	ND	0.061	ND	0.034	ND	0.059	ND	0.023	ND	0.0077	ND	0.0072	ND	0.0004
206	ND	0.11	ND	0.061	ND	0.034	ND	0.059	ND	0.023	ND	0.0077	ND	0.0072	ND	0.0004
209	ND	0.11	ND	0.071	ND	0.043	ND	0.052	ND	0.028	0.014*	0.0077	0.008*	0.0076	ND	0.0004
Total PCB concentration**	0.192		0.237		0.211		0.220		0.388		0.443		0.303		0.254	
TEQ-Mammalian (ng/kg ww)	0.0072		0.0097		0.0081		0.0090		0.0064		0.0123		0.0096		0.0133	
TEQ-Avian (ng/kg ww)	0.00072		0.00097		0.00081		0.00090		0.00064		0.00178		0.00204		0.00280	
% Lipid	0.7		0.7		0.6		0.7		0.4		0.6		0.4		0.5	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-PCB-2		TC-99-PCB-2		TC-99-PCB-2		TC-99-PCB-2		TC-00-PCB-3		TC-00-PCB-2		TC-00-PCB-2		TC-00-PCB-4	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected.

Table 26 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 2000								Fall 2001							
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	ND	0.083	ND	0.084	ND	0.086	ND	0.089	ND	0.0182	ND	0.0222	ND	0.0137	ND	0.0164
15	ND	0.083	ND	0.084	ND	0.086	ND	0.089	ND	0.0109	ND	0.0133	ND	0.0082	ND	0.0098
19	ND	0.012	ND	0.016	ND	0.018	ND	0.018	ND	0.0104	ND	0.0118	ND	0.0182	ND	0.0176
18	ND	0.012	ND	0.016	ND	0.018	ND	0.018	ND	0.0104	ND	0.0118	ND	0.0182	ND	0.0176
17	ND	0.012	ND	0.016	ND	0.018	ND	0.018	ND	0.0104	ND	0.0118	ND	0.0182	ND	0.0176
24/27	ND	0.012	ND	0.016	ND	0.018	ND	0.018	ND	0.0104	ND	0.0118	ND	0.0182	ND	0.0176
16/32	ND	0.0079	ND	0.011	ND	0.0095	ND	0.01	ND	0.0104	ND	0.0118	ND	0.0182	ND	0.0176
26	ND	0.0079	ND	0.011	ND	0.0095	ND	0.01	ND	0.0104	ND	0.0118	ND	0.0182	ND	0.0176
25	ND	0.0079	ND	0.011	ND	0.0095	ND	0.01	ND	0.0104	ND	0.0118	ND	0.0182	ND	0.0176
31/28	0.01*	0.0079	0.013*	0.011	ND	0.0095	0.015	0.01	0.0307*	0.0065	ND	0.0074	ND	0.0114	ND	0.0110
33/20/21	ND	0.0079	ND	0.011	ND	0.0095	ND	0.01	ND	0.0065	ND	0.0074	ND	0.0114	ND	0.0110
22	ND	0.0079	ND	0.011	ND	0.0095	ND	0.01	ND	0.0065	ND	0.0074	ND	0.0114	ND	0.0110
45	ND	0.011	ND	0.019	ND	0.017	ND	0.013	ND	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
46	ND	0.011	ND	0.019	ND	0.017	ND	0.013	ND	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
52/73	ND	0.011	ND	0.019	ND	0.017	ND	0.013	ND	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
49/43	ND	0.011	ND	0.019	ND	0.017	ND	0.013	ND	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
47/48 /75	ND	0.011	ND	0.019	ND	0.017	ND	0.013	0.0110	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
44	ND	0.011	ND	0.019	ND	0.018	ND	0.014	ND	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
42/59	ND	0.011	ND	0.019	ND	0.018	ND	0.014	ND	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
41/71/64/68	ND	0.0081	ND	0.014	ND	0.013	ND	0.01	ND	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
40	ND	0.0081	ND	0.014	ND	0.013	ND	0.01	ND	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
74/61	0.017	0.0081	0.016	0.014	0.021	0.013	0.02	0.01	0.0745	0.0075	0.0460	0.0077	0.0545	0.0094	0.0464	0.0057
70/76	ND	0.0081	ND	0.014	ND	0.013	ND	0.01	0.0135	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
66/80	0.024	0.0081	0.028	0.014	0.026*	0.013	0.028	0.01	0.0703	0.0075	0.0220	0.0077	0.0278	0.0094	0.0243	0.0057
56/60	ND	0.0095	ND	0.011	ND	0.0099	ND	0.011	0.0198	0.0075	ND	0.0077	ND	0.0094	ND	0.0057
95/93	ND	0.011	ND	0.021	ND	0.015	ND	0.016	ND	0.0076	ND	0.0071	ND	0.0083	ND	0.0046
91	ND	0.011	ND	0.021	ND	0.015	ND	0.016	ND	0.0076	ND	0.0071	ND	0.0083	ND	0.0046
92	ND	0.014	ND	0.018	ND	0.014	ND	0.019	ND	0.0076	ND	0.0071	ND	0.0083	ND	0.0046
84	ND	0.014	ND	0.018	ND	0.014	ND	0.019	ND	0.0076	ND	0.0071	ND	0.0083	ND	0.0046
89/90/101	ND	0.014	ND	0.018	ND	0.014	ND	0.019	ND	0.0076	ND	0.0071	ND	0.0083	ND	0.0046
99	0.022	0.014	0.024*	0.018	0.019	0.014	0.026	0.019	0.0430	0.0076	0.0086	0.0071	0.0093	0.0083	0.0099	0.0046
83/108	ND	0.012	ND	0.015	ND	0.012	ND	0.016	ND	0.0077	ND	0.0072	ND	0.0084	ND	0.0047
97/86	ND	0.012	ND	0.015	ND	0.012	ND	0.016	0.0091	0.0077	ND	0.0072	ND	0.0084	ND	0.0047
87/115/116	ND	0.012	ND	0.015	ND	0.012	ND	0.016	ND	0.0077	ND	0.0072	ND	0.0084	ND	0.0047
85/120	ND	0.012	ND	0.015	ND	0.012	ND	0.016	0.0079	0.0077	ND	0.0072	ND	0.0084	ND	0.0047
110	ND	0.012	ND	0.015	ND	0.012	ND	0.016	ND	0.0077	ND	0.0072	ND	0.0084	ND	0.0047
107/109	ND	0.011	ND	0.014	ND	0.014	ND	0.018	0.0164	0.0077	0.0077	0.0072	0.0093	0.0084	0.0066*	0.0047
106/118	0.088	0.014	0.094	0.017	0.082	0.016	0.09	0.021	0.134	0.0077	0.0648	0.0072	0.0769	0.0084	0.0735	0.0047
114	ND	0.011	ND	0.014	ND	0.014	ND	0.018	ND	0.0077	ND	0.0072	ND	0.0085	ND	0.0047
105/127	0.022*	0.015	0.029*	0.017	0.021	0.017	ND	0.022	0.0358	0.0080	0.0106	0.0075	0.0131	0.0088	0.0134	0.0049
136	ND	0.013	ND	0.016	ND	0.016	ND	0.019	ND	0.0045	ND	0.0037	ND	0.0070	ND	0.0060
151	ND	0.015	ND	0.017	ND	0.016	ND	0.018	not analyzed		not analyzed		not analyzed		not analyzed	
144/135	ND	0.015	ND	0.017	ND	0.016	ND	0.018	ND	0.0045	ND	0.0037	ND	0.0070	ND	0.0060
149/139	ND	0.015	ND	0.017	ND	0.016	ND	0.018	0.0076	0.0045	ND	0.0037	ND	0.0070	ND	0.0060
134/143	ND	0.015	ND	0.017	ND	0.016	ND	0.018	ND	0.0045	ND	0.0037	ND	0.0070	ND	0.0060
131/142	ND	0.015	ND	0.017	ND	0.016	ND	0.018	ND	0.0045	ND	0.0037	ND	0.0070	ND	0.0060
146	0.029	0.018	0.021	0.02	ND	0.019	ND	0.021	0.0306	0.0045	0.0105	0.0037	0.0123	0.0070	0.0125	0.0060

Table 26 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Fall 2000								Fall 2001							
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
153	0.081	0.018	0.12	0.02	0.09	0.019	0.1	0.021	0.170	0.0056	0.0585	0.0046	0.0754	0.0087	0.0792	0.0075
141	ND	0.022	ND	0.026	ND	0.024	ND	0.026	ND	0.0056	ND	0.0046	ND	0.0087	ND	0.0075
130	ND	0.022	ND	0.025	ND	0.024	ND	0.026	ND	0.0056	ND	0.0046	ND	0.0087	ND	0.0075
137	ND	0.022	ND	0.025	ND	0.024	ND	0.026	0.0060*	0.0056	ND	0.0046	ND	0.0087	ND	0.0075
138/163/164	0.064	0.022	0.073	0.025	0.036	0.024	0.062	0.026	0.113	0.0056	0.0317	0.0046	0.0398	0.0087	0.0390	0.0075
158/160	ND	0.022	ND	0.025	ND	0.024	ND	0.026	0.0075	0.0056	ND	0.0046	ND	0.0087	ND	0.0075
129	ND	0.022	ND	0.025	ND	0.024	ND	0.026	ND	0.0056	ND	0.0046	ND	0.0087	ND	0.0075
128	ND	0.022	ND	0.025	ND	0.024	ND	0.026	0.0091	0.0056	ND	0.0046	ND	0.0087	ND	0.0075
156	ND	0.022	ND	0.025	ND	0.024	ND	0.026	0.0145	0.0056	0.0079	0.0046	0.0106	0.0087	0.0085	0.0075
157	ND	0.022	ND	0.025	ND	0.024	ND	0.026	ND	0.0056	ND	0.0047	ND	0.0088	ND	0.0075
179	ND	0.022	ND	0.031	ND	0.028	ND	0.036	ND	0.0049	ND	0.0061	ND	0.0065	ND	0.0055
176	ND	0.022	ND	0.031	ND	0.028	ND	0.036	ND	0.0049	ND	0.0061	ND	0.0065	ND	0.0055
178	ND	0.022	ND	0.031	ND	0.028	ND	0.036	0.0071	0.0065	ND	0.0081	ND	0.0085	ND	0.0073
175	ND	0.022	ND	0.031	ND	0.028	ND	0.036	ND	0.0065	ND	0.0081	ND	0.0085	ND	0.0073
187/182	0.034	0.022	0.052	0.031	0.053	0.028	0.041	0.036	0.0823	0.0065	0.0272	0.0081	0.0405	0.0085	0.0364	0.0073
183	ND	0.023	ND	0.032	ND	0.029	ND	0.037	0.0130	0.0065	ND	0.0081	ND	0.0085	ND	0.0073
185	ND	0.023	ND	0.032	ND	0.029	ND	0.037	ND	0.0065	ND	0.0081	ND	0.0085	ND	0.0073
174/181	ND	0.023	ND	0.032	ND	0.029	ND	0.037	ND	0.0065	ND	0.0081	ND	0.0085	ND	0.0073
177	ND	0.023	ND	0.032	ND	0.029	ND	0.037	0.0086	0.0067	ND	0.0084	ND	0.0089	ND	0.0076
171	ND	0.021	ND	0.029	ND	0.027	ND	0.035	ND	0.0067	ND	0.0084	ND	0.0089	ND	0.0076
172/192	ND	0.021	ND	0.029	ND	0.027	ND	0.035	ND	0.0067	ND	0.0084	ND	0.0089	ND	0.0076
180	ND	0.021	ND	0.029	ND	0.027	ND	0.035	0.0511	0.0067	0.0116	0.0084	0.0190	0.0089	0.0175	0.0076
193	ND	0.021	ND	0.029	ND	0.027	ND	0.035	0.0080	0.0067	ND	0.0084	ND	0.0089	ND	0.0076
191	ND	0.021	ND	0.029	ND	0.027	ND	0.035	ND	0.0067	ND	0.0084	ND	0.0089	ND	0.0076
170/190	ND	0.026	ND	0.037	ND	0.033	ND	0.043	0.0203	0.0075	ND	0.0094	0.0109	0.0101	ND	0.0086
189	ND	0.026	ND	0.037	ND	0.033	ND	0.043	ND	0.0053	ND	0.0066	ND	0.0070	ND	0.0060
201	ND	0.033	ND	0.047	ND	0.04	ND	0.058	ND	0.0063	ND	0.0055	ND	0.0067	ND	0.0059
197	ND	0.033	ND	0.047	ND	0.04	ND	0.058	ND	0.0063	ND	0.0055	ND	0.0067	ND	0.0059
198	ND	0.033	ND	0.047	ND	0.04	ND	0.058	ND	0.0063	ND	0.0055	ND	0.0067	ND	0.0059
199	ND	0.033	ND	0.047	ND	0.04	ND	0.058	0.0113	0.0063	ND	0.0055	ND	0.0067	ND	0.0059
196/203	ND	0.033	ND	0.047	ND	0.04	ND	0.058	ND	0.0063	ND	0.0055	ND	0.0067	ND	0.0059
195	ND	0.038	ND	0.055	ND	0.051	ND	0.047	ND	0.0063	ND	0.0055	ND	0.0067	ND	0.0059
194	ND	0.038	ND	0.055	ND	0.051	ND	0.047	ND	0.0063	ND	0.0055	ND	0.0067	ND	0.0059
205	ND	0.038	ND	0.055	ND	0.051	ND	0.047	ND	0.0064	ND	0.0056	ND	0.0067	ND	0.0059
208	ND	0.041	ND	0.06	ND	0.055	ND	0.055	ND	0.0084	ND	0.0093	ND	0.0068	ND	0.0096
207	ND	0.041	ND	0.06	ND	0.055	ND	0.055	ND	0.0084	ND	0.0093	ND	0.0068	ND	0.0096
206	ND	0.041	ND	0.06	ND	0.055	ND	0.055	ND	0.0100	ND	0.0110	ND	0.0081	ND	0.0115
209	ND	0.042	ND	0.059	ND	0.057	ND	0.053	0.0068	0.0060	ND	0.0091	ND	0.0073	ND	0.0061
Total PCB concentration**	0.347		0.449		0.327		0.382		0.981		0.292		0.399		0.352	
TEQ-Mammalian (ng/kg ww)	0.0110		0.0123		0.0103		0.0090		0.0242		0.0115		0.0143		0.0129	
TEQ-Avian (ng/kg ww)	0.00308		0.00384		0.00292		0.00090		0.00637		0.00250		0.00314		0.00293	
% Lipid	0.6		0.5		0.4		0.5		1.1		0.4		0.5		0.7	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PCB-3		TC-00-PCB-3		TC-00-PCB-3		TC-00-PCB-3		TC-01-PCB-1		TC-01-PCB-1		TC-01-PCB-1		TC-01-PCB-1	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected.

Table 26 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

PCB Congeners	Mean of 4 exposure periods				PCB Congeners	Mean of 4 exposure periods			
	Control Conc.	Ref Conc.	mid Ag Conc.	d/s Ag Conc.		Control Conc.	Ref Conc.	mid Ag Conc.	d/s Ag Conc.
8/5	ND	ND	ND	ND	153	0.1203	0.1071	0.0949	0.0968
15	ND	ND	ND	ND	141	ND	ND	ND	ND
19	ND	ND	ND	0.0004	130	ND	ND	ND	ND
18	ND	ND	ND	ND	137	0.0015	ND	ND	ND
17	ND	ND	ND	ND	138/163/164	0.0603	0.0647	0.0457	0.0357
24/27	ND	ND	ND	ND	158/160	0.0019	ND	ND	ND
16/32	ND	ND	ND	ND	129	ND	ND	ND	ND
26	ND	ND	ND	ND	128	0.0023	ND	ND	ND
25	ND	ND	ND	ND	156	0.0036	0.0047	0.0049	0.0066
31/28	0.0121	0.0078	0.0035	0.0067	157	ND	ND	ND	ND
33/20/21	ND	ND	ND	ND	179	ND	ND	ND	ND
22	ND	ND	ND	ND	176	ND	ND	ND	ND
45	ND	ND	ND	ND	178	0.0018	ND	ND	ND
46	ND	ND	ND	ND	175	ND	ND	ND	ND
52/73	ND	ND	ND	ND	187/182	0.0441	0.0573	0.0544	0.0486
49/43	ND	ND	ND	ND	183	0.0033	0.0023	ND	ND
47/48 /75	0.0070	ND	0.0020	0.0006	185	ND	ND	ND	ND
44	ND	ND	ND	ND	174/181	ND	ND	ND	ND
42/59	ND	ND	ND	ND	177	0.0022	ND	ND	ND
41/71/64/68	ND	0.0018	ND	ND	171	ND	0.0020	ND	ND
40	ND	ND	ND	ND	172/192	ND	ND	ND	ND
74/61	0.0264	0.0193	0.0226	0.0187	180	0.0128	0.0109	0.0095	0.0044
70/76	0.0034	ND	ND	ND	193	0.0020	ND	0.0048	ND
66/80	0.0281	0.0175	0.0147	0.0168	191	ND	ND	ND	ND
56/60	0.0050	0.0010	ND	ND	170/190	0.0051	ND	0.0027	ND
95/93	ND	ND	ND	ND	189	ND	ND	ND	ND
91	ND	ND	ND	ND	201	ND	ND	ND	ND
92	ND	ND	ND	ND	197	ND	ND	ND	ND
84	ND	ND	ND	ND	198	ND	ND	ND	ND
89/90/101	ND	0.0035	0.0018	ND	199	0.0028	ND	ND	ND
99	0.0198	0.0127	0.0118	0.0117	196/203	ND	ND	ND	ND
83/108	ND	ND	ND	0.0002	195	ND	ND	ND	ND
97/86	0.0023	ND	ND	ND	194	ND	ND	ND	ND
87/115/116	ND	ND	ND	ND	205	ND	ND	ND	ND
85/120	0.0020	0.0020	ND	ND	208	ND	ND	ND	ND
110	ND	ND	ND	0.0009	207	ND	ND	ND	ND
107/109	0.0041	0.0019	0.0023	0.0017	206	ND	ND	ND	ND
106/118	0.0895	0.0810	0.0710	0.0726	209	0.0017	0.0035	0.0020	ND
114	ND	ND	ND	ND	Total PCB concentration**	0.477	0.355	0.310	0.302
105/127	0.0145	0.0099	0.0103	0.0049	TEQ-Mammalian (ng/kg ww)	0.0122	0.0114	0.0106	0.0111
136	ND	ND	ND	ND	TEQ-Avian (ng/kg ww)	0.00270	0.00227	0.00223	0.00188
151	ND	ND	ND	ND	% Lipid	0.71	0.55	0.48	0.60
144/135	ND	0.0013	ND	ND	Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	-	-	-	-
149/139	0.0019	0.0015	0.0020	ND					
134/143	ND	ND	ND	0.0015					
131/142	ND	ND	ND	ND					
146	0.0197	0.0079	0.0073	0.0059					

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 27: Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish hepatopancreas exposed to Elk Creek water during one exposure period.

PCB Congeners	Fall 2001								PCB Congeners	Fall 2001							
	Control		Ref		mid Ag		d/s Ag			Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL		Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	ND	0.187	ND	0.198	ND	0.228	ND	0.160	141	ND	0.0972	ND	0.0925	ND	0.113	ND	0.120
15	ND	0.112	ND	0.119	ND	0.137	ND	0.0962	130	0.239	0.0972	0.150	0.0925	0.165	0.113	0.159	0.120
19	ND	0.193	ND	0.118	ND	0.216	ND	0.169	137	0.306	0.0972	0.307	0.0925	0.330	0.113	0.268	0.120
18	ND	0.193	ND	0.118	ND	0.216	ND	0.169	138/163/164	7.32	0.0972	5.26	0.0925	6.02	0.113	5.16	0.120
17	ND	0.193	ND	0.118	ND	0.216	ND	0.169	158/160	0.342	0.0972	0.203	0.0925	0.166	0.113	0.186	0.120
24/27	ND	0.193	ND	0.118	ND	0.216	ND	0.169	129	ND	0.0972	ND	0.0925	ND	0.113	ND	0.120
16/32	ND	0.193	ND	0.118	ND	0.216	ND	0.169	128	0.411	0.0972	0.260	0.0925	0.194	0.113	0.219	0.120
26	ND	0.193	ND	0.118	ND	0.216	ND	0.169	156	0.957	0.0972	0.858	0.0925	1.04	0.113	0.812	0.120
25	ND	0.193	ND	0.118	ND	0.216	ND	0.169	157	0.251	0.0977	0.255	0.0930	0.303	0.113	0.228	0.120
31/28	0.949*	0.121	0.4865*	0.0734	0.572*	0.135	0.437	0.105	179	ND	0.0617	ND	0.0961	ND	0.100	ND	0.0428
33/20/21	ND	0.121	ND	0.0734	ND	0.135	ND	0.105	176	ND	0.0617	ND	0.0961	ND	0.100	ND	0.0428
22	ND	0.121	ND	0.0734	ND	0.135	ND	0.105	178	0.441	0.0811	0.287	0.126	0.261	0.132	0.298	0.0563
45	ND	0.135	ND	0.0601	ND	0.146	ND	0.105	175	0.0857*	0.0811	ND	0.126	ND	0.132	ND	0.0563
46	ND	0.135	ND	0.0601	ND	0.146	ND	0.105	187/182	6.06	0.0811	5.23	0.126	5.96	0.132	5.16	0.0563
52/73	ND	0.135	ND	0.0601	ND	0.146	ND	0.105	183	0.846	0.0811	0.662	0.126	0.689	0.132	0.649	0.0563
49/43	ND	0.135	ND	0.0601	ND	0.146	ND	0.105	185	ND	0.0811	ND	0.126	ND	0.132	ND	0.0563
47/48 /75	0.355	0.135	0.160	0.0601	ND	0.146	0.149	0.105	174/181	ND	0.0811	ND	0.126	ND	0.132	ND	0.0563
44	ND	0.135	ND	0.0601	ND	0.146	ND	0.105	177	0.517	0.0847	0.369	0.132	0.326	0.137	0.379	0.0588
42/59	ND	0.135	ND	0.0601	ND	0.146	ND	0.105	171	0.196	0.0847	ND	0.132	ND	0.137	0.138*	0.0588
41/71/64/68	ND	0.135	ND	0.0601	ND	0.146	ND	0.105	172/192	0.201	0.0847	0.154	0.132	0.162	0.137	0.157	0.0588
40	ND	0.135	ND	0.0601	ND	0.146	ND	0.105	180	3.30	0.0847	3.18	0.132	3.40	0.137	2.82	0.0588
74/61	2.41	0.135	1.88	0.0601	2.07	0.146	1.87	0.105	193	0.494	0.0847	0.475	0.132	0.577	0.137	0.464	0.0588
70/76	0.259	0.135	0.0785*	0.0601	ND	0.146	ND	0.105	191	0.0861	0.0847	ND	0.132	ND	0.137	ND	0.0588
66/80	3.54	0.135	2.33	0.0601	2.38	0.146	2.37	0.105	170/190	1.30	0.0957	1.30	0.149	1.36	0.155	1.24	0.0664
56/60	0.701	0.135	0.363	0.0601	0.390	0.146	0.367	0.105	189	0.111	0.0665	0.122*	0.104	ND	0.108	0.121	0.0462
95/93	ND	0.0722	ND	0.0646	ND	0.0980	ND	0.0761	201	0.109	0.0772	0.125	0.0897	ND	0.126	0.0920	0.0758
91	ND	0.0722	ND	0.0646	ND	0.0980	ND	0.0761	197	ND	0.0772	ND	0.0897	ND	0.126	ND	0.0758
92	ND	0.0722	ND	0.0646	ND	0.0980	ND	0.0761	198	ND	0.0772	ND	0.0897	ND	0.126	ND	0.0758
84	ND	0.0722	ND	0.0646	ND	0.0980	ND	0.0761	199	0.742	0.0772	0.680	0.0897	0.819	0.126	0.639	0.0758
89/90/101	0.330	0.0722	0.221	0.0646	0.239*	0.0980	0.245	0.0761	196/203	0.427	0.0772	0.335	0.0897	0.395	0.126	0.319	0.0758
99	2.47	0.0722	1.49	0.0646	1.42	0.0980	1.50	0.0761	195	0.148	0.0772	0.160	0.0897	0.202	0.126	0.153	0.0758
83/108	ND	0.0732	ND	0.0655	ND	0.0993	ND	0.0772	194	0.390	0.0772	0.354	0.0897	0.397	0.126	0.327	0.0758
97/86	0.272	0.0732	0.113	0.0655	ND	0.0993	0.104	0.0772	205	ND	0.0778	ND	0.0905	ND	0.127	ND	0.0764
87/115/116	ND	0.0732	ND	0.0655	ND	0.0993	ND	0.0772	208	0.151	0.118	0.134	0.0852	ND	0.186	0.119	0.0688
85/120	0.432	0.0732	0.224	0.0655	0.234	0.0993	0.202	0.0772	207	ND	0.118	0.129*	0.0852	ND	0.186	0.0729	0.0688
110	0.0889	0.0732	ND	0.0655	ND	0.0993	ND	0.0772	206	0.198	0.141	0.189	0.101	ND	0.222	0.163	0.0820
107/109	1.02	0.0732	0.891	0.0655	0.993	0.0993	0.846	0.0772	209	0.325	0.0708	0.272	0.101	0.297	0.0909	0.253	0.0681
106/118	8.60	0.0732	7.62	0.0655	8.42	0.0993	7.24	0.0772	Total PCB concentration**		64.433	51.287	57.129	50.185			
114	0.208*	0.0735	0.204*	0.0658	0.238*	0.0997	0.206*	0.0775	TEQ-Mammalian (ng/kg ww)		1.7941	1.5647	1.7735	1.4941			
105/127	2.15	0.0763	1.32	0.0682	1.41	0.104	1.35	0.0804	TEQ-Avian (ng/kg ww)		0.44371	0.34112	0.3833	0.33321			
136	ND	0.0779	ND	0.0741	ND	0.0903	ND	0.0960	% Lipid		53.0	30.0	26.0	32.0			
151	not analyzed		not analyzed		not analyzed		not analyzed		Corresponding Lab Blank & Spiked Matrix (see Tissue QA)		TC-01-PCB-1	TC-01-PCB-1	TC-01-PCB-1	TC-01-PCB-1			
144/135	ND	0.0779	ND	0.0741	ND	0.0903	ND	0.0960	Exceeds tissue residue guideline for mammalian consumption (see Appendix A).								
149/139	0.223	0.0779	ND	0.0741	ND	0.0903	ND	0.0960	NOTE: Sample per site per exposure period is a composite of hepatopancreas tissue from 24 crayfish.								
134/143	ND	0.0779	ND	0.0741	ND	0.0903	ND	0.0960	* = Peak detected, but did not meet quantification criteria.								
131/142	ND	0.0779	ND	0.0741	ND	0.0903	ND	0.0960	** = Total standardized to highest detection limit.								
146	1.99	0.0779	1.69	0.0741	1.90	0.0903	1.65	0.0960	ND = Not detected.								
153	13.2	0.0972	11.5	0.0925	13.8	0.113	11.5	0.120									

4.2.3 Pesticides

4.2.3.1 Organochlorines

Cutthroat Trout

Table 28: Organochlorine concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

Organochlorine compounds	Fall 1999															
	Food		Control		Ref		Ref (replicate)		Ref (lab split)		mid Ag		d/s Ag		d/s Ag (replicate)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	NQ	-	NQ	-	NQ	-	NQ	-	NQ	-	NQ	-	NQ	-	NQ	-
1,3/1,4-Dichlorobenzene	NQ	-	NQ	-	NQ	-	NQ	-	NQ	-	NQ	-	NQ	-	NQ	-
1,2,3-Trichlorobenzene	0.27	0.014	ND	0.032	ND	0.045	0.036	0.032	ND	0.026	ND	0.018	ND	0.017	0.02	0.016
1,2,4-Trichlorobenzene	ND	0.015	0.14	0.033	0.28	0.046	0.21	0.033	0.19	0.026	0.15	0.018	0.14	0.017	0.2	0.017
1,3,5-Trichlorobenzene	0.77	0.015	ND	0.034	ND	0.046	ND	0.033	ND	0.027	ND	0.019	ND	0.018	ND	0.017
1,2,3,4-Tetrachlorobenzene	0.23	0.01	ND	0.0099	0.031	0.026	0.026	0.017	ND	0.023	0.024	0.019	0.021	0.011	ND	0.02
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.062	0.01	ND	0.0097	ND	0.025	ND	0.017	ND	0.023	ND	0.018	0.021	0.011	ND	0.019
Pentachlorobenzene	0.28	0.017	0.056	0.028	0.066	0.024	0.082	0.017	0.088	0.024	0.09	0.015	0.082	0.0063	0.085	0.013
Hexachlorobenzene	2	0.023	0.33	0.036	0.35	0.039	0.39	0.041	0.35	0.022	0.36	0.036	0.31	0.034	0.34	0.034
Hexachlorobutadiene	ND	0.01	ND	0.0099	ND	0.026	ND	0.017	ND	0.023	ND	0.019	ND	0.011	ND	0.02
Aldrin	ND	0.068	ND	0.049	ND	0.1	ND	0.065	ND	0.11	ND	0.056	ND	0.04	ND	0.078
Dieldrin	2.1	0.034	0.15	0.017	0.17	0.018	0.22	0.022	0.21	0.032	0.12	0.02	0.16	0.015	0.2	0.033
Endrin	0.67	0.13	ND	0.092	ND	0.092	ND	0.12	ND	0.16	ND	0.1	ND	0.069	ND	0.16
Chlordane, alpha (cis)	1.5	0.034	0.28	0.05	0.31	0.052	0.33	0.077	0.28	0.11	0.29	0.076	0.28	0.039	0.27	0.048
Chlordane, gamma (trans)	0.48	0.037	0.064	0.053	0.11	0.055	0.1	0.082	ND	0.12	0.13*	0.081	0.12	0.042	0.073	0.051
Chlordane, oxy-	1.6*	0.18	ND	0.18	ND	0.3	ND	0.19	ND	0.17	0.24	0.12	ND	0.13	ND	0.08
o,p'-DDD	0.94	0.02	0.05	0.0066	0.088*	0.021	0.08	0.032	0.073	0.013	0.07*	0.013	0.084	0.014	0.085	0.02
p,p'-DDD	4.3	0.02	0.6	0.0069	0.71	0.021	0.72	0.033	0.63	0.013	0.66	0.014	0.8	0.015	0.79	0.021
o,p'-DDE	2	0.067	0.11	0.048	0.13	0.056	0.15	0.056	0.16	0.024	0.16	0.021	0.15	0.029	0.19	0.037
p,p'-DDE	19	0.059	4.3	0.043	4.5	0.05	4.6	0.05	4.5	0.021	5	0.018	4.6	0.026	4.9	0.033
o,p'-DDT	0.47*	0.022	0.054	0.026	0.093	0.024	0.066	0.042	0.08	0.045	0.1*	0.033	0.066	0.028	0.091	0.023
p,p'-DDT	3.5	0.03	0.43	0.036	0.51	0.033	0.49	0.057	0.46	0.061	0.53	0.045	0.5	0.038	0.54	0.031
Endosulphan (I), alpha-	0.41	0.095	ND	0.05	ND	0.04	ND	0.05	ND	0.06	ND	0.07	0.12	0.028	0.21	0.085
Endosulphan (II), beta-	ND	0.13	ND	0.07	ND	0.05	ND	0.07	ND	0.1	ND	0.1	0.22	0.044	0.47	0.12
Endosulphan Sulphate	0.57***	0.077	ND	0.09	ND	0.07	ND	0.1	ND	0.08	ND	0.13	0.12	0.058	0.41	0.16
HCH, alpha-	0.46	0.076	0.065	0.063	ND	0.11	ND	0.12	ND	0.09	0.11*	0.096	0.12*	0.071	ND	0.071
HCH, beta-	0.49*	0.098	0.1*	0.08	ND	0.14	ND	0.16	ND	0.11	0.13*	0.12	ND	0.091	0.092*	0.091
HCH, gamma-	1.7	0.14	ND	0.12	ND	0.21	0.31	0.23	ND	0.17	ND	0.18	ND	0.13	ND	0.13
HCH, delta-	ND	0.046	ND	0.023	ND	0.023	ND	0.035	ND	0.046	ND	0.023	ND	0.023	ND	0.046
Heptachlor	ND	0.4	ND	0.28	ND	0.63	ND	0.47	ND	0.54	ND	0.37	ND	0.36	ND	0.4
Heptachlor Epoxide	0.44	0.035	0.046	0.019	ND	0.023	0.046	0.023	ND	0.035	ND	0.023	ND	0.012	ND	0.035
Methoxychlor	2.4	0.12	ND	0.092	ND	0.092	ND	0.15	ND	0.12	ND	0.12	ND	0.081	ND	0.17
Mirex	0.19	0.021	0.048	0.025	ND	0.058	0.052	0.04	0.048	0.023	0.048*	0.023	ND	0.031	0.06	0.02
Nonachlor, cis-	1.1	0.028	0.28	0.04	0.29	0.038	0.3	0.047	0.25	0.046	0.37	0.011	0.27	0.029	0.28	0.029
Nonachlor, trans-	1.8	0.038	0.37	0.053	0.4	0.052	0.47	0.064	0.39	0.063	0.41	0.015	0.41	0.039	0.36	0.039
Total Chlorobenzene**	3.612		0.526		0.727		0.708		0.628		0.600		0.532		0.625	
Total Chlordane**	3.580		0.280		0.310		0.330		0.280		0.420		0.400		0.270	
Total DDD/DDE/DDT**	30.210		5.544		6.031		6.106		5.903		6.520		6.200		6.596	
Total Endosulphan**	0.98		ND		ND		ND		ND		0.34		1.09		ND	
Total HCH**	2.650		ND		ND		0.310		ND		ND		0.120		ND	
Total Organochlorine concentration**	49.732		7.196		7.928		8.490		7.661		8.440		8.432		9.481	
% Lipid	19.0		2.5		2.4		2.4		2.4		2.4		2.4		2.9	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-OC-1		TC-99-OC-1		TC-99-OC-1		TC-99-OC-1		TC-99-OC-1		TC-99-OC-1		TC-99-OC-1		TC-99-OC-1	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period (Food not included).

*** = Results reported from re-injection data.

NQ = Not quantifiable.

ND = Not detected.

Table 28 (cont'd): Organochlorine concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

Organochlorine compounds	Spring 2000																	
	Food		Control		Control (replicate)		Ref		Ref (lab split)		mid Ag		mid Ag (lab split)		d/s Ag		d/s Ag (lab split)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	0.15	0.0015	0.07	0.0019	0.066	0.0024	0.075	0.0038	0.047	0.0023	0.054	0.0013	0.065	0.0022	0.063	0.0021	0.052	0.0012
1,3/1,4-Dichlorobenzene	4	0.0014	0.45	0.0019	0.5	0.0021	0.58	0.0037	0.47	0.0022	0.58	0.0011	0.45	0.0019	0.42	0.0018	0.39	0.001
1,2,3-Trichlorobenzene	0.084	0.0021	0.008	0.0026	0.012*	0.0033	0.011	0.0043	0.007	0.0026	0.014*	0.0027	0.009*	0.0023	0.007	0.0026	0.008	0.0022
1,2,4-Trichlorobenzene	0.31	0.002	0.084	0.0024	0.11	0.003	0.12	0.0039	0.096	0.0024	0.11	0.0024	0.098	0.0021	0.082	0.0025	0.087	0.0021
1,3,5-Trichlorobenzene	0.007	0.0021	ND	0.0025	ND	0.0031	ND	0.0041	ND	0.0025	0.003*	0.0025	ND	0.0022	0.003*	0.0025	ND	0.0022
1,2,3,4-Tetrachlorobenzene	0.11	0.0024	0.006*	0.0031	0.006*	0.0027	0.013	0.0028	0.013	0.0033	0.013	0.0024	0.014*	0.0021	0.012	0.004	0.01	0.0021
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.042	0.0022	0.003*	0.0029	0.005	0.0024	0.007	0.0026	0.006*	0.0031	0.012	0.0021	0.015	0.0019	0.008	0.0037	0.007*	0.0019
Pentachlorobenzene	0.21	0.003	0.016*	0.0036	0.016*	0.0061	0.031	0.0041	0.03*	0.0037	0.063*	0.0032	0.062*	0.004	0.045	0.0044	0.042	0.0037
Hexachlorobenzene	2.4	0.0056	0.28	0.0064	0.31	0.0063	0.43	0.0088	0.43	0.0072	0.46	0.0041	0.47	0.0059	0.36	0.0059	0.36	0.0056
Hexachlorobutadiene	0.006	0.0017	0.002	0.0019	ND	0.003	ND	0.0018	ND	0.0021	ND	0.0015	ND	0.002	ND	0.0016	ND	0.0019
Aldrin	0.018	0.011	ND	0.013	ND	0.012	ND	0.011	ND	0.019	ND	0.0078	ND	0.0067	ND	0.024	ND	0.013
Dieldrin	1.8	0.069	0.12	0.025	ND	0.035	0.17	0.011	0.16	0.017	0.15	0.045	0.16	0.039	0.15	0.013	0.16	0.013
Endrin	0.18	0.13	ND	0.046	ND	0.058	ND	0.023	ND	0.035	ND	0.081	ND	0.069	ND	0.023	ND	0.023
Chlordane, alpha (cis)	1.9	0.044	0.32*	0.038	0.36	0.054	0.4	0.041	0.25*	0.02	0.39*	0.037	0.39	0.048	0.41	0.035	0.29	0.044
Chlordane, gamma (trans)	0.39	0.04	0.06*	0.034	0.064*	0.05	0.088*	0.037	0.063*	0.018	0.07*	0.035	0.073	0.045	0.082*	0.034	0.081*	0.042
Chlordane, oxy-	0.33*	0.04	0.062*	0.048	ND	0.046	0.095*	0.042	0.12	0.068	0.079	0.03	0.16*	0.025	ND	0.088	ND	0.049
o,p'-DDD	1	0.05	ND	0.062	ND	0.14	0.081	0.069	ND	0.079	ND	0.09	ND	0.1	0.066*	0.06	0.07*	0.068
p,p'-DDD	5.7	0.06	0.53	0.075	0.57	0.16	0.84	0.083	0.29	0.095	0.58	0.11	0.46	0.14	0.8	0.098	0.85	0.077
o,p'-DDE	0.58	0.048	0.11	0.077	0.12	0.085	0.098	0.072	ND	0.11	0.13	0.1	0.14	0.11	0.11*	0.08	0.089	0.068
p,p'-DDE	36	0.064	4.3	0.1	4.6	0.11	5.9	0.096	4.6	0.14	5.9	0.13	4.2	0.14	5.8	0.17	5.9	0.091
o,p'-DDT	0.59	0.071	ND	0.13	ND	0.13	0.15	0.094	ND	0.12	ND	0.1	ND	0.1	0.18	0.12	0.14	0.086
p,p'-DDT	1.4	0.099	0.33	0.18	0.31	0.15	0.43	0.13	0.33	0.17	0.37	0.2	0.4	0.23	0.36	0.18	0.37	0.12
Endosulphan (I), alpha-	0.09	0.059	ND	0.02	ND	0.030	0.090	0.012	0.080	0.017	ND	0.050	ND	0.040	0.24	0.014	0.23	0.014
Endosulphan (II), beta-	ND	0.08	ND	0.03	ND	0.050	ND	0.020	ND	0.020	ND	0.070	ND	0.060	0.23	0.019	0.22	0.019
Endosulphan Sulphate	0.57	0.1	ND	0.04	ND	0.060	0.10	0.019	0.10	0.027	ND	0.090	ND	0.070	0.34	0.024	0.34	0.024
HCH, alpha-	1.5	0.028	ND	0.02	ND	0.029	0.058	0.023	0.036*	0.029	0.044*	0.018	0.044*	0.027	0.041*	0.029	0.03*	0.018
HCH, beta-	1.4	0.048	ND	0.034	ND	0.048	ND	0.04	ND	0.049	0.034*	0.031	ND	0.046	ND	0.048	0.03*	0.022
HCH, gamma-	0.46	0.032	ND	0.023	ND	0.033	0.033	0.027	ND	0.033	ND	0.021	ND	0.032	0.065*	0.05	0.079	0.031
HCH, delta-	ND	0.092	ND	0.035	ND	0.046	ND	0.012	ND	0.023	ND	0.069	ND	0.058	0.012	0.013	0.023	0.022
Heptachlor	ND	0.0088	ND	0.027	ND	0.027	ND	0.024	ND	0.035	ND	0.011	ND	0.017	ND	0.029	ND	0.018
Heptachlor Epoxide	0.53	0.073	0.023	0.022	ND	0.035	0.046	0.013	0.046	0.019	ND	0.046	ND	0.046	0.035	0.013	0.035	0.013
Methoxychlor	0.58	0.27	ND	0.092	ND	0.12	ND	0.046	ND	0.069	ND	0.17	ND	0.14	ND	0.046	ND	0.046
Mirex	0.098	0.012	0.027*	0.011	0.028*	0.0059	0.031*	0.013	0.03*	0.01	0.035	0.0064	0.04	0.0084	0.031	0.02	0.04	0.0073
Nonachlor, cis-	0.78	0.055	0.17*	0.068	0.15	0.031	0.19*	0.07	0.28	0.053	0.18	0.045	0.26	0.045	0.2*	0.092	0.21	0.064
Nonachlor, trans-	2.3	0.042	0.4	0.036	0.39	0.053	0.59	0.04	0.48	0.02	0.52	0.037	0.58	0.048	0.51	0.033	0.43	0.04
Total Chlorobenzene**	7.313		0.914		1.025		1.267		1.099		1.306		1.183		0.997		0.956	
Total Chlordane**	2.620		0.380		0.424		0.583		0.433		0.460		0.623		0.492		0.371	
Total DDD/DDE/DDT**	45.270		5.270		5.600		7.320		5.220		6.980		5.200		7.250		7.260	
Total Endosulphan**	0.66		ND		ND		0.19		0.18		ND		ND		0.81		0.79	
Total HCH**	3.360		ND		ND		0.058		0.036		0.044		0.044		0.106		0.109	
Total Organochlorine concentration**	65.515		7.161		7.617		10.445		7.964		9.675		8.090		10.546		10.326	
% Lipid	18.0		3.4		3.5		3.7		3.7		4.0		4.0		3.6		3.6	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-OC-1		TC-00-OC-1		TC-00-OC-2		TC-00-OC-1		TC-00-OC-1		TC-00-OC-2		TC-00-OC-2		TC-00-OC-3		TC-00-OC-3	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 28 (cont'd): Organochlorine concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

Organochlorine compounds	Fall 2000											
	Food		Control		Control (replicate)		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	0.84	0.0028	0.057	0.0012	0.096	0.0015	0.092	0.003	0.067	0.002	0.068	0.0016
1,3/1,4-Dichlorobenzene	6.8	0.0027	0.92	0.0011	1.1	0.0013	1.1	0.003	0.71	0.0019	1.2	0.0015
1,2,3-Trichlorobenzene	0.047	0.0021	0.007*	0.0015	0.008*	0.0031	0.008	0.0036	0.009	0.0021	0.007*	0.0022
1,2,4-Trichlorobenzene	0.32	0.0019	0.11	0.0014	0.14*	0.0028	0.12	0.0033	0.09	0.002	0.099	0.002
1,3,5-Trichlorobenzene	ND	0.002	0.003*	0.0015	ND	0.003	ND	0.0035	ND	0.0021	ND	0.0021
1,2,3,4-Tetrachlorobenzene	0.062	0.0033	0.009	0.0018	0.008	0.0017	0.011	0.0044	0.009	0.0024	0.01*	0.0018
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.064	0.003	0.005	0.0016	0.005*	0.0016	0.01*	0.0041	0.003*	0.0022	0.005*	0.0017
Pentachlorobenzene	0.17	0.0049	0.036*	0.0026	0.036*	0.0063	0.032	0.0045	0.04	0.004	0.042	0.0041
Hexachlorobenzene	2.5	0.0083	0.77	0.0039	0.73	0.0098	0.71	0.0083	0.67	0.01	0.65	0.0041
Hexachlorobutadiene	0.005*	0.0018	ND	0.0011	ND	0.0025	ND	0.0024	ND	0.003	ND	0.0016
Aldrin	ND	0.022	ND	0.0088	ND	0.02	ND	0.019	ND	0.0094	ND	0.0079
Dieldrin	1.4	0.043	0.23	0.016	0.24	0.046	0.17	0.019	0.17	0.008	0.17	0.014
Endrin	0.1	0.08	ND	0.023	ND	0.081	ND	0.035	0.023	0.018	ND	0.023
Chlordane, alpha (cis)	3	0.068	0.66*	0.031	0.62	0.049	0.63	0.058	0.6	0.034	0.81	0.032
Chlordane, gamma (trans)	0.63	0.062	0.097	0.028	0.11	0.045	0.15*	0.052	0.14	0.03	0.1	0.029
Chlordane, oxy-	0.4	0.08	0.28*	0.033	ND	0.075	0.16*	0.07	0.11	0.035	0.19*	0.029
o,p'-DDD	1.3	0.083	0.15	0.068	0.12	0.094	0.16	0.097	0.16	0.064	0.14	0.066
p,p'-DDD	7.8	0.099	1.5	0.08	1.5	0.11	1.6	0.12	1.6	0.077	0.67	0.079
o,p'-DDE	0.51	0.073	0.099	0.08	ND	0.13	0.096*	0.069	0.085	0.08	ND	0.072
p,p'-DDE	47	0.097	11	0.1	9.3	0.16	11	0.091	10	0.11	11	0.096
o,p'-DDT	0.65	0.12	0.19	0.11	ND	0.13	0.14	0.13	0.22*	0.087	ND	0.095
p,p'-DDT	1.6	0.17	0.51	0.14	0.42	0.17	0.46	0.18	0.45	0.12	0.37	0.13
Endosulphan (I), alpha-	ND	0.05	ND	0.020	ND	0.060	ND	0.020	ND	0.009	0.10	0.015
Endosulphan (II), beta-	ND	0.06	ND	0.030	ND	0.080	ND	0.030	0.010	0.008	0.20	0.020
Endosulphan Sulphate	0.13	0.077	ND	0.030	ND	0.10	ND	0.040	0.050	0.015	0.41	0.026
HCH, alpha-	1.1	0.029	ND	0.017	ND	0.039	0.026	0.019	0.023	0.018	0.039	0.023
HCH, beta-	1.2	0.05	ND	0.028	ND	0.065	ND	0.033	ND	0.03	ND	0.03
HCH, gamma-	0.33	0.033	ND	0.019	ND	0.045	ND	0.022	ND	0.02	ND	0.02
HCH, delta-	0.069	0.061	ND	0.023	ND	0.069	ND	0.023	ND	0.012	ND	0.023
Heptachlor	0.093*	0.027	ND	0.012	0.049	0.028	ND	0.033	ND	0.031	0.041*	0.031
Heptachlor Epoxide	0.39	0.046	ND	0.023	ND	0.046	0.035	0.018	0.046	0.010	0.023	0.020
Methoxychlor	ND	0.16	ND	0.058	ND	0.17	ND	0.069	ND	0.035	ND	0.046
Mirex	0.13	0.017	0.05	0.0039	0.045*	0.0073	0.057*	0.0064	0.052*	0.01	0.056	0.012
Nonachlor, cis-	0.92	0.098	0.27	0.022	0.29	0.038	0.37*	0.031	0.26*	0.044	0.37	0.07
Nonachlor, trans-	3.4	0.066	0.83	0.03	0.91	0.048	0.9	0.056	0.94	0.032	0.97	0.031
Total Chlorobenzene**	10.803		1.914		2.123		2.083		1.595		2.081	
Total Chlordane**	4.030		1.037		0.730		0.940		0.850		1.100	
Total DDD/DDE/DDT**	58.860		13.350		11.340		13.220		12.430		12.180	
Total Endosulphan**	0.13		ND		ND		ND		ND		0.61	
Total HCH**	2.699		ND		ND		ND		ND		0.039	
Total Organochlorine concentration**	82.960		17.681		15.727		17.740		16.297		17.617	
% Lipid	17.0		3.1		3.0		3.0		3.0		3.3	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-OC-1		TC-00-OC-2		TC-00-OC-2		TC-00-OC-1		TC-00-OC-1		TC-00-OC-1	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 28 (cont'd): Organochlorine concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during each exposure period.

Organochlorine compounds	Fall 2001										Mean of 4 exposure periods						
	Food		Control		Ref		mid Ag		d/s Ag		d/s Ag (lab split)		Food	Control	Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.	Conc.
1,2-Dichlorobenzene	0.215*	0.0126	0.145	0.0840	0.132	0.0553	0.134	0.0790	0.0943	0.0493	0.108	0.0643	0.4017	0.0907	0.0997	0.0850	0.0751
1,3/1,4-Dichlorobenzene	11.847*	0.0151	1.84	0.0938	0.7392	0.0618	1.123	0.0883	0.588	0.055	0.816	0.0718	7.5490	1.0700	0.8064	0.8043	0.7360
1,2,3-Trichlorobenzene	ND	0.180	ND	0.0533	ND	0.0470	ND	0.0683	ND	0.0278	ND	0.0400	0.1003	0.0038	0.0048	0.0058	0.0035
1,2,4-Trichlorobenzene	ND	0.180	0.165	0.0536	0.150	0.0473	0.151	0.0687	0.101	0.0279	0.129	0.0403	0.1575	0.1248	0.1675	0.1253	0.1055
1,3,5-Trichlorobenzene	ND	0.178	ND	0.0535	ND	0.0472	ND	0.0686	ND	0.0279	ND	0.0402	0.1943	0.0008	ND	0.0008	0.0008
1,2,3,4-Tetrachlorobenzene	0.0605	0.0067	ND	0.0273	ND	0.0256	ND	0.0296	ND	0.0183	ND	0.0181	0.1156	0.0038	0.0138	0.0115	0.0108
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.0527	0.0066	ND	0.0264	ND	0.0249	ND	0.0288	ND	0.0178	ND	0.0176	0.0552	0.0020	0.0043	0.0038	0.0085
Pentachlorobenzene	0.112	0.0105	ND	0.0300	0.0245*	0.0244	0.0517	0.0223	0.0386	0.0194	0.0350	0.0212	0.1930	0.0270	0.0384	0.0612	0.0519
Hexachlorobenzene	0.575	0.0160	0.308	0.0267	0.259	0.0219	0.241	0.0283	0.240	0.0266	0.229	0.0238	1.8688	0.4220	0.4373	0.4328	0.3900
Hexachlorobutadiene	ND	0.0067	not analyzed		not analyzed		not analyzed		not analyzed		not analyzed		0.0028	0.0007	ND	ND	ND
Aldrin	ND	0.438	ND	0.0711	ND	0.0739	ND	0.0511	ND	0.0527	ND	0.0680	0.0045	ND	ND	ND	ND
Dieldrin	0.584	0.0513	0.127	0.113	ND	0.0554	ND	0.0932	0.0980	0.0810	0.0725	0.0416	1.4710	0.1325	0.1275	0.1100	0.1445
Endrin	0.0970	0.0580	ND	0.207	ND	0.102	ND	0.171	ND	0.151	ND	0.0776	0.2618	ND	ND	0.0058	ND
Chlordane, alpha (cis)	0.290	0.0347	0.171	0.0339	0.151	0.0284	0.124	0.0300	0.135	0.0396	0.120	0.0205	1.6725	0.3578	0.3728	0.3510	0.4088
Chlordane, gamma (trans)	0.0967	0.0284	0.0347	0.0278	0.0426	0.0233	0.0320	0.0246	ND	0.0325	0.0323	0.0168	0.3992	0.0639	0.0977	0.0930	0.0755
Chlordane, oxy-	ND	0.0984	ND	0.105	ND	0.0970	0.199	0.145	ND	0.171	ND	0.106	0.5825	0.0855	0.0638	0.1570	0.0475
o,p'-DDD	ND	0.174	0.0434	0.0287	0.0347	0.0269	0.0297	0.0281	0.0360	0.0207	ND	0.0328	0.8100	0.0609	0.0909	0.0649	0.0815
p,p'-DDD	0.611	0.184	0.360	0.0316	0.293	0.0296	0.254*	0.0309	0.315	0.0228	0.350	0.0361	4.6028	0.7475	0.8608	0.7735	0.6463
o,p'-DDE	ND	0.180	ND	0.0494	ND	0.0249	0.0226*	0.0138	ND	0.0285	0.0166*	0.0149	0.7725	0.0798	0.0810	0.0994	0.0650
p,p'-DDE	2.57	0.240	1.36	0.0658	1.25	0.0331	1.11	0.0183	1.17	0.0380	1.20	0.0199	26.1425	5.2400	5.6625	5.5025	5.6425
o,p'-DDT	0.852*	0.190	0.0363	0.0324	ND	0.0304	ND	0.0317	0.0291	0.0234	0.0377	0.0370	0.6405	0.0701	0.0958	0.0800	0.0688
p,p'-DDT	0.387*	0.224	0.125	0.0414	0.115	0.0388	0.0921	0.0405	0.101	0.0299	0.0990	0.0473	1.7218	0.3488	0.3788	0.3605	0.3328
Endosulphan (I), alpha-	ND	0.0306	ND	0.0979	ND	0.0560	ND	0.0798	1.17	0.0760	1.12	0.0378	0.1250	ND	0.0225	ND	0.4075
Endosulphan (II), beta-	ND	0.0539	ND	0.148	ND	0.0909	ND	0.136	0.823	0.158	1.04	0.0812	ND	ND	ND	0.0025	0.3683
Endosulphan Sulphate	ND	0.0749	ND	0.206	ND	0.127	ND	0.190	0.761	0.250	0.961	0.128	0.3175	ND	0.0250	0.0125	0.4078
HCH, alpha-	ND	0.998	ND	0.0655	ND	0.0750	ND	0.0819	ND	0.111	ND	0.0727	0.7650	0.0163	0.0210	0.0443	0.0500
HCH, beta-	ND	0.506	ND	0.0867	ND	0.107	ND	0.0985	ND	0.108	ND	0.0952	0.7725	0.0250	ND	0.0410	ND
HCH, gamma-	ND	1.19	ND	0.0777	ND	0.0889	ND	0.0972	0.134*	0.132	ND	0.0863	0.6225	ND	0.0083	ND	0.0498
HCH, delta-	ND	0.225	ND	0.367	ND	0.111	ND	0.285	ND	0.298	ND	0.153	0.0173	0.0088	ND	ND	0.0030
Heptachlor	2.73*	0.791	ND	0.143	ND	0.0823	ND	0.132	ND	0.0937	ND	0.106	0.7058	ND	ND	ND	0.0103
Heptachlor Epoxide	ND	0.0518	ND	0.0930	ND	0.0456	ND	0.0768	ND	0.0598	ND	0.0307	0.3400	0.0115	0.0203	0.0115	0.0145
Methoxychlor	ND	0.334	ND	0.562	ND	0.276	ND	0.465	ND	0.845	ND	0.434	0.7450	ND	ND	ND	ND
Mirex	ND	0.0981	ND	0.0513	ND	0.0413	ND	0.0337	ND	0.0349	ND	0.0244	0.1045	0.0313	0.0220	0.0338	0.0218
Nonachlor, cis-	0.0885	0.0298	0.0796	0.0203	0.0769	0.0159	0.0629	0.0225	0.0589	0.0227	0.0532	0.0263	0.7221	0.1999	0.2317	0.2182	0.2247
Nonachlor, trans-	0.251	0.0262	0.209	0.0181	0.193	0.0141	0.159	0.0200	0.164	0.0202	0.158	0.0234	1.9378	0.4523	0.5208	0.5073	0.5135
Total Chlorobenzene**	12.862		2.458		1.280		1.701		1.062		1.317		8.6476	1.4530	1.3393	1.3004	1.1680
Total Chlordane**	0.387		0.206		0.194		0.323		0.135		0.120		2.6542	0.4757	0.5067	0.5133	0.5318
Total DDD/DDE/DDT**	4.420		1.888		1.693		1.456		1.622		1.687		34.6900	6.5131	7.0659	6.8465	6.8130
Total Endosulphan**	ND		ND		ND		ND		2.75		3.12		0.4425	ND	0.0475	0.0850	1.3160
Total HCH**	ND		ND		ND		ND		0.134		ND		2.1773	ND	0.0145	0.0110	0.0998
Total Organochlorine concentration**	21.419		4.968		3.436		3.702		5.930		6.456		54.907	9.251	9.887	9.528	10.631
% Lipid	26.0		3.0		3.6		3.0		3.1		3.1		20.00	3.00	3.18	3.10	3.10
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-OC-2		TC-01-OC-1		TC-01-OC-1		TC-01-OC-1		TC-01-OC-1		TC-01-OC-1		-	-	-	-	-

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period (Food not included).

ND = Not detected. Considered a zero value for statistical calculations.

Table 29: Toxaphene and chlorobornane concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during one exposure period.

Toxaphene & Chlorobornane compounds	Fall 1999							
	Food		Control		Ref		Ref (replicate)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane	0.48	0.042	0.1	0.079	0.13	0.074	0.15	0.077
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane	ND	0.064	ND	0.053	ND	0.083	ND	0.07
P3-GC/MS:Octachloro-Derivative	0.11	0.013	ND	0.023	ND	0.033	0.04*	0.033
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane	1.7	0.051	0.44	0.078	0.42	0.1	0.67	0.16
P5-GC/MS:Nonachloro-Derivative	0.057	0.029	ND	0.031	ND	0.026	ND	0.07
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.022	ND	0.024	ND	0.049	ND	0.062
P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	0.099	0.012	0.02	0.011	0.015	0.014	ND	0.034
P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.072	ND	0.051	ND	0.096	ND	0.1
P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.063	ND	0.086	ND	0.14	ND	0.085
P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	ND	0.032	ND	0.06	ND	0.082	ND	0.2
Total Toxaphene	26	0.16	2.8	0.35	3.1	0.28	2.4	0.45
% Lipid	19.0		2.5		2.4		2.4	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-TOX-1		TC-99-TOX-1		TC-99-TOX-1		TC-99-TOX-1	

Toxaphene & Chlorobornane compounds	Fall 1999							
	Ref (lab split)		mid Ag		d/s Ag		d/s Ag (replicate)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane	0.12	0.094	0.086	0.048	0.1	0.052	ND	0.12
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane	ND	0.046	ND	0.064	ND	0.032	ND	0.12
P3-GC/MS:Octachloro-Derivative	ND	0.032	ND	0.016	ND	0.017	ND	0.026
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane	0.44	0.053	0.35	0.078	0.41	0.046	0.46	0.1
P5-GC/MS:Nonachloro-Derivative	ND	0.028	ND	0.037	ND	0.024	ND	0.046
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.087	ND	0.038	ND	0.061	ND	0.055
P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	0.023	0.017	0.02	0.018	ND	0.02	ND	0.04
P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.077	ND	0.052	ND	0.041	ND	0.091
P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.16	ND	0.12	ND	0.05	ND	0.073
P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	ND	0.12	ND	0.076	ND	0.048	ND	0.17
Total Toxaphene	2.6	0.31	2.2	0.22	3.3	0.18	3	0.44
% Lipid	2.4		2.4		2.4		2.9	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-TOX-1		TC-99-TOX-1		TC-99-TOX-1		TC-99-TOX-1	

NOTE: Sample per site is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

Crayfish

Table 30: Organochlorine concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

Organochlorine compounds	Fall 1999								Spring 2000							
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	NQ	n/a	NQ	n/a	NQ	n/a	NQ	n/a	0.58	0.0023	0.15	0.0038	0.17	0.0025	0.13	0.0004
1,3/1,4-Dichlorobenzene	NQ	n/a	NQ	n/a	NQ	n/a	NQ	n/a	1.6	0.002	0.61	0.0033	0.66	0.0022	0.63	0.0009
1,2,3-Trichlorobenzene	ND	0.055	ND	0.082	ND	0.076	ND	0.066	0.011	0.0033	0.016	0.0075	0.019	0.0054	0.01*	0.001
1,2,4-Trichlorobenzene	ND	0.059	ND	0.088	ND	0.082	ND	0.07	0.18	0.0032	0.19	0.0067	0.16	0.0049	0.15	0.001
1,3,5-Trichlorobenzene	ND	0.05	ND	0.074	ND	0.069	ND	0.059	ND	0.0032	ND	0.0071	ND	0.0051	ND	0.0011
1,2,3,4-Tetrachlorobenzene	ND	0.058	ND	0.063	ND	0.05	ND	0.029	0.005	0.0029	0.01	0.0047	0.007*	0.0047	0.007*	0.0028
1,2,3,5/1,2,4,5-Tetrachlorobenzene	ND	0.057	ND	0.062	ND	0.049	ND	0.028	0.003*	0.0027	0.006	0.0042	0.008*	0.0042	ND	0.0026
Pentachlorobenzene	0.088	0.069	0.078	0.073	0.068	0.046	0.056*	0.047	ND	0.0052	0.009	0.0068	0.011*	0.0078	ND	0.0042
Hexachlorobenzene	ND	0.091	0.064	0.059	0.065	0.059	0.069	0.062	0.1*	0.0069	0.098	0.011	0.12	0.01	0.086	0.0036
Hexachlorobutadiene	ND	0.058	ND	0.063	ND	0.05	ND	0.029	ND	0.0018	ND	0.0049	0.004*	0.0031	ND	0.0005
Aldrin	ND	0.17	ND	0.1	ND	0.12	ND	0.062	ND	0.025	0.032*	0.019	ND	0.024	ND	0.012
Dieldrin	ND	0.046	ND	0.035	ND	0.046	ND	0.046	0.023	0.013	ND	0.092	ND	0.069	ND	0.014
Endrin	ND	0.18	ND	0.12	ND	0.18	ND	0.18	ND	0.035	ND	0.16	ND	0.13	ND	0.039
Chlordane, alpha (cis)	ND	0.12	ND	0.046	ND	0.052	ND	0.063	ND	0.059	ND	0.056	ND	0.065	ND	0.015
Chlordane, gamma (trans)	ND	0.13	ND	0.049	ND	0.055	ND	0.067	ND	0.056	ND	0.052	ND	0.06	ND	0.013
Chlordane, oxy-	ND	0.86	ND	0.65	ND	0.34	ND	0.57	ND	0.092	ND	0.071	ND	0.091	ND	0.038
op'-DDD	ND	0.079	ND	0.046	ND	0.024	ND	0.049	ND	0.088	ND	0.15	ND	0.14	ND	0.021
pp'-DDD	ND	0.08	ND	0.046	ND	0.024	ND	0.049	ND	0.1	ND	0.18	ND	0.17	ND	0.019
op'-DDE	ND	0.088	ND	0.11	ND	0.05	ND	0.066	ND	0.18	ND	0.14	ND	0.16	ND	0.22
pp'-DDE	0.26	0.08	0.29	0.1	0.3	0.046	0.3	0.061	0.13	0.1	0.21	0.17	ND	0.2	ND	0.27
op'-DDT	ND	0.062	ND	0.049	ND	0.038	ND	0.12	ND	0.13	ND	0.2	ND	0.2	ND	0.028
pp'-DDT	ND	0.074	ND	0.058	ND	0.046	ND	0.15	ND	0.19	ND	0.2	ND	0.2	ND	0.032
Endosulphan (I), alpha-	ND	0.05	ND	0.03	ND	0.05	ND	0.05	ND	0.020	ND	0.11	ND	0.080	ND	0.11
Endosulphan (II), beta-	ND	0.07	ND	0.05	ND	0.07	ND	0.08	ND	0.02	ND	0.15	ND	0.10	ND	0.28
Endosulphan Sulphate	ND	0.08	ND	0.05	ND	0.08	ND***	0.02	ND	0.03	ND	0.19	ND	0.13	ND	0.020
HCH, alpha-	ND	0.27	ND	0.15	ND	0.13	ND	0.19	ND	0.045	ND	0.057	ND	0.03	ND	0.02
HCH, beta-	ND	0.35	ND	0.2	ND	0.17	ND	0.24	ND	0.055	ND	0.096	ND	0.05	ND	0.03
HCH, gamma-	ND	0.49	ND	0.27	ND	0.24	ND	0.34	ND	0.079	ND	0.067	ND	0.035	ND	0.023
HCH, delta-	ND	0.081	ND	0.046	ND	0.069	ND	0.081	0.035	0.021	ND	0.14	ND	0.092	ND	0.0074
Heptachlor	ND	0.83	ND	0.56	ND	0.54	ND	0.48	ND	0.056	ND	0.032	ND	0.067	ND	0.0084
Heptachlor Epoxide	ND	0.046	ND	0.035	ND	0.046	ND	0.046	ND	0.019	ND	0.10	ND	0.069	ND	0.0076
Methoxychlor	ND	0.12	ND	0.069	ND	0.21	ND***	0.046	ND	0.058	ND	0.35	ND	0.25	ND	0.031
Mirex	ND	0.1	ND	0.068	ND	0.046	ND	0.054	ND	0.01	ND	0.011	ND	0.013	ND	0.0046
Nonachlor, cis-	ND	0.072	ND	0.037	ND	0.032	ND	0.028	ND	0.049	ND	0.095	ND	0.059	ND	0.019
Nonachlor, trans-	ND	0.098	ND	0.05	ND	0.043	ND	0.038	ND	0.055	ND	0.056	ND	0.065	ND	0.014
Total Chlorobenzene**	0.088		0.078		ND		ND		2.476		1.089		1.155		1.013	
Total Chlordane**	ND		ND		ND		ND		ND		ND		ND		ND	
Total DDD/DDE/DDT**	0.260		0.290		0.300		0.300		ND		ND		ND		ND	
Total Endosulphan**	ND		ND		ND		ND		ND		ND		ND		ND	
Total HCH**	ND		ND		ND		ND		ND		ND		ND		ND	
Total Organochlorine concentration**	0.348		0.368		0.300		0.300		2.476		1.121		1.155		1.013	
% Lipid	0.7		0.7		0.6		0.7		0.4		0.6		0.4		0.4	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-OC-2		TC-99-OC-2		TC-99-OC-2		TC-99-OC-2		TC-00-OC-3		TC-00-OC-2		TC-00-OC-2		TC-00-OC-4	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

*** = Results reported from re-injection data.

NQ = Not quantifiable; high background levels in lab blank.

ND = Not detected.

Table 30 (con't): Organochlorine concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during each exposure period.

Organochlorine compounds	Fall 2000								Fall 2001								Mean of 4 exposure periods			
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag		Control	Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.
1,2-Dichlorobenzene	0.15	0.0044	0.25*	0.0077	0.25	0.0074	0.27	0.0049	0.217	0.0678	0.163	0.0448	0.140	0.0640	0.0880	0.0238	0.3157	0.1877	0.1867	0.1627
1,3/1,4-Dichlorobenzene	0.49	0.0038	0.62	0.0066	0.69	0.0064	0.85	0.0042	3*	0.0758	0.6723	0.0501	0.8387*	0.0708	0.4475*	0.0264	1.6967	0.6341	0.7296	0.6425
1,2,3-Trichlorobenzene	0.011*	0.0057	ND	0.01	0.024*	0.0052	0.014	0.0059	ND	0.0345	ND	0.0221	ND	0.0417	ND	0.0203	0.0055	0.0040	0.0108	0.0060
1,2,4-Trichlorobenzene	0.17	0.0055	0.26*	0.0099	0.21	0.005	0.23	0.0057	0.158	0.0347	0.165	0.0223	0.200	0.0422	0.0949	0.0205	0.1270	0.1538	0.1425	0.1187
1,3,5-Trichlorobenzene	ND	0.0055	ND	0.01	ND	0.005	ND	0.0057	ND	0.0346	ND	0.0222	ND	0.0424	ND	0.0206	ND	ND	ND	ND
1,2,3,4-Tetrachlorobenzene	0.007	0.0059	0.009	0.0073	0.015*	0.0069	0.012*	0.0057	ND	0.0097	ND	0.0103	ND	0.0177	ND	0.0079	0.0030	0.0048	0.0055	0.0048
1,2,3,5/1,2,4,5-Tetrachlorobenzene	ND	0.0053	0.007	0.0067	0.008*	0.0063	ND	0.0051	ND	0.0095	ND	0.0100	ND	0.0172	ND	0.0077	0.0008	0.0033	0.0040	ND
Pentachlorobenzene	0.009	0.0082	ND	0.015	ND	0.012	ND	0.0091	ND	0.0108	ND	0.0114	ND	0.0144	ND	0.0083	0.0243	0.0218	0.0198	0.0140
Hexachlorobenzene	0.12	0.022	0.21*	0.02	0.15	0.013	0.15	0.013	0.0364	0.0097	0.0288	0.0111	0.0309	0.0123	0.0264	0.0062	0.0641	0.1002	0.0915	0.0829
Hexachlorobutadiene	ND	0.0026	ND	0.0063	ND	0.0038	ND	0.005	not analyzed		not analyzed		not analyzed		not analyzed		ND	ND	0.0013	ND
Aldrin	ND	0.069	ND	0.047	ND	0.029	ND	0.042	ND	0.0461	0.0434*	0.0402	ND	0.0526	ND	0.0389	ND	0.0189	ND	ND
Dieldrin	ND	0.023	0.046	0.020	ND	0.023	ND	0.035	ND	0.0375	ND	0.0363	ND	0.0456	ND	0.0240	0.0058	0.0115	ND	ND
Endrin	ND	0.046	ND	0.035	ND	0.049	ND	0.069	ND	0.0687	ND	0.0665	ND	0.0783	ND	0.0412	ND	ND	ND	ND
Chlordane, alpha (cis)	ND	0.058	ND	0.14	ND	0.085	ND	0.12	ND	0.0109	ND	0.0075	ND	0.0119	ND	0.0120	ND	ND	ND	ND
Chlordane, gamma (trans)	ND	0.056	ND	0.14	ND	0.081	ND	0.12	ND	0.0090	ND	0.0062	ND	0.0099	ND	0.0099	ND	ND	ND	ND
Chlordane, oxy-	ND	0.12	ND	0.17	ND	0.11	ND	0.15	0.0626	0.0432	0.0747	0.0460	ND	0.0815	ND	0.0760	0.0157	0.0187	ND	ND
op'-DDD	ND	0.19	ND	0.21	ND	0.21	ND	0.15	ND	0.0125	ND	0.0097	ND	0.0105	ND	0.0155	ND	ND	ND	ND
pp'-DDD	ND	0.22	ND	0.24	ND	0.23	ND	0.17	ND	0.0138	ND	0.0107	ND	0.0113	ND	0.0167	ND	ND	ND	ND
op'-DDE	ND	0.2	ND	0.3	ND	0.22	ND	0.23	ND	0.0069	ND	0.0067	ND	0.0053	ND	0.0092	ND	ND	ND	ND
pp'-DDE	0.16*	0.14	ND	0.26	ND	0.3	ND	0.31	0.338	0.0092	0.0809	0.0089	0.0936	0.0070	0.122	0.0122	0.2220	0.1452	0.0984	0.1055
op'-DDT	ND	0.24	ND	0.27	ND	0.29	ND	0.21	ND	0.0142	ND	0.0109	ND	0.0119	ND	0.0176	ND	ND	ND	ND
pp'-DDT	ND	0.2	ND	0.4	ND	0.24	ND	0.3	ND	0.0181	ND	0.0140	ND	0.0150	ND	0.0220	ND	ND	ND	ND
Endosulphan (I), alpha-	ND	0.030	ND	0.020	ND	0.030	ND	0.040	ND	0.0288	ND	0.0328	ND	0.0458	ND	0.0207	ND	ND	ND	ND
Endosulphan (II), beta-	ND	0.040	ND	0.030	ND	0.040	ND	0.050	ND	0.0533	ND	0.0516	ND	0.0730	ND	0.0281	ND	ND	ND	ND
Endosulphan Sulphate	ND	0.050	ND	0.030	ND	0.060	ND	0.070	ND	0.0745	ND	0.0722	ND	0.0976	ND	0.0377	ND	ND	ND	ND
HCH, alpha-	ND	0.048	ND	0.084	ND	0.074	ND	0.074	ND	0.0545	ND	0.0638	ND	0.0570	ND	0.0572	ND	ND	ND	ND
HCH, beta-	ND	0.058	ND	0.1	ND	0.089	ND	0.09	ND	0.0937	ND	0.0837	ND	0.0928	ND	0.0768	ND	ND	ND	ND
HCH, gamma-	ND	0.083	ND	0.15	ND	0.13	ND	0.13	ND	0.0646	ND	0.0757	ND	0.0680	ND	0.0682	ND	ND	ND	ND
HCH, delta-	0.058	0.042	0.058	0.027	0.046	0.043	0.058	0.053	ND	0.132	ND	0.185	ND	0.133	ND	0.0992	0.0233	0.0145	0.0115	0.0145
Heptachlor	ND	0.071	ND	0.092	ND	0.064	ND	0.078	ND	0.0448	0.0476	0.0446	0.0764*	0.0609	ND	0.0947	ND	0.0119	0.0191	ND
Heptachlor Epoxide	ND	0.028	ND	0.021	ND	0.029	ND	0.042	ND	0.0309	ND	0.0299	ND	0.0392	ND	0.0206	ND	ND	ND	ND
Methoxychlor	ND	0.10	ND	0.069	ND	0.10	ND	0.14	ND	0.187	ND	0.181	ND	0.202	ND	0.106	ND	ND	ND	ND
Mirex	ND	0.02	ND	0.02	ND	0.027	ND	0.016	ND	0.0149	ND	0.0224	ND	0.0127	ND	0.0190	ND	ND	ND	ND
Nonachlor, cis-	ND	0.069	ND	0.11	ND	0.1	ND	0.083	0.0166	0.0098	ND	0.0042	ND	0.0056	ND	0.0097	0.0042	ND	ND	ND
Nonachlor, trans-	ND	0.054	ND	0.13	ND	0.079	ND	0.11	0.0173*	0.0087	ND	0.0037	ND	0.0050	ND	0.0087	0.0043	ND	ND	ND
Total Chlorobenzene**	0.941		1.356		1.347		1.526		3.411		1.029		1.210		0.657		1.7291	0.8880	0.9279	0.7990
Total Chlordane**	ND		ND		ND		ND		ND		ND		ND		ND		ND	ND	ND	ND
Total DDD/DDE/DDT**	ND		ND		ND		ND		0.338		0.081		0.094		0.122		0.1495	0.0927	0.0984	0.1055
Total Endosulphan**	ND		ND		ND		ND		ND		ND		ND		ND		ND	ND	ND	ND
Total HCH**	0.058		0.058		ND		0.058		ND		ND		ND		ND		0.0145	0.0145	ND	0.0145
Total Organochlorine concentration**	0.999		1.460		1.347		1.584		3.783		1.110		1.303		0.779		1.902	1.015	1.026	0.919
% Lipid	0.6		0.5		0.4		0.5		1.1		0.4		0.5		0.7		0.71	0.55	0.48	0.64
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-OC-3		TC-00-OC-3		TC-00-OC-3		TC-00-OC-3		TC-01-OC-1		TC-01-OC-1		TC-01-OC-1		TC-01-OC-1		-	-	-	-

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

Table 31: Toxaphene and chlorobornane concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during one exposure period.

Toxaphene & Chlorobornane compounds	Fall 1999							
	Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane	ND	0.051	ND	0.065	ND	0.1	ND	0.12
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane	ND	0.13	ND	0.061	ND	0.056	ND	0.12
P3-GC/MS:Octachloro-Derivative	ND	0.044	ND	0.024	ND	0.03	ND	0.053
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane	ND	0.13	ND	0.16	ND	0.16	ND	0.25
P5-GC/MS:Nonachloro-Derivative	ND	0.062	ND	0.057	ND	0.039	ND	0.085
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.093	ND	0.052	ND	0.079	ND	0.096
P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.041	ND	0.041	ND	0.029	ND	0.043
P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.14	ND	0.14	ND	0.16	ND	0.36
P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.18	ND	0.16	ND	0.21	ND	0.39
P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	ND	0.21	ND	0.1	ND	0.14	ND	0.2
Total Toxaphene	ND	0.36	ND	0.37	ND	0.24	ND	0.49
% Lipid	0.7		0.7		0.6		0.7	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-99-TOX-2		TC-99-TOX-2		TC-99-TOX-2		TC-99-TOX-2	

NOTE: Sample per site is a composite of abdominal muscle tissue from 24 crayfish.

ND = Not detected.

Crayfish Hepatopancreas

Table 32: Organochlorine concentrations (ng/g) in crayfish hepatopancreas exposed to Elk Creek water during one exposure period.

Organochlorine compounds	Control		Ref		Fall 2001 mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	0.659	0.268	0.627	0.373	0.843	0.708	0.610	0.414
1,3/1,4-Dichlorobenzene	6.136*	0.296	2.455	0.413	2.09	0.783	2.24	0.458
1,2,3-Trichlorobenzene	ND	0.129	ND	0.163	ND	0.232	ND	0.231
1,2,4-Trichlorobenzene	1.00	0.131	0.905	0.165	1.25	0.235	0.852	0.234
1,3,5-Trichlorobenzene	ND	0.131	ND	0.165	ND	0.236	ND	0.235
1,2,3,4-Tetrachlorobenzene	ND	0.0908	ND	0.0652	ND	0.0767	ND	0.0456
1,2,3,5/1,2,4,5-Tetrachlorobenzene	ND	0.0881	ND	0.0632	0.116	0.0743	0.0470	0.0443
Pentachlorobenzene	0.134*	0.0839	ND	0.0669	0.128*	0.0886	0.0942*	0.0770
Hexachlorobenzene	0.441	0.0978	0.420	0.0798	0.406	0.105	0.388	0.0868
Hexachlorobutadiene	not analyzed		not analyzed		not analyzed		not analyzed	
Aldrin	ND	0.329	0.400*	0.242	ND	0.750	ND	0.249
Dieldrin	ND	0.265	ND	0.658	ND	0.366	ND	0.559
Endrin	ND	0.455	ND	1.37	ND	0.629	ND	0.961
Chlordane, alpha (cis)	ND	0.106	ND	0.142	ND	0.191	ND	0.0887
Chlordane, gamma (trans)	ND	0.0875	ND	0.118	ND	0.158	ND	0.0734
Chlordane, oxy-	ND	0.606	ND	0.965	ND	1.33	ND	0.529
op'-DDD	ND	0.104	ND	0.0867	ND	0.111	ND	0.0885
pp'-DDD	0.142	0.113	ND	0.0936	ND	0.120	0.191	0.0955
op'-DDE	ND	0.0786	ND	0.0534	ND	0.107	ND	0.0752
pp'-DDE	22.1	0.104	15.2	0.0709	14.6	0.142	17.0	0.0998
op'-DDT	ND	0.118	ND	0.0985	ND	0.126	ND	0.101
pp'-DDT	ND	0.148	ND	0.123	ND	0.158	ND	0.126
Endosulphan (I), alpha-	ND	0.234	ND	0.650	ND	0.254	ND	0.387
Endosulphan (II), beta-	ND	0.338	ND	1.19	ND	0.374	ND	0.599
Endosulphan Sulphate	ND	0.452	ND	1.90	ND	0.500	ND	0.802
HCH, alpha-	ND	0.762	ND	0.536	ND	0.789	ND	0.611
HCH, beta-	ND	0.749	ND	0.838	ND	0.698	ND	0.688
HCH, gamma-	ND	0.909	ND	0.639	ND	0.941	ND	0.729
HCH, delta-	ND	0.837	ND	1.12	ND	0.589	2.07	1.76
Heptachlor	ND	0.958	9.09*	0.379	ND	1.03	1.19*	0.714
Heptachlor Epoxide	ND	0.228	ND	0.475	ND	0.315	ND	0.481
Methoxychlor	ND	1.17	ND	6.81	ND	1.63	ND	2.48
Mirex	0.320	0.187	0.241	0.209	ND	0.372	0.323	0.192
Nonachlor, cis-	0.869	0.0802	0.725	0.0637	0.693	0.0959	0.733	0.0944
Nonachlor, trans-	1.05	0.0716	0.747	0.0568	0.597	0.0856	0.697	0.0842
Total Chlorobenzene**	7.711		3.780		4.833		3.574	
Total Chlordane**	ND		ND		ND		ND	
Total DDD/DDE/DDT**	22.100		15.200		14.600		17.191	
Total Endosulphan**	ND		ND		ND		ND	
Total HCH**	ND		ND		ND		2.07	
Total Organochlorine concentration**	31.730		29.542		20.723		25.455	
% Lipid	53.0		30.0		26.0		32.0	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-OC-1		TC-01-OC-1		TC-01-OC-1		TC-01-OC-1	

NOTE: Sample per site is a composite of hepatopancreas tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit.

ND = Not detected.

4.2.3.2 Carbamates, Herbicides, Organophosphates and Organonitrogens

Table 33: Various pesticides analyzed for in commercial fish food and cutthroat trout and crayfish muscle tissue and their corresponding detection limits.

Carbamates	DL (µg/g) -Spring/Fall 2000-	Organophosphate pesticides	DL (mg/kg) -Fall 1999-	DL (µg/g) -Spring/Fall 2000-	Organophosphate pesticides cont'd	DL (µg/g) -Spring/Fall 2000-
Aldicarb*	0.01	Azinphos methyl**	0.001		Sulfotep*	0.1
Aldicarb Sulfone*	0.01	Carbophenothion	0.001	0.1	Terbufos*	0.1
Aldicarb Sulfoxide*	0.01	Chlorpyrifos*		0.1		
Carbaryl*	0.05	Coumaphos*		0.1		
Carbofuran*	0.01	Demeton-O*		0.2		
3-Hydroxycarbofuran*	0.01	Demeton-S*		0.1		
Methomyl*	0.01	Diazinon	0.001	0.1		
Oxamyl*	0.01	Dichlorvos/Naled*		0.1		
Propoxur*	0.01	Dimethoate	0.001	0.1		
		Disulfoton*		0.1		
		Ethion*		0.1		
		Fenitrothion	0.001	0.2		
		Fensulfothion	0.001	0.3		
		Fenthion	0.001	0.1		
		Fonofos	0.001	0.1		
		Malathion	0.001	0.1		
		Methidathion*		0.5		
		Mevinphos	0.001	0.2		
		Parathion	0.001	0.1		
		Parathion-methyl	0.001	0.1		
		Phorate*		0.1		
		Phosalone*		0.1		
		Phosmet	0.001	0.1		

Organonitrogen pesticides	DL (µg/g) -Spring/Fall 2000-
Metolachlor*	0.1
Trifluralin*	0.1
Vinclozolin*	0.1

Detected in at least one exposure period.

* = Compounds not analyzed for in Fall 1999.

** = Only analyzed in Fall 1999.

Corresponding Lab Blanks and Spiked Matrix are: TC-99-PEST for Fall 1999 samples and TC-00-PEST for Spring/Fall 2000 samples.

Cutthroat Trout

Table 34: Detected pesticide concentrations (µg/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during three exposure periods (see Table 31 for complete list of compounds analyzed and corresponding detection limits).

Pesticide compounds	Spring 2000		Fall 2000			
	Food		Food		Control	
	Conc.	DL	Conc.	DL	Conc.	DL
2,4,5-T	-	-	-	-	0.02	0.02
Carbofuran	0.23	0.01	0.83	0.01	-	-
3-Hydroxycarbofuran	-	-	0.03	0.01	-	-
Oxamyl	-	-	0.16	0.01	-	-
Propoxur	0.06	0.01	0.24	0.01	-	-
Total pesticide concentration	0.29		1.26		0.02	
% Lipid	18.0		17.0		3.1	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PEST		TC-00-PEST		TC-00-PEST	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout. All sample results ND for Fall 1999.

Crayfish

Table 35: Detected pesticide concentrations (ug/g) in crayfish muscle tissue exposed to Elk Creek water during three exposure periods.
(see Table 31 for complete list of compounds analyzed and corresponding detection limits)

Pesticide compounds	Spring 2000					
	Control		Ref		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL
Aldicarb	-	-	0.02	0.01	0.03	0.01
Methomyl	0.02	0.01	0.02	0.01	0.03	0.01
Total pesticide concentration	0.02		0.04		0.06	
% Lipid	0.4		0.6		0.5	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PEST		TC-00-PEST		TC-00-PEST	

Pesticide compounds	Fall 2000							
	Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Methomyl	0.02	0.01	0.06	0.01	0.02	0.01	0.11	0.01
Total pesticide concentration	0.02		0.06		0.02		0.11	
% Lipid	0.6		0.5		0.4		0.5	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PEST		TC-00-PEST		TC-00-PEST		TC-00-PEST	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish. All sample results ND for Fall 1999.

4.2.4 Polycyclic Aromatic Hydrocarbons

Cutthroat Trout

Table 36: Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during three exposure periods.

Polycyclic aromatic hydrocarbons	Food		Control		Control (replicate)		Ref		Spring 2000 Ref (lab split)		mid Ag		mid Ag (lab split)		d/s Ag		d/s Ag (lab split)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	9.1	0.037	1.1	0.027	1.4	0.014	0.74	0.013	0.77	0.0085	1.1	0.0022	1	0.0071	1.1	0.0059	1.1	0.076
Acenaphthylene ^{1P}	0.48	0.012	0.074*	0.011	0.12	0.0054	0.064	0.016	0.056*	0.018	0.09	0.01	0.085	0.0076	0.075	0.0036	0.1	0.014
Acenaphthene ^{1P}	2.1	0.042	2*	0.027	2.8*	0.012	0.36*	0.017	1.2*	0.0074	2.9*	0.011	2.6*	0.0085	2	0.013	1.6	0.021
Fluorene ^{1P}	2.2	0.038	0.15	0.019	0.2	0.016	0.13	0.013	0.16	0.0022	0.29	0.0099	0.3	0.0075	0.6	0.0056	0.55	0.0051
Phenanthrene ^{1P}	6.6	0.17	0.54	0.01	0.52	0.013	0.37	0.013	0.39	0.013	0.61	0.0087	0.63	0.0077	0.82	0.0016	0.86	0.015
Anthracene ^{1P}	0.89	0.25	0.057	0.021	0.036	0.018	0.036	0.015	0.037*	0.014	0.043	0.012	0.036	0.01	0.053	0.0032	0.052	0.0043
Fluoranthene ^{2P}	2.5	0.039	0.17*	0.014	0.14	0.011	0.11	0.0087	0.1	0.012	0.17	0.012	0.19	0.0059	0.26	0.0071	0.28	0.013
Pyrene ^{2P}	2.1	0.039	0.16*	0.008	0.12*	0.01	0.079*	0.0041	0.089*	0.023	0.096*	0.0082	0.1*	0.0097	0.1*	0.013	0.11*	0.0065
Benz(a)anthracene ^{2P}	0.43*	0.035	0.0084*	0.0077	ND	0.012	ND	0.0061	0.01	0.0084	ND	0.0058	ND	0.014	ND	0.008	ND	0.013
Chrysene ^{2P}	0.7	0.034	0.018*	0.011	0.025	0.0074	0.025	0.0087	0.021	0.02	0.021	0.0082	0.024*	0.0048	0.025*	0.0064	0.023	0.011
Benzofluoranthenes ^{2P}	0.41	0.067	ND	0.024	0.017	0.013	0.033	0.011	0.035	0.02	ND	0.015	0.015	0.0083	ND	0.0059	ND	0.019
Benzo(a)pyrene ^{2P}	0.15*	0.11	ND	0.031	ND	0.017	ND	0.014	ND	0.048	ND	0.011	ND	0.0066	ND	0.017	ND	0.023
Benzo(e)pyrene ^{2P}	1.3*	0.066	0.029*	0.009	ND	0.021	0.038*	0.0038	ND	0.045	0.019*	0.008	0.0084*	0.0066	ND	0.0043	ND	0.018
Perylene ^{2P}	0.26	0.048	ND	0.32	0.027	0.018	0.019	0.0068	0.016*	0.014	0.03	0.0091	0.025	0.01	ND	0.013	ND	0.012
Dibenz(ah)anthracene ^{2P}	ND	0.08	ND	0.019	ND	0.045	ND	0.04	ND	0.025	ND	0.014	ND	0.014	ND	0.03	ND	0.052
Benzo(ghi)perylene ^{2P}	1.5*	0.029	ND	0.0096	ND	0.015	ND	0.015	ND	0.0098	ND	0.0085	ND	0.01	ND	0.019	ND	0.017
Indeno(1,2,3,cd)pyrene ^{2P}	0.13*	0.076	ND	0.013	ND	0.026	ND	0.012	0.0077*	0.0059	ND	0.0045	ND	0.019	ND	0.023	ND	0.014
C1-Naphthalene ^A	45	0.17	1.8	0.016	2	0.0084	1	0.24	1.1	0.0068	1.6	0.0053	1.6	0.0065	1.6	0.0052	1.6	0.0095
C2-Naphthalene ^A	25	0.072	1.9	0.02	1.6	0.0072	1	0.0045	1.2	0.0093	1.2	0.003	1.1	0.0033	1.4	0.0096	1.5	0.018
C3-Naphthalene ^A	25	0.29	1	0.0097	1.1	0.0069	0.77	0.015	0.63	0.0085	0.75	0.0098	0.75	0.0037	1	0.0047	1.1	0.014
C4-Naphthalene ^A	54	0.069	4.5	0.019	0.094	0.0056	1.5	0.0054	16	0.019	0.13	0.026	0.11	0.017	5.8	1.7	8.5	0.04
C1-Phenanthrene/Anthracene ^A	12	0.14	1.5	0.017	0.6	0.014	0.76	0.032	0.61	0.011	0.46	0.015	0.43	0.016	0.44	0.017	0.5	0.017
C2-Phenanthrene/Anthracene ^A	11	0.11	0.55	0.027	0.42	0.012	0.47	0.013	0.57	0.011	0.32	0.0081	0.39	0.0068	0.34	0.011	0.37	0.012
C3-Phenanthrene/Anthracene ^A	3.9	0.064	0.24	0.024	0.049	0.0051	0.18	0.049	0.23	0.011	0.073	0.025	0.075	0.015	0.054	0.0084	0.065	0.021
C4-Phenanthrene/Anthracene ^A	5.1	0.094	2.1	0.019	0.29	0.011	0.85	0.0083	0.3	0.0037	0.31	0.013	0.3	0.016	0.29	0.011	0.25	0.0084
Retene	1.6	0.21	0.41	0.024	0.12	0.022	0.32	0.032	0.31	0.018	0.1	0.02	0.1	0.028	0.086	0.024	0.088*	0.021
Dibenzothiophene	1.6	0.0078	0.12	0.0089	0.11*	0.016	0.044*	0.0085	0.047*	0.012	0.059*	0.019	0.067*	0.018	0.12	0.0041	0.11	0.0054
C1-Dibenzothiophenes	1.1	0.2	0.54	0.011	0.63	0.022	0.47	0.014	0.36	0.0091	0.53	0.015	0.36	0.012	0.32	0.013	0.28	0.014
C2-Dibenzothiophenes	7.3	0.19	0.75	0.074	0.91	0.15	0.71	0.041	0.61	0.052	1	0.072	0.83	0.026	0.63	0.036	0.56	0.1
Total Parent ^(P) LPAH**	21.370		3.921		5.076		1.700		2.613		5.033		4.651		4.648		4.262	
Total Parent ^(P) HPAH**	9.480		0.330		0.285		0.247		0.245		0.287		0.314		0.385		0.413	
Total Alkylated ^{(A)**}	181.0		13.590		6.059		5.030		20.640		4.713		4.645		10.924		13.885	
Total Dibenzothiophene**	10.0		1.410		1.650		1.224		1.017		1.589		1.257		1.070		0.950	
Total PAH concentration**	223.45		19.25		13.07		8.20		24.52		11.62		10.87		17.03		19.51	
% Lipid	18.0		3.4		3.5		3.7		3.7		4.0		4.0		3.6		3.6	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PAH-1		TC-00-PAH-1		TC-00-PAH-2		TC-00-PAH-1		TC-00-PAH-1		TC-00-PAH-2		TC-00-PAH-2		TC-00-PAH-3		TC-00-PAH-3	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period. (Food not included).

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

Table 36 (cont'd): Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during three exposure periods.

Polycyclic aromatic hydrocarbons	Fall 2000											
	Food		Control		Control (replicate)		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	13	0.051	1.3	0.0048	1.8	0.018	1.4	0.017	1.3	0.0089	2.2	0.016
Acenaphthylene ^{1P}	0.84	0.035	0.084*	0.0094	0.13	0.0057	0.098	0.008	0.15	0.013	0.26	0.0061
Acenaphthene ^{1P}	1.8	0.068	1.8*	0.012	0.69*	0.016	0.62*	0.01	1*	0.014	3.6*	0.014
Fluorene ^{1P}	2.7	0.095	0.15	0.0059	0.14	0.012	0.091	0.019	0.19	0.02	0.63	0.0081
Phenanthrene ^{1P}	6.6	0.13	0.46	0.0075	0.49	0.0067	0.36	0.0035	0.47	0.016	0.88	0.0091
Anthracene ^{1P}	0.99	0.11	0.031*	0.017	0.035	0.019	0.046	0.0063	0.043	0.016	0.065	0.012
Fluoranthene ^{2P}	2.1	0.15	0.12	0.0086	0.13	0.0093	0.11	0.012	0.13	0.0059	0.29	0.012
Pyrene ^{2P}	1.7	0.15	0.084*	0.0087	0.1*	0.0099	0.11*	0.014	0.084*	0.0062	0.11*	0.0098
Benz(a)anthracene ^{2P}	0.46*	0.066	ND	0.016	ND	0.01	ND	0.021	ND	0.0063	ND	0.011
Chrysene ^{2P}	0.89	0.1	0.028	0.014	0.027	0.019	ND	0.037	0.028*	0.01	0.033	0.013
Benzofluoranthenes ^{2P}	0.59	0.084	0.01*	0.0093	ND	0.014	0.015*	0.011	0.02	0.011	0.022	0.016
Benzo(a)pyrene ^{2P}	ND	0.065	ND	0.023	ND	0.015	ND	0.021	ND	0.025	ND	0.018
Benzo(e)pyrene ^{2P}	0.086*	0.024	0.044*	0.0044	ND	0.017	0.018*	0.0072	0.016*	0.0069	0.016*	0.0053
Perylene ^{2P}	0.61*	0.094	0.011	0.009	ND	0.015	ND	0.0098	ND	0.012	0.0091*	0.0084
Dibenz(ah)anthracene ^{2P}	ND	0.18	ND	0.0093	ND	0.043	ND	0.047	ND	0.026	ND	0.048
Benzo(ghi)perylene ^{2P}	1.2*	0.043	ND	0.008	ND	0.017	ND	0.014	0.014*	0.0094	ND	0.024
Indeno(1,2,3,cd)pyrene ^{2P}	0.15*	0.036	ND	0.012	ND	0.03	ND	0.023	ND	0.77	ND	0.021
C1-Naphthalene ^A	53	0.14	1.8	0.0053	2.4	0.0066	1.6	0.29	2.2	0.0074	2.9	0.028
C2-Naphthalene ^A	14	0.1	1.1	0.0067	1.4	0.008	1.3	0.021	2.7	0.83	2.2	0.0078
C3-Naphthalene ^A	19	0.35	0.75	0.0071	0.8	0.003	6.2	0.0071	1.7	0.0093	1.1	0.0081
C4-Naphthalene ^A	63	0.061	0.071	0.0015	0.072	0.014	0.067	0.022	9	0.018	12	0.037
C1-Phenanthrene/Anthracene ^A	11	0.12	0.6	0.017	0.42	0.014	0.6	0.03	0.62	0.25	0.61	0.03
C2-Phenanthrene/Anthracene ^A	8.5	0.13	0.32	0.0072	0.33	0.0096	0.59	0.011	0.34	0.0052	0.45	0.023
C3-Phenanthrene/Anthracene ^A	3.3	0.18	0.091	0.027	0.069	0.0053	0.21	0.0065	0.16	0.017	0.2	0.032
C4-Phenanthrene/Anthracene ^A	7.9	0.19	0.46	0.011	0.37	0.0091	0.49	0.012	0.43	0.013	0.58	0.02
Retene	1.5	0.14	0.11	0.03	0.11	0.024	0.38	0.031	0.23	0.049	0.3	0.057
Dibenzothiophene	0.96*	0.044	0.096	0.0034	0.089*	0.01	0.031*	0.0052	0.043*	0.013	0.12*	0.02
C1-Dibenzothiophenes	ND	0.34	0.19	0.017	0.15	0.011	0.19	0.013	0.12	0.018	0.12	0.045
C2-Dibenzothiophenes	9.5	0.46	0.38	0.041	0.18	0.021	0.17	0.024	0.15	0.046	0.21	0.046
Total Parent ^(P) LPAH**	25.930		3.794		3.250		2.615		3.153		7.635	
Total Parent ^(P) HPAH**	7.786		0.248		0.230		0.238		0.234		0.422	
Total Alkylated ^{(A)**}	179.700		5.121		5.789		10.990		17.150		20.040	
Total Dibenzothiophene**	10.460		0.666		0.419		0.391		0.313		0.450	
Total PAH concentration**	225.38		9.94		9.80		14.61		21.08		28.85	
% Lipid	17.0		3.1		3.0		3.0		3.0		3.3	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PAH-1		TC-00-PAH-2		TC-00-PAH-2		TC-00-PAH-1		TC-00-PAH-1		TC-00-PAH-1	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period. (Food not included).

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

Table 36 (cont'd): Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during three exposure periods.

Polycyclic aromatic hydrocarbons	Fall 2001										Mean of 3 exposure periods						
	Food		Control		Control (lab split)		Ref		mid Ag		d/s Ag		Food	Control	Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.	Conc.
Naphthalene ^{1P}	23.5	0.524	0.795	0.0584	0.829	0.0398	0.811	0.0462	1.13	0.0583	1.31	0.0967	15.200	1.065	0.984	1.177	1.537
Acenaphthylene ^{1P}	2.10	0.556	ND	0.0689	0.0438*	0.0397	ND	0.0834	ND	0.0591	0.0819*	0.0685	1.140	0.053	0.054	0.080	0.139
Acenaphthene ^{1P}	1.91	0.635	0.185	0.0986	0.286	0.0933	5.32*	0.132	0.282*	0.0815	2.28*	0.141	1.937	1.328	2.100	1.394	2.627
Fluorene ^{1P}	3.02	0.494	0.0687*	0.0569	0.0915*	0.0510	0.143*	0.0522	0.121*	0.0361	0.276	0.0449	2.640	0.123	0.121	0.200	0.502
Phenanthrene ^{1P}	11.4	0.301	0.397	0.0585	0.353	0.0382	0.218	0.0530	0.296	0.0189	0.484	0.0422	8.200	0.466	0.316	0.459	0.728
Anthracene ^{1P}	1.24	0.323	ND	0.0632	ND	0.0413	ND	0.0573	ND	0.0204	ND	0.0456	1.040	0.029	0.027	0.029	0.039
Fluoranthene ^{2P}	1.48	0.177	0.166	0.0229	0.120	0.0383	ND	0.101	0.0787	0.0389	0.166*	0.0355	2.027	0.152	0.073	0.126	0.239
Pyrene ^{2P}	2.12*	0.171	0.0947*	0.0224	0.150*	0.0374	ND	0.0990	0.0656*	0.0380	0.0793*	0.0347	1.973	0.113	0.063	0.082	0.096
Benz(a)anthracene ^{2P}	0.429*	0.283	ND	0.0215	ND	0.0291	ND	0.0512	ND	0.0173	ND	0.0380	0.440	0.003	ND	ND	ND
Chrysene ^{2P}	1.40	0.288	0.0507*	0.0290	0.0453*	0.0376	ND	0.0677	0.0455*	0.0267	ND	0.0499	0.997	0.032	0.008	0.032	0.019
Benzo(a)fluoranthene ^{2P}	ND	0.466	ND	0.0727	ND	0.0320	ND	0.0816	ND	0.0986	ND	0.0825	0.333	0.003	0.016	0.007	0.007
Benzo(a)pyrene ^{2P}	ND	0.353	ND	0.0503	ND	0.0252	ND	0.0703	ND	0.0782	ND	0.0602	0.050	ND	ND	ND	ND
Benzo(e)pyrene ^{2P}	ND	0.333	ND	0.0458	ND	0.0233	ND	0.0650	ND	0.0711	ND	0.0547	0.462	0.024	0.019	0.012	0.005
Perylene ^{2P}	ND	0.500	ND	0.0587	ND	0.0258	ND	0.0768	ND	0.0856	ND	0.0692	0.290	0.004	0.006	0.010	0.003
Dibenz(a,h)anthracene ^{2P}	ND	0.382	ND	0.0459	ND	0.0291	ND	0.0318	ND	0.0646	ND	0.0614	ND	ND	ND	ND	ND
Benzo(ghi)perylene ^{2P}	ND	0.523	0.0929*	0.0377	ND	0.0875	ND	0.0723	0.0811*	0.0573	ND	0.0561	0.900	0.031	ND	0.032	ND
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.661	ND	0.0441	ND	0.0766	ND	0.0639	ND	0.0598	ND	0.0653	0.093	ND	ND	ND	ND
C1-Naphthalene ^A	21.7	1.08	0.822	0.203	0.848	0.116	0.585	0.122	1.25	0.101	1.10	0.183	39.900	1.474	1.062	1.683	1.867
C2-Naphthalene ^A	37.3	0.480	1.09	0.176	0.958	0.0736	0.690	0.0721	2.75	0.102	1.35	0.164	25.433	1.363	0.997	2.217	1.650
C3-Naphthalene ^A	90.8	1.31	9.47	0.121	7.06	0.0859	4.97	0.0740	1.78	0.100	2.44	0.0875	44.933	3.740	3.980	1.410	1.513
C4-Naphthalene ^A	96.0	0.932	3.18	0.102	15.4	0.192	12.0	0.260	1.25	0.179	4.55	0.276	71.000	2.584	4.522	3.460	7.450
C1-Phenanthrene/Anthracene ^A	15.1	0.657	0.489	0.0786	0.372	0.0743	0.415	0.0884	0.339	0.0648	0.508	0.0840	12.700	0.863	0.592	0.473	0.519
C2-Phenanthrene/Anthracene ^A	23.3	0.511	0.710	0.0734	0.459	0.196	0.526	0.178	0.461	0.0571	0.666	0.0608	14.267	0.527	0.529	0.374	0.485
C3-Phenanthrene/Anthracene ^A	8.75	0.547	0.168	0.0607	0.234	0.0640	0.301	0.0751	0.328	0.0483	0.198	0.0592	5.317	0.166	0.230	0.187	0.151
C4-Phenanthrene/Anthracene ^A	15.0	1.04	1.52	0.120	1.35	0.0715	1.13	0.0867	4.52	0.0828	2.77	0.0970	9.333	1.360	0.823	1.753	1.213
Retene	ND	1.04	0.232	0.120	0.183	0.0715	0.146	0.0867	0.157	0.0828	ND	0.0970	1.033	0.251	0.282	0.162	0.129
Dibenzothiophene	1.19*	0.519	ND	0.0687	ND	0.0578	0.0658*	0.0546	ND	0.0446	0.0553*	0.0546	1.250	0.072	0.047	0.034	0.098
C1-Dibenzothiophenes	6.87	0.685	1.40	0.0995	0.118	0.0378	0.361	0.0542	0.911	0.0583	0.909	0.0897	2.657	0.710	0.340	0.520	0.450
C2-Dibenzothiophenes	10.0	1.18	1.47	0.133	0.929	0.0579	0.788	0.133	0.917	0.179	1.23	0.126	8.933	0.867	0.556	0.689	0.690
Total Parent ^(P) LPAH**	43.170		1.377		1.560		6.492		1.829		4.350		30.157	3.031	3.602	3.338	5.544
Total Parent ^(P) HPAH**	5.429		0.259		0.270		ND		ND		0.166		7.565	0.279	0.162	0.174	0.324
Total Alkylated ^{(A)**}	307.950		17.449		26.681		20.617		12.678		13.582		222.883	12.053	12.212	11.514	14.849
Total Dibenzothiophene**	18.060		2.870		1.047		1.149		1.828		2.139		12.840	1.649	0.921	1.243	1.220
Total PAH concentration**	374.61		22.19		29.74		28.40		16.49		20.24		274.478	17.126	17.072	16.400	22.038
% Lipid	26.0		3.0		3.0		3.6		3.0		3.1		20.00	3.17	3.43	3.33	3.33
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PAH		TC-01-PAH		TC-01-PAH		TC-01-PAH		TC-01-PAH		TC-01-PAH		-	-	-	-	-

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period. (Food not included).

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 37: Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during three exposure periods.

Polycyclic aromatic hydrocarbons	Spring 2000								Fall 2000							
	Control		Ref		mid Ag		d/s Ag		Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	1.3	0.008	1.4	0.013	1.7	0.014	1.6	0.013	1.5	0.013	1.5	0.031	1.7	0.01	1.9	0.021
Acenaphthylene ^{1P}	0.093	0.011	0.084	0.02	0.12	0.0091	0.12	0.013	0.092	0.015	0.091	0.014	0.096	0.014	0.1	0.012
Acenaphthene ^{1P}	0.039	0.021	0.042	0.026	0.06	0.0097	0.076	0.043	0.084	0.019	0.071	0.026	0.087	0.016	0.13	0.046
Fluorene ^{1P}	0.069	0.016	0.081	0.02	0.097	0.021	0.086	0.023	0.12	0.02	0.096	0.027	0.11	0.023	0.12	0.023
Phenanthrene ^{1P}	0.3	0.0065	0.36	0.0087	0.35	0.0071	0.42	0.011	0.41	0.01	0.38	0.015	0.46	0.017	0.51	0.0038
Anthracene ^{1P}	0.028	0.016	0.041	0.018	0.032	0.016	0.046	0.0096	0.036	0.014	ND	0.052	0.048	0.031	0.036	0.023
Fluoranthene ^{2P}	0.11	0.014	0.13	0.011	0.13	0.0084	0.19	0.013	0.14	0.0076	0.16	0.027	0.19	0.014	0.23	0.023
Pyrene ^{2P}	0.12	0.014	0.14	0.01	0.13	0.013	0.18	0.005	0.15	0.015	0.17	0.026	0.23	0.013	0.26	0.021
Benz(a)anthracene ^{2P}	ND	0.012	0.013*	0.013	0.013*	0.0088	0.031	0.014	ND	0.023	ND	0.028	ND	0.014	ND	0.021
Chrysene ^{2P}	ND	0.025	0.035	0.016	0.038	0.016	0.046	0.015	ND	0.033	0.035	0.021	0.046	0.023	0.05	0.027
Benzo(a)fluoranthene ^{2P}	ND	0.012	ND	0.02	0.03	0.012	0.05	0.019	0.021	0.016	ND	0.028	ND	0.023	0.036	0.02
Benzo(a)pyrene ^{2P}	ND	0.012	ND	0.021	ND	0.015	ND	0.023	ND	0.022	ND	0.021	ND	0.038	ND	0.064
Benzo(e)pyrene ^{2P}	ND	0.0095	ND	0.014	0.011*	0.0074	ND	0.016	ND	0.014	ND	0.012	ND	0.021	ND	0.043
Perylene ^{2P}	ND	0.029	0.034	0.024	0.084	0.012	0.036*	0.022	ND	0.026	ND	0.03	ND	0.042	ND	0.07
Dibenz(ah)anthracene ^{2P}	ND	0.042	ND	0.093	ND	0.033	ND	0.061	ND	0.054	ND	0.04	ND	0.098	ND	0.16
Benzo(ghi)perylene ^{2P}	ND	0.028	ND	0.045	ND	0.024	ND	0.022	ND	0.052	ND	0.049	ND	0.048	ND	0.049
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.026	ND	0.018	ND	0.035	ND	0.046	ND	0.052	ND	0.04	ND	0.028	ND	0.037
C1-Naphthalene ^A	1.2	0.009	1.3	0.0077	1.5	0.014	1.4	0.018	1.7	0.027	1.4	0.03	1.7	0.048	1.8	0.023
C2-Naphthalene ^A	0.72	0.019	0.74	0.018	0.82	0.013	0.89	0.03	1.2	0.032	1.3	0.039	1.3	0.016	1.2	0.019
C3-Naphthalene ^A	0.33	0.015	0.36	0.025	0.38	0.025	0.39	0.02	0.5	0.012	0.45	0.026	0.65	0.018	0.51	0.022
C4-Naphthalene ^A	ND	0.021	ND	0.026	ND	0.0071	ND	0.034	ND	0.03	0.068	0.028	ND	0.034	0.11	0.013
C1-Phenanthrene/Anthracene ^A	0.37	0.019	0.45	0.03	0.53	0.025	0.5	0.022	0.44	0.015	0.68	0.038	0.74	0.073	0.55	0.02
C2-Phenanthrene/Anthracene ^A	0.3	0.0051	0.39	0.0082	0.39	0.0098	0.37	0.006	0.44	0.015	0.55	0.047	0.69	0.03	0.56	0.013
C3-Phenanthrene/Anthracene ^A	0.11	0.033	0.16	0.02	0.14	0.02	0.13	0.018	0.12	0.017	0.27	0.015	0.3	0.029	0.39	0.025
C4-Phenanthrene/Anthracene ^A	0.05	0.019	0.082	0.017	0.07	0.016	0.07	0.016	0.13	0.015	0.5	0.03	0.15	0.016	0.14	0.03
Retene	0.071	0.018	0.15	0.048	0.16	0.027	0.13	0.033	0.11	0.06	0.18	0.072	0.25	0.068	0.18	0.075
Dibenzothiophene	ND	0.016	0.024*	0.0065	0.02*	0.004	0.026*	0.018	0.037*	0.019	ND	0.0079	ND	0.035	0.027*	0.003
C1-Dibenzothiophenes	0.11	0.015	0.13	0.015	0.11	0.027	0.11	0.017	0.11	0.012	0.16	0.012	0.15	0.035	0.14	0.028
C2-Dibenzothiophenes	0.06	0.019	0.067	0.02	0.078	0.017	ND	0.032	ND	0.018	ND	0.029	ND	0.042	ND	0.041
Total Parent ^(P) LPAH**	1.790		1.966		2.359		2.348		2.206		2.138		2.453		2.760	
Total Parent ^(P) HPAH**	0.230		0.339		0.412		0.533		0.290		0.330		0.466		0.540	
Total Alkylated ^{(A)**}	3.080		3.482		3.830		3.750		4.530		5.218		5.530		5.260	
Total Dibenzothiophene**	0.170		0.221		0.208		0.136		0.147		0.160		0.150		0.140	
Total PAH concentration**	5.34		6.16		6.97		6.90		7.28		8.03		8.85		8.88	
% Lipid	0.4		0.6		0.4		0.45		0.6		0.5		0.4		0.5	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PAH-2		TC-00-PAH-2		TC-00-PAH-2		TC-00-PAH-2		TC-00-PAH-3		TC-00-PAH-3		TC-00-PAH-3		TC-00-PAH-3	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

Table 37 (cont'd): Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in crayfish muscle tissue exposed to Elk Creek water during three exposure periods.

Polycyclic aromatic hydrocarbons	Fall 2001								Mean of 3 exposure periods			
	Control		Ref		mid Ag		d/s Ag		Control	Ref	mid Ag	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.
Naphthalene ^{1P}	1.71	0.165	0.877	0.103	1.15	0.0787	1.13*	0.0733	1.503	1.259	1.517	1.543
Acenaphthylene ^{1P}	ND	0.0626	ND	0.136	ND	0.0856	ND	0.0412	0.062	0.058	0.072	0.073
Acenaphthene ^{1P}	0.138*	0.114	ND	0.134	ND	0.128	0.0798	0.0718	0.087	0.038	0.049	0.095
Fluorene ^{1P}	ND	0.101	ND	0.0867	0.132*	0.101	0.138*	0.0580	0.063	0.059	0.113	0.115
Phenanthrene ^{1P}	0.732	0.0551	0.353	0.0764	0.372	0.0527	0.371	0.0384	0.481	0.364	0.394	0.434
Anthracene ^{1P}	0.0790*	0.0596	ND	0.0827	ND	0.0571	ND	0.0415	0.048	0.014	0.027	0.027
Fluoranthene ^{2P}	1.19	0.0505	0.108	0.0435	0.104*	0.0342	0.119	0.0296	0.480	0.133	0.141	0.180
Pyrene ^{2P}	1.40	0.0491	0.0950	0.0423	0.0935*	0.0333	0.124	0.0288	0.557	0.135	0.151	0.188
Benz(a)anthracene ^{2P}	0.0852*	0.0373	ND	0.0754	ND	0.0366	ND	0.0244	0.028	0.004	0.004	0.010
Chrysene ^{2P}	0.195*	0.0425	ND	0.0463	ND	0.0337	0.0467*	0.0348	0.065	0.023	0.028	0.048
Benzo(a)fluoranthene ^{2P}	ND	0.511	ND	0.125	ND	0.124	ND	0.111	0.007	ND	0.010	0.029
Benzo(a)pyrene ^{2P}	ND	0.356	ND	0.0937	ND	0.0888	ND	0.0822	ND	ND	ND	ND
Benzo(e)pyrene ^{2P}	ND	0.327	ND	0.0859	ND	0.0814	ND	0.0753	ND	ND	0.004	ND
Perylene ^{2P}	ND	0.406	ND	0.0985	ND	0.0957	ND	0.0965	ND	0.011	0.028	0.012
Dibenz(ah)anthracene ^{2P}	ND	0.0643	ND	0.146	ND	0.0541	ND	0.0656	ND	ND	ND	ND
Benzo(ghi)perylene ^{2P}	ND	0.101	0.175*	0.0783	0.171*	0.104	0.121*	0.0703	ND	0.058	0.057	0.040
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.0986	ND	0.0915	ND	0.107	ND	0.0709	ND	ND	ND	ND
C1-Naphthalene ^A	0.970	0.211	0.556	0.282	0.623	0.235	0.546	0.135	1.290	1.085	1.274	1.249
C2-Naphthalene ^A	0.884	0.142	0.477	0.278	0.406	0.127	0.522	0.0958	0.935	0.839	0.842	0.871
C3-Naphthalene ^A	0.420	0.110	ND	0.150	0.215	0.0953	0.363	0.0680	0.417	0.270	0.415	0.421
C4-Naphthalene ^A	ND	0.184	ND	0.136	ND	0.172	0.237	0.0807	ND	0.023	ND	0.116
C1-Phenanthrene/Anthracene ^A	0.748	0.0723	0.298	0.110	0.321	0.110	0.341	0.0580	0.519	0.476	0.530	0.464
C2-Phenanthrene/Anthracene ^A	1.11	0.126	ND	0.290	0.129	0.0594	0.351	0.0824	0.617	0.313	0.403	0.427
C3-Phenanthrene/Anthracene ^A	0.830	0.101	ND	0.0745	ND	0.0646	0.227	0.0396	0.353	0.143	0.147	0.249
C4-Phenanthrene/Anthracene ^A	12.9	0.164	0.767	0.128	2.42	0.0874	3.47	0.0577	4.360	0.450	0.880	1.227
Retene	0.283	0.164	0.128	0.128	0.133	0.0874	0.0973	0.0577	0.155	0.153	0.181	0.136
Dibenzothiophene	0.103*	0.0798	ND	0.0862	ND	0.0642	ND	0.0570	0.047	0.008	0.007	0.018
C1-Dibenzothiophenes	0.260	0.0708	ND	0.0926	ND	0.0629	0.108	0.0504	0.160	0.097	0.087	0.119
C2-Dibenzothiophenes	0.438	0.136	ND	0.0245	ND	0.109	0.206	0.0746	0.166	0.022	0.026	0.069
Total Parent ^(P) LPAH**	2.580		1.230		1.654		1.639		2.192	1.778	2.155	2.249
Total Parent ^(P) HPAH**	2.870		0.378		0.369		0.411		1.130	0.349	0.416	0.495
Total Alkylated ^{(A)**}	17.862		2.098		3.985		6.057		8.491	3.599	4.448	5.022
Total Dibenzothiophene**	0.801		ND		ND		0.314		0.373	0.127	0.119	0.197
Total PAH concentration**	24.40		3.71		6.01		8.42		12.339	5.965	7.275	8.066
% Lipid	1.1		0.4		0.5		0.7		0.70	0.50	0.43	0.55
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PAH		TC-01-PAH		TC-01-PAH		TC-01-PAH		-	-	-	-

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 38: Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in crayfish hepatopancreas exposed to Elk Creek water during one exposure period.

Polycyclic aromatic hydrocarbons	Fall 2001							
	Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	11.7	0.324	3.64	0.437	3.51	0.479	7.04	0.389
Acenaphthylene ^{1P}	0.904*	0.331	ND	0.523	ND	0.422	ND	0.600
Acenaphthene ^{1P}	4.36	0.622	ND	0.364	ND	0.383	2.24	0.646
Fluorene ^{1P}	4.33	0.848	ND	0.366	0.578*	0.224	0.991	0.719
Phenanthrene ^{1P}	9.72	0.352	1.59	0.323	1.67	0.163	2.97	0.499
Anthracene ^{1P}	1.73	0.374	ND	0.349	ND	0.176	ND	0.539
Fluoranthene ^{2P}	20.6	0.320	0.472*	0.104	0.669	0.154	1.29*	0.411
Pyrene ^{2P}	20.7	0.311	0.605	0.101	0.696*	0.148	1.32	0.396
Benz(a)anthracene ^{2P}	0.906*	0.392	ND	0.145	0.174*	0.124	ND	0.549
Chrysene ^{2P}	2.92	0.511	ND	0.251	0.369	0.121	ND	0.647
Benzofluoranthenes ^{2P}	16.1	2.35	ND	0.656	ND	0.392	ND	0.989
Benzo(a)pyrene ^{2P}	6.65*	1.80	ND	0.476	ND	0.263	ND	0.709
Benzo(e)pyrene ^{2P}	3.48*	1.65	ND	0.436	0.759*	0.242	ND	0.652
Perylene ^{2P}	2.20	1.93	ND	0.509	1.10*	0.302	ND	0.775
Dibenz(ah)anthracene ^{2P}	ND	0.367	ND	0.448	ND	0.331	ND	0.538
Benzo(ghi)perylene ^{2P}	ND	0.729	0.484*	0.219	0.706*	0.284	ND	0.420
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.646	ND	0.231	ND	0.333	ND	0.483
C1-Naphthalene ^A	8.60	0.656	2.42	0.708	2.14	0.726	3.27	1.92
C2-Naphthalene ^A	16.5	0.569	9.76	0.988	12.5	0.532	6.41	1.34
C3-Naphthalene ^A	7.38	0.690	2.48	0.684	3.68	0.404	4.46	1.13
C4-Naphthalene ^A	39.7	1.02	11.5	1.03	3.17	0.917	5.35	1.14
C1-Phenanthrene/Anthracene ^A	9.77	0.718	2.38	0.431	3.36	0.207	5.26	0.848
C2-Phenanthrene/Anthracene ^A	7.46	0.722	2.06	0.296	2.15	0.323	4.80	0.730
C3-Phenanthrene/Anthracene ^A	5.10	0.958	1.48	0.483	1.86	0.155	5.33	0.515
C4-Phenanthrene/Anthracene ^A	10.3	4.90	6.98	0.664	3.84	0.308	6.17	1.16
Retene	ND	4.90	2.40	0.664	0.914	0.308	1.71	1.16
Dibenzothiophene	1.04*	0.357	ND	0.353	ND	0.270	0.376*	0.231
C1-Dibenzothiophenes	2.87	0.416	1.61	0.568	1.94	0.450	0.972	0.552
C2-Dibenzothiophenes	3.53	1.25	2.10	0.617	2.52	0.774	ND	0.885
Total Parent ^(P) LPAH**	32.744		5.230		5.180		13.241	
Total Parent ^(P) HPAH**	73.556		1.077		1.365		2.610	
Total Alkylated ^{(A)**}	104.81		39.06		28.86		41.05	
Total Dibenzothiophene**	7.440		3.710		4.460		1.348	
Total PAH concentration**	218.55		49.08		39.87		58.25	
% Lipid	53.0		30.0		26.0		32.0	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PAH		TC-01-PAH		TC-01-PAH		TC-01-PAH	

NOTE: Sample per site is a composite of hepatopancreas tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

4.2.5 Polybrominated Diphenyl Ethers

Cutthroat Trout

Table 39: Polybrominated diphenyl ether (PBDE) concentrations (pg/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Elk Creek water during one exposure period.

Polybrominated diphenyl ethers	Fall 2001											
	Food		Control		Ref		mid Ag		d/s Ag		d/s Ag (lab split)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	33.0	ND	26.0	ND	30.0	ND	31.0	ND	29.0	ND	28.0
3-MonoBDE (2)	ND	33.0	ND	26.0	ND	30.0	ND	31.0	ND	29.0	ND	28.0
4-MonoBDE (3)	ND	33.0	ND	26.0	ND	30.0	ND	31.0	ND	29.0	ND	28.0
2,4-DiBDE (7)	ND	1.50	ND	1.09	ND	1.22	ND	1.30	ND	1.09	ND	1.16
2,4'/3,3'-DiBDE (8/11)	ND	1.50	ND	1.09	ND	1.22	ND	1.30	ND	1.09	ND	1.16
2,6-DiBDE (10)	ND	1.50	ND	1.09	ND	1.22	ND	1.30	ND	1.09	ND	1.16
3,4-DiBDE (12)	ND	1.50	ND	1.09	ND	1.22	ND	1.30	ND	1.09	ND	1.16
3,4'-DiBDE (13)	ND	1.50	ND	1.09	ND	1.22	ND	1.30	ND	1.09	ND	1.16
4,4'-DiBDE (15)	ND	1.50	ND	1.09	ND	1.22	ND	1.30	ND	1.09	ND	1.16
2,2',4-TriBDE (17)	4.73	3.31	ND	2.85	ND	2.95	7.36*	3.18	2.83*	2.61	ND	3.26
2,3',4-TriBDE (25)	ND	3.10	ND	2.69	ND	2.79	ND	3.00	ND	2.47	ND	3.08
2,4,4'/2',3,4-TriBDE (28/33)	14.5	2.91	5.78	2.55	7.23	2.64	33.5	2.84	14.3	2.34	14.5	2.92
2,4,6-TriBDE (30)	ND	3.10	ND	2.69	ND	2.79	ND	3.00	ND	2.47	ND	3.08
2,4',6-TriBDE (32)	ND	3.10	ND	2.69	ND	2.79	ND	3.00	ND	2.47	ND	3.08
3,3',4-TriBDE (35)	ND	3.10	ND	2.69	ND	2.79	ND	3.00	ND	2.47	ND	3.08
3,4,4'-TriBDE (37)	ND	3.10	ND	2.69	ND	2.79	ND	3.00	ND	2.47	ND	3.08
2,2',4,4'-TetraBDE (47)	252	1.33	116	1.13	118	1.54	1080	1.45	289	1.76	279	1.35
2,2',4,5'-TetraBDE (49)	29.8	1.76	18.8	1.42	18.3	2.00	43.5	1.66	25.0*	2.26	20.7	1.81
2,3',4,4'-TetraBDE (66)	10.0	2.44	5.43*	1.94	5.13	2.74	22.8*	2.20	7.85*	3.09	9.19	2.50
2,3',4',6-TetraBDE (71)	4.29	1.76	ND	1.42	ND	2.00	ND	1.66	ND	2.26	3.18*	1.81
2,4,4',6-TetraBDE (75)	ND	1.78	ND	1.41	ND	1.99	ND	1.60	ND	2.25	ND	1.82
3,3',4,4'-TetraBDE (77)	ND	1.76	ND	1.42	ND	2.00	ND	1.66	ND	2.26	ND	1.81
2,2',3,4,4'-PentaBDE (85)	ND	3.17	ND	2.23	ND	2.43	ND	4.12	ND	3.33	ND	2.34
2,2',4,4',5-PentaBDE (99)	86.9	2.61	37.9*	1.66	34.4	1.78	372	3.00	75.9	2.42	73.3	1.82
2,2',4,4',6-PentaBDE (100)	44.8	1.53	22.0	1.12	20.6*	1.16	87.2	1.84	28.4	1.52	27.6	1.01
2,3,3',4,4'-PentaBDE (105)	ND	2.26	ND	1.57	ND	1.66	ND	2.74	ND	2.23	ND	1.56
2,3,4,5,6-PentaBDE (116)	ND	2.26	ND	1.57	ND	1.66	ND	2.74	ND	2.23	ND	1.56
2,3',4,4',6-PentaBDE (119)	ND	2.26	ND	1.57	ND	1.66	ND	2.74	ND	2.23	ND	1.56
3,3',4,4',5-PentaBDE (126)	ND	2.26	ND	1.57	ND	1.66	ND	2.74	ND	2.23	ND	1.56
2,2',3,4,4',5'/2,3,4,4',5,6 -HexaBDE (138/166)	ND	4.62	ND	3.70	ND	3.65	ND	3.81	ND	4.52	ND	4.11
2,2',3,4,4',6'-HexaBDE (140)	ND	3.75	ND	3.03	ND	2.99	ND	3.13	ND	3.71	ND	3.39
2,2',4,4',5,5'-HexaBDE (153)	12.6	4.58	6.17*	3.91	4.98*	3.77	13.7	3.96	ND	4.70	7.42*	4.55
2,2',4,4',5,6'-HexaBDE (154)	13.0	2.61	6.92	2.12	9.49	2.13	13.0*	2.24	7.97	2.65	7.04	2.37
2,2',4,4',6,6'-HexaBDE (155)	ND	3.75	3.89	3.03	ND	2.99	4.80	3.13	ND	3.71	ND	3.39
2,2',3,4,4',5,6-HeptaBDE (181)	ND	13.8	ND	5.75	ND	5.45	ND	6.95	ND	6.17	ND	5.62
2,2',3,4,4',5',6-HeptaBDE (183)	ND	10.2	ND	4.33	12.2*	4.11	ND	5.23	ND	4.65	ND	4.23
2,3,3',4,4',5,6-HeptaBDE (190)	ND	21.3	ND	8.55	ND	8.11	ND	10.3	ND	9.17	ND	8.36
2,2',3,3',4,4',5,5',6-NonaBDE (206)	177	40.3	ND	7.54	ND	6.95	ND	8.93	ND	8.20	ND	10.9
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	160*	40.3	ND	7.54	ND	6.95	ND	8.93	ND	8.20	ND	10.9
2,2',3,3',4,4',5,5',6,6'-NonaBDE (208)	85.1*	40.3	ND	7.54	ND	6.95	ND	8.93	ND	8.20	ND	10.9
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	6910	50.0	ND	149	113	42.5	149*	73.1	109*	68.4	87.2*	76.7
Total MonoBDE**	ND		ND		ND		ND		ND		ND	
Total DiBDE**	ND		ND		ND		ND		ND		ND	
Total TriBDE**	19.23		5.78		7.23		40.86		14.30		14.50	
Total TetraBDE**	296.09		140.23		141.43		1146.30		321.85		312.07	
Total PentaBDE**	131.7		59.9		55.0		459.2		104.3		100.9	
Total HexaBDE**	25.60		16.98		14.47		31.50		7.97		14.46	
Total HeptaBDE**	ND		ND		12.2		ND		ND		ND	
Total NonaBDE**	422.1		ND		ND		ND		ND		ND	
Total DecaBDE**	6910		ND		ND		149		ND		ND	
Total PBDE concentration**	7804.72		222.89		230.33		1826.86		448.42		441.93	
% Lipid		26.0		3.0		3.6		3.0		3.1		3.1
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)		TC-01-PBDE		TC-01-PBDE		TC-01-PBDE		TC-01-PBDE		TC-01-PBDE		TC-01-PBDE

NOTE: Sample per site is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit (Food not included).

ND = Not detected.

Crayfish

Table 40: Polybrominated diphenyl ether (PBDE) concentrations (pg/g) in crayfish muscle tissue exposed to Elk Creek water during one exposure period.

Polybrominated diphenyl ethers	Fall 2001							
	Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	33.0	ND	28.0	ND	30.0	ND	26.0
3-MonoBDE (2)	ND	33.0	ND	28.0	ND	30.0	ND	26.0
4-MonoBDE (3)	ND	33.0	ND	28.0	ND	30.0	ND	26.0
2,4-DiBDE (7)	ND	1.20	ND	1.15	ND	1.22	ND	0.958
2,4'/3,3'-DiBDE (8/11)	ND	1.20	ND	1.15	ND	1.22	ND	0.958
2,6-DiBDE (10)	ND	1.20	ND	1.15	ND	1.22	ND	0.958
3,4-DiBDE (12)	ND	1.20	ND	1.15	ND	1.22	ND	0.958
3,4'-DiBDE (13)	ND	1.20	ND	1.15	ND	1.22	ND	0.958
4,4'-DiBDE (15)	ND	1.20	ND	1.15	ND	1.22	ND	0.958
2,2',4-TriBDE (17)	ND	2.81	ND	2.40	ND	2.84	ND	2.63
2,3',4-TriBDE (25)	ND	2.65	ND	2.40	ND	2.66	ND	2.47
2,4,4'/2',3,4-TriBDE (28/33)	7.16	2.51	ND	2.40	ND	2.50	ND	2.32
2,4,6-TriBDE (30)	ND	2.65	ND	2.40	ND	2.66	ND	2.47
2,4',6-TriBDE (32)	ND	2.65	ND	2.40	ND	2.66	ND	2.47
3,3',4-TriBDE (35)	ND	2.65	ND	2.40	ND	2.66	ND	2.47
3,4,4'-TriBDE (37)	ND	2.65	ND	2.40	ND	2.66	ND	2.47
2,2',4,4'-TetraBDE (47)	97.7	1.32	9.68	1.32	54.0	1.42	18.1	1.22
2,2',4,5'-TetraBDE (49)	ND	1.69	ND	1.69	ND	1.82	ND	1.59
2,3',4,4'-TetraBDE (66)	ND	2.30	ND	2.31	ND	2.50	ND	2.20
2,3',4',6-TetraBDE (71)	ND	1.69	ND	1.69	ND	1.82	ND	1.59
2,4,4',6-TetraBDE (75)	ND	1.68	ND	1.68	ND	1.82	ND	1.60
3,3',4,4'-TetraBDE (77)	ND	1.69	ND	1.69	ND	1.82	ND	1.59
2,2',3,4,4'-PentaBDE (85)	ND	2.35	ND	2.35	ND	2.44	ND	1.48
2,2',4,4',5-PentaBDE (99)	24.8	1.88	8.72	1.86	33.5	1.79	11.7	1.38
2,2',4,4',6-PentaBDE (100)	7.95	1.11	1.98*	1.25	8.69*	1.10	3.71	0.805
2,3,3',4,4'-PentaBDE (105)	ND	1.65	ND	1.72	ND	1.64	ND	1.14
2,3,4,5,6-PentaBDE (116)	ND	1.65	ND	1.72	ND	1.64	ND	1.14
2,3',4,4',6-PentaBDE (119)	ND	1.65	ND	1.72	ND	1.64	ND	1.14
3,3',4,4',5-PentaBDE (126)	ND	1.65	ND	1.72	ND	1.64	ND	1.14
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	ND	3.35	ND	2.85	ND	4.22	ND	3.95
2,2',3,4,4',6'-HexaBDE (140)	ND	2.74	ND	2.60	ND	3.44	ND	3.22
2,2',4,4',5,5'-HexaBDE (153)	4.84*	3.42	4.02*	3.90	ND	4.32	ND	3.80
2,2',4,4',5,6'-HexaBDE (154)	3.42	1.97	ND	2.19	3.13*	2.39	ND	2.36
2,2',4,4',6,6'-HexaBDE (155)	ND	2.74	ND	2.60	ND	3.44	ND	3.22
2,2',3,4,4',5,6-HeptaBDE (181)	ND	4.21	ND	5.04	ND	6.83	ND	6.78
2,2',3,4,4',5',6-HeptaBDE (183)	ND	3.17	ND	3.80	ND	5.06	ND	5.02
2,3,3',4,4',5,6-HeptaBDE (190)	ND	6.27	ND	7.50	ND	10.5	ND	10.4
2,2',3,3',4,4',5,5',6-NonaBDE (206)	ND	9.18	ND	12.4	ND	17.0	ND	11.6
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	ND	9.18	ND	12.4	23.8	17.0	ND	11.6
2,2',3,3',4,5,5',6,6'-NonaBDE (208)	ND	9.18	ND	12.4	ND	17.0	ND	11.6
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	660	42.1	674	68.3	1050	59.3	423	71.1
Total MonoBDE**	ND		ND		ND		ND	
Total DiBDE**	ND		ND		ND		ND	
Total TriBDE**	7.16		ND		ND		ND	
Total TetraBDE**	97.70		9.68		54.00		18.10	
Total PentaBDE**	32.75		10.70		42.19		15.41	
Total HexaBDE**	3.42		ND		3.13		ND	
Total HeptaBDE**	ND		ND		ND		ND	
Total NonaBDE**	ND		ND		23.8		ND	
Total DecaBDE**	660		674		1050		423	
Total PBDE concentration**	801.03		694.38		1173.12		456.51	
% Lipid	1.1		0.4		0.5		0.7	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PBDE		TC-01-PBDE		TC-01-PBDE		TC-01-PBDE	

NOTE: Sample per site is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit.

ND = Not detected.

Crayfish Hepatopancreas

Table 41: Polybrominated diphenyl ether (PBDE) concentrations (pg/g) in crayfish hepatopancreas exposed to Elk Creek water during one exposure period.

Polybrominated diphenyl ethers	Fall 2001							
	Control		Ref		mid Ag		d/s Ag	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	300	ND	300	ND	360	ND	280
3-MonoBDE (2)	ND	300	ND	300	ND	360	ND	280
4-MonoBDE (3)	ND	300	ND	300	ND	360	ND	280
2,4-DiBDE (7)	ND	12.8	ND	12.4	ND	13.0	ND	10.8
2,4'/3,3'-DiBDE (8/11)	ND	12.8	ND	12.4	ND	13.0	ND	10.8
2,6-DiBDE (10)	ND	12.8	ND	12.4	ND	13.0	ND	10.8
3,4-DiBDE (12)	ND	12.8	ND	12.4	ND	13.0	ND	10.8
3,4'-DiBDE (13)	ND	12.8	ND	12.4	ND	13.0	ND	10.8
4,4'-DiBDE (15)	52.2	12.8	ND	12.4	ND	13.0	ND	10.8
2,2',4-TriBDE (17)	ND	32.7	ND	24.9	ND	33.7	ND	27.0
2,3',4-TriBDE (25)	ND	30.6	ND	23.3	ND	31.6	ND	25.3
2,4,4'/2',3,4-TriBDE (28/33)	271	28.8	66.6	21.9	114	29.7	81.6	23.8
2,4,6-TriBDE (30)	ND	30.6	ND	23.3	ND	31.6	ND	25.3
2,4',6-TriBDE (32)	ND	30.6	ND	23.3	ND	31.6	ND	25.3
3,3',4-TriBDE (35)	ND	30.6	ND	23.3	ND	31.6	ND	25.3
3,4,4'-TriBDE (37)	ND	30.6	ND	23.3	ND	31.6	ND	25.3
2,2',4,4'-TetraBDE (47)	3030	14.6	848	10.3	5820	15.3	1850	12.4
2,2',4,5'-TetraBDE (49)	ND	19.1	ND	13.2	ND	19.8	ND	16.6
2,3',4,4'-TetraBDE (66)	72.8	26.4	22.5*	18.2	73.5	27.3	26.8	23.0
2,3',4',6-TetraBDE (71)	ND	19.1	ND	13.2	ND	19.8	ND	16.6
2,4,4',6-TetraBDE (75)	ND	19.2	ND	13.3	ND	19.9	ND	16.8
3,3',4,4'-TetraBDE (77)	ND	19.1	ND	13.2	ND	19.8	ND	16.6
2,2',3,4,4'-PentaBDE (85)	ND	22.9	ND	26.4	77.9	26.2	ND	23.3
2,2',4,4',5-PentaBDE (99)	510	16.6	385	18.3	4470	22.6	923	17.5
2,2',4,4',6-PentaBDE (100)	279	9.43	240	12.1	884	13.8	349	10.2
2,3,3',4,4'-PentaBDE (105)	ND	14.7	ND	17.6	ND	19.7	ND	15.5
2,3,4,5,6-PentaBDE (116)	ND	14.7	ND	17.6	ND	19.7	ND	15.5
2,3',4,4',6-PentaBDE (119)	17.9*	14.7	ND	17.6	ND	19.7	ND	15.5
3,3',4,4',5-PentaBDE (126)	ND	14.7	ND	17.6	ND	19.7	ND	15.5
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	ND	35.5	ND	47.4	ND	49.6	ND	38.9
2,2',3,4,4',6'-HexaBDE (140)	ND	28.8	ND	38.7	ND	40.5	ND	31.6
2,2',4,4',5,5'-HexaBDE (153)	120	36.0	133	49.8	328	49.0	155	39.3
2,2',4,4',5,6'-HexaBDE (154)	182	19.9	171	27.0	280	29.0	184	21.9
2,2',4,4',6,6'-HexaBDE (155)	ND	28.8	ND	38.7	ND	40.5	ND	31.6
2,2',3,4,4',5,6-HeptaBDE (181)	ND	57.2	ND	47.0	ND	72.3	ND	56.1
2,2',3,4,4',5',6-HeptaBDE (183)	ND	42.3	70.2	34.8	72.6	53.5	60.0*	41.5
2,3,3',4,4',5,6-HeptaBDE (190)	ND	88.1	ND	72.4	ND	111	ND	86.4
2,2',3,3',4,4',5,5',6-NonaBDE (206)	ND	81.9	ND	108	117	103	186*	117
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	ND	81.9	131*	108	212*	103	158*	117
2,2',3,3',4,4',5,5',6,6'-NonaBDE (208)	ND	81.9	ND	108	223*	103	254	117
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	1370*	465	2700*	714	4760*	871	5890	469
Total MonoBDE**	ND		ND		ND		ND	
Total DiBDE**	52.2		ND		ND		ND	
Total TriBDE**	271.0		66.6		114.0		81.6	
Total TetraBDE**	3102.8		848.0		5893.5		1850.0	
Total PentaBDE**	789.0		625.0		5431.9		1272.0	
Total HexaBDE**	302		304		608		339	
Total HeptaBDE**	ND		70.2		72.6		60.0	
Total NonaBDE**	ND		131		435		598	
Total DecaBDE**	1370		2700		4760		5890	
Total PBDE concentration**	5887.0		4744.8		17315.0		10090.6	
% Lipid	53.0		30		26.0		32	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PBDE		TC-01-PBDE		TC-01-PBDE		TC-01-PBDE	

NOTE: Sample per site is a composite of hepatopancreas tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit.

ND = Not detected.

4.3 Biological Indicators

4.3.1 Fish Growth

Table 42: Summary of size, growth, condition factor and somatic indices of cutthroat trout exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Statistic	initial Weight (g)	final Weight (g)	% Weight Growth	initial Length (cm)	final Length (cm)	% Length Growth	Gutted Weight (g)	Liver Weight (g)	Gonad Weight (g)
Fall 1999	Control (n=24)	mean	22.68	-	-	13.30	-	-	19.00	0.30	0.05
		SD	4.27	-	-	0.62	-	-	2.75	0.09	0.04
		min	15.5	-	-	12.2	-	-	14.49	0.16	0.02
		max	31.5	-	-	14.3	-	-	23.76	0.60	0.07
	Ref (n=24)	mean	25.15	29.42	18.61	13.41	14.15	5.78	23.26	0.47	0.07
		SD	5.41	7.01	23.39	1.03	1.03	6.60	5.40	0.16	0.03
		min	14.4	16.6	-27.1	11.4	12.2	-7.2	14.43	0.14	0.02
		max	38.1	45.4	70.4	15.2	15.9	24.4	34.63	0.79	0.15
	mid Ag (n=26)	mean	24.60	28.26	14.16	13.27	14.02	5.70	22.45	0.45	0.07
		SD	4.75	7.99	16.53	0.99	1.18	5.02	6.13	0.15	0.04
		min	18.9	18.8	-21.7	11.9	12.5	-6.3	16.32	0.18	0.02
		max	38.8	52.0	41.8	16.3	17.8	14.8	41.70	0.84	0.19
d/s Ag (n=26)	mean	23.81	32.62	38.72	13.30	14.74	10.92	26.00	0.50	0.08	
	SD	4.23	5.82	21.71	0.72	0.82	4.20	4.68	0.11	0.03	
	min	16.8	23.2	-19.6	11.8	13.3	2.9	18.59	0.16	0.02	
	max	33.6	45.4	82.4	15.0	16.3	18.6	36.52	0.74	0.14	
Spring 2000	Control (n=24)	mean	63.63	-	-	17.76	-	-	54.58	0.66	0.62
		SD	12.83	-	-	0.97	-	-	10.90	0.17	1.08
		min	50.0	-	-	16.0	-	-	37.41	0.44	0.06
		max	91.6	-	-	19.8	-	-	80.65	1.16	3.70
	Ref (n=24)	mean	71.40	77.15	8.14	18.85	19.51	3.46	67.99	0.99	0.16
		SD	18.20	24.08	18.47	1.71	2.08	4.35	21.47	0.58	0.09
		min	35.6	43.0	-19.4	15.3	15.5	-5.8	35.50	0.27	0.04
		max	108.4	131.4	48.2	21.8	23.1	11.3	112.56	2.35	0.46
	mid Ag (n=19)	mean	69.67	77.98	11.87	18.69	19.68	5.26	69.14	1.03	0.19
		SD	12.41	18.56	20.85	1.09	1.30	3.24	14.65	0.50	0.18
		min	42.0	32.9	-21.7	15.6	16.0	-2.0	36.14	0.09	0.07
		max	88.2	105.0	50.5	20.4	21.2	12.2	87.90	1.91	0.86
d/s Ag (n=26)	mean	70.42	77.44	10.50	18.69	19.70	5.43	68.29	0.98	0.22	
	SD	16.86	22.99	21.10	1.64	1.89	5.32	20.08	0.47	0.32	
	min	34.2	38.6	-20.8	15.6	16.2	-3.0	33.72	0.26	0.05	
	max	96.6	120.2	53.0	21.5	22.8	22.6	102.01	1.95	1.73	
Fall 2000	Control (n=24)	mean	37.47	-	-	15.06	-	-	31.35	0.41	0.07
		SD	7.96	-	-	0.99	-	-	6.52	0.09	0.06
		min	25.6	-	-	13.0	-	-	21.88	0.25	0.02
		max	58.2	-	-	17.0	-	-	46.39	0.58	0.19
	Ref (n=24)	mean	25.06	31.47	30.95	13.25	14.04	5.80	26.49	0.39	0.06
		SD	8.71	9.29	28.06	1.29	1.68	5.00	8.36	0.13	0.02
		min	10.2	14.2	-18.7	11.0	11.0	-1.8	13.33	0.13	0.02
		max	41.0	53.0	91.0	15.2	17.5	15.1	46.10	0.67	0.10
	mid Ag (n=26)	mean	26.65	34.18	30.98	13.42	14.26	6.29	28.90	0.49	0.07
		SD	8.72	9.85	21.97	1.37	1.62	5.80	8.87	0.15	0.03
		min	16.4	17.2	1.9	11.5	11.5	-5.3	14.60	0.18	0.03
		max	42.8	56.0	69.1	15.8	17.5	17.6	50.14	0.80	0.19
d/s Ag (n=26)	mean	27.52	37.64	41.29	13.56	15.03	10.93	32.59	0.47	0.06	
	SD	10.40	11.84	17.66	1.65	1.80	5.13	10.69	0.13	0.02	
	min	10.0	16.8	11.1	10.8	10.8	-0.9	12.85	0.27	0.03	
	max	49.4	61.6	81.5	16.6	17.4	19.8	54.95	0.68	0.12	
Fall 2001	Control (n=26)	mean	21.85	-	-	12.35	-	-	17.70	0.25	0.04
		SD	3.52	-	-	0.73	-	-	3.11	0.11	0.02
		min	16.6	-	-	10.8	-	-	13.14	0.10	0.01
		max	31.9	-	-	13.8	-	-	26.29	0.68	0.09
	Ref (n=24)	mean	16.20	19.12	17.77	11.38	12.22	7.42	16.05	0.26	0.03
		SD	3.09	4.56	14.62	0.68	0.87	3.49	3.87	0.07	0.01
		min	10.8	11.4	-7.5	10.2	10.7	0.9	9.70	0.13	0.01
		max	26.4	32.7	48.1	13.3	14.6	15.2	27.77	0.39	0.05
	mid Ag (n=26)	mean	15.45	21.12	38.39	11.18	12.58	12.74	17.75	0.35	0.03
		SD	3.28	4.21	18.63	0.79	0.82	4.86	3.45	0.09	0.02
		min	8.4	13.4	1.4	9.2	10.9	2.4	10.72	0.20	0.01
		max	22.2	30.7	64.8	12.7	14.0	19.5	24.11	0.60	0.06
d/s Ag (n=26)	mean	16.22	21.78	35.54	11.37	12.88	13.29	18.74	0.30	0.03	
	SD	3.74	4.71	18.18	0.84	1.03	4.57	4.11	0.05	0.02	
	min	10.4	11.0	5.8	9.7	10.3	5.3	9.69	0.21	0.01	
	max	24.6	31.1	86.0	13.1	15.0	23.5	26.59	0.36	0.08	
All exposures	Control	mean	36.41	-	-	14.62	-	-	30.66	0.40	0.20
	Ref	mean	34.45	39.29	18.87	14.22	14.98	5.62	33.45	0.53	0.08
	mid Ag	mean	34.09	40.39	23.85	14.14	15.14	7.49	34.56	0.58	0.09
	d/s Ag	mean	34.49	42.37	31.51	14.23	15.59	10.14	36.41	0.56	0.10

n = Sample size.

Table 42 (cont'd): Summary of size, growth, condition factor and somatic indices of cutthroat trout exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Statistic	initial Condition Factor	final Condition Factor	% change in Condition Factor	HSI	GSI	K
Fall 1999	Control (n=24)	mean	0.96	-	-	1.30	0.17	0.80
		SD	0.10	-	-	0.26	0.10	0.04
		min	0.66	-	-	0.83	0.10	0.70
		max	1.13	-	-	1.90	0.24	0.89
	Ref (n=24)	mean	1.04	1.02	0.82	1.71	0.27	0.77
		SD	0.17	0.10	20.51	0.38	0.11	0.05
		min	0.77	0.83	-34.94	0.80	0.08	0.66
		max	1.38	1.20	46.46	2.42	0.46	0.87
	mid Ag (n=26)	mean	1.05	1.01	-3.47	1.71	0.27	0.78
		SD	0.10	0.11	10.81	0.34	0.11	0.04
		min	0.89	0.80	-26.73	0.90	0.08	0.68
		max	1.30	1.21	19.67	2.17	0.49	0.86
	d/s Ag (n=26)	mean	1.01	1.01	1.60	1.68	0.27	0.79
		SD	0.09	0.10	14.67	0.28	0.09	0.04
		min	0.85	0.87	-26.18	0.72	0.08	0.71
		max	1.20	1.30	43.92	2.21	0.45	0.91
Spring 2000	Control (n=24)	mean	1.12	-	-	1.02	0.85	0.91
		SD	0.10	-	-	0.15	1.36	0.06
		min	0.97	-	-	0.69	0.11	0.83
		max	1.34	-	-	1.31	4.21	1.03
	Ref (n=24)	mean	1.05	1.01	-2.52	1.18	0.20	0.83
		SD	0.13	0.10	13.95	0.38	0.09	0.06
		min	0.82	0.86	-26.65	0.68	0.04	0.73
		max	1.35	1.24	24.28	1.84	0.43	0.94
	mid Ag (n=19)	mean	1.06	1.00	-4.35	1.23	0.23	0.86
		SD	0.08	0.14	15.24	0.44	0.19	0.07
		min	0.91	0.77	-31.91	0.10	0.09	0.71
		max	1.18	1.25	19.54	1.87	0.99	0.98
	d/s Ag (n=26)	mean	1.06	0.99	-6.36	1.19	0.29	0.84
		SD	0.09	0.09	11.29	0.41	0.45	0.06
		min	0.90	0.83	-26.77	0.64	0.09	0.73
		max	1.22	1.20	11.53	2.06	2.46	0.97
Fall 2000	Control (n=24)	mean	1.08	-	-	1.11	0.20	0.88
		SD	0.08	-	-	0.14	0.15	0.05
		min	0.92	-	-	0.87	0.05	0.79
		max	1.22	-	-	1.42	0.54	0.98
	Ref (n=24)	mean	1.04	1.12	10.85	1.30	0.20	0.88
		SD	0.16	0.13	24.33	0.36	0.09	0.06
		min	0.71	0.86	-18.70	0.71	0.10	0.75
		max	1.35	1.44	69.52	2.31	0.51	0.99
	mid Ag (n=26)	mean	1.07	1.16	9.55	1.49	0.22	0.89
		SD	0.14	0.17	18.05	0.24	0.12	0.06
		min	0.75	0.90	-20.38	0.88	0.11	0.77
		max	1.42	1.54	44.30	1.94	0.69	0.99
	d/s Ag (n=26)	mean	1.05	1.08	4.48	1.29	0.17	0.88
		SD	0.13	0.11	19.27	0.19	0.08	0.05
		min	0.77	0.92	-12.91	0.95	0.07	0.79
		max	1.25	1.35	72.71	1.82	0.41	0.98
Fall 2001	Control (n=26)	mean	1.15	-	-	1.11	0.19	0.93
		SD	0.07	-	-	0.39	0.11	0.05
		min	1.06	-	-	0.49	0.04	0.86
		max	1.32	-	-	2.57	0.52	1.06
	Ref (n=24)	mean	1.09	1.03	-5.44	1.38	0.14	0.86
		SD	0.04	0.07	4.95	0.19	0.09	0.05
		min	1.01	0.91	-14.20	0.96	0.03	0.76
		max	1.17	1.22	5.07	1.72	0.44	0.94
	mid Ag (n=26)	mean	1.09	1.05	-3.92	1.66	0.14	0.88
		SD	0.07	0.06	4.80	0.39	0.07	0.04
		min	0.99	0.97	-15.94	0.85	0.04	0.81
		max	1.26	1.28	4.26	2.67	0.27	1.00
	d/s Ag (n=26)	mean	1.09	1.01	-7.16	1.41	0.12	0.86
		SD	0.07	0.06	5.58	0.37	0.08	0.04
		min	0.89	0.81	-21.04	0.91	0.04	0.77
		max	1.23	1.11	5.48	2.55	0.35	0.95
All exposures	Control	mean	1.08	-	-	1.14	0.35	0.88
	Ref	mean	1.05	1.05	0.93	1.39	0.20	0.83
	mid Ag	mean	1.07	1.06	-0.55	1.52	0.21	0.85
	d/s Ag	mean	1.05	1.02	-1.86	1.39	0.21	0.84

Condition Factor = (final weight/final length³)x100
 HSI = Hepatosomatic Index = (liver weight/final weight)x100
 n = Sample size.

K = Condition Factor using gutted weight.
 GSI = Gonadosomatic Index = (gonad weight/final weight)x100

4.3.2 Crayfish Measurements

Table 43: Summary of size of crayfish exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Statistic	FEMALE			MALE		
			total length (cm)	post-orbital length (cm)	total weight (g)	total length (cm)	post-orbital length (cm)	total weight (g)
Fall 1999	Control	mean	85.89	31.38	21.68	86.36	33.98	24.37
		SD	5.81	2.30	6.04	5.83	4.04	6.32
		min	76.2	28.2	13.3	74.5	28.5	15.2
		max	95.6	36.4	31.9	96.0	44.5	37.5
	Ref	mean	85.30	31.38	20.29	83.37	31.85	22.15
		SD	6.37	2.26	4.84	5.27	2.11	5.29
		min	74.6	27.2	13.7	75.1	28.5	12.0
		max	98.5	35.5	30.0	91.1	34.8	31.1
	mid Ag	mean	86.43	31.73	21.34	83.01	32.32	22.40
		SD	6.67	2.28	4.76	6.38	2.94	6.87
		min	76.2	28.3	15.5	74.7	28.2	14.9
		max	96.2	34.8	29.2	95.7	38.0	36.4
	d/s Ag	mean	83.85	30.48	18.96	81.60	31.04	20.60
		SD	7.81	3.14	5.59	5.40	2.11	3.75
		min	70.7	25.7	11.2	75.1	28.2	15.7
		max	95.7	35.7	30.2	92.9	34.8	28.7
Spring 2000	Control	mean	95.02	35.15	31.89	91.35	35.41	32.16
		SD	12.84	5.28	12.87	9.90	3.72	11.93
		min	71.6	26.0	12.9	76.6	29.8	16.7
		max	111.9	42.9	55.2	104.3	40.4	49.9
	Ref	mean	92.15	34.02	28.10	87.34	33.50	27.52
		SD	13.55	5.05	12.88	10.78	4.73	14.55
		min	70.2	26.5	11.3	74.2	28.1	13.3
		max	110.0	41.7	47.5	106.6	42.0	56.2
	mid Ag	mean	97.94	36.20	35.28	91.03	34.91	32.64
		SD	12.47	4.95	12.36	8.69	3.75	11.52
		min	73.6	27.2	15.7	74.6	28.1	14.0
		max	112.0	42.8	50.9	103.1	39.7	48.5
	d/s Ag	mean	90.13	33.11	25.62	88.40	34.30	28.81
		SD	10.34	3.85	8.89	9.53	4.07	12.22
		min	77.8	28.2	15.0	75.4	29.3	14.7
		max	106.3	38.9	40.2	103.4	41.4	51.1
Fall 2000	Control	mean	79.01	28.98	16.89	84.51	32.34	21.75
		SD	5.04	2.31	4.04	8.02	3.54	5.46
		min	69.7	25.5	12.0	73.7	27.3	14.0
		max	88.3	33.0	25.2	104.1	41.5	35.2
	Ref	mean	81.68	29.71	18.10	84.73	32.30	23.22
		SD	6.39	2.30	5.01	5.57	2.08	5.19
		min	74.4	26.6	13.2	76.1	28.3	15.2
		max	95.3	34.4	29.6	91.1	35.5	31.3
	mid Ag	mean	82.89	29.89	17.76	84.62	32.19	24.66
		SD	6.16	2.14	4.39	5.90	2.16	4.88
		min	74.0	27.2	11.5	73.3	27.8	13.7
		max	93.7	34.1	26.1	93.9	35.7	30.2
	d/s Ag	mean	83.21	30.38	19.17	81.83	31.48	21.52
		SD	6.98	2.64	5.44	4.66	2.30	4.29
		min	74.6	26.7	13.0	73.2	27.6	16.2
		max	98.9	36.1	32.9	89.4	35.1	30.9
Fall 2001	Control	mean	85.16	30.63	20.13	75.74	28.34	16.31
		SD	9.51	3.40	8.66	4.81	2.03	3.80
		min	76.3	27.2	11.7	65.5	24.5	10.9
		max	109.9	39.0	43.2	83.0	30.8	22.0
	Ref	mean	91.91	33.59	27.09	81.15	30.36	20.62
		SD	11.19	4.09	8.88	5.83	2.64	4.88
		min	77.5	28.0	14.3	68.0	25.0	12.3
		max	108.7	40.1	42.1	88.7	35.1	29.1
	mid Ag	mean	94.13	34.21	28.51	83.87	31.51	23.62
		SD	8.76	3.37	8.65	8.28	3.37	7.03
		min	78.0	28.9	15.2	69.9	25.8	12.9
		max	109.8	39.8	44.6	95.8	35.4	37.0
	d/s Ag	mean	94.16	33.98	28.53	81.02	30.31	20.56
		SD	9.13	3.03	7.50	8.45	3.62	6.77
		min	77.2	27.9	16.5	69.3	24.6	11.1
		max	110.0	38.0	41.4	99.3	38.4	38.5
All exposures	All sites	measurement error	+/- 1.56	+/- 0.32	+/- 0.56	+/- 1.63	+/- 0.66	+/- 0.50

NOTE: Sample size (n) per site per exposure period is 24 except in Spring 2000 at our mid Ag site (n=23).

4.3.3 Fish Health Assessment Index

Table 44: Health assessments (percent occurrence) and index (HAI) of cutthroat trout exposed to Elk Creek water during each exposure period.

		Fins			Eyes		Gills			Opercula			Bile				Liver				
		Normal	Light Erosion	Severe Erosion	Normal	Opaque (one or both)	Normal	Frayed	Pale	Normal	Slight shortening	Severe shortening	Yellow; bladder part-full	Yellow; bladder full	Light green	Dark green	Normal (red)	Fatty (light brown)	Nodules	Focal discolouration	General discolouration
Fall 1999	Control (n=24)	0	100	0	100	0	79	0	21	96	4	0	31	65	4	0	100	0	0	0	0
	Ref (n=24)	83	17	0	100	0	100	0	0	100	0	0	43	57	0	0	100	0	0	0	0
	mid-Ag (n=26)	96	4	0	100	0	100	0	0	88	12	0	31	65	0	4	100	0	0	0	0
	d/s-Ag (n=26)	100	0	0	100	0	100	0	0	73	27	0	19	73	4	4	100	0	0	0	0
Spring 2000	Control (n=24)	21	58	21	100	0	92	8	0	71	29	0	33	67	0	0	100	0	0	0	0
	Ref (n=24)	75	17	8	100	0	100	0	0	92	4	4	42	25	4	29	96	4	0	0	0
	mid-Ag (n=24)	71	25	4	100	0	100	0	0	75	25	0	50	25	0	25	96	4	0	0	0
	d/s-Ag (n=26)	54	38	8	100	0	100	0	0	76	20	4	35	50	4	19	100	0	0	0	0
Fall 2000	Control (n=24)	25	75	0	100	0	100	0	0	92	4	4	29	67	4	0	100	0	0	0	0
	Ref (n=24)	88	12	0	100	0	100	0	0	79	21	0	42	54	0	4	96	4	0	0	0
	mid-Ag (n=26)	77	23	0	100	0	100	0	0	88	12	0	27	69	4	0	96	0	0	0	4
	d/s-Ag (n=26)	73	27	0	100	0	100	0	0	65	35	0	15	85	0	0	100	0	0	0	0
Fall 2001	Control (n=26)	85	15	0	100	0	100	0	0	96	4	0	65	35	0	0	96	4	0	0	0
	Ref (n=24)	96	4	0	100	0	100	0	0	92	8	0	83	0	17	0	100	0	0	0	0
	mid-Ag (n=26)	92	8	0	100	0	100	0	0	85	15	0	58	19	23	0	100	0	0	0	0
	d/s-Ag (n=26)	100	0	0	100	0	100	0	0	96	4	0	42	12	46	0	100	0	0	0	0

		Mesenteric Fat					Spleen					Hindgut		Kidney		HAI				
		None	Slight (< 50%)	Moderate (~50%)	Fatty (>50%)	Very fatty (100%)	Normal (black)	Normal (red)	Normal (granular)	Nodular	Enlarged	Other	Normal	Slight inflammation	Normal	Other	Mean	Standard deviation	Minimum	Maximum
Fall 1999	Control (n=24)	4	4	70	18	4	0	87	17	0	0	0	100	0	100	0	6.7	12.4	0	30
	Ref (n=24)	0	29	63	8	0	0	92	12	0	4	0	96	4	100	0	1.7	6.4	0	30
	mid-Ag (n=26)	0	15	54	31	0	4	85	65	15	4	0	100	0	100	0	5.8	12.1	0	40
	d/s-Ag (n=26)	0	12	65	23	0	0	92	42	4	0	0	96	4	100	0	4.2	8.6	0	40
Spring 2000	Control (n=24)	0	4	63	25	8	4	96	0	0	0	0	96	4	100	0	5.8	8.8	0	30
	Ref (n=24)	0	13	29	29	29	12	38	54	0	0	0	100	0	100	0	2.5	7.4	0	30
	mid-Ag (n=24)	4	25	33	17	21	12	29	67	12	21	0	100	0	96	4	12.5	19.6	0	70
	d/s-Ag (n=26)	4	15	35	15	31	4	58	46	0	8	0	96	4	100	0	5.4	10.3	0	40
Fall 2000	Control (n=24)	0	25	33	38	4	0	88	4	0	0	8	100	0	100	0	3.7	9.2	0	30
	Ref (n=24)	4	12	42	38	4	0	75	21	4	0	0	100	0	100	0	4.6	8.8	0	30
	mid-Ag (n=26)	0	15	35	50	0	0	27	61	4	8	0	100	0	100	0	5.8	13.9	0	60
	d/s-Ag (n=26)	0	15	50	35	0	4	65	31	0	0	0	92	8	100	0	4.2	5.8	0	20
Fall 2001	Control (n=26)	0	27	31	38	4	4	96	0	0	0	0	100	0	100	0	1.5	6.1	0	40
	Ref (n=24)	4	21	42	21	12	0	83	17	0	0	0	100	0	100	0	0.8	2.8	0	10
	mid-Ag (n=26)	0	19	38	35	8	8	54	34	4	0	0	100	0	100	0	2.7	6.7	0	30
	d/s-Ag (n=26)	0	16	28	48	8	0	77	23	0	0	0	100	0	100	0	0.4	2.0	0	10

NOTE: HAI calculated without fin assessment. HAI based on Adams et al. (1993). Percentages are based on the number of fish exposed. Percentages for a tissue type that exceed 100 represent tissue samples that had more than one observation/irregularity present.
n = Sample size.

4.3.4 Histology

Cutthroat Trout

Table 45: Histological assessments (percent occurrence) of cutthroat trout exposed to Elk Creek water during three exposure periods.

		Gonads			Hingut	Pyloric Caeca	Spleen		Gill					Liver					Head Kidney											
		Male	Female	Unknown	Normal	Normal	Normal	Hemosiderin	Normal	Hyperplasia	Epithelial Lifting	Hypertrophy	Aneurysm	Normal	Inflammatory Focus	Regenerative tissue	Vacuolated	Melanin	IRND (mean +/- SD)											
Fall 1999	Control (n=24)	17	29	54	100	100	100	not examined	57	35	0	4	0	not sampled					5.69 (0.25)											
	Ref (n=23)	29	42	29	100	100	100		67	21	4	0	0						not sampled					6.28 (0.30)						
	mid-Ag (n=26)	35	46	19	100	100	100		38	42	0	0	0											not sampled					6.42 (0.44)	
	d/s-Ag (n=26)	35	42	23	100	100	100		88	8	0	0	4																not sampled	
Fall 2000	Control (n=24)	54	21	25	100	100	96	4	21	71	8	not examined	8	71	4	8	100	21												
	Ref (n=24)	29	38	33	100	100	42	50	79	21	0	not examined	0	33	67	0	100	21	not measured											
	mid-Ag (n=26)	50	42	8	100	100	0	100	34	50	19	not examined	4	0	100++	0	100	0			not measured									
	d/s-Ag (n=26)	31	54	15	100	100	62	38	38	54	12	not examined	0	0	100+	0	100	0					not measured							
Spring 2000	Control (n=24)	42	38	20	100	100	100	0	58	42	0	not examined	8	96	0	0	4	not examined							not measured					
	Ref (n=24)	46	42	12	100	100	46	54	42	58	0	not examined	4	17	79	0	46	not examined	not measured											
	mid-Ag (n=20)	43	43	14	100	100	13	74	4	83	0	not examined	4	4	83	9	68	not examined			not measured									
	d/s-Ag (n=26)	50	38	12	100	100	54	46	46	54	4	not examined	0	35	62	4	62	not examined					not measured							

NOTE: Percentages are based on the number of fish exposed. Some tissues may not have been examined for all samples. Therefore percentages that do not add up to 100 for a tissue type indicate that some tissue samples are missing. Percentages for a tissue type that exceed 100 represent tissue samples that had more than one observation/irregularity present.

++ = Severe inflammatory focus in 100% of samples.

+ = Inflammatory focus is severe in 50% of samples.

n = Sample size.

Crayfish

Table 46: Histological assessments (percent occurrence) of crayfish exposed to Elk Creek water during three exposure periods.

		Gonads		Seminiferous Tubules			Oogenesis		Hepatopancreas				Hepatopancreas (R-cell vacuolation)			Hepatopancreas (Nuclear diameter)			
		Male	Female	Spermatids present	Arrested spermatogenesis	Synchronous spermatogenesis	Early	Mature	B-cell no. > F-cell no.	B-cell no. < F-cell no.	Granulocytes	Necrosis	No vacuoles	Moderately vacuolated	Extremely vacuolated	Mean	Standard deviation	Minimum	Maximum
Fall 1999	Control	50	50	75	92	67	33	92	71	29	not examined	not examined	4	17	79	15.09	0.98	13.0	16.7
	Ref	50	50	17	83	83	50	50	58	42	not examined	not examined	0	0	100	14.69	1.12	12.5	17.1
	mid-Ag	50	50	67	33	42	75	42	21	79	not examined	not examined	0	37	63	15.43	1.30	13.1	17.7
	d/s-Ag	50	50	42	83	67	58	58	29	71	not examined	not examined	0	21	79	15.02	1.43	12.1	17.6
Fall 2000	Control	54	46	85	8	23	36	82	63	37	42	83	0	4	96	not measured			
	Ref	50	50	92	91	82	25	75	83	17	0	96	0	13	87				
	mid-Ag	50	50	100	36	73	50	75	50	50	13	87	0	0	100				
	d/s-Ag	50	50	100	8	83	58	58	54	46	13	92	0	8	92				
Spring 2000	Control	50	50	33	25	83	100	25	42	58	33	not examined	4	8	88	not measured			
	Ref	50	50	8	33	75	100	8	67	33	17	not examined	4	4	92				
	mid-Ag	48	52	0	0	90	100	9	62	38	19	not examined	0	0	100				
	d/s-Ag	48	52	0	0	73	100	8	39	61	0	not examined	0	0	100				

NOTE: Percentages are based on the number of crayfish exposed. Some tissues may not have been examined for all samples. Therefore percentages that do not add up to 100 for a tissue type indicate that some tissue samples are missing. Percentages for a tissue type that exceed 100 represent tissue samples that had more than one observation/irregularity present. Sample size (n) per site per exposure period is 24 except in Spring 2000 at our mid Ag (n=21) and d/s Ag (n=23) sites. Smaller sample sizes were observed due to the fact that some crayfish died during the Spring 2000 exposure period.

4.3.5 Mixed Function Oxidase

Cutthroat Trout

Table 47: Summary of mixed function oxidase (MFO) activity in cutthroat trout liver exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Statistic	GST (nmol/min/mg)	P450 (nmol/mg)	EROD (pmol/min/mg)
Fall 1999	Control (n=24)	mean	192.600	0.077	8.901
		SD	20.447	0.067	7.927
		min	153.40	ND	ND
		max	231.90	0.25	30.02
	Ref (n=24)	mean	239.579	0.149	11.584
		SD	54.916	0.123	5.593
		min	158.00	ND	ND
		max	402.98	0.36	23.40
	mid Ag (n=26)	mean	208.351	0.211	19.058
		SD	48.789	0.120	9.741
		min	127.32	ND	ND
		max	315.35	0.41	42.10
	d/s Ag (n=26)	mean	251.149	0.221	29.381
		SD	76.643	0.142	15.169
		min	171.91	ND	ND
max		440.75	0.56	66.90	
Spring 2000	Control (n=24)	mean	202.984	0.100	11.813
		SD	24.673	0.069	8.891
		min	174.77	ND	ND
		max	284.75	0.25	27.80
	Ref (n=24)	mean	213.219	0.133	14.208
		SD	38.042	0.089	7.940
		min	137.80	ND	ND
		max	289.30	0.29	31.70
	mid Ag (n=24)	mean	253.649	0.211	25.700
		SD	43.364	0.103	10.303
		min	175.60	ND	ND
		max	338.75	0.35	44.60
	d/s Ag (n=26)	mean	216.526	0.262	26.988
		SD	35.752	0.153	11.006
		min	163.66	ND	10.50
max		312.60	0.67	48.30	
Fall 2000	Control (n=24)	mean	173.867	0.107	10.771
		SD	39.420	0.062	7.128
		min	114.40	ND	ND
		max	243.30	0.24	32.64
	Ref (n=23)	mean	200.883	0.097	8.023
		SD	49.028	0.085	3.210
		min	131.10	ND	4.04
		max	293.30	0.33	20.23
	mid Ag (n=26)	mean	229.962	0.202	25.484
		SD	55.916	0.113	11.924
		min	126.60	ND	5.85
		max	342.60	0.36	48.64
	d/s Ag (n=26)	mean	199.027	0.237	37.361
		SD	38.586	0.180	18.715
		min	125.50	ND	10.84
max		287.50	0.67	100.76	
Fall 2001	Control (n=26)	mean	197.896	0.087	11.212
		SD	55.755	0.069	7.122
		min	107.20	ND	ND
		max	313.70	0.24	25.80
	Ref (n=24)	mean	199.921	0.094	12.629
		SD	63.909	0.059	8.675
		min	101.50	ND	ND
		max	300.20	0.21	26.40
	mid Ag (n=26)	mean	251.719	0.207	24.585
		SD	63.009	0.114	11.211
		min	128.40	ND	9.30
		max	361.40	0.48	55.40
	d/s Ag (n=26)	mean	240.777	0.255	27.265
		SD	67.642	0.137	12.108
		min	113.20	ND	7.90
max		384.40	0.54	55.60	
All exposures	Control	mean	191.837	0.093	10.674
	Ref	mean	213.400	0.118	11.611
	mid Ag	mean	235.920	0.208	23.707
	d/s Ag	mean	226.870	0.244	30.249

GST = Glutathione-S-transferase.

P450 = Cytochrome system.

EROD = 7-ethoxyresorufin-O-deethylase.

n = Sample size.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 48: Summary of mixed function oxidase (MFO) activity in crayfish hepatopancreas exposed to Elk Creek water during each exposure period.

Exposure Period	Site	Statistic	GST (nmol/min/mg)	P450 (nmol/mg)	EROD (pmol/min/mg)
Fall 1999	Control (n=24)	mean	76.479	0.033	1.348
		SD	22.261	0.044	1.044
		min	39.40	ND	ND
		max	123.70	0.15	3.11
	Ref (n=24)	mean	108.014	0.090	1.646
		SD	42.129	0.096	1.548
		min	52.45	ND	ND
		max	231.43	0.31	4.29
	mid Ag (n=24)	mean	152.815	0.139	3.187
		SD	75.164	0.120	3.458
		min	42.02	ND	ND
		max	382.94	0.38	14.33
d/s Ag (n=24)	mean	168.555	0.263	7.674	
	SD	73.828	0.129	5.917	
	min	55.25	ND	ND	
	max	372.46	0.54	20.51	
Spring 2000	Control (n=24)	mean	80.542	0.075	2.192
		SD	35.564	0.059	1.760
		min	18.75	ND	ND
		max	161.99	0.21	5.94
	Ref (n=24)	mean	139.146	0.079	2.102
		SD	81.500	0.066	1.495
		min	37.40	ND	ND
		max	339.58	0.21	4.59
	mid Ag (n=21)	mean	94.002	0.125	2.028
		SD	35.084	0.106	1.784
		min	40.08	ND	ND
		max	164.37	0.31	4.72
d/s Ag (n=23)	mean	81.434	0.139	2.848	
	SD	44.133	0.117	2.768	
	min	27.38	ND	ND	
	max	189.34	0.40	11.54	
Fall 2000	Control (n=24)	mean	139.614	0.086	2.122
		SD	72.286	0.069	1.597
		min	29.22	ND	ND
		max	347.28	0.24	5.96
	Ref (n=22)	mean	118.122	0.055	1.276
		SD	44.951	0.046	0.838
		min	46.72	ND	ND
		max	202.70	0.15	2.71
	mid Ag (n=21)	mean	113.504	0.122	4.540
		SD	61.121	0.091	3.427
		min	45.02	ND	ND
		max	277.36	0.27	11.89
d/s Ag (n=23)	mean	99.155	0.140	5.184	
	SD	62.169	0.110	4.486	
	min	36.72	ND	ND	
	max	269.50	0.32	14.74	
Fall 2001	Control (n=24)	mean	129.010	0.049	1.497
		SD	62.354	0.056	1.097
		min	20.23	ND	ND
		max	258.90	0.21	4.30
	Ref (n=23)	mean	138.303	0.081	1.593
		SD	68.988	0.075	1.373
		min	44.80	ND	ND
		max	327.20	0.25	5.74
	mid Ag (n=23)	mean	165.900	0.200	3.020
		SD	80.764	0.121	2.989
		min	37.30	ND	ND
		max	361.20	0.46	11.69
d/s Ag (n=24)	mean	178.251	0.242	4.211	
	SD	74.689	0.119	4.061	
	min	51.33	0.06	ND	
	max	366.00	0.51	14.62	
All exposures	Control	mean	106.411	0.061	1.790
	Ref	mean	125.896	0.076	1.654
	mid Ag	mean	131.555	0.147	3.194
	d/s Ag	mean	131.849	0.196	4.980

GST = Glutathione-S-transferase.

P450 = Cytochrome system.

EROD = 7-ethoxyresorufin-O-deethylase.

n = Sample size.

ND = Not detected. Considered a zero value for statistical calculations.

4.3.6 Hepatopancreas Biochemical Indicators

Table 49: Biochemical indicators of contaminant exposure analyzed in crayfish hepatopancreas exposed to Elk Creek water during two exposure periods.

Exposure Period	Site	DNA strand breaks	Labile zinc (Zn)	Lipid peroxidase	Metallothionein
Fall 2000	Ref (n=18)	1.00	1.00	1.00	1.00
	mid Ag (n=17)	0.93	1.25	2.70	1.80
	d/s Ag (n=17)	0.80	0.79	1.80	1.08
Fall 2001	Ref (n=16)	1.00	1.00	1.00	1.00
	mid Ag (n=16)	0.79	0.73	0.40	0.68
	d/s Ag (n=16)	1.45	1.86	1.24	0.88

NOTE: All mean values are normalized to Reference site. Results considered significant if normalized value greater than 2.

4.3.7 Egg Mortality, Hatching & Gene Expression

Table 50: Summary of mortality of rainbow trout eggs and alevins exposed to Elk Creek water during two exposure periods.

Exposure Period	Site	Statistic	% Egg Mortality	% Alevin Mortality
Fall 2000	Ref (n=4)	mean	2.5	0.8
		SD	2.4	1.0
		min	0	0
		max	5.0	2.0
	mid Ag (n=4)	mean	2.4	0.3
		SD	1.3	0.5
		min	1.0	0
		max	4.1	1.0
	d/s Ag (n=4)	mean	4.9	0.5
		SD	2.6	1.1
		min	1.0	0
		max	6.2	2.1
Fall 2001	Ref (n=8)	mean	3.2	3.0
		SD	2.1	4.7
		min	0	0
		max	5.9	13.5
	mid Ag (n=8)	mean	3.2	3.6
		SD	3.2	3.6
		min	0	0
		max	9.6	8.5
	d/s Ag (n=8)	mean	5.1	14.6
		SD	3.7	11.8
		min	1.1	1.3
		max	12.7	31.2

n = Number of exposed egg baskets. Each basket contained approximately 100 eggs.

Table 51: Hatching rate and success of rainbow trout eggs exposed to Elk Creek water during fall 2001.

Day	Ref	% Hatched	
		mid Ag	d/s Ag
1	0	0	0
3	0	0	0
5	0	0	0
7	0	0	0
9	0	0	0
11	0	0	0.1
13	0.1	0	0.4
15	0.1	0.1	26.5
17	0.1	0.1	-
19	0.1	4.6	87.0
21	8.3	67.7	91.6
23	55.2	96.8	95.9
25	96.8	97.3	95.9
27	97.1	97.3	95.9
29	97.2	97.3	95.9
31	97.2	97.3	95.9
33	97.2	97.3	95.9
35	97.2	97.3	95.9
37	97.2	97.3	95.9

- Missing data point.

Table 52: Gene expression in rainbow trout alevins exposed to Elk Creek water during one exposure period.

Gene #	Gene ID	Fall 2001	
		mid Ag	d/s Ag
27	α -globin	3.83	0.88
29	α -tubulin	1.26	NQ
31	apolipoprotein A-I-2	0.83	NQ
36	ATPaseb	NQ	0.59
39	β -globin2	2.30	NQ
40	β -globin	4.70	5.14
47	a21collagen	2.12	NQ
52	carbonyl reductase/20bHDA (CR-20bHDA)	2.28	NQ
57	cystatin	3.27	2.05
58	cytochrome c oxidase subunit VIA	3.63	2.02
69	fatty acid binding protein (H-FABP)	3.61	6.03
70	inhibitor of DNA binding/differentiation(Id1)	1.43	NQ
71	inhibitor of DNA binding/differentiation(Id2)	1.78	NQ
90	myc	NQ	1.88
93	NADH-dehydrogenase (subunit 6)	0.80	NQ
114	secreted protein, acidic, rich in cys (SPARC)	7.24	1.83
126	vitellogenin receptor (vtgR)	NQ	1.53
130	metallothionein	4.27	NQ
131	ubiquitin	2.07	NQ
135	arginase	1.56	NQ
139	myostatin	NQ	1.41
142	myosin heavy chain fast (MHCfast)	1.92	3.24
143	myosin heavy chain slow (MHCslow)	1.03	NQ
144	retinol binding protein	NQ	NQ
147	α -actin	3.67	3.19
160	glutamine synthetase GS-3	2.19	1.80
163	cytp450 2K5	1.45	NQ
174	heat shock protein 90 (hsp90)	1.56	NQ
176	pyruvate kinase	NQ	1.15
179	glutamate dehydrogenase	NQ	1.75
180	18S rRNA	1.11	NQ
Lamda Q	-	1.00	1.00

NOTE: Each gene array run in triplicate. All gene expression values are an average of 3 arrays and are normalized to Reference site. Results considered significant if normalized value greater than 2.

Sample size per site is: Ref (70), mid Ag (80), d/s Ag (100).

NQ = Not quantifiable.

5.0 Data Tables - Urban Study

5.1 Water Quality

5.1.1 Water Chemistry

Table 53: Summary of daily temperature and dissolved oxygen (DO) levels in Yorkson Creek during each exposure period.

Exposure Period	Site	Statistic	Temperature (°C)	DO (% saturation)	DO (mg/L)
Spring 2000	Ref	mean	6.80	100.39	12.31
		(SD)	0.87	13.67	1.44
		min	5.2	82.8	10.4
		max	8.9	131.4	16.0
	d/s Urban	mean	12.04	62.53	6.44
		(SD)	1.54	14.53	1.79
		min	9.7	42.6	4.3
		max	16.1	102.5	11.6
Fall 2000	Ref	mean	6.53	107.14	13.64
		(SD)	1.66	4.82	0.98
		min	3.6	95.5	11.3
		max	9.2	111.3	14.9
	d/s Urban	mean	8.30	53.38	6.39
		(SD)	2.72	14.24	2.12
		min	2.9	30.1	3.2
		max	11.9	81.3	10.8
Fall 2001	Ref	mean	6.49	97.02	11.92
		(SD)	1.47	3.85	0.57
		min	3.9	88.7	10.4
		max	9.1	104.8	13.1
	d/s Urban	mean	8.86	44.54	5.20
		(SD)	1.50	8.99	1.14
		min	4.6	30.6	3.4
		max	11.3	69.7	8.6
All exposures	Ref	mean	6.61	101.52	12.62
	d/s Urban	mean	9.73	53.48	6.01

NOTE: Sample size (n) varies among site and exposure period for each parameter due to recalibration and repairs of YSI probes.

Mean below guideline for freshwater aquatic life (see Appendix A).

Table 54: Summary of water chemistry and major ion concentrations (mg/L) in Yorkson Creek during each exposure period.

Exposure Period	Site	Statistic	Alkalinity	Conductivity (µS/cm)	pH (relative units)	Hardness (Ca + Mg)	Calcium (Ca)	
Spring 2000	Ref	mean	44.30	131.2	7.675	58.57	21.01	
		SD	7.34	23.7	0.179	10.60	3.80	
		min	30.7	87	7.08	39.7	14.3	
		max	56.6	168	7.92	74.9	26.8	
	d/s Urban	mean	59.16	189.7	7.232	58.82	15.31	
		SD	15.87	55.0	0.246	15.98	3.92	
		min	23.2	78	6.68	24.3	6.9	
		max	85.2	268	7.70	84.7	21.7	
	Fall 2000	Ref	mean	77.45	216.5	7.813	108.27	38.50
			SD	14.38	40.5	0.308	21.75	7.68
min			33.4	89	7.01	43.1	15.4	
max			93.1	258	8.17	134.0	47.6	
d/s Urban		mean	63.45	307.5	7.164	70.53	17.73	
		SD	17.20	172.0	0.239	18.63	4.74	
		min	33.4	134	6.80	38.9	9.8	
		max	103.0	876	7.64	111.0	31.4	
Fall 2001		Ref	mean	65.32	189.5	7.808	86.28	30.77
			SD	23.98	63.8	0.196	32.33	11.47
	min		16.1	69	7.30	34.8	12.6	
	max		108.0	308	8.13	154.2	55.0	
	d/s Urban	mean	54.11	223.7	7.312	55.13	14.18	
		SD	18.71	108.5	0.291	16.56	3.87	
		min	28.5	109	6.77	33.2	8.7	
		max	95.1	540	7.82	90.3	21.9	
	All exposures	Ref	mean	62.36	179.1	7.765	84.37	30.09
		d/s Urban	mean	58.91	240.3	7.236	61.49	15.74
Detection limit for all exposure periods			0.5	2	0.01	0.4	0.1	

NOTE: Sample size (n) per site per exposure period is 31.

Table 54 (cont'd): Summary of water chemistry and major ion concentrations (mg/L) in Yorkson Creek during each exposure period.

Exposure Period	Site	Statistic	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Silicon (Si)
Spring 2000	Ref	mean	1.48	0.23	1.68	3.142
		SD	0.27	0.05	0.24	0.237
		min	1.0	0.1	1.2	2.70
		max	1.9	0.3	2.0	3.51
	d/s Urban	mean	4.99	1.61	14.17	4.880
		SD	1.52	0.23	4.11	0.799
		min	1.7	1.2	4.8	2.86
		max	7.4	2.0	21.1	6.11
Fall 2000	Ref	mean	2.93	0.40	2.56	3.856
		SD	0.61	0.10	0.46	0.366
		min	1.1	0.2	1.3	2.58
		max	3.6	0.6	3.2	4.24
	d/s Urban	mean	6.37	2.63	32.23	5.999
		SD	1.76	0.31	29.98	1.238
		min	3.4	2.3	8.6	3.85
		max	9.1	3.4	139.0	7.99
Fall 2001	Ref	mean	2.30	0.31	2.34	3.437
		SD	0.91	0.09	0.68	0.483
		min	0.8	0.2	1.1	2.22
		max	4.2	0.5	3.7	4.33
	d/s Urban	mean	4.79	2.43	22.91	5.025
		SD	1.70	0.28	19.17	1.389
		min	2.7	1.9	7.9	2.98
		max	8.6	3.0	92.8	8.29
All exposures	Ref	mean	2.24	0.31	2.19	3.478
	d/s Urban	mean	5.38	2.22	23.10	5.301
Detection limit for all exposure periods			0.1	0.1	0.1	0.05

NOTE: Sample size (n) per site per exposure period is 31.

5.1.2 Nutrients

Table 55: Summary of nutrient concentrations (mg/L) in Yorkson Creek during each exposure period.

Exposure Period	Site	Statistic	Ammonia	Nitrite	Nitrite and Nitrate	Total Nitrogen	Ortho - Phosphate	Total Phosphorus	Total Dissolved Phosphorus
Spring 2000	Ref	mean	0.0039	ND	0.2102	0.286	0.0005	0.0083	0.0039
		SD	0.0080	ND	0.0461	0.046	0.0009	0.0045	0.0023
		min	ND	ND	0.132	0.19	ND	ND	ND
		max	0.032	ND	0.294	0.41	0.004	0.023	0.007
	d/s Urban	mean	0.0506	0.0047	0.5594	1.036	0.0079	0.0468	0.0229
		SD	0.0224	0.0021	0.1670	0.149	0.0042	0.0244	0.0075
		min	ND	ND	0.238	0.83	ND	0.029	0.006
		max	0.088	0.009	0.960	1.33	0.019	0.139	0.044
Fall 2000	Ref	mean	0.0013	ND	0.3260	0.406	0.0008	0.0123	0.0076
		SD	0.0031	ND	0.0742	0.083	0.0018	0.0152	0.0017
		min	ND	ND	0.122	0.26	ND	0.004	0.003
		max	0.012	ND	0.418	0.59	0.010	0.093	0.011
	d/s Urban	mean	0.0612	0.0052	0.5950	1.056	0.0089	0.0465	0.0293
		SD	0.0380	0.0030	0.1641	0.188	0.0055	0.0137	0.0101
		min	ND	ND	0.238	0.70	ND	0.030	0.017
		max	0.130	0.012	0.910	1.80	0.026	0.078	0.061
Fall 2001	Ref	mean	0.0035	ND	0.2805	0.415	0.0005	0.0079	0.0015
		SD	0.0048	ND	0.0944	0.293	0.0008	0.0124	0.0018
		min	ND	ND	0.119	0.22	ND	ND	ND
		max	0.018	ND	0.473	1.90	0.002	0.056	0.006
	d/s Urban	mean	0.0468	0.0055	0.5893	1.038	0.0106	0.0459	0.0248
		SD	0.0339	0.0034	0.1253	0.177	0.0036	0.0184	0.0096
		min	0.008	0.003	0.342	0.54	0.004	0.018	0.004
		max	0.131	0.016	0.840	1.35	0.017	0.112	0.041
All exposures	Ref	mean	0.003	ND	0.272	0.369	0.001	0.009	0.004
	d/s Urban	mean	0.053	0.005	0.581	1.044	0.009	0.046	0.026
Detection limit for all exposure periods			0.005	0.002	0.002	0.02	0.001	0.002	0.002

NOTE: Sample size (n) per site per exposure period is 31.

ND = Not detected. Considered a zero value for statistical calculations.

5.1.3 Bacteriological Parameters

Table 56: Summary of bacteriological counts (MPN/100mL) in Yorkson Creek during each exposure period.

Exposure Period	Site	Statistic	<i>E.coli</i>	Fecal Coliforms	Total Coliforms
Spring 2000	Ref	geometric mean	1	2	34
		min	0	0	0
		max	33	33	920
	d/s Urban	geometric mean	108	149	1855
		min	2	5	56
		max	11000	92000	92000
Fall 2000	Ref	geometric mean	3	4	85
		min	0	0	2
		max	79	79	2200
	d/s Urban	geometric mean	32	52	1135
		min	0	0	13
		max	1400	2200	92000
Fall 2001	Ref	geometric mean	2	2	10
		min	0	0	0
		max	45	45	490
	d/s Urban	geometric mean	47	55	238
		min	0	0	17
		max	5400	5400	24000
All exposures	Ref	mean	2.0	2.7	43.0
	d/s Urban	mean	62.3	85.3	1076.0

NOTE: Sample size (n) per site per exposure period is 31 except in Fall 2001 at our d/s Urban site (n=30). One sample was reported as too numerable to count due to different analytical methods.

Exceeds guideline for irrigation (see Appendix A).

Exceeds BC criteria for recreation (see Appendix A).

5.1.4 Trace Metals

Table 57: Summary of metal concentrations (mg/L) and guideline exceedances in Yorkson Creek during each exposure period. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Statistic	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)
Spring 2000	Ref	mean	0.1133	0.00005	0.01471	ND	0.00001	0.00023	0.00009	0.00044	0.14006	0.00005
		(SD)	0.0813	0.00006	0.00181	ND	0.00003	0.00020	0.00007	0.00020	0.11264	0.00011
		min	0.038	ND	0.0124	ND	ND	ND	ND	0.0002	0.0429	ND
		max	0.351	0.0002	0.0200	ND	0.0001	0.0006	0.0002	0.0010	0.4930	0.0004
		# exceedances	13	0	0	0	0	0	0	0	0	3
	d/s Urban	mean	0.3061	0.00024	0.01654	0.002	0.00010	0.00089	0.00030	0.00192	0.90526	0.00042
		(SD)	0.6108	0.00010	0.00334	0.011	0.00005	0.00078	0.00026	0.00093	0.50308	0.00059
		min	0.057	ND	0.0129	ND	ND	ND	0.0001	0.0012	0.6350	ND
		max	3.260	0.0005	0.0298	0.06	0.0003	0.0044	0.0015	0.0058	3.2600	0.0030
		# exceedances	18	0	0	0	1	2	0	6	31	2
Fall 2000	Ref	mean	0.0435	0.00007	0.02145	ND	0.00001	0.00004	0.00005	0.00014	0.05675	0.00007
		(SD)	0.0897	0.00005	0.00318	ND	0.00002	0.00011	0.00007	0.00026	0.11666	0.00019
		min	0.013	ND	0.0128	ND	ND	ND	ND	ND	0.0183	ND
		max	0.497	0.0002	0.0280	ND	0.0001	0.0004	0.0003	0.0013	0.6530	0.0009
		# exceedances	2	0	0	0	0	0	0	0	1	0
	d/s Urban	mean	0.1597	0.00031	0.01687	ND	0.00007	0.00052	0.00019	0.00157	0.65529	0.00030
		(SD)	0.1120	0.00013	0.00311	ND	0.00005	0.00027	0.00008	0.00066	0.17730	0.00042
		min	0.017	0.0001	0.0121	ND	ND	ND	0.0001	ND	0.0920	ND
		max	0.524	0.0006	0.0229	ND	0.0001	0.0012	0.0004	0.0031	1.1900	0.0017
		# exceedances	20	0	0	0	0	0	0	7	30	0
Fall 2001	Ref	mean	0.0998	0.00007	0.01840	ND	0.00001	0.00363	0.00007	0.00052	0.12836	0.00003
		(SD)	0.1999	0.00005	0.00524	ND	0.00004	0.01026	0.00013	0.00048	0.27585	0.00009
		min	0.014	ND	0.0122	ND	ND	ND	ND	ND	0.0224	ND
		max	1.120	0.0001	0.0314	ND	0.0002	0.0508	0.0007	0.0026	1.5500	0.0004
		# exceedances	5	0	0	0	0	6	0	1	2	0
	d/s Urban	mean	0.2192	0.00034	0.01546	ND	0.00004	0.00150	0.00021	0.00182	0.74732	0.00012
		(SD)	0.1812	0.00011	0.00326	ND	0.00006	0.00123	0.00013	0.00064	0.33560	0.00027
		min	0.035	0.0002	0.0103	ND	ND	0.0004	0.0001	0.0006	0.4660	ND
		max	0.909	0.0006	0.0227	ND	0.0002	0.0064	0.0008	0.0037	2.3400	0.0013
		# exceedances	24	0	0	0	0	5	0	9	31	1
All exposures	Ref	mean	0.0855	0.00007	0.01818	ND	0.00001	0.00130	0.00007	0.00037	0.10839	0.00005
	d/s Urban	mean	0.2283	0.00030	0.01629	0.001	0.00007	0.00097	0.00023	0.00177	0.76929	0.00028
Detection limit for all exposure periods			0.002	0.0001	0.0002	0.05	0.0001	0.0002	0.0001	0.0002	0.0004	0.0002

NOTE: Sample size (n) per site per exposure period is 31.

Mean exceeds guideline for freshwater aquatic life (see Appendix A).

ND = Not detected. Considered a zero value for statistical calculations.

Table 57 (cont'd): Summary of metal concentrations (mg/L) and guideline exceedances in Yorkson Creek during each exposure period. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Statistic	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Vanadium (V)	Zinc (Zn)
Spring 2000	Ref	mean	0.00095	0.00524	0.0017	0.00067	0.00011	0.00063	0.00003	0.16571	0.00033	0.00068
		(SD)	0.00014	0.00464	0.0030	0.00015	0.00015	0.00020	0.00008	0.03291	0.00020	0.00048
		min	0.0007	0.0023	ND	0.0004	ND	ND	ND	0.1070	0.0001	0.0002
		max	0.0014	0.0244	0.009	0.0009	0.0005	0.0009	0.0004	0.2170	0.0009	0.0022
		# exceedances	no guideline	0	0	0	0	0	1	no guideline	no guideline	0
	d/s Urban	mean	0.00055	0.19450	0.0023	0.00023	0.00115	0.00012	0.00003	0.09993	0.00101	0.00491
		(SD)	0.00025	0.09892	0.0036	0.00007	0.00060	0.00019	0.00005	0.02497	0.00120	0.00283
		min	0.0002	0.0525	ND	0.0001	0.0007	ND	ND	0.4890	0.0004	0.0032
		max	0.0016	0.3990	0.009	0.0004	0.0039	0.0009	0.0001	0.1410	0.0066	0.0174
		# exceedances	no guideline	0	0	0	0	0	0	no guideline	no guideline	0
Fall 2000	Ref	mean	0.00118	0.00377	0.0007	0.00112	0.00008	0.00108	0.00001	0.28523	0.00021	0.00047
		(SD)	0.00050	0.00457	0.0033	0.00025	0.00017	0.00024	0.00002	0.06028	0.00021	0.00063
		min	0.0003	0.0018	ND	0.0004	ND	0.0004	ND	0.1120	ND	ND
		max	0.0021	0.0274	0.017	0.0015	0.0006	0.0014	0.0001	0.3790	0.0012	0.0031
		# exceedances	no guideline	0	0	0	0	20	0	no guideline	no guideline	0
	d/s Urban	mean	0.00058	0.12562	0.0016	0.00018	0.00094	0.00006	0.000003	0.10575	0.00070	0.00372
		(SD)	0.00049	0.08302	0.0030	0.00018	0.00024	0.00006	0.00002	0.02832	0.00029	0.00177
		min	ND	0.0126	ND	ND	0.0003	ND	ND	0.0593	0.0002	0.0014
		max	0.0023	0.3040	0.009	0.0010	0.0014	0.0002	0.0001	0.1900	0.0014	0.0110
		# exceedances	no guideline	0	0	0	0	0	0	no guideline	no guideline	0
Fall 2001	Ref	mean	0.00125	0.00592	0.0012	0.00118	0.00008	0.00094	0.00003	0.24883	0.00034	0.00064
		(SD)	0.00045	0.00968	0.0025	0.00052	0.00028	0.00035	0.00005	0.10625	0.00043	0.00121
		min	0.0008	0.0017	ND	0.0004	ND	0.0003	ND	0.0846	ND	ND
		max	0.0024	0.0555	0.008	0.0026	0.0014	0.0016	0.0002	0.4730	0.0024	0.0067
		# exceedances	no guideline	0	0	0	0	12	1	no guideline	no guideline	0
	d/s Urban	mean	0.00050	0.08851	0.0023	0.00055	0.00085	0.00008	0.00003	0.08781	0.00086	0.00403
		(SD)	0.00025	0.06250	0.0035	0.00039	0.00037	0.00006	0.00006	0.02783	0.00046	0.00229
		min	0.0002	0.0307	ND	0.0002	0.0005	ND	ND	0.0518	0.0003	0.0012
		max	0.0011	0.3160	0.010	0.0019	0.0023	0.0002	0.0002	0.1470	0.0026	0.0113
		# exceedances	no guideline	0	0	0	0	0	2	no guideline	no guideline	0
All exposures	Ref	mean	0.00112	0.00498	0.0012	0.00099	0.00009	0.00088	0.00002	0.23325	0.00029	0.00060
	d/s Urban	mean	0.00054	0.13621	0.0021	0.00032	0.00098	0.00009	0.00002	0.09783	0.00086	0.00422
Detection limit for all exposure periods			0.0001	0.0001	0.005	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002

NOTE: Sample size (n) per site per exposure period is 31.

Mean exceeds guideline for freshwater aquatic life (see Appendix A).

ND = Not detected. Considered a zero value for statistical calculations.

5.1.5 Polychlorinated Biphenyls

5.1.5.1 PCB Aroclors

Table 58: Polychlorinated biphenyl (PCB) aroclor concentrations (ng/L) in Yorkson Creek during each exposure period.

PCB Aroclors	Spring 2000				Fall 2000				Fall 2001				Mean of 3 exposure periods	
	Ref		d/s Urban		Ref		d/s Urban		Ref		d/s Urban		Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.
Aroclor 1242	ND	0.0058	0.012	0.0099	ND	0.0074	0.037	0.0079	ND	0.0441	ND	0.0217	ND	0.01633
Aroclor 1254	ND	0.0088	ND	0.012	ND	0.01	ND	0.014	ND	0.0330	ND	0.0375	ND	ND
Aroclor 1260	ND	0.0057	ND	0.0087	ND	0.0074	ND	0.0078	ND	0.0263	ND	0.0206	ND	ND
Total PCB Aroclor concentration**	ND		0.012		ND		0.037		ND		ND		ND	0.01633
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-ARO		WQ-00-ARO		WQ-00-ARO		WQ-00-ARO		WQ-01-ARO		WQ-01-ARO		-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

5.1.5.2 PCB Congeners

Table 59: Polychlorinated biphenyl (PCB) congener concentrations (ng/L) in Yorkson Creek during each exposure period.

PCB Congeners	Spring 2000				Fall 2000				Fall 2001				Mean of 3 exposure periods	
	Ref		d/s Urban		Ref		d/s Urban		Ref		d/s Urban		Ref	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.
8/5	ND	0.011	ND	0.02	ND	0.016	ND	0.011	0.000298	0.000079	0.00151	0.0000878	0.000099	0.000503
15	ND	0.011	ND	0.02	ND	0.016	ND	0.011	0.00018	0.000069	0.000933	0.0000766	0.000060	0.000311
19	ND	0.00029	ND	0.00062	ND	0.00046	0.0015	0.00049	0.00004	0.000036	0.000449	0.0000475	0.000013	0.000650
18	ND	0.00029	0.002	0.00062	ND	0.00046	0.003	0.00049	0.000199	0.000036	0.00241	0.0000475	0.000066	0.002470
17	ND	0.00029	ND	0.00062	ND	0.00046	0.0017*	0.00049	0.000084	0.000036	0.00081	0.0000475	0.000028	0.000837
24/27	ND	0.00029	ND	0.00062	ND	0.00046	ND	0.00049	ND	0.000036	0.000333	0.0000475	ND	0.000111
16/32	ND	0.00025	0.0008	0.00029	ND	0.00031	0.002	0.00023	0.000099*	0.000028	0.00114	0.0000638	0.000033	0.001313
26	ND	0.00025	ND	0.00029	ND	0.00031	0.00048	0.00023	ND	0.000028	0.00029	0.0000638	ND	0.000257
25	ND	0.00025	ND	0.00029	ND	0.00031	0.00025	0.00023	ND	0.000028	0.000113	0.0000638	ND	0.000121
31/28	0.00022	0.00018	0.00193*	0.00029	0.00033*	0.00031	0.0048	0.00023	0.000324	0.000028	0.00319	0.0000638	0.000291	0.003307
33/20/21	ND	0.00025	0.00071	0.00029	ND	0.00031	0.0013	0.00023	0.000096	0.000028	0.000859	0.0000638	0.000032	0.000956
22	ND	0.00025	0.00054	0.00029	ND	0.00031	0.0012*	0.00023	0.000064*	0.000028	0.000553	0.0000638	0.000021	0.000764
45	ND	0.0002	ND	0.00037	ND	0.00038	0.00071*	0.00017	0.00002*	0.000009	0.000239	0.0000132	0.000007	0.000316
46	ND	0.0002	ND	0.00037	ND	0.00038	0.00022*	0.00017	ND	0.000009	0.000127*	0.0000132	ND	0.000116
52/73	0.00039*	0.0002	0.0014	0.00037	ND	0.00038	0.0027	0.00017	0.000163	0.000009	0.00127	0.0000132	0.000184	0.001790
49/43	ND	0.00021	0.00094*	0.00038	ND	0.00039	0.0018	0.00018	0.000078	0.000009	0.00072	0.0000132	0.000026	0.001153
47/48 /75	ND	0.0002	0.00067*	0.00037	ND	0.00038	0.0017*	0.00017	0.000065	0.000009	0.000508	0.0000132	0.000022	0.000959
44	0.00029*	0.00022	0.001*	0.00039	ND	0.0004	0.0016	0.00018	0.000103*	0.000009	0.000801	0.0000132	0.000131	0.001134
42/59	ND	0.00022	ND	0.00039	ND	0.0004	0.0011	0.00018	0.000038*	0.000009	0.000389	0.0000132	0.000013	0.000496
41/71/64/68	0.00017*	0.00015	0.00092*	0.00027	ND	0.00028	0.002	0.00013	0.000118	0.000009	0.00114	0.0000132	0.000096	0.001353
40	ND	0.00015	0.00028	0.00027	ND	0.00028	0.00022*	0.00013	ND	0.000009	ND	0.0000132	ND	0.000167
74/61	ND	0.00015	0.00078*	0.00027	ND	0.00028	0.00048*	0.00013	0.000089	0.000009	0.000395	0.0000132	0.000030	0.000552
70/76	ND	0.00015	0.0007*	0.00027	ND	0.00028	0.00092	0.00013	0.000146	0.000009	0.000886	0.0000132	0.000049	0.000835
66/80	0.00018*	0.00015	0.00068	0.00027	ND	0.00028	0.00087*	0.00013	0.000104	0.000009	0.000663	0.0000132	0.000095	0.000738
56/60	0.00024*	0.00011	0.00047	0.0002	0.00027*	0.00015	0.00057	0.00016	0.000121	0.000018	0.000501	0.0000265	0.000210	0.000514
95/93	ND	0.00023	0.00064	0.0003	ND	0.00026	0.00074*	0.00018	0.000079	0.000013	0.000328	0.0000181	0.000026	0.000569
91	ND	0.00023	ND	0.0003	ND	0.00026	ND	0.00018	ND	0.000013	0.000076	0.0000181	ND	0.000025
84/92	ND	0.00025	ND	0.00034	0.00029*	0.00029	ND	0.00039	ND	0.000037	0.000267*	0.0000559	0.000097	0.000089
89/90/101	ND	0.00025	0.0011*	0.00034	0.00042*	0.00029	0.0011	0.00039	0.000139	0.000037	0.000951	0.0000559	0.000186	0.001050
99	ND	0.00025	0.00036*	0.00034	ND	0.00029	0.00039*	0.00039	0.000062	0.000037	0.000423	0.0000559	0.000021	0.000391
83/108	ND	0.00022	ND	0.00031	ND	0.00025	ND	0.00034	ND	0.000037	ND	0.0000559	ND	ND
97/86	ND	0.00022	ND	0.00031	ND	0.00025	ND	0.00034	ND	0.000037	0.000178	0.0000559	ND	0.000059
87/115/116	ND	0.00022	0.00048*	0.00031	ND	0.00025	ND	0.00034	0.000069*	0.000037	0.000351	0.0000559	0.000023	0.000277
85/120	ND	0.00022	ND	0.00031	ND	0.00025	ND	0.00034	ND	0.000037	0.000143	0.0000559	ND	0.000048
110	0.00028	0.00022	0.0011	0.00031	ND	0.00025	0.0011	0.00034	0.000156	0.000037	0.000977	0.0000559	0.000145	0.001059
107/109	ND	0.00037	ND	0.00041	ND	0.00036	ND	0.00038	ND	0.000027	0.000079*	0.000045	ND	0.000026
106/118	ND	0.00025	0.0011	0.00027	ND	0.00023	0.0011*	0.00026	0.000117	0.000023	0.000982	0.000038	0.000039	0.001061
114	ND	0.00037	ND	0.00041	ND	0.00036	ND	0.00038	ND	0.000025	ND	0.0000407	ND	ND
105/127	ND	0.00025	0.00055*	0.00028	ND	0.00024	0.00027	0.00024	0.000072	0.000025	0.000414	0.0000415	0.000024	0.000411
136	ND	0.00015	ND	0.00026	ND	0.00026	ND	0.00023	ND	0.000020	0.00011	0.00003	ND	0.000037
151	ND	0.00026	ND	0.00035	ND	0.0003	0.00039*	0.00023	0.000034	0.000019	0.000224	0.000037	0.000011	0.000205
144/135	ND	0.00026	ND	0.00035	ND	0.0003	ND	0.00023	0.000036	0.000019	0.000162	0.000037	0.000012	0.000054
149/139	0.00044	0.00026	0.00072	0.00035	ND	0.0003	0.0012*	0.00023	0.000124	0.000019	0.000783	0.000037	0.000188	0.000901
134/143	ND	0.00026	ND	0.00035	ND	0.0003	ND	0.00023	ND	0.000019	ND	0.000037	ND	ND
131/142	ND	0.00026	ND	0.00035	ND	0.0003	ND	0.00023	ND	0.000019	ND	0.000037	ND	ND

Table 59 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/L) in Yorkson Creek during each exposure period.

PCB Congeners	Spring 2000				Fall 2000				Fall 2001				Mean of 3 exposure periods	
	Ref		d/s Urban		Ref		d/s Urban		Ref		d/s Urban		Ref	d/s Ag
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.
146	ND	0.00029	ND	0.00038	ND	0.00036	ND	0.00024	0.00003*	0.000019	0.000169	0.000037	0.000010	0.000056
153	0.00032*	0.00029	0.00075	0.00038	ND	0.00036	0.001	0.00024	0.000133	0.000019	0.00113	0.000037	0.000151	0.000960
141	ND	0.00038	ND	0.00049	ND	0.00046	0.00055*	0.00031	ND	0.000019	0.000222	0.000037	ND	0.000257
130	ND	0.00037	ND	0.00048	ND	0.00045	ND	0.0003	ND	0.000019	0.000063*	0.000037	ND	0.000021
137	ND	0.00037	ND	0.00048	ND	0.00045	ND	0.0003	ND	0.000019	0.000051*	0.000037	ND	0.000017
138/163/164	ND	0.00037	0.0011*	0.00048	0.00063*	0.00045	0.0012*	0.0003	0.000118	0.000019	0.00123	0.000037	0.000249	0.001177
158/160	ND	0.00037	ND	0.00048	ND	0.00045	ND	0.0003	ND	0.000019	0.00009*	0.000037	ND	0.000030
129	ND	0.00037	ND	0.00048	ND	0.00045	ND	0.0003	ND	0.000019	ND	0.000037	ND	ND
128	ND	0.00037	ND	0.00048	ND	0.00045	ND	0.0003	ND	0.000019	0.000125	0.000037	ND	0.000042
156	ND	0.00037	ND	0.00048	ND	0.00045	ND	0.0003	0.000031*	0.000019	0.000136	0.0000372	0.000010	0.000045
157	ND	0.00037	ND	0.00048	ND	0.00045	ND	0.0003	ND	0.000020	ND	0.0000381	ND	ND
179	ND	0.00028	ND	0.00043	ND	0.00037	ND	0.00039	ND	0.000018	0.00012	0.0000271	ND	0.000040
176	ND	0.00028	ND	0.00043	ND	0.00037	ND	0.00039	ND	0.000018	ND	0.0000271	ND	ND
178	ND	0.00028	ND	0.00043	ND	0.00037	ND	0.00039	ND	0.000018	ND	0.0000271	ND	ND
175	ND	0.00028	ND	0.00043	ND	0.00037	ND	0.00039	ND	0.000018	ND	0.0000271	ND	ND
187/182	ND	0.00028	ND	0.00043	ND	0.00037	ND	0.00039	0.000067*	0.000018	0.000276*	0.0000267	0.000022	0.000092
183	ND	0.00029	ND	0.00044	ND	0.00038	ND	0.00039	0.000031	0.000018	0.000139	0.0000271	0.000010	0.000046
185	ND	0.00029	ND	0.00044	ND	0.00038	ND	0.00039	ND	0.000018	ND	0.0000271	ND	ND
174/181	ND	0.00029	ND	0.00044	ND	0.00038	ND	0.00039	ND	0.000018	ND	0.0000271	ND	ND
177	ND	0.00029	ND	0.00044	ND	0.00038	ND	0.00039	ND	0.000018	0.000097	0.0000271	ND	0.000032
171	ND	0.00026	ND	0.00039	ND	0.00033	ND	0.00035	ND	0.000018	0.00007*	0.0000271	ND	0.000023
172/192	ND	0.00026	ND	0.00039	ND	0.00033	ND	0.00035	ND	0.000018	ND	0.0000271	ND	ND
180	ND	0.00026	ND	0.00039	ND	0.00033	ND	0.00035	0.000091*	0.000020	0.0000636	0.0000305	0.000030	0.000212
193	ND	0.00026	0.00058*	0.00039	ND	0.00033	ND	0.00035	ND	0.000018	ND	0.0000271	ND	0.000193
191	ND	0.00026	ND	0.00039	ND	0.00033	ND	0.00035	ND	0.000018	ND	0.0000271	ND	ND
170/190	ND	0.00031	ND	0.00047	ND	0.0004	ND	0.00042	ND	0.000025	0.000361*	0.0000374	ND	0.000120
189	ND	0.00031	ND	0.00047	ND	0.0004	ND	0.00042	ND	0.000019	0.000054*	0.000028	ND	0.000018
201	ND	0.00032	ND	0.00056	ND	0.00052	ND	0.00037	ND	0.000017	ND	0.0000225	ND	ND
197	ND	0.00032	ND	0.00056	ND	0.00052	ND	0.00037	ND	0.000017	ND	0.0000225	ND	ND
198	ND	0.00032	ND	0.00056	ND	0.00052	ND	0.00037	ND	0.000017	ND	0.0000225	ND	ND
199	ND	0.00032	ND	0.00056	ND	0.00052	ND	0.00037	ND	0.000017	0.000045*	0.0000225	ND	0.000015
196/203	ND	0.00032	ND	0.00056	ND	0.00052	ND	0.00037	ND	0.000017	0.000072*	0.0000225	ND	0.000024
195	ND	0.00049	ND	0.00066	ND	0.00073	ND	0.0006	ND	0.000018	0.000051*	0.00002	ND	0.000017
194	ND	0.00049	ND	0.00066	ND	0.00073	ND	0.0006	ND	0.000018	0.000126*	0.00002	ND	0.000042
205	ND	0.00049	ND	0.00066	ND	0.00073	ND	0.0006	0.000021*	0.000013	0.000038*	0.000014	0.000007	0.000013
208	ND	0.00027	ND	0.00037	ND	0.00045	ND	0.00034	ND	0.000012	0.000043*	0.0000129	ND	0.000014
207	ND	0.00027	ND	0.00037	ND	0.00045	ND	0.00034	ND	0.000014	ND	0.0000147	ND	ND
206	ND	0.00027	ND	0.00037	ND	0.00045	ND	0.00034	0.000017*	0.000017	0.0001	0.0000172	0.000006	0.000033
209	ND	0.00028	ND	0.0004	ND	0.00042	ND	0.00037	0.000115	0.000018	0.000273	0.0000225	0.000038	0.000091
Total PCB concentration**	0.0011		0.0219		0.0013		0.0387		0.0036		0.0324		0.00201	0.03099
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-PCB		WQ-00-PCB		WQ-00-PCB		WQ-00-PCB		WQ-01-PCB		WQ-01-PCB		-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

5.1.6 Pesticides

5.1.6.1 Organochlorines

Table 60: Organochlorine concentrations (ng/L) in Yorkson Creek during each exposure period.

Organochlorine compounds	Spring 2000				Fall 2000				Fall 2001				Mean of 3 exposure periods	
	Ref	DL	d/s Urban	DL	Ref	DL	d/s Urban	DL	Ref	DL	d/s Urban	DL	Ref	d/s Urban
1,2-Dichlorobenzene	0.016	0.00026	0.042	0.0016	0.036	0.0011	0.054	0.00096	ND	0.0331	0.0167	0.0093	0.0173	0.0376
1,3/1,4-Dichlorobenzene	0.079	0.00022	0.39	0.0013	0.15	0.0009	0.9	0.00081	0.909	0.0359	0.653	0.0099	0.3793	0.6477
1,2,3-Trichlorobenzene	0.036	0.00036	0.039	0.00095	0.039	0.002	0.024	0.001	0.0044	0.0021	ND	0.0087	0.0265	0.0210
1,2,4-Trichlorobenzene	0.15	0.00033	0.16	0.00088	0.19	0.0018	0.095	0.00092	0.0529	0.0021	0.0364	0.0146	0.1310	0.0971
1,3,5-Trichlorobenzene	0.0006*	0.00034	0.0047*	0.00092	ND	0.0019	0.0067	0.00097	0.0026*	0.0021	ND	0.0146	0.0011	0.0038
1,2,3,4-Tetrachlorobenzene	0.0052	0.00039	0.0075	0.00059	0.0058	0.00084	0.0058	0.00066	ND	0.0050	ND	0.0053	0.0037	0.0044
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.003	0.00038	0.0094	0.00058	0.0048	0.00082	0.0079	0.00065	ND	0.0048	ND	0.0052	0.0026	0.0058
Pentachlorobenzene	0.0033	0.00029	0.096	0.00035	0.0058	0.00078	0.058	0.00043	ND	0.0027	0.0397	0.0032	0.0030	0.0646
Hexachlorobenzene	0.011	0.00035	0.015	0.00076	0.013	0.00086	0.014	0.00047	0.0073	0.0056	0.0098	0.0033	0.0104	0.0129
Hexachlorobutadiene	ND	0.00034	ND	0.00078	ND	0.0012	ND	0.00069	ND	0.0025	ND	0.0032	ND	ND
Aldrin	ND	0.00067	ND	0.00082	ND	0.00099	ND	0.00076	ND	0.0062	ND	0.0132	ND	ND
Dieldrin	0.0022	0.00011	0.027	0.00031	0.0014	0.000078	0.019	0.00019	ND	0.0052	0.0261	0.0102	0.0012	0.0240
Endrin	ND	0.0003	ND	0.00084	0.00031*	0.00021	ND	0.00052	ND	0.0084	ND	0.0163	0.0001	ND
Chlordane, alpha (cis)	ND	0.0012	0.003	0.0018	ND	0.0016	0.0018	0.0013	ND	0.0021	ND	0.0029	ND	0.0016
Chlordane, gamma (trans)	ND	0.001	0.0031	0.0016	ND	0.0014	0.0015	0.0011	ND	0.0018	ND	0.0025	ND	0.0015
Chlordane, oxy-	ND	0.0021	0.0028*	0.0026	ND	0.0031	ND	0.0024	ND	0.0197	ND	0.0491	ND	0.0009
o,p'-DDD	ND	0.0015	ND	0.0033	ND	0.0037	ND	0.0013	ND	0.0034	ND	0.0111	ND	ND
p,p'-DDD	ND	0.0017	ND	0.0036	ND	0.004	0.0029	0.0014	ND	0.0044	ND	0.0145	ND	0.0010
o,p'-DDE	ND	0.0054	ND	0.0056	ND	0.0069	ND	0.0042	ND	0.0026	ND	0.0074	ND	ND
p,p'-DDE	ND	0.0073	ND	0.0076	ND	0.0094	ND	0.0057	0.0140	0.0034	0.0096	0.0096	0.0047	0.0032
o,p'-DDT	ND	0.0016	ND	0.0036	ND	0.0043	ND	0.0017	ND	0.0043	ND	0.0139	ND	ND
p,p'-DDT	ND	0.0021	ND	0.0047	ND	0.0057	ND	0.0022	ND	0.0046	ND	0.0152	ND	ND
Endosulphan (I), alpha-	0.021	0.00044	0.015	0.0012	0.0027*	0.0003	0.0049	0.00075	ND	0.0050	0.0077	0.0076	0.0079	0.0092
Endosulphan (II), beta-	0.0065*	0.00097	0.036	0.0026	0.0032	0.0012	0.018	0.0013	ND	0.0076	0.0415	0.0156	0.0032	0.0318
Endosulphan Sulphate	0.037	0.00009	0.17	0.00022	0.022	0.00013	0.15	0.0001	0.0409	0.0110	0.312	0.0227	0.0333	0.2107
HCH, alpha-	0.022	0.001	0.075	0.0033	0.0093	0.0019	0.059	0.0021	0.0130	0.0086	0.102	0.0204	0.0148	0.0787
HCH, beta-	ND	0.0016	0.0056	0.0051	ND	0.003	0.0067*	0.0032	ND	0.0145	ND	0.0197	ND	0.0041
HCH, gamma-	0.013	0.0011	0.075	0.0035	0.0066	0.002	0.08	0.0022	ND	0.0105	0.0523	0.0246	0.0065	0.0691
HCH, delta-	ND	0.00011	ND	0.00029	ND	0.00015	ND	0.00017	0.0149	0.0049	0.0660	0.0433	0.0050	0.0220
Heptachlor	ND	0.00075	ND	0.0011	ND	0.0011	ND	0.00078	ND	0.0096	ND	0.0115	ND	ND
Heptachlor Epoxide	0.0014*	0.000086	0.0096	0.00022	0.00058*	0.000085	0.0084	0.000059	ND	0.0055	0.0180	0.0107	0.0007	0.0120
Methoxychlor	0.00034	0.00018	0.0051	0.00085	ND	0.00031	0.0034	0.00053	ND	0.0364	ND	0.0710	0.0001	0.0028
Mirex	ND	0.00027	ND	0.00036	ND	0.00032	ND	0.0002	ND	0.0023	ND	0.0112	ND	ND
Nonachlor, cis-	ND	0.0014	ND	0.0023	ND	0.002	ND	0.0013	ND	0.0027	ND	0.0027	ND	ND
Nonachlor, trans-	ND	0.001	ND	0.0016	ND	0.0014	0.0013*	0.0011	ND	0.0024	ND	0.0024	ND	0.0004
Total Chlorobenzene**	0.3035		0.7636		0.4444		1.1654		0.9692		0.7389		0.5724	0.8893
Total Chlordane**	ND		0.0061		ND		ND		ND		ND		ND	0.0020
Total DDD/DDE/DDT**	ND		ND		ND		ND		0.0140		0.0096		0.0047	0.0032
Total Endosulphan**	0.0645		0.2210		0.0279		0.1729		0.0409		0.3535		0.0444	0.2491
Total HCH**	0.0350		0.1556		0.0159		0.1457		ND		0.2203		0.0170	0.1739
Total Organochlorine concentration**	0.407		1.188		0.490		1.515		1.024		1.366		0.6403	1.3564
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-OC		WQ-00-OC		WQ-00-OC		WQ-00-OC		WQ-01-OC		WQ-01-OC		-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

5.1.6.2 Carbamates, Herbicides, Organophosphates, Organonitrogens and Triazines

Table 61: Various pesticides analyzed for in Yorkson Creek and their corresponding detection limits.

Carbamates	DL (µg/L)	Organophosphate pesticides	DL (µg/L)	Organophosphate pesticides cont'd	DL (µg/L)
Aldicarb	0.01	Azinphos methyl	0.01	Sulfotep	0.01
Aldicarb Sulfone	0.01	Carbophenothion*	0.01	Terbufos	0.01
Aldicarb Sulfoxide	0.01	Chlorpyrifos	0.01		
Carbaryl	0.01	Coumaphos	0.01	Organonitrogen pesticides	DL (µg/L)
Carbofuran	0.01	Demeton-O	0.02	Hexazinone	0.02
3-Hydroxycarbofuran	0.01	Demeton-S	0.01	Metolachlor	0.01
Methiocarb	0.01	Diazinon	0.01	Propanil	0.03
Methomyl	0.01	Dichlorvos/Naled	0.02	Trifluralin	0.01
Oxamyl	0.01	Dimethoate	0.01	Vinclozolin	0.01
Propoxur	0.01	Disulfoton	0.01		
		Ethion	0.01	Triazines	DL (µg/L)
Herbicides	DL (µg/L)	Fenitrothion	0.01	Atrazine	0.02
Bromoxynil	0.1	Fensulfthion	0.01	Simazine	0.02
2,4,5-T	0.02	Fenthion	0.01		
2,4-D	0.05	Fonofos	0.02		
Dicamba	0.2	Malathion	0.01		
2,4-DB*	0.8	Methidathion	0.02		
Dichloroprop	0.1	Mevinphos	0.02		
Dinoseb	0.2	Parathion	0.01		
MCPA	0.1	Parathion-methyl	0.01		
Mecoprop (MCP)*	0.05	Phorate	0.01		
Picloram	0.3	Phosalone*	0.01		
Silvex (2,4,5-TP)	0.1	Phosmet*	0.01		

Detected in Yorkson Creek during at least one exposure period.

Table 62: Detected pesticide concentrations (µg/L) in Yorkson Creek during two exposure periods.

Pesticide compound	Spring 2000 d/s Urban		Fall 2000 d/s Urban	
	Conc.	DL	Conc.	DL
Diazinon	0.01	0.01	0.04	0.01
Total pesticide concentration**	0.01		0.04	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-PEST		WQ-00-PEST	

NOTE: Single integrated water sample (~300L) per site per exposure period.

5.1.7 Nonylphenol

Table 63: 4-Nonylphenol concentration (ng/L) in Yorkson Creek during each exposure period.

Compound	Spring 2000 d/s Urban				Fall 2000 d/s Urban				Fall 2001 d/s Urban				Mean of 3 exposure periods	
	Ref	DL	Conc.	DL	Ref	DL	Conc.	DL	Ref	DL	Conc.	DL	Ref	Conc.
4-Nonylphenol	ND	0.22	ND	0.9	ND	0.2	ND	0.9	3.58	0.0485	11.2	0.325	1.193	3.733
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-NP		WQ-00-NP		WQ-00-NP		WQ-00-NP		WQ-01-NP		WQ-01-NP		-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

5.1.8 Polycyclic Aromatic Hydrocarbons

Table 64: Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/L) in Yorkson Creek during each exposure period.

Polycyclic aromatic hydrocarbons	Spring 2000				Fall 2000				Fall 2001				Mean of 3 exposure periods	
	Ref	DL	Conc.	DL	Ref	DL	Conc.	DL	Ref	DL	Conc.	DL	Ref	d/s Urban
Naphthalene ^{1P}	0.95	0.0019	1.4	0.0066	1.2	0.015	2.2	0.0056	0.631	0.0238	1.59	0.0296	0.927	1.730
Acenaphthylene ^{1P}	0.038	0.0009	0.055	0.0036	0.054	0.0011	0.15	0.0016	0.0441*	0.0239	0.143*	0.0399	0.045	0.116
Acenaphthene ^{1P}	0.039	0.001	0.22	0.0021	0.027	0.0023	0.24	0.0021	0.0359	0.0212	0.365	0.0488	0.034	0.275
Fluorene ^{1P}	0.085	0.0024	0.23	0.0037	0.055	0.0027	0.3	0.0049	ND	0.0370	0.251	0.0603	0.047	0.260
Phenanthrene ^{1P}	0.19	0.0025	0.65	0.0083	0.16	0.0017	0.73	0.0055	0.110	0.0218	0.920	0.0287	0.153	0.767
Anthracene ^{1P}	0.015	0.0009	0.06	0.011	0.021	0.0023	0.072	0.0075	ND	0.0236	0.0361	0.0310	0.012	0.056
Fluoranthene ^{2P}	0.044	0.0019	0.4	0.01	0.036	0.0018	0.45	0.0025	0.0398	0.0115	0.786	0.0236	0.040	0.545
Pyrene ^{2P}	0.037	0.0012	0.79	0.0034	0.031	0.0009	0.73	0.0095	0.0308	0.0113	1.27	0.0231	0.033	0.930
Benz(a)anthracene ^{2P}	ND	0.0022	0.058	0.001	0.0028*	0.0013	0.078*	0.0032	ND	0.0129	0.125*	0.0239	0.001	0.087
Chrysene ^{2P}	0.011	0.0029	0.19	0.0037	0.0095	0.003	0.16	0.0023	ND	0.0141	0.274	0.0272	0.007	0.208
Benzo(a)fluoranthene ^{2P}	0.0079	0.0021	0.18	0.005	0.0049	0.0011	0.14	0.0037	ND	0.0407	0.255	0.0973	0.004	0.192
Benzo(a)pyrene ^{2P}	ND	0.0025	0.026	0.0021	ND	0.0033	0.022	0.0054	ND	0.0293	ND	0.0728	ND	0.016
Benzo(e)pyrene ^{2P}	ND	0.0018	0.056	0.0019	ND	0.0025	0.037	0.0031	ND	0.0267	0.0945	0.0662	ND	0.063
Perylene ^{2P}	0.087	0.0029	0.18	0.0032	0.099	0.0021	0.14	0.0078	ND	0.0308	ND	0.0780	0.062	0.107
Dibenz(ah)anthracene ^{2P}	ND	0.0073	ND	0.013	ND	0.0082	ND	0.0061	ND	0.0351	ND	0.0446	ND	ND
Benzo(ghi)perylene ^{2P}	0.0077	0.004	0.057	0.0097	ND	0.0057	0.03	0.0025	ND	0.0220	0.0713*	0.0438	0.003	0.053
Indeno(1,2,3,cd)pyrene ^{2P}	0.0055*	0.0009	0.047	0.0031	ND	0.0013	0.026*	0.02	ND	0.0247	0.0803*	0.0443	0.002	0.051
C1-Naphthalene ^A	0.34	0.0028	0.96	0.0033	0.36	0.0025	1.6	0.0035	0.233	0.0573	1.32	0.130	0.311	1.293
C2-Naphthalene ^A	0.23	0.066	1.2	0.0062	0.27	0.0043	1.7	0.005	0.140	0.0368	2.33	0.0479	0.213	1.743
C3-Naphthalene ^A	0.1	0.0012	1.6	0.011	0.12	0.0023	2	0.0009	ND	0.0355	2.82	0.0478	0.073	2.140
C4-Naphthalene ^A	ND	0.0025	0.49	0.011	0.019	0.002	0.32	0.019	ND	0.0396	2.64	0.111	0.006	1.150
C1-Phenanthrene/Anthracene ^A	0.11	0.0038	1.2	0.0028	0.13	0.0044	1.2	0.0046	ND	0.0299	1.26	0.0706	0.080	1.220
C2-Phenanthrene/Anthracene ^A	0.052	0.0018	0.75	0.0038	0.059	0.0043	0.8	0.0039	ND	0.0216	1.31	0.0533	0.037	0.953
C3-Phenanthrene/Anthracene ^A	0.017	0.002	0.42	0.0083	0.02	0.0016	0.44	0.0061	ND	0.0202	0.703	0.0627	0.012	0.521
C4-Phenanthrene/Anthracene ^A	0.019	0.002	0.25	0.0049	0.026	0.0021	0.15	0.0033	ND	0.0356	0.774	0.0668	0.015	0.391
Retene	0.029	0.0055	0.22	0.0089	0.046	0.0056	0.16	0.012	ND	0.0356	0.298	0.0668	0.025	0.226
Dibenzothiophene	0.014	0.0015	0.11	0.015	0.0061*	0.0025	0.13	0.0086	ND	0.0273	0.106*	0.0432	0.007	0.115
C1-Dibenzothiophenes	0.012	0.0029	0.31	0.0086	0.011	0.006	0.32	0.012	ND	0.0227	0.285	0.0825	0.008	0.305
C2-Dibenzothiophenes	0.039	0.0043	0.43	0.034	0.036	0.0032	0.49	0.0097	ND	0.0470	0.615	0.0974	0.025	0.512
Total Parent ^(P) LPAH**	1.317		2.615		1.517		3.692		0.741		3.269		1.192	3.192
Total Parent ^(P) HPAH**	0.192		1.984		0.180		1.813		0.071		2.862		0.148	2.220
Total Alkylated ^{(A)**}	0.868	0.000	6.870		1.004		8.210		0.373		13.157		0.748	9.412
Total Dibenzothiophene**	0.051		0.850		0.036		0.940		ND		1.006		0.029	0.932
Total PAH concentration**	2.46		12.54		2.78		14.82		1.18		20.59		2.142	15.982
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-PAH		WQ-00-PAH		WQ-00-PAH		WQ-00-PAH		WQ-01-PAH		WQ-01-PAH		-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected. Considered a zero value for statistical calculations.

5.1.9 Sterols

Table 65: Sterol concentrations (ng/L) in Yorkson Creek during each exposure period.

Sterols	Spring 2000				Fall 2000				Fall 2001				Mean of 3 exposure periods	
	Ref		d/s Urban		Ref		d/s Urban		Ref		d/s Urban		Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.
Desogestrel ^A	ND	0.61	ND	1.7	ND	0.85	1.80*	1.50	ND	0.900	ND	1.40	ND	0.600
Mestranol ^A	ND	0.067	ND	0.22	ND	0.10	ND	0.13	ND	0.120	ND	0.120	ND	ND
Norethindrone ^A	ND	0.21	ND	0.32	ND	0.38	ND	1.20	ND	0.750	ND	1.20	ND	ND
Estrone ^A	0.014*	0.011	ND	0.028	ND	0.03	ND	0.02	ND	0.036	ND	0.015	0.005	ND
Equilin ^A	ND	0.026	ND	0.11	ND	0.04	ND	0.05	ND	0.180	ND	0.120	ND	ND
Norgestrel ^A	ND	0.17	ND	0.75	ND	0.26	ND	0.51	ND	0.930	ND	0.410	ND	ND
Testosterone ^A	0.089*	0.063	0.35*	0.13	0.40*	0.08	0.15*	0.06	ND	0.160	ND	0.099	0.163	0.167
17a-Dihydroequilin ^A	ND	0.035	ND	0.065	ND	0.03	ND	0.05	ND	0.088	ND	0.072	ND	ND
Ethinylestradiol ^A	ND	0.099	ND	0.17	ND	0.11	ND	0.09	ND	0.330	ND	0.150	ND	ND
17a-Estradiol ^A	ND	0.027	ND	0.032	ND	0.03	ND	0.03	ND	0.052	ND	0.028	ND	ND
17b-Estradiol ^A	0.06*	0.021	ND	0.024	ND	0.02	ND	0.02	ND	0.034	ND	0.019	0.020	ND
a-Zearalanol ^A	ND	0.046	ND	0.098	ND	0.04	ND	0.07	ND	0.860	ND	0.560	ND	ND
Coprostanol ^A	ND	0.088	1	0.22	ND	0.14	1.40	0.21	ND	0.130	0.890	0.280	ND	1.097
Epicoprostanol ^A	ND	0.052	0.19	0.13	ND	0.08	0.17	0.12	ND	0.095	ND	0.200	ND	0.120
Cholesterol ^A	4.6	0.076	17	0.12	6.60	0.10	12.00	0.10	4.90	0.060	15.0	0.066	5.367	14.667
Cholestanol ^A	0.25*	0.038	2.4	0.079	0.20*	0.09	1.40	0.09	0.240	0.220	2.20	0.150	0.230	2.000
Desmosterol ^A	0.29*	0.2	ND	0.29	0.36*	0.09	1.10	0.19	0.990	0.170	2.50*	0.190	0.547	1.200
Campesterol ^P	ND	0.13	ND	0.19	ND	0.29	ND	0.09	ND	0.140	ND	0.097	ND	ND
Ergosterol ^P	0.86*	0.16	7	0.27	0.71*	0.23	6.10	0.12	1.60	0.110	8.30	0.190	1.057	7.133
Stigmasterol ^P	ND	0.34	4.3	0.32	0.57	0.32	2.60	0.25	1.20	0.990	4.00	0.320	0.590	3.633
b-Estradiol 3-benzoate ^A	0.11*	0.02	ND	0.042	ND	0.04	ND	0.02	ND	0.190	ND	0.077	0.037	ND
b-Sitosterol ^P	3	0.094	14	0.13	5.50	0.11	11.00	0.10	7.90	0.083	16.0	0.077	5.467	13.667
Total Animal ^(A) Sterols**	5.31		20.94		7.56		17.87		6.13		20.59		6.333	19.800
Total Plant ^(P) Sterols**	3.86		25.30		6.78		19.70		10.70		28.30		7.113	24.433
Total Sterol concentration**	9.17		46.24		14.34		37.57		16.83		48.89		13.447	44.233
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-00-STER		WQ-00-STER		WQ-00-STER		WQ-00-STER		WQ-01-STER		WQ-01-STER		-	-

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

5.1.10 Polybrominated Diphenyl Ethers

Table 66: Polybrominated diphenyl ether (PBDE) concentrations (pg/L) in Yorkson Creek during one exposure period.

Polybrominated diphenyl ethers	Fall 2001			
	Ref	d/s Urban		
	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	0.430	ND	0.420
3-MonoBDE (2)	ND	0.430	ND	0.420
4-MonoBDE (3)	ND	0.430	ND	0.420
2,4-DiBDE (7)	ND	0.0179	0.071*	0.0326
2,4'/3,3'-DiBDE (8/11)	0.019*	0.0179	0.040*	0.0326
2,6-DiBDE (10)	ND	0.0179	ND	0.0326
3,4-DiBDE (12)	0.061	0.0179	0.059*	0.0326
3,4'-DiBDE (13)	ND	0.0179	ND	0.0326
4,4'-DiBDE (15)	0.030*	0.0179	0.187*	0.0326
2,2',4-TriBDE (17)	ND	0.0471	0.312	0.0568
2,3',4-TriBDE (25)	ND	0.0445	ND	0.0536
2,4,4'/2',3,4-TriBDE (28/33)	0.330*	0.0422	0.890*	0.0508
2,4,6-TriBDE (30)	ND	0.0445	ND	0.0536
2,4',6-TriBDE (32)	ND	0.0445	ND	0.0536
3,3',4-TriBDE (35)	ND	0.0445	ND	0.0536
3,4,4'-TriBDE (37)	ND	0.0445	ND	0.0536
2,2',4,4'-TetraBDE (47)	3.43	0.0735	18.2	0.0669
2,2',4,5'-TetraBDE (49)	ND	0.0920	0.617	0.0834
2,3',4,4'-TetraBDE (66)	ND	0.122	0.453*	0.111
2,3',4',6-TetraBDE (71)	ND	0.0920	ND	0.0834
2,4,4',6-TetraBDE (75)	ND	0.0918	ND	0.0831
3,3',4,4'-TetraBDE (77)	ND	0.0920	ND	0.0834
2,2',3,4,4'-PentaBDE (85)	0.282*	0.0504	0.693	0.0458
2,2',4,4',5-PentaBDE (99)	2.76	0.0401	14.6	0.0400
2,2',4,4',6-PentaBDE (100)	0.546	0.0263	2.73	0.0263
2,3,3',4,4'-PentaBDE (105)	ND	0.0367	ND	0.0354
2,3,4,5,6-PentaBDE (116)	ND	0.0367	ND	0.0354
2,3',4,4',6-PentaBDE (119)	ND	0.0367	ND	0.0354
3,3',4,4',5-PentaBDE (126)	ND	0.0367	ND	0.0354
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	0.078*	0.0579	0.155	0.0531
2,2',3,4,4',6'-HexaBDE (140)	ND	0.0513	0.066	0.0471
2,2',4,4',5,5'-HexaBDE (153)	0.318	0.0601	1.55	0.0552
2,2',4,4',5,6'-HexaBDE (154)	0.224*	0.0408	0.967	0.0374
2,2',4,4',6,6'-HexaBDE (155)	0.089*	0.0513	0.179*	0.0471
2,2',3,4,4',5,6-HeptaBDE (181)	ND	0.0813	ND	0.0711
2,2',3,4,4',5',6-HeptaBDE (183)	0.830	0.0638	1.32	0.0558
2,3,3',4,4',5,6-HeptaBDE (190)	0.139*	0.112	0.109*	0.0981
2,2',3,3',4,4',5,5',6-NonaBDE (206)	11.2	1.26	6.56	0.712
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	7.24	1.26	5.54	0.712
2,2',3,3',4,5,5',6,6'-NonaBDE (208)	6.47	1.26	4.31	0.712
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	534	0.521	321	0.411
Total MonoBDE**	ND		ND	
Total DiBDE**	0.061		0.317	
Total TriBDE**	0.33		1.20	
Total TetraBDE**	3.43		19.27	
Total PentaBDE**	3.588		18.023	
Total HexaBDE**	0.631		2.851	
Total HeptaBDE**	0.830		1.320	
Total NonaBDE**	24.91		16.41	
Total DecaBDE**	534		321	
Total PBDE concentration**	567.78		380.39	
Corresponding Lab Blank & Spiked Matrix (see Water QA)	WQ-01-PBDE		WQ-01-PBDE	

NOTE: Single integrated water sample (~300L) per site per exposure period.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit.

ND = Not detected.

5.2 Tissue Contaminants

5.2.1 Trace Metals

Cutthroat Trout

Table 67: Metal concentrations (mg/kg) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)
Spring 2000	Food	0.016	2.38	3.420	0.166	1.06	0.439
	Control	ND	0.96	0.010	0.001	ND	0.018
	Ref	0.001	0.83	0.010	0.001	ND	0.008
	Ref (replicate)	0.001	0.78	0.012	0.001	ND	0.006
	d/s Urban	0.001	0.87	0.023	0.001	ND	0.021
Fall 2000	Food	0.011	2.53	3.140	0.287	0.550	0.420
	Control	ND	0.75	0.015	0.002	ND	0.223
	Ref	ND	0.88	0.010	ND	ND	0.069
	d/s Urban	0.001	0.87	0.008	0.001	ND	0.165
Fall 2001	Food	0.011	3.04	2.200	0.553	0.270	0.062
	Control	ND	0.70	0.015	0.001	0.10	0.241
	Ref	ND	0.63	0.019	0.001	ND	0.050
	d/s Urban	ND	0.63	0.020	0.005	ND	0.017
All exposures (mean)	Food	0.0127	2.650	2.9200	0.3353	0.6267	0.3070
	Control	ND	0.803	0.0133	0.0013	0.0333	0.1607
	Ref	0.0003	0.780	0.0130	0.0007	ND	0.0423
	d/s Urban	0.0007	0.790	0.0170	0.0023	ND	0.0677
Detection limit for all exposure periods		0.001	0.01	0.005	0.001	0.05	0.001

Exposure Period	Site	Copper (Cu)	Gallium (Ga)	Lanthanum (La)	Lead (Pb)	Lithium (Li)	Manganese (Mn)
Spring 2000	Food	19.30	0.211	0.056	0.583	0.331	52.400
	Control	0.71	0.021	ND	0.003	ND	0.204
	Ref	0.94	0.023	0.001	0.004	ND	0.226
	Ref (replicate)	0.92	0.021	0.001	0.003	ND	0.183
	d/s Urban	0.93	0.023	ND	0.017	ND	0.343
Fall 2000	Food	12.90	0.173	0.026	0.164	0.402	48.200
	Control	0.58	0.025	ND	0.004	ND	0.334
	Ref	0.86	0.022	ND	0.007	ND	0.174
	d/s Urban	0.87	0.020	ND	0.005	ND	0.212
Fall 2001	Food	6.55	0.148	0.009	0.168	0.384	28.200
	Control	0.89	0.018	ND	0.008	ND	0.320
	Ref	0.50	0.015	ND	0.002	ND	0.231
	d/s Urban	0.73	0.017	ND	0.003	ND	0.290
All exposures (mean)	Food	12.917	0.1773	0.0303	0.3050	0.3723	42.9333
	Control	0.727	0.0213	ND	0.0050	ND	0.2860
	Ref	0.767	0.0200	0.0003	0.0043	ND	0.2103
	d/s Urban	0.843	0.0200	ND	0.0083	ND	0.2817
Detection limit for all exposure periods		0.01	0.001	0.001	0.002	0.005	0.001

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

ND = Not detected. Considered a zero value for statistical calculations.

Table 67 (cont'd): Metal concentrations (mg/kg) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Rubidium (Rb)	Selenium (Se)	Silver (Ag)
Spring 2000	Food	0.126	0.460	1.32	3.570	2.25	0.016
	Control	0.066	0.004	0.06	2.540	0.35	ND
	Ref	0.074	0.006	0.05	2.510	0.36	0.001
	Ref (replicate)	0.075	0.005	0.05	2.360	0.43	ND
	d/s Urban	0.068	0.004	0.11	2.360	0.34	0.001
Fall 2000	Food	0.130	0.314	0.51	3.130	3.73	0.016
	Control	0.096	0.005	0.03	1.750	0.31	ND
	Ref	0.091	0.005	0.02	1.690	0.36	ND
	d/s Urban	0.095	0.005	0.04	1.710	0.37	ND
	Fall 2001	Food	0.041	0.193	0.45	2.040	2.20
Control		0.082	0.019	0.08	1.060	0.31	ND
Ref		0.037	0.005	0.01	0.922	0.22	ND
d/s Urban		0.037	0.011	0.04	1.020	0.20	ND
All exposures (mean)		Food	0.0990	0.3223	0.760	2.9133	2.727
	Control	0.0813	0.0093	0.057	1.7833	0.323	ND
	Ref	0.0673	0.0053	0.027	1.7073	0.313	0.0003
	d/s Urban	0.0667	0.0067	0.063	1.6967	0.303	0.0003
	Detection limit for all exposure periods	0.002	0.004	0.01	0.001	0.05	0.001

Exposure Period	Site	Strontium (Sr)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)
Spring 2000	Food	123.000	0.026	0.034	0.478	186.00
	Control	0.478	0.005	ND	ND	5.61
	Ref	0.854	0.005	ND	0.002	6.63
	Ref (replicate)	0.775	0.005	ND	ND	6.43
	d/s Urban	1.880	0.002	ND	ND	6.91
Fall 2000	Food	86.100	0.028	0.028	0.458	154.00
	Control	1.800	0.004	ND	ND	8.21
	Ref	0.661	0.005	ND	ND	8.42
	d/s Urban	0.476	0.004	ND	ND	7.92
	Fall 2001	Food	59.200	0.013	0.017	1.840
Control		1.040	0.003	ND	0.027	8.36
Ref		0.670	0.003	ND	0.014	7.25
d/s Urban		0.579	0.002	ND	0.011	7.02
All exposures (mean)		Food	89.4333	0.0223	0.0263	0.9253
	Control	1.1060	0.0040	ND	0.0090	7.393
	Ref	0.7283	0.0043	ND	0.0053	7.433
	d/s Urban	0.9783	0.0027	ND	0.0037	7.283
	Detection limit for all exposure periods	0.005	0.001	0.001	0.002	0.01

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 68: Metal concentrations (mg/kg) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)
Spring 2000	Control	0.006	0.2	0.023	0.002	ND	0.081
	Ref	0.001	0.18	0.337	0.004	0.1	0.034
	d/s Urban	0.001	0.16	0.583	0.005	0.23	0.044
	Fall 2000	Control	0.001	0.19	0.022	0.002	ND
Ref		0.002	0.24	0.088	0.003	ND	0.094
d/s Urban		0.002	0.26	0.117	0.003	0.06	0.05
Fall 2001		Control	0.001	0.17	0.014	0.003	0.06
	Ref	0.001	0.28	0.152	0.001	ND	0.013
	d/s Urban	0.001	0.31	0.078	0.001	0.08	0.083
	All exposures (mean)	Control	0.0027	0.187	0.0197	0.0023	0.020
Ref		0.0013	0.233	0.1923	0.0027	0.033	0.0470
d/s Urban		0.0013	0.243	0.2593	0.0030	0.123	0.0590
Detection limit for all exposure periods		0.001	0.01	0.005	0.001	0.05	0.001

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

ND = Not detected. Considered a zero value for statistical calculations.

Table 68 (cont'd): Metal concentrations (mg/kg) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Copper (Cu)	Gallium (Ga)	Lanthanum (La)	Lead (Pb)	Lithium (Li)	Manganese (Mn)
Spring 2000	Control	7.6	0.024	0.001	0.035	ND	0.848
	Ref	5.39	0.026	0.006	0.013	0.018	2.06
	d/s Urban	5.32	0.028	0.006	0.018	0.007	29.5
Fall 2000	Control	6.61	0.019	ND	0.011	ND	0.318
	Ref	8.1	0.019	0.002	0.008	0.007	0.616
	d/s Urban	9.34	0.022	0.002	0.021	ND	4.9
Fall 2001	Control	10.7	0.015	0.001	0.003	ND	0.447
	Ref	8.04	0.016	0.003	0.007	0.012	0.728
	d/s Urban	9.81	0.02	0.003	0.127	ND	2.77
All exposures (mean)	Control	8.303	0.0193	0.0007	0.0163	ND	0.5377
	Ref	7.177	0.0203	0.0037	0.0093	0.0123	1.1347
	d/s Urban	8.157	0.0233	0.0037	0.0553	0.0023	12.3900
Detection limit for all exposure periods		0.01	0.001	0.001	0.002	0.005	0.001

Exposure Period	Site	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Rubidium (Rb)	Selenium (Se)	Silver (Ag)
Spring 2000	Control	0.089	0.014	0.13	3.22	0.26	0.008
	Ref	0.064	0.02	0.08	2.93	0.18	0.04
	d/s Urban	0.067	0.056	0.24	2.95	0.4	0.008
Fall 2000	Control	0.049	0.012	0.06	2.78	0.23	0.007
	Ref	0.043	0.013	0.06	2.54	0.3	0.009
	d/s Urban	0.051	0.016	0.13	2.95	0.23	0.012
Fall 2001	Control	0.058	0.03	0.05	2.29	0.27	0.014
	Ref	0.119	0.012	0.01	2.4	0.22	0.008
	d/s Urban	0.106	0.018	0.07	2.46	0.19	0.008
All exposures (mean)	Control	0.0653	0.0187	0.080	2.763	0.253	0.0097
	Ref	0.0753	0.0150	0.050	2.623	0.233	0.0190
	d/s Urban	0.0747	0.0300	0.147	2.787	0.273	0.0093
Detection limit for all exposure periods		0.002	0.004	0.01	0.001	0.05	0.001

Exposure Period	Site	Strontium (Sr)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)
Spring 2000	Control	0.22	0.001	ND	0.003	15.4
	Ref	0.407	0.002	0.001	0.053	15
	d/s Urban	1.43	0.001	0.001	0.04	17.5
Fall 2000	Control	0.321	0.001	ND	ND	12.7
	Ref	0.244	0.001	ND	0.016	11.8
	d/s Urban	0.332	0.001	ND	0.013	14
Fall 2001	Control	0.147	ND	ND	0.024	12.9
	Ref	0.203	0.001	ND	0.043	13.4
	d/s Urban	0.183	0.001	ND	0.016	14.4
All exposures (mean)	Control	0.2293	0.0007	ND	0.0090	13.67
	Ref	0.2847	0.0013	0.0003	0.0373	13.40
	d/s Urban	0.6483	0.0010	0.0003	0.0230	15.30
Detection limit for all exposure periods		0.005	0.001	0.001	0.002	0.01

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 69: Metal concentrations (mg/kg) in crayfish hepatopancreas exposed to Yorkson Creek water during one exposure period.

Exposure Period	Site	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Gallium (Ga)	Lanthanum (La)	Lead (Pb)	Lithium (Li)	Manganese (Mn)
Fall 2001	Control	0.001	0.63	2.63	0.154	ND	0.545	77.3	0.015	0.033	0.092	ND	9.02
	Ref	0.007	0.44	26.9	0.267	1.27	2.53	93.6	0.017	0.031	1.02	0.011	27
	d/s Urban	0.003	0.45	0.466	0.178	ND	0.574	98.5	0.02	0.019	0.071	ND	190
Detection limit (all exposures)		0.001	0.01	0.005	0.001	0.05	0.001	0.01	0.001	0.001	0.002	0.005	0.001

Exposure Period	Site	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Rubidium (Rb)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)
Fall 2001	Control	0.007	0.498	0.2	2.08	1.81	0.178	0.919	0.003	0.009	0.021	30.2
	Ref	0.032	0.64	1.15	1.98	1.82	0.252	1.35	0.009	0.011	0.011	55
	d/s Urban	0.01	0.508	0.46	1.85	1.91	0.292	0.826	0.002	0.012	0.014	40.3
Detection limit (all exposures)		0.002	0.004	0.01	0.001	0.05	0.001	0.005	0.001	0.001	0.002	0.01

NOTE: Sample per site is a composite of hepatopancreas tissue from 24 crayfish.

ND = Not detected.

5.2.2 Polychlorinated Biphenyls

5.2.2.1 PCB Aroclors

Cutthroat Trout

Table 70: Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

	Spring 2000											
	Food		Control		Control (replicate)		Ref		Ref (lab split)		d/s Urban	
PCB Aroclors	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	1.6	0.038	15	0.22	17	0.35	5	0.096	5.2	0.085	6	0.074
Aroclor 1254	13	0.27	3.3	0.19	3.6	0.35	3.8	0.2	3.7	0.19	4.1	0.16
Aroclor 1260	7.1	0.076	2.1	0.17	2.5	0.1	2.4	0.13	2.4	0.13	2.5	0.14
Total PCB Aroclor concentration**	21.7		20.4		23.1		11.2		11.3		12.6	
Mammalian TEQ (ng/kg ww)												
Aroclor 1242	n/a		0.077		0.087		0.026		0.027		0.031	
Aroclor 1254	n/a		0.099		0.108		0.114		0.111		0.123	
Aroclor 1260	n/a		0.024		0.028		0.027		0.027		0.028	
Avian TEQ (ng/kg ww)												
Aroclor 1242	n/a		3.519		3.988		1.173		1.220		1.408	
Aroclor 1254	n/a		0.147		0.160		0.169		0.165		0.182	
Aroclor 1260	n/a		0.054		0.064		0.061		0.061		0.064	
% Lipid	18.0		3.4		3.5		3.7		3.7		3.3	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-ARO-1		TC-00-ARO-1		TC-00-ARO-2		TC-00-ARO-1		TC-00-ARO-1		TC-00-ARO-1	

Exceeds tissue residue guidelines for avian consumption (see Appendix A).

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

** = Total standardized to highest detection limit per exposure period (Food not included).

Table 70 (cont'd): Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Aroclors	Fall 2000									
	Food		Control		Control (replicate)		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	2.1	0.059	2.4	0.1	2.6	0.11	1.7	0.094	1.9	0.068
Aroclor 1254	20	0.23	5.4	0.35	6.2	0.37	5.5	0.26	6.3	0.45
Aroclor 1260	9.6	0.12	3.4	0.074	3.4	0.084	2.8	0.24	3.4	0.069
Total PCB Aroclor concentration**	31.7		11.2		12.2		10.0		11.6	
Mammalian TEQ (ng/kg ww)										
Aroclor 1242	n/a		0.012		0.013		0.009		0.010	
Aroclor 1254	n/a		0.163		0.187		0.166		0.190	
Aroclor 1260	n/a		0.038		0.038		0.032		0.038	
Avian TEQ (ng/kg ww)										
Aroclor 1242	n/a		0.563		0.610		0.399		0.446	
Aroclor 1254	n/a		0.240		0.276		0.245		0.280	
Aroclor 1260	n/a		0.087		0.087		0.071		0.087	
% Lipid	17.0		3.1		3.0		3.0		2.9	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-ARO-1		TC-00-ARO-2		TC-00-ARO-2		TC-00-ARO-1		TC-00-ARO-2	

PCB Aroclors	Fall 2001								Mean of 3 exposure periods			
	Food		Control		Ref		d/s Urban		Food	Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.
Aroclor 1242	ND	0.893	0.247	0.138	0.23	0.219	0.323	0.0859	1.233	5.882	2.310	2.741
Aroclor 1254	3.41	0.395	2.48	0.459	2.19	0.285	1.98	0.255	12.137	3.727	3.830	4.127
Aroclor 1260	2.28	0.0781	1.15	0.183	1.01	0.104	0.954	0.0717	6.327	2.217	2.070	2.285
Total PCB Aroclor concentration**	5.69		3.88		3.43		3.26		19.70	11.83	8.21	9.15
Mammalian TEQ (ng/kg ww)												
Aroclor 1242	n/a		0.001		0.001		0.002		n/a	0.030	0.012	0.014
Aroclor 1254	n/a		0.075		0.066		0.060		n/a	0.112	0.115	0.124
Aroclor 1260	n/a		0.013		0.011		0.011		n/a	0.025	0.023	0.026
Avian TEQ (ng/kg ww)												
Aroclor 1242	n/a		0.058		0.054		0.076		n/a	1.380	0.542	0.643
Aroclor 1254	n/a		0.110		0.097		0.088		n/a	0.166	0.170	0.184
Aroclor 1260	n/a		0.029		0.026		0.024		n/a	0.057	0.053	0.058
% Lipid	26.0		3.0		3.6		3.2		20.33	3.17	3.43	3.13
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-ARO-2		TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1		-	-	-	-

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 71: Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Aroclors	Spring 2000						Fall 2000					
	Control		Ref		d/s Urban		Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	ND	0.16	ND	0.18	ND	0.11	ND	0.19	ND	0.25	ND	0.24
Aroclor 1254	ND	0.39	ND	0.29	ND	0.25	ND	0.48	ND	0.6	ND	0.57
Aroclor 1260	ND	0.47	ND	0.18	ND	0.26	ND	0.49	ND	0.68	ND	0.74
Total PCB Aroclor concentration**	ND		ND		ND		ND		ND		ND	
Mammalian TEQ (ng/kg ww)												
Aroclor 1242	0		0		0		0		0		0	
Aroclor 1254	0		0		0		0		0		0	
Aroclor 1260	0		0		0		0		0		0	
Avian TEQ (ng/kg ww)												
Aroclor 1242	0		0		0		0		0		0	
Aroclor 1254	0		0		0		0		0		0	
Aroclor 1260	0		0		0		0		0		0	
% Lipid	0.4		0.6		0.4		0.6		0.5		0.6	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-ARO-3		TC-00-ARO-2		TC-00-ARO-3		TC-00-ARO-3		TC-00-ARO-3		TC-00-ARO-3	

PCB Aroclors	Fall 2001						Mean of 3 exposure periods			
	Control		Ref		d/s Urban		Control	Ref	d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	
Aroclor 1242	0.0707	0.0692	ND	0.0844	ND	0.0676	0.0236	ND	ND	
Aroclor 1254	0.782	0.116	0.129	0.108	0.248	0.129	0.2607	0.043	0.0827	
Aroclor 1260	0.599	0.0533	0.0824	0.0667	0.197	0.0419	0.1997	0.0275	0.0657	
Total PCB Aroclor concentration**	1.381		0.211		0.445		0.4603	0.0705	0.1483	
Mammalian TEQ (ng/kg ww)										
Aroclor 1242	0.0004		0		0		0.00012	0	0	
Aroclor 1254	0.024		0.004		0.007		0.0078	0.0013	0.0025	
Aroclor 1260	0.007		0.001		0.002		0.0023	0.00031	0.00074	
Avian TEQ (ng/kg ww)										
Aroclor 1242	0.017		0		0		0.0055	0	0	
Aroclor 1254	0.035		0.006		0.011		0.0116	0.0019	0.0037	
Aroclor 1260	0.015		0.002		0.005		0.0051	0.0007	0.0017	
% Lipid	1.1		0.4		0.5		0.70		0.50	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1		-	-	-	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 72: Polychlorinated biphenyl (PCB) aroclor concentrations (ng/g) in crayfish hepatopancreas exposed to Yorkson Creek water during one exposure period.

PCB Aroclors	Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	2.82	0.733	1.55	0.752	2.39	0.665
Aroclor 1254	41.1	1.1	24	0.983	34.6	1.52
Aroclor 1260	38.7	0.679	36.5	1.06	42.8	0.831
Total PCB Aroclor concentration**	82.62		62.05		79.79	
Mammalian TEQ (ng/kg ww)						
Aroclor 1242	0.014		0.008		0.012	
Aroclor 1254	1.237		0.722		1.041	
Aroclor 1260	0.437		0.412		0.484	
Avian TEQ (ng/kg ww)						
Aroclor 1242	0.662		0.364		0.561	
Aroclor 1254	1.829		1.068		1.540	
Aroclor 1260	0.987		0.931		1.091	
% Lipid	53.0		30.0		28.0	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-ARO-1		TC-01-ARO-1		TC-01-ARO-1	

Exceeds tissue residue guideline for mammalian consumption (see Appendix A).

NOTE: Sample per site per exposure period is a composite of hepatopancreas tissue from 24 crayfish.

** = Total standardized to highest detection limit.

5.2.2.2 PCB Congeners

Cutthroat Trout

Table 73: Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Spring 2000											
	Food		Control		Control (replicate)		Ref		Ref (lab split)		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	0.034	0.012	0.48	0.022	0.69	0.1	0.12	0.019	0.13	0.021	0.11	0.013
15	ND	0.012	0.06	0.022	ND	0.1	ND	0.019	ND	0.021	ND	0.013
19	0.0044*	0.0019	0.056	0.003	0.08	0.0079	0.013	0.0032	0.016	0.0032	0.015	0.0033
18	0.082	0.0019	0.86	0.003	1.2	0.0079	0.27	0.0032	0.29	0.0032	0.3	0.0033
17	0.032	0.0019	0.41	0.003	0.51	0.0079	0.13	0.0032	0.14	0.0032	0.15	0.0033
24/27	0.011	0.0019	0.091	0.003	0.13	0.0079	0.029	0.0032	0.032	0.0032	0.029	0.0033
16/32	0.036	0.0018	0.49	0.01	0.52	0.015	0.15	0.0045	0.16	0.004	0.16	0.0035
26	0.027	0.0018	0.25	0.01	0.27	0.015	0.088	0.0045	0.091	0.004	0.11	0.0035
25	0.011	0.0018	0.11	0.01	0.11	0.015	0.032	0.0045	0.035	0.004	0.04	0.0035
31/28	0.32	0.0018	2.56	0.01	2.8	0.015	0.92	0.0045	0.94	0.004	1.13	0.0035
33/20/21	0.058	0.0018	0.67	0.01	0.69	0.015	0.18	0.0045	0.19	0.004	0.19	0.0035
22	0.039	0.0018	0.3	0.01	0.3	0.015	0.075	0.0045	0.078	0.004	0.1	0.0035
45	0.019	0.0019	0.14	0.0047	0.15	0.003	0.048	0.0035	0.047	0.0042	0.057	0.0034
46	0.0063	0.0019	0.033	0.0047	0.04	0.003	0.0086	0.0035	0.01	0.0042	0.008	0.0034
52/73	0.57	0.0019	0.92	0.0047	0.98	0.003	0.43	0.0035	0.43	0.0042	0.53	0.0034
49/43	0.29	0.0018	0.71	0.0047	0.81	0.0032	0.29	0.0035	0.29	0.0042	0.38	0.0034
47/48 /75	0.21	0.0019	0.62	0.0047	0.65	0.003	0.25	0.0035	0.25	0.0042	0.33	0.0034
44	0.2	0.0019	0.62	0.0048	0.68	0.0033	0.23	0.0035	0.23	0.0043	0.28	0.0035
42/59	0.1	0.0019	0.35	0.0048	0.37	0.0033	0.12	0.0035	0.12	0.0043	0.16	0.0035
41/71/64/68	0.25	0.0014	0.76	0.0036	0.81	0.0024	0.29	0.0026	0.29	0.0032	0.37	0.0026
40	0.018	0.0014	0.057	0.0036	0.053	0.0024	0.015	0.0026	0.015	0.0032	0.02	0.0026
74/61	0.26	0.0014	0.21	0.0036	0.23	0.0024	0.11	0.0026	0.11	0.0032	0.14	0.0026
70/76	0.41	0.0014	0.35	0.0036	0.4	0.0024	0.19	0.0026	0.19	0.0032	0.24	0.0026
66/80	0.38	0.0014	0.24	0.0036	0.28	0.0024	0.15	0.0026	0.15	0.0032	0.18	0.0026
56/60	0.14	0.0019	0.031	0.003	0.032	0.0054	0.025	0.0022	0.027	0.0023	0.033	0.0023
95/93	0.38	0.0015	0.17	0.0035	0.17	0.0025	0.13	0.0024	0.14	0.0034	0.15	0.0034
91	0.079	0.0015	0.038	0.0035	0.038	0.0025	0.028	0.0024	0.029	0.0034	0.033	0.0034
92	0.22	0.0078	0.057	0.0055	0.06	0.0099	0.06	0.0059	0.065	0.0054	0.067	0.0045
84	0.078	0.0078	0.024	0.0055	0.028	0.0099	0.018	0.0059	0.019	0.0054	0.019	0.0045
89/90/101	1.3	0.0078	0.33	0.0055	0.39	0.0099	0.38	0.0059	0.39	0.0054	0.41	0.0045
99	0.8	0.0078	0.21	0.0055	0.23	0.0099	0.24	0.0059	0.24	0.0054	0.26	0.0045
83/108	0.027	0.0068	0.0077	0.0048	ND	0.0087	0.0077	0.0051	0.0057	0.0047	0.005	0.004
97/86	0.16	0.0068	0.037	0.0048	0.041	0.0087	0.044	0.0051	0.042	0.0047	0.047	0.004
87/115/116	0.29	0.0068	0.075	0.0048	0.072	0.0087	0.082	0.0051	0.082	0.0047	0.09	0.004
85/120	0.18	0.0068	0.046	0.0048	0.058	0.0087	0.057	0.0051	0.052	0.0047	0.058	0.004
110	0.82	0.0068	0.22	0.0048	0.25	0.0087	0.25	0.0051	0.25	0.0047	0.26	0.004
107/109	0.13	0.0048	0.031	0.0046	0.054	0.0074	0.043	0.0033	0.041	0.004	0.041	0.0035
106/118	1.2	0.0055	0.3	0.0053	0.33	0.0054	0.36	0.0036	0.37	0.0045	0.38	0.004
114	0.025	0.0048	0.0047	0.0046	0.019	0.0074	0.006	0.0033	0.0086	0.004	0.0076	0.0035
105/127	0.41	0.0059	0.096	0.0055	0.11	0.0053	0.12	0.0038	0.11	0.0048	0.12	0.0042
136	0.079	0.0021	0.02*	0.0038	0.021*	0.0025	0.024	0.0029	0.022	0.0035	0.025	0.0038
151	0.29	0.0035	0.08	0.0047	0.086	0.0057	0.1	0.0037	0.091	0.0049	0.094	0.0034
144/135	0.18	0.0035	0.056	0.0047	0.056	0.0057	0.063	0.0037	0.054	0.0049	0.06	0.0034
149/139	0.96	0.0035	0.29	0.0047	0.34	0.0057	0.33	0.0037	0.33	0.0049	0.35	0.0034
134/143	0.03	0.0035	0.0069	0.0047	0.008*	0.0057	0.011	0.0037	0.0082	0.0049	0.0095	0.0034
131/142	ND	0.0035	ND	0.0047	ND	0.0057	ND	0.0037	ND	0.0049	ND	0.0034

Table 73 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Spring 2000											
	Food		Control		Control (replicate)		Ref		Ref (lab split)		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
146	0.42	0.0043	0.12	0.0057	0.14	0.0067	0.13	0.004	0.13	0.0058	0.15	0.0042
153	2.8	0.0043	0.75	0.0057	0.83	0.0067	0.82	0.004	0.84	0.0058	0.94	0.0042
141	0.22	0.0054	0.061	0.0072	0.068	0.0089	0.063	0.005	0.067	0.0073	0.078	0.0053
130	0.09	0.0054	0.026	0.0071	0.035	0.0091	0.031	0.0049	0.026	0.0072	0.032	0.0053
137	0.08	0.0054	0.024	0.0071	0.029	0.0091	0.025	0.0049	0.022	0.0072	0.024	0.0053
138/163/164	2.4	0.0054	0.65	0.0071	0.76	0.0091	0.75	0.0049	0.76	0.0072	0.8	0.0053
158/160	0.17	0.0054	0.048	0.0071	0.044*	0.0091	0.052	0.0049	0.058	0.0072	0.057	0.0053
129	0.026	0.0054	ND	0.0071	ND	0.0091	0.0053*	0.0049	ND	0.0072	0.0071	0.0053
128	0.24	0.0054	0.069	0.0071	0.077*	0.0091	0.074	0.0049	0.071	0.0072	0.082	0.0053
156	0.13	0.0054	0.032	0.0071	0.046	0.0091	0.038	0.0049	0.038	0.0072	0.046	0.0053
157	0.037	0.0054	0.0075*	0.0071	0.016*	0.0091	0.012	0.0049	0.0081	0.0072	0.011	0.0053
179	0.17	0.0036	0.053	0.0081	0.057	0.0049	0.059	0.006	0.058	0.0062	0.062	0.0066
176	0.043	0.0036	0.011	0.0081	0.024*	0.0049	0.01	0.006	0.011	0.0062	0.0094	0.0066
178	0.11	0.0036	0.034	0.0081	0.055*	0.0049	0.039	0.006	0.04	0.0062	0.04	0.0066
175	0.017	0.0036	ND	0.0081	0.009*	0.0049	0.0063	0.006	ND	0.0062	ND	0.0066
187/182	0.73	0.0036	0.24	0.0081	0.23	0.0049	0.26	0.006	0.24	0.0062	0.27	0.0066
183	0.25	0.0037	0.073	0.0084	0.1	0.0051	0.083	0.0062	0.08	0.0065	0.086	0.0068
185	0.026	0.0037	0.0092	0.0084	0.006*	0.0051	ND	0.0062	0.0088	0.0065	0.0072	0.0068
174/181	0.19	0.0037	0.054	0.0084	0.085	0.0051	0.06	0.0062	0.063	0.0065	0.062	0.0068
177	0.15	0.0037	0.049	0.0084	0.055	0.0051	0.054	0.0062	0.051	0.0065	0.056	0.0068
171	0.067	0.0034	0.023	0.0076	0.021	0.0044	0.023	0.0056	0.025	0.0059	0.027	0.0062
172/192	0.05	0.0034	0.014	0.0076	0.021*	0.0044	0.017	0.0056	0.019	0.0059	0.017	0.0062
180	0.66	0.0034	0.19	0.0076	0.21	0.0044	0.22	0.0056	0.21	0.0059	0.22	0.0062
193	0.057	0.0034	0.015	0.0076	0.028*	0.0044	0.022	0.0056	0.018	0.0059	0.017	0.0062
191	0.012	0.0034	ND	0.0076	0.009*	0.0044	ND	0.0056	ND	0.0059	ND	0.0062
170/190	0.26	0.0041	0.088	0.0092	0.1	0.0055	0.094	0.0068	0.098	0.0071	0.1	0.0075
189	0.0093	0.0041	ND	0.0092	0.008*	0.0055	ND	0.0068	ND	0.0071	ND	0.0075
201	0.035	0.0043	0.011*	0.01	0.016	0.0062	0.01	0.0078	0.011	0.0095	0.014	0.0089
197	0.01	0.0043	ND	0.01	ND	0.0062	ND	0.0078	ND	0.0095	ND	0.0089
198	0.0057	0.0043	ND	0.01	ND	0.0062	ND	0.0078	ND	0.0095	ND	0.0089
199	0.13	0.0043	0.043	0.01	0.044	0.0062	0.054	0.0078	0.052	0.0095	0.047	0.0089
196/203	0.12	0.0043	0.043	0.01	0.058	0.0062	0.045	0.0078	0.043	0.0095	0.04	0.0089
195	0.053	0.0047	0.018	0.012	0.029	0.01	0.017	0.0097	0.017	0.01	0.016	0.012
194	0.15	0.0047	0.056	0.012	0.062	0.01	0.056	0.0097	0.054	0.01	0.054	0.012
205	0.0088	0.0047	ND	0.012	ND	0.01	ND	0.0097	ND	0.01	ND	0.012
208	0.05	0.0044	0.025	0.012	0.025	0.0051	0.029	0.0073	0.027*	0.011	0.03	0.0086
207	0.024	0.0044	ND	0.012	0.008	0.0051	0.012*	0.0073	ND	0.011	0.013	0.0086
206	0.072	0.0044	0.033	0.012	0.026	0.0051	0.038	0.0073	0.035	0.011	0.037	0.0086
209	0.057	0.0042	0.029	0.013	0.024*	0.0055	0.03	0.008	0.029	0.013	0.029	0.0098
Total PCB concentration**	21.27		16.28		18.46		9.71		9.78		10.97	
TEQ-Mammalian (ng/kg ww)	n/a		0.062		0.085		0.076		0.075		0.082	
TEQ-Avian (ng/kg ww)	n/a		0.017		0.022		0.021		0.020		0.022	
% Lipid	18.0		3.4		3.5		3.7		3.7		3.3	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PCB-1		TC-00-PCB-1		TC-00-PCB-2		TC-00-PCB-1		TC-00-PCB-1		TC-00-PCB-1	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 73 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Fall 2000									
	Food		Control		Control (replicate)		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	0.029	0.017	ND	0.06	ND	0.1	ND	0.024	ND	0.025
15	ND	0.017	ND	0.06	ND	0.1	ND	0.024	ND	0.025
19	0.0039	0.0026	0.005*	0.0044	ND	0.0068	ND	0.0045	0.008*	0.0032
18	0.1	0.0026	0.13	0.0044	0.14	0.0068	0.068	0.0045	0.1	0.0032
17	0.025	0.0026	0.06	0.0044	0.055	0.0068	0.033	0.0045	0.045	0.0032
24/27	0.013	0.0026	0.012*	0.0044	0.014	0.0068	0.0066	0.0045	0.012*	0.0032
16/32	0.045	0.0028	0.063	0.0044	0.062	0.0048	0.036	0.0044	0.046	0.003
26	0.046	0.0028	0.044	0.0044	0.048	0.0048	0.034	0.0044	0.035	0.003
25	0.013	0.0028	0.015*	0.0044	0.017	0.0048	0.0079	0.0044	0.01	0.003
31/28	0.46	0.0028	0.47	0.0044	0.52	0.0048	0.36	0.0044	0.38	0.003
33/20/21	0.082	0.0028	0.065	0.0044	0.064	0.0048	0.035	0.0044	0.046	0.003
22	0.056	0.0028	0.033	0.0044	0.034*	0.0048	0.014	0.0044	0.023*	0.003
45	0.016	0.0033	0.018*	0.0031	0.02*	0.0061	0.014	0.0051	0.02*	0.0032
46	0.006	0.0033	ND	0.0031	ND	0.0061	ND	0.0051	0.005*	0.0032
52/73	0.83	0.0033	0.4	0.0031	0.38	0.0061	0.34	0.0051	0.37	0.0032
49/43	0.33	0.0033	0.22	0.0033	0.21	0.0065	0.18	0.0051	0.21	0.0034
47/48 /75	0.3	0.0033	0.19	0.0031	0.17	0.0061	0.14	0.0051	0.17	0.0032
44	0.28	0.0033	0.18	0.0033	0.16	0.0066	0.12	0.0051	0.16	0.0035
42/59	0.11	0.0033	0.092	0.0033	0.074	0.0066	0.059	0.0051	0.077	0.0035
41/71/64/68	0.33	0.0025	0.22	0.0024	0.21	0.0047	0.16	0.0038	0.2	0.0025
40	0.026	0.0025	0.011*	0.0024	0.013*	0.0047	0.0066	0.0038	0.009*	0.0025
74/61	0.38	0.0025	0.14	0.0024	0.15	0.0047	0.12	0.0038	0.15	0.0025
70/76	0.65	0.0025	0.26	0.0024	0.25	0.0047	0.22	0.0038	0.26	0.0025
66/80	0.54	0.0025	0.21	0.0024	0.21	0.0047	0.18	0.0038	0.21	0.0025
56/60	0.21	0.0023	0.049	0.0038	0.055	0.0031	0.041	0.0031	0.046	0.0038
95/93	0.55	0.0027	0.2	0.0023	0.22	0.0038	0.18	0.0044	0.19	0.003
91	0.095	0.0027	0.03	0.0023	0.033*	0.0038	0.029	0.0044	0.035*	0.003
92	0.31	0.0067	0.093	0.01	0.1	0.011	0.095	0.0074	0.086	0.013
84	0.1	0.0067	0.026*	0.01	0.024*	0.011	0.022	0.0074	0.028	0.013
89/90/101	1.9	0.0067	0.6	0.01	0.59	0.011	0.58	0.0074	0.62	0.013
99	1.2	0.0067	0.35	0.01	0.35	0.011	0.33	0.0074	0.37	0.013
83/108	0.037	0.0059	ND	0.0089	0.01	0.0093	0.011	0.0064	ND	0.011
97/86	0.24	0.0059	0.071*	0.0089	0.077	0.0093	0.069	0.0064	0.08	0.011
87/115/116	0.47	0.0059	0.16	0.0089	0.15	0.0093	0.13	0.0064	0.14	0.011
85/120	0.31	0.0059	0.1	0.0089	0.098	0.0093	0.083	0.0064	0.097	0.011
110	1.3	0.0059	0.4	0.0089	0.4	0.0093	0.36	0.0064	0.39	0.011
107/109	0.21	0.007	0.099	0.009	0.077	0.011	0.053	0.006	0.1	0.0087
106/118	2.1	0.0077	0.6	0.0062	0.58	0.0078	0.57	0.0068	0.67	0.007
114	0.048	0.007	0.021	0.009	0.028*	0.011	0.013	0.006	0.02	0.0087
105/127	0.78	0.008	0.22	0.0062	0.18	0.0072	0.2	0.0072	0.23	0.0066
136	0.1	0.0027	0.027	0.0022	0.03	0.0039	0.025	0.0051	0.03	0.0028
151	0.42	0.0049	0.15	0.0077	0.13	0.0043	0.12	0.007	0.14	0.0053
144/135	0.27	0.0049	0.082	0.0077	0.098	0.0043	0.076	0.007	0.078	0.0053
149/139	1.4	0.0049	0.48	0.0077	0.46	0.0043	0.42	0.007	0.41	0.0053
134/143	0.048	0.0049	0.015*	0.0077	0.012*	0.0043	0.013	0.007	0.013*	0.0053
131/142	0.008	0.0049	ND	0.0077	ND	0.0043	ND	0.007	ND	0.0053
146	0.55	0.0054	0.17	0.0086	0.17	0.0046	0.17	0.0084	0.18	0.0064
153	3.8	0.0054	1.2	0.0086	1.2	0.0046	1.1	0.0084	1.2	0.0064

Table 73 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Fall 2000									
	Food		Control		Control (replicate)		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
141	0.34	0.0068	0.11	0.012	0.13	0.0061	0.097	0.011	0.12	0.0085
130	0.14	0.0068	0.052*	0.012	0.048	0.0062	0.038	0.01	0.045	0.0087
137	0.12	0.0068	0.043	0.012	0.045	0.0062	0.032	0.01	0.04	0.0087
138/163/164	3.6	0.0068	1.2	0.012	1.1	0.0062	1	0.01	1.2	0.0087
158/160	0.27	0.0068	0.085*	0.012	0.077*	0.0062	0.076	0.01	0.096	0.0087
129	0.055	0.0068	ND	0.012	0.011*	0.0062	ND	0.01	0.014*	0.0087
128	0.38	0.0068	0.13	0.012	0.12	0.0062	0.1	0.01	0.13	0.0087
156	0.21	0.0068	0.065	0.012	0.074*	0.0062	0.053	0.01	0.073*	0.0087
157	0.059	0.0068	0.014*	0.012	0.017*	0.0062	0.013	0.01	0.021*	0.0087
179	0.2	0.0059	0.089	0.0036	0.081	0.0041	0.063	0.011	0.08	0.0033
176	0.055	0.0059	0.018*	0.0036	0.024	0.0041	0.014	0.011	0.012*	0.0033
178	0.16	0.0059	0.048	0.0036	0.041	0.0041	0.043	0.011	0.048*	0.0033
175	0.024	0.0059	0.004*	0.0036	ND	0.0041	ND	0.011	0.008*	0.0033
187/182	0.98	0.0059	0.31	0.0036	0.33	0.0041	0.3	0.011	0.31	0.0033
183	0.34	0.0061	0.11	0.0037	0.13	0.0043	0.1	0.012	0.12	0.0035
185	0.032	0.0061	0.009*	0.0037	0.017*	0.0043	ND	0.012	ND	0.0035
174/181	0.27	0.0061	0.073*	0.0037	0.079*	0.0043	0.071	0.012	0.077	0.0035
177	0.21	0.0061	0.066*	0.0037	0.072	0.0043	0.061	0.012	0.077	0.0035
171	0.093	0.0055	0.036*	0.0032	0.034*	0.0037	0.026	0.011	0.024*	0.003
172/192	0.068	0.0055	0.017*	0.0032	0.024	0.0037	0.018*	0.011	0.033	0.003
180	0.87	0.0055	0.32	0.0032	0.31	0.0037	0.25	0.011	0.32	0.003
193	0.082	0.0055	0.029	0.0032	0.03*	0.0037	0.021	0.011	0.027	0.003
191	0.019	0.0055	ND	0.0032	ND	0.0037	ND	0.011	ND	0.003
170/190	0.38	0.0067	0.12	0.0039	0.13	0.0045	0.11	0.013	0.12	0.0037
189	0.017	0.0067	0.006*	0.0039	0.006	0.0045	ND	0.013	0.006*	0.0037
201	0.05	0.008	0.014*	0.0044	0.016*	0.0074	ND	0.016	0.015*	0.0031
197	0.016	0.008	0.006	0.0044	ND	0.0074	ND	0.016	0.004*	0.0031
198	ND	0.008	ND	0.0044	ND	0.0074	ND	0.016	ND	0.0031
199	0.16	0.008	0.051	0.0044	0.053	0.0074	0.059	0.016	0.052	0.0031
196/203	0.16	0.008	0.06	0.0044	0.071	0.0074	0.051	0.016	0.065	0.0031
195	0.067	0.0076	0.025	0.0068	0.021*	0.0071	0.019	0.015	0.027	0.0059
194	0.19	0.0076	0.079	0.0068	0.081*	0.0071	0.065	0.015	0.083	0.0059
205	0.014	0.0076	0.007*	0.0068	ND	0.0071	ND	0.015	ND	0.0059
208	0.061	0.0069	0.02	0.004	0.023	0.005	0.021	0.015	0.018	0.0034
207	0.031	0.0069	ND	0.004	0.012*	0.005	ND	0.015	0.011*	0.0034
206	0.08	0.0069	0.022	0.004	0.028*	0.005	0.027	0.015	0.022	0.0034
209	0.063	0.0072	0.017	0.0038	0.015	0.0046	0.024	0.014	0.016*	0.0031
Total PCB concentration**	30.99		11.19		11.08		9.57		10.96	
TEQ-Mammalian (ng/kg ww)	n/a		0.133		0.136		0.117		0.148	
TEQ-Avian (ng/kg ww)	n/a		0.038		0.036		0.034		0.041	
% Lipid	17.0		3.1		3.0		3.0		2.9	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PCB-1		TC-00-PCB-2		TC-00-PCB-2		TC-00-PCB-1		TC-00-PCB-2	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 73 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Fall 2001								Mean of 3 exposure periods			
	Food		Control		Ref		d/s Urban		Food	Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.
8/5	ND	0.235	0.0183*	0.0179	ND	0.0575	ND	0.0226	0.0210	0.1661	0.0400	0.0367
15	ND	0.139	ND	0.0107	ND	0.0344	ND	0.0135	ND	0.0200	ND	ND
19	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0204	0.0028	0.0203	0.0043	0.0077
18	ND	0.0745	ND	0.0363	ND	0.0333	0.0267	0.0204	0.0607	0.3300	0.1127	0.1422
17	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0204	0.0190	0.1567	0.0543	0.0650
24/27	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0204	0.0080	0.0343	0.0119	0.0137
16/32	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0204	0.0270	0.1843	0.0620	0.0687
26	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0204	0.0243	0.0980	0.0407	0.0483
25	ND	0.0745	ND	0.0363	ND	0.0333	ND	0.0204	0.0080	0.0417	0.0133	0.0167
31/28	0.0486*	0.0457	0.1294*	0.0229	0.1152*	0.021	0.1124*	0.0128	0.2762	1.0531	0.4651	0.5408
33/20/21	0.210*	0.0457	0.0231*	0.0229	ND	0.0210	ND	0.0128	0.1167	0.2527	0.0717	0.0787
22	ND	0.0457	ND	0.0229	ND	0.0210	ND	0.0128	0.0317	0.1110	0.0297	0.0410
45	ND	0.0865	ND	0.0139	ND	0.0175	ND	0.0114	0.0117	0.0527	0.0207	0.0257
46	ND	0.0865	ND	0.0139	ND	0.0175	ND	0.0114	0.0041	0.0110	0.0029	0.0043
52/73	ND	0.0865	0.108	0.0139	0.105	0.0175	0.110	0.0114	0.4667	0.4760	0.2917	0.3367
49/43	ND	0.0865	0.0534	0.0139	0.0582	0.0175	0.0542	0.0114	0.2067	0.3278	0.1761	0.2147
47/48 /75	ND	0.0865	0.0427	0.0139	0.0393	0.0175	0.0413	0.0114	0.1700	0.2842	0.1431	0.1804
44	ND	0.0865	0.0483	0.0139	0.0411	0.0175	0.0401	0.0114	0.1600	0.2828	0.1304	0.1600
42/59	ND	0.0865	0.0284	0.0139	0.0306	0.0175	0.0217	0.0114	0.0700	0.1568	0.0699	0.0862
41/71/64/68	0.141*	0.0865	0.0630	0.0139	0.0594	0.0175	0.0622	0.0114	0.2403	0.3477	0.1698	0.2107
40	ND	0.0865	ND	0.0139	ND	0.0175	ND	0.0114	0.0147	0.0227	0.0072	0.0097
74/61	0.254*	0.0865	0.0828	0.0139	0.0939	0.0175	0.0814	0.0114	0.2980	0.1443	0.1080	0.1238
70/76	ND	0.0865	0.0952	0.0139	0.0831	0.0175	0.0838	0.0114	0.3533	0.2351	0.1644	0.1946
66/80	ND	0.0865	0.0806	0.0139	0.0772	0.0175	0.0681	0.0114	0.3067	0.1769	0.1357	0.1527
56/60	ND	0.0865	ND	0.0139	ND	0.0175	0.0180	0.0114	0.1167	0.0267	0.0220	0.0323
95/93	ND	0.0263	0.0743	0.0300	0.0724	0.0186	0.0569	0.0167	0.3100	0.1481	0.1275	0.1323
91	ND	0.0263	ND	0.0300	ND	0.0186	ND	0.0167	0.0580	0.0227	0.0190	0.0227
92	ND	0.0263	ND	0.0300	0.0249	0.0186	0.0215	0.0167	0.1767	0.0500	0.0600	0.0582
84	ND	0.0263	ND	0.0300	ND	0.0186	ND	0.0167	0.0593	0.0167	0.0133	0.0157
89/90/101	0.245	0.0263	0.150	0.0300	0.142	0.0186	0.123	0.0167	1.1483	0.3600	0.3673	0.3843
99	0.139	0.0263	0.0902	0.0300	0.0796	0.0186	0.0695	0.0167	0.7130	0.2167	0.2165	0.2332
83/108	ND	0.0262	ND	0.0306	ND	0.0190	ND	0.0170	0.0213	0.0026	0.0062	0.0017
97/86	0.0430*	0.0262	0.0318	0.0306	0.0270	0.0190	0.0211	0.0170	0.1477	0.0466	0.0467	0.0494
87/115/116	0.0882	0.0262	0.0434	0.0306	0.0392	0.0190	0.0412	0.0170	0.2827	0.0928	0.0837	0.0904
85/120	0.0514*	0.0262	ND	0.0306	0.0304	0.0190	0.0283	0.0170	0.1805	0.0487	0.0568	0.0611
110	0.171	0.0262	ND	0.0306	0.103	0.0190	0.0904	0.0170	0.7637	0.2067	0.2377	0.2468
107/109	0.0388*	0.0262	ND	0.0306	0.0211	0.0190	0.0186	0.0170	0.1263	0.0433	0.0390	0.0532
106/118	0.336	0.0262	0.184	0.0306	0.165	0.0190	0.164	0.0170	1.2120	0.3613	0.3650	0.4047
114	ND	0.0263	ND	0.0307	ND	0.0191	ND	0.0171	0.0243	0.0086	0.0063	0.0092
105/127	0.170	0.0272	0.0680	0.0319	0.0599	0.0198	0.0558	0.0177	0.4533	0.1280	0.1266	0.1353
136	ND	0.0446	ND	0.0110	0.0102	0.0078	0.0074	0.0048	0.0597	0.0157	0.0197	0.0208
151	0.0474	0.0446	not analyzed		not analyzed		not analyzed		0.2525	0.1150	0.1100	0.1170
144/135	ND	0.0446	0.0185	0.0110	0.0195	0.0078	0.0161	0.0048	0.1500	0.0522	0.0528	0.0514
149/139	0.171	0.0446	0.0928	0.0110	0.0851	0.0078	0.0778	0.0048	0.8437	0.2876	0.2784	0.2793
134/143	ND	0.0446	ND	0.0110	ND	0.0078	0.0051	0.0048	0.0260	0.0073	0.0080	0.0092
131/142	ND	0.0446	ND	0.0110	ND	0.0078	ND	0.0048	0.0027	ND	ND	ND
146	0.0665	0.0446	0.0401	0.0110	0.0297	0.0078	0.0300	0.0048	0.3455	0.1100	0.1099	0.1200
153	0.478	0.0514	0.266	0.0137	0.238	0.0097	0.223	0.0060	2.3593	0.7387	0.7193	0.7877

Table 73 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Fall 2001								Mean of 3 exposure periods			
	Food		Control		Ref		d/s Urban		Food	Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.
141	ND	0.0514	0.0300	0.0137	0.0266	0.0097	0.0231	0.0060	0.1867	0.0670	0.0622	0.0737
130	ND	0.0514	ND	0.0137	0.0112	0.0097	0.0087	0.0060	0.0767	0.0260	0.0267	0.0286
137	ND	0.0514	ND	0.0137	ND	0.0097	0.0099	0.0060	0.0667	0.0223	0.0190	0.0246
138/163/164	0.456	0.0514	0.248	0.0137	0.226	0.0097	0.209	0.0060	2.1520	0.6993	0.6587	0.7363
158/160	ND	0.0514	ND	0.0137	0.0190	0.0097	0.0141	0.0060	0.1467	0.0443	0.0490	0.0557
129	ND	0.0514	ND	0.0137	ND	0.0097	ND	0.0060	0.0270	ND	0.0018	0.0070
128	ND	0.0514	0.0275	0.0137	0.0252	0.0097	0.0241	0.0060	0.2067	0.0755	0.0664	0.0787
156	ND	0.0514	0.0181	0.0137	0.0126	0.0097	0.0146	0.0060	0.1133	0.0384	0.0345	0.0445
157	ND	0.0525	ND	0.0138	ND	0.0099	ND	0.0060	0.0320	0.0072	0.0083	0.0107
179	0.0157	0.0069	0.0178*	0.0167	0.0115	0.0095	0.0100	0.0066	0.1286	0.0533	0.0445	0.0507
176	ND	0.0069	ND	0.0167	ND	0.0095	ND	0.0066	0.0327	0.0097	0.0080	0.0071
178	0.0141	0.0091	ND	0.0222	0.0142	0.0127	0.0097	0.0087	0.0947	0.0273	0.0321	0.0326
175	ND	0.0091	ND	0.0222	ND	0.0127	ND	0.0087	0.0137	0.0013	0.0021	0.0027
187/182	0.108	0.0091	0.0892	0.0222	0.0740	0.0127	0.0613	0.0087	0.6060	0.2131	0.2113	0.2138
183	0.0476	0.0091	0.0318	0.0222	0.0245	0.0127	0.0209	0.0087	0.2125	0.0716	0.0692	0.0756
185	ND	0.0091	ND	0.0222	ND	0.0127	ND	0.0087	0.0193	0.0061	ND	0.0024
174/181	0.0414	0.0091	0.0272	0.0222	0.0221	0.0127	0.0187	0.0087	0.1671	0.0514	0.0510	0.0526
177	0.0343	0.0096	ND	0.0230	0.0167	0.0131	0.0174	0.0090	0.1314	0.0383	0.0439	0.0501
171	0.0168	0.0096	ND	0.0230	ND	0.0131	ND	0.0090	0.0589	0.0197	0.0163	0.0170
172/192	ND	0.0096	ND	0.0230	ND	0.0131	ND	0.0090	0.0393	0.0103	0.0117	0.0167
180	0.177	0.0096	0.0876	0.0230	0.0823	0.0131	0.0760	0.0090	0.5690	0.1992	0.1841	0.2053
193	0.0152	0.0096	ND	0.0230	ND	0.0131	ND	0.0090	0.0514	0.0147	0.0143	0.0147
191	ND	0.0096	ND	0.0230	ND	0.0131	ND	0.0090	0.0103	ND	ND	ND
170/190	0.0960	0.0110	0.0422	0.0258	0.0359	0.0147	0.0375	0.0101	0.2453	0.0834	0.0800	0.0858
189	ND	0.0082	ND	0.0181	ND	0.0103	ND	0.0071	0.0088	0.0020	ND	0.0020
201	ND	0.0094	ND	0.0195	ND	0.0108	ND	0.0121	0.0283	0.0083	0.0033	0.0097
197	ND	0.0094	ND	0.0195	ND	0.0108	ND	0.0121	0.0087	0.0020	ND	0.0013
198	ND	0.0094	ND	0.0195	ND	0.0108	ND	0.0121	0.0019	ND	ND	ND
199	0.0206*	0.0094	ND	0.0195	ND	0.0108	ND	0.0121	0.1035	0.0313	0.0377	0.0330
196/203	0.0218*	0.0094	ND	0.0195	ND	0.0108	ND	0.0121	0.1006	0.0343	0.0320	0.0350
195	ND	0.0094	ND	0.0195	ND	0.0108	ND	0.0121	0.0400	0.0143	0.0120	0.0143
194	0.0199*	0.0094	ND	0.0195	ND	0.0108	ND	0.0121	0.1200	0.0450	0.0403	0.0457
205	ND	0.0098	ND	0.0197	ND	0.0110	ND	0.0123	0.0076	0.0023	ND	ND
208	ND	0.0116	ND	0.0225	ND	0.0136	ND	0.0091	0.0370	0.0150	0.0167	0.0160
207	ND	0.0116	ND	0.0225	ND	0.0136	ND	0.0091	0.0183	ND	0.0040	0.0080
206	ND	0.0140	ND	0.0267	ND	0.0161	ND	0.0108	0.0507	0.0183	0.0217	0.0197
209	ND	0.0110	ND	0.0182	ND	0.0102	ND	0.0121	0.0400	0.0153	0.0180	0.0150
Total PCB concentration**	3.78		2.38		2.22		2.03		18.682	9.948	7.166	7.987
TEQ-Mammalian (ng/kg ww)	n/a		0.034		0.029		0.029		n/a	0.0762	0.0738	0.0864
TEQ-Avian (ng/kg ww)	n/a		0.010		0.009		0.009		n/a	0.0218	0.0212	0.0240
% Lipid	26.0		3.0		3.6		3.2		20.33	3.17	3.43	3.13
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PCB-2		TC-01-PCB-1		TC-01-PCB-1		TC-01-PCB-1		-	-	-	-

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period (Food not included).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 74: Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Spring 2000						Fall 2000					
	Control		Ref		d/s Urban		Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	ND	0.055	ND	0.2	ND	0.037	ND	0.083	ND	0.084	ND	0.092
15	ND	0.055	ND	0.2	ND	0.037	ND	0.083	ND	0.084	ND	0.092
19	ND	0.01	ND	0.011	ND	0.007	ND	0.012	ND	0.016	ND	0.013
18	ND	0.01	ND	0.011	ND	0.007	ND	0.012	ND	0.016	ND	0.013
17	ND	0.01	ND	0.011	ND	0.007	ND	0.012	ND	0.016	ND	0.013
24/27	ND	0.01	ND	0.011	ND	0.007	ND	0.012	ND	0.016	ND	0.013
16/32	ND	0.0076	ND	0.0054	ND	0.005	ND	0.0079	ND	0.011	ND	0.011
26	ND	0.0076	ND	0.0054	ND	0.005	ND	0.0079	ND	0.011	ND	0.011
25	ND	0.0076	ND	0.0054	ND	0.005	ND	0.0079	ND	0.011	ND	0.011
31/28	0.0077	0.0076	0.018*	0.0054	0.01*	0.005	0.01*	0.0079	0.013*	0.011	0.015	0.011
33/20/21	ND	0.0076	ND	0.0054	ND	0.005	ND	0.0079	ND	0.011	ND	0.011
22	ND	0.0076	ND	0.0054	ND	0.005	ND	0.0079	ND	0.011	ND	0.011
45	ND	0.012	ND	0.008	ND	0.0077	ND	0.011	ND	0.019	ND	0.019
46	ND	0.012	ND	0.008	ND	0.0077	ND	0.011	ND	0.019	ND	0.019
52/73	ND	0.012	ND	0.008	ND	0.0077	ND	0.011	ND	0.019	ND	0.019
49/43	ND	0.012	ND	0.0085	ND	0.0077	ND	0.011	ND	0.019	ND	0.019
47/48 /75	0.017	0.012	ND	0.008	ND	0.0077	ND	0.011	ND	0.019	ND	0.019
44	ND	0.013	ND	0.0086	ND	0.0078	ND	0.011	ND	0.019	ND	0.019
42/59	ND	0.013	ND	0.0086	ND	0.0078	ND	0.011	ND	0.019	ND	0.019
41/71/64/68	ND	0.0093	0.007*	0.0062	ND	0.0058	ND	0.0081	ND	0.014	ND	0.014
40	ND	0.0093	ND	0.0062	ND	0.0058	ND	0.0081	ND	0.014	ND	0.014
74/61	0.014	0.0093	0.015*	0.0062	0.012	0.0058	0.017	0.0081	0.016	0.014	0.018	0.014
70/76	ND	0.0093	ND	0.0062	ND	0.0058	ND	0.0081	ND	0.014	ND	0.014
66/80	0.018	0.0093	0.02*	0.0062	0.021	0.0058	0.024	0.0081	0.028	0.014	0.025	0.014
56/60	ND	0.007	0.004*	0.0039	ND	0.0054	ND	0.0095	ND	0.011	ND	0.01
95/93	ND	0.012	ND	0.0087	ND	0.0062	ND	0.011	ND	0.021	ND	0.019
91	ND	0.012	ND	0.0087	ND	0.0062	ND	0.011	ND	0.021	ND	0.019
92	ND	0.011	ND	0.0083	ND	0.0074	ND	0.014	ND	0.018	ND	0.017
84	ND	0.011	ND	0.0083	ND	0.0074	ND	0.014	ND	0.018	ND	0.017
89/90/101	ND	0.011	0.014*	0.0083	ND	0.0074	ND	0.014	ND	0.018	ND	0.017
99	0.014	0.011	0.018*	0.0083	0.013	0.0074	0.022	0.014	0.024*	0.018	0.021	0.017
83/108	ND	0.0099	ND	0.0074	ND	0.0064	ND	0.012	ND	0.015	ND	0.014
97/86	ND	0.0099	ND	0.0074	ND	0.0064	ND	0.012	ND	0.015	ND	0.014
87/115/116	ND	0.0099	ND	0.0074	ND	0.0064	ND	0.012	ND	0.015	ND	0.014
85/120	ND	0.0099	0.008*	0.0074	ND	0.0064	ND	0.012	ND	0.015	ND	0.014
110	ND	0.0099	ND	0.0074	ND	0.0064	ND	0.012	ND	0.015	ND	0.014
107/109	ND	0.0088	ND	0.012	ND	0.0063	ND	0.011	ND	0.014	ND	0.015
106/118	0.064	0.011	0.068	0.0081	0.068	0.0078	0.088	0.014	0.094	0.017	0.1	0.019
114	ND	0.0088	ND	0.012	ND	0.0063	ND	0.011	ND	0.014	ND	0.015
105/127	ND	0.011	ND	0.0089	0.01	0.0076	0.022*	0.015	0.029*	0.017	0.023	0.019
136	ND	0.011	ND	0.0036	ND	0.0074	ND	0.013	ND	0.016	ND	0.016
151	ND	0.011	ND	0.0045	ND	0.0077	ND	0.015	ND	0.017	ND	0.021
144/135	ND	0.011	0.005*	0.0045	ND	0.0077	ND	0.015	ND	0.017	ND	0.021
149/139	ND	0.011	0.006*	0.0045	ND	0.0077	ND	0.015	ND	0.017	ND	0.021
134/143	ND	0.011	ND	0.0045	ND	0.0077	ND	0.015	ND	0.017	ND	0.021
131/142	ND	0.011	ND	0.0045	ND	0.0077	ND	0.015	ND	0.017	ND	0.021
146	0.019*	0.013	ND	0.005	0.022	0.0092	0.029	0.018	0.021	0.02	ND	0.024

Table 74 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Spring 2000						Fall 2000					
	Control		Ref		d/s Urban		Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
153	0.11	0.013	0.11	0.005	0.11	0.0092	0.081	0.018	0.12	0.02	0.11	0.024
141	ND	0.016	ND	0.0067	ND	0.012	ND	0.022	ND	0.026	ND	0.03
130	ND	0.016	ND	0.0068	ND	0.012	ND	0.022	ND	0.025	ND	0.03
137	ND	0.016	ND	0.0068	ND	0.012	ND	0.022	ND	0.025	ND	0.03
138/163/164	0.064	0.016	0.082	0.0068	0.063	0.012	0.064	0.022	0.073	0.025	0.056	0.03
158/160	ND	0.016	ND	0.0068	ND	0.012	ND	0.022	ND	0.025	ND	0.03
129	ND	0.016	ND	0.0068	ND	0.012	ND	0.022	ND	0.025	ND	0.03
128	ND	0.016	ND	0.0068	ND	0.012	ND	0.022	ND	0.025	ND	0.03
156	ND	0.016	0.011	0.0068	ND	0.012	ND	0.022	ND	0.025	ND	0.03
157	ND	0.016	ND	0.0068	ND	0.012	ND	0.022	ND	0.025	ND	0.03
179	ND	0.021	ND	0.0086	ND	0.012	ND	0.022	ND	0.031	ND	0.033
176	ND	0.021	ND	0.0086	ND	0.012	ND	0.022	ND	0.031	ND	0.033
178	ND	0.021	ND	0.0086	ND	0.012	ND	0.022	ND	0.031	ND	0.033
175	ND	0.021	ND	0.0086	ND	0.012	ND	0.022	ND	0.031	ND	0.033
187/182	0.06	0.021	0.066	0.0086	0.057	0.012	0.034	0.022	0.052	0.031	0.049	0.033
183	ND	0.022	0.009*	0.009	ND	0.012	ND	0.023	ND	0.032	ND	0.034
185	ND	0.022	ND	0.009	ND	0.012	ND	0.023	ND	0.032	ND	0.034
174/181	ND	0.022	ND	0.009	ND	0.012	ND	0.023	ND	0.032	ND	0.034
177	ND	0.022	ND	0.009	ND	0.012	ND	0.023	ND	0.032	ND	0.034
171	ND	0.02	0.008*	0.0077	ND	0.011	ND	0.021	ND	0.029	ND	0.032
172/192	ND	0.02	ND	0.0077	ND	0.011	ND	0.021	ND	0.029	ND	0.032
180	ND	0.02	0.032*	0.0077	0.022	0.011	ND	0.021	ND	0.029	ND	0.032
193	ND	0.02	ND	0.0077	ND	0.011	ND	0.021	ND	0.029	ND	0.032
191	ND	0.02	ND	0.0077	ND	0.011	ND	0.021	ND	0.029	ND	0.032
170/190	ND	0.025	ND	0.0095	ND	0.014	ND	0.026	ND	0.037	ND	0.04
189	ND	0.025	ND	0.0095	ND	0.014	ND	0.026	ND	0.037	ND	0.04
201	ND	0.027	ND	0.009	ND	0.019	ND	0.033	ND	0.047	ND	0.055
197	ND	0.027	ND	0.009	ND	0.019	ND	0.033	ND	0.047	ND	0.055
198	ND	0.027	ND	0.009	ND	0.019	ND	0.033	ND	0.047	ND	0.055
199	ND	0.027	ND	0.009	ND	0.019	ND	0.033	ND	0.047	ND	0.055
196/203	ND	0.027	ND	0.009	ND	0.019	ND	0.033	ND	0.047	ND	0.055
195	ND	0.03	ND	0.017	ND	0.023	ND	0.038	ND	0.055	ND	0.037
194	ND	0.03	ND	0.017	ND	0.023	ND	0.038	ND	0.055	ND	0.037
205	ND	0.03	ND	0.017	ND	0.023	ND	0.038	ND	0.055	ND	0.037
208	ND	0.023	ND	0.0077	ND	0.022	ND	0.041	ND	0.06	ND	0.038
207	ND	0.023	ND	0.0077	ND	0.022	ND	0.041	ND	0.06	ND	0.038
206	ND	0.023	ND	0.0077	ND	0.022	ND	0.041	ND	0.06	ND	0.038
209	ND	0.028	0.014*	0.0077	ND	0.023	ND	0.042	ND	0.059	ND	0.044
Total PCB concentration**	0.388		0.443		0.398		0.347		0.449		0.417	
TEQ-Mammalian (ng/kg ww)	0.0064		0.0123		0.0078		0.0110		0.0123		0.0123	
TEQ-Avian (ng/kg ww)	0.00064		0.00178		0.00168		0.00308		0.00384		0.00330	
% Lipid	0.4		0.6		0.4		0.6		0.5		0.6	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PCB-3		TC-00-PCB-2		TC-00-PCB-3		TC-00-PCB-3		TC-00-PCB-3		TC-00-PCB-3	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected.

Table 74 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Fall 2001						Mean of 3 exposure periods		
	Control		Ref		d/s Urban		Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
8/5	ND	0.0182	ND	0.0222	ND	0.0135	ND	ND	ND
15	ND	0.0109	ND	0.0133	ND	0.0081	ND	ND	ND
19	ND	0.0104	ND	0.0118	ND	0.0178	ND	ND	ND
18	ND	0.0104	ND	0.0118	ND	0.0178	ND	ND	ND
17	ND	0.0104	ND	0.0118	ND	0.0178	ND	ND	ND
24/27	ND	0.0104	ND	0.0118	ND	0.0178	ND	ND	ND
16/32	ND	0.0104	ND	0.0118	ND	0.0178	ND	ND	ND
26	ND	0.0104	ND	0.0118	ND	0.0178	ND	ND	ND
25	ND	0.0104	ND	0.0118	ND	0.0178	ND	ND	ND
31/28	0.0307*	0.0065	ND	0.0074	0.0117*	0.0111	0.0161	0.0103	0.0122
33/20/21	ND	0.0065	ND	0.0074	0.0129*	0.0111	ND	ND	0.0043
22	ND	0.0065	ND	0.0074	ND	0.0111	ND	ND	ND
45	ND	0.0075	ND	0.0077	ND	0.0085	ND	ND	ND
46	ND	0.0075	ND	0.0077	ND	0.0085	ND	ND	ND
52/73	ND	0.0075	ND	0.0077	ND	0.0085	ND	ND	ND
49/43	ND	0.0075	ND	0.0077	ND	0.0085	ND	ND	ND
47/48 /75	0.0110	0.0075	ND	0.0077	ND	0.0085	0.0093	ND	ND
44	ND	0.0075	ND	0.0077	ND	0.0085	ND	ND	ND
42/59	ND	0.0075	ND	0.0077	ND	0.0085	ND	ND	ND
41/71/64/68	ND	0.0075	ND	0.0077	ND	0.0085	ND	0.0023	ND
40	ND	0.0075	ND	0.0077	ND	0.0085	ND	ND	ND
74/61	0.0745	0.0075	0.0460	0.0077	0.0580	0.0085	0.0352	0.0257	0.0293
70/76	0.0135	0.0075	ND	0.0077	ND	0.0085	0.0045	ND	ND
66/80	0.0703	0.0075	0.0220	0.0077	0.0312	0.0085	0.0374	0.0233	0.0257
56/60	0.0198	0.0075	ND	0.0077	ND	0.0085	0.0066	0.0013	ND
95/93	ND	0.0076	ND	0.0071	ND	0.0085	ND	ND	ND
91	ND	0.0076	ND	0.0071	ND	0.0085	ND	ND	ND
92	ND	0.0076	ND	0.0071	ND	0.0085	ND	ND	ND
84	ND	0.0076	ND	0.0071	ND	0.0085	ND	ND	ND
89/90/101	ND	0.0076	ND	0.0071	ND	0.0085	ND	0.0047	ND
99	0.0430	0.0076	0.0086	0.0071	0.0165	0.0085	0.0263	0.0169	0.0168
83/108	ND	0.0077	ND	0.0072	ND	0.0086	ND	ND	ND
97/86	0.0091	0.0077	ND	0.0072	ND	0.0086	0.0030	ND	ND
87/115/116	ND	0.0077	ND	0.0072	ND	0.0086	ND	ND	ND
85/120	0.0079	0.0077	ND	0.0072	ND	0.0086	0.0026	0.0027	ND
110	ND	0.0077	ND	0.0072	ND	0.0086	ND	ND	ND
107/109	0.0164	0.0077	0.0077	0.0072	ND	0.0086	0.0055	0.0026	ND
106/118	0.134	0.0077	0.0648	0.0072	0.0923	0.0086	0.0953	0.0756	0.0868
114	ND	0.0077	ND	0.0072	ND	0.0086	ND	ND	ND
105/127	0.0358	0.0080	0.0106	0.0075	0.0174	0.0090	0.0193	0.0132	0.0168
136	ND	0.0045	ND	0.0037	ND	0.0054	ND	ND	ND
151	not analyzed		not analyzed		not analyzed		ND	ND	ND
144/135	ND	0.0045	ND	0.0037	ND	0.0054	ND	0.0017	ND
149/139	0.0076	0.0045	ND	0.0037	ND	0.0054	0.0025	0.0020	ND
134/143	ND	0.0045	ND	0.0037	ND	0.0054	ND	ND	ND
131/142	ND	0.0045	ND	0.0037	ND	0.0054	ND	ND	ND
146	0.0306	0.0045	0.0105	0.0037	0.0134	0.0054	0.0262	0.0105	0.0118
153	0.170	0.0056	0.0585	0.0046	0.0891	0.0067	0.1203	0.0962	0.1030

Table 74 (cont'd): Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

PCB Congeners	Fall 2001						Mean of 3 exposure periods		
	Control		Ref		d/s Urban		Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
141	ND	0.0056	ND	0.0046	ND	0.0067	ND	ND	ND
130	ND	0.0056	ND	0.0046	ND	0.0067	ND	ND	ND
137	0.0060*	0.0056	ND	0.0046	ND	0.0067	0.0020	ND	ND
138/163/164	0.113	0.0056	0.0317	0.0046	0.0491	0.0067	0.0803	0.0622	0.0560
158/160	0.0075	0.0056	ND	0.0046	ND	0.0067	0.0025	ND	ND
129	ND	0.0056	ND	0.0046	ND	0.0067	ND	ND	ND
128	0.0091	0.0056	ND	0.0046	ND	0.0067	0.0030	ND	ND
156	0.0145	0.0056	0.0079	0.0046	0.0091	0.0067	0.0048	0.0063	0.0030
157	ND	0.0056	ND	0.0047	ND	0.0067	ND	ND	ND
179	ND	0.0049	ND	0.0061	ND	0.0038	ND	ND	ND
176	ND	0.0049	ND	0.0061	ND	0.0038	ND	ND	ND
178	0.0071	0.0065	ND	0.0081	ND	0.0050	0.0024	ND	ND
175	ND	0.0065	ND	0.0081	ND	0.0050	ND	ND	ND
187/182	0.0823	0.0065	0.0272	0.0081	0.0396	0.0050	0.0588	0.0484	0.0485
183	0.0130	0.0065	ND	0.0081	0.0062	0.0050	0.0043	0.0030	0.0021
185	ND	0.0065	ND	0.0081	ND	0.0050	ND	ND	ND
174/181	ND	0.0065	ND	0.0081	ND	0.0050	ND	ND	ND
177	0.0086	0.0067	ND	0.0084	ND	0.0052	0.0029	ND	ND
171	ND	0.0067	ND	0.0084	ND	0.0052	ND	0.0027	ND
172/192	ND	0.0067	ND	0.0084	ND	0.0052	ND	ND	ND
180	0.0511	0.0067	0.0116	0.0084	0.0215	0.0052	0.0170	0.0145	0.0145
193	0.0080	0.0067	ND	0.0084	ND	0.0052	0.0027	ND	ND
191	ND	0.0067	ND	0.0084	ND	0.0052	ND	ND	ND
170/190	0.0203	0.0075	ND	0.0094	0.0066*	0.0059	0.0068	ND	0.0022
189	ND	0.0053	ND	0.0066	ND	0.0041	ND	ND	ND
201	ND	0.0063	ND	0.0055	ND	0.0062	ND	ND	ND
197	ND	0.0063	ND	0.0055	ND	0.0062	ND	ND	ND
198	ND	0.0063	ND	0.0055	ND	0.0062	ND	ND	ND
199	0.0113	0.0063	ND	0.0055	ND	0.0062	0.0038	ND	ND
196/203	ND	0.0063	ND	0.0055	ND	0.0062	ND	ND	ND
195	ND	0.0063	ND	0.0055	ND	0.0062	ND	ND	ND
194	ND	0.0063	ND	0.0055	ND	0.0062	ND	ND	ND
205	ND	0.0064	ND	0.0056	ND	0.0063	ND	ND	ND
208	ND	0.0084	ND	0.0093	ND	0.0072	ND	ND	ND
207	ND	0.0084	ND	0.0093	ND	0.0072	ND	ND	ND
206	ND	0.0100	ND	0.0110	ND	0.0086	ND	ND	ND
209	0.0068	0.0060	ND	0.0091	ND	0.0067	0.0023	0.0047	ND
Total PCB concentration**	0.981		0.292		0.462		0.572	0.395	0.426
TEQ-Mammalian (ng/kg ww)	0.0242		0.0115		0.0155		0.0139	0.0120	0.0119
TEQ-Avian (ng/kg ww)	0.00637		0.00250		0.00357		0.00336	0.00271	0.00285
% Lipid	1.1		0.4		0.5		0.7	0.5	0.5
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PCB-1		TC-01-PCB-1		TC-01-PCB-1		-	-	-

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Total standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 75: Polychlorinated biphenyl (PCB) congener concentrations (ng/g) in crayfish hepatopancreas exposed to Yorkson Creek water during one exposure period.

PCB Congeners	Fall 2001						PCB Congeners	Fall 2001							
	Control		Ref		d/s Urban			Control		Ref		d/s Urban			
	Conc.	DL	Conc.	DL	Conc.	DL		Conc.	DL	Conc.	DL	Conc.	DL		
8/5	ND	0.187	ND	0.198	ND	0.175	141	ND	0.0972	ND	0.0925	ND	0.105		
15	ND	0.112	ND	0.119	ND	0.105	130	0.239	0.0972	0.150	0.0925	0.181	0.105		
19	ND	0.193	ND	0.118	ND	0.152	137	0.306	0.0972	0.307	0.0925	0.332	0.105		
18	ND	0.193	ND	0.118	ND	0.152	138/163/164	7.32	0.0972	5.26	0.0925	7.17	0.105		
17	ND	0.193	ND	0.118	ND	0.152	158/160	0.342	0.0972	0.203	0.0925	0.287	0.105		
24/27	ND	0.193	ND	0.118	ND	0.152	129	ND	0.0972	ND	0.0925	ND	0.105		
16/32	ND	0.193	ND	0.118	ND	0.152	128	0.411	0.0972	0.260	0.0925	0.330	0.105		
26	ND	0.193	ND	0.118	ND	0.152	156	0.957	0.0972	0.858	0.0925	1.11	0.105		
25	ND	0.193	ND	0.118	ND	0.152	157	0.251	0.0977	0.255	0.0930	0.350	0.106		
31/28	0.949*	0.121	0.4865*	0.0734	0.628	0.0950	179	ND	0.0617	ND	0.0961	ND	0.0754		
33/20/21	ND	0.121	ND	0.0734	ND	0.0950	176	ND	0.0617	ND	0.0961	ND	0.0754		
22	ND	0.121	ND	0.0734	ND	0.0950	178	0.441	0.0811	0.287	0.126	0.326	0.0992		
45	ND	0.135	ND	0.0601	ND	0.0794	175	0.0857*	0.0811	ND	0.126	ND	0.0992		
46	ND	0.135	ND	0.0601	ND	0.0794	187/182	6.06	0.0811	5.23	0.126	6.12	0.0992		
52/73	ND	0.135	ND	0.0601	ND	0.0794	183	0.846	0.0811	0.662	0.126	0.805	0.0992		
49/43	ND	0.135	ND	0.0601	ND	0.0794	185	ND	0.0811	ND	0.126	ND	0.0992		
47/48 /75	0.355	0.135	0.160	0.0601	0.198	0.0794	174/181	ND	0.0811	ND	0.126	ND	0.0992		
44	ND	0.135	ND	0.0601	ND	0.0794	177	0.517	0.0847	0.369	0.132	0.404	0.104		
42/59	ND	0.135	ND	0.0601	ND	0.0794	171	0.196	0.0847	ND	0.132	0.182	0.104		
41/71/64/68	ND	0.135	ND	0.0601	0.104	0.0794	172/192	0.201	0.0847	0.154	0.132	0.159	0.104		
40	ND	0.135	ND	0.0601	ND	0.0794	180	3.30	0.0847	3.18	0.132	3.60	0.104		
74/61	2.41	0.135	1.88	0.0601	2.58	0.0794	193	0.494	0.0847	0.475	0.132	0.583	0.104		
70/76	0.259	0.135	0.0785*	0.0601	0.123	0.0794	191	0.0861	0.0847	ND	0.132	ND	0.104		
66/80	3.54	0.135	2.33	0.0601	3.26	0.0794	170/190	1.30	0.0957	1.30	0.149	1.62	0.117		
56/60	0.701	0.135	0.363	0.0601	0.533	0.0794	189	0.111	0.0665	0.122*	0.104	0.114	0.0813		
95/93	ND	0.0722	ND	0.0646	ND	0.0994	201	0.109	0.0772	0.125	0.0897	0.115	0.0718		
91	ND	0.0722	ND	0.0646	ND	0.0994	197	ND	0.0772	ND	0.0897	ND	0.0718		
92	ND	0.0722	ND	0.0646	ND	0.0994	198	ND	0.0772	ND	0.0897	ND	0.0718		
84	ND	0.0722	ND	0.0646	ND	0.0994	199	0.742	0.0772	0.680	0.0897	0.803	0.0718		
89/90/101	0.330	0.0722	0.221	0.0646	0.293*	0.0994	196/203	0.427	0.0772	0.335	0.0897	0.370	0.0718		
99	2.47	0.0722	1.49	0.0646	2.18	0.0994	195	0.148	0.0772	0.160	0.0897	0.191	0.0718		
83/108	ND	0.0732	ND	0.0655	ND	0.101	194	0.390	0.0772	0.354	0.0897	0.480	0.0718		
97/86	0.272	0.0732	0.113	0.0655	0.128	0.101	205	ND	0.0778	ND	0.0905	ND	0.0724		
87/115/116	ND	0.0732	ND	0.0655	ND	0.101	208	0.151	0.118	0.134	0.0852	0.124	0.0817		
85/120	0.432	0.0732	0.224	0.0655	0.275	0.101	207	ND	0.118	0.129*	0.0852	0.128	0.0817		
110	0.0889	0.0732	ND	0.0655	ND	0.101	206	0.198	0.141	0.189	0.101	0.166	0.0973		
107/109	1.02	0.0732	0.891	0.0655	1.06	0.101	209	0.325	0.0708	0.272	0.101	0.302	0.0667		
106/118	8.60	0.0732	7.62	0.0655	9.58	0.101	Total PCB concentration**						64.433	51.287	65.494
114	0.208*	0.0735	0.204*	0.0658	0.260*	0.101	TEQ-Mammalian (ng/kg ww)						1.7941	1.5647	2.0414
105/127	2.15	0.0763	1.32	0.0682	2.12	0.105	TEQ-Avian (ng/kg ww)						0.44371	0.34112	0.48094
136	ND	0.0779	ND	0.0741	ND	0.0844	% Lipid						53.0	30.0	28.0
151	not analyzed		not analyzed		not analyzed		Corresponding Lab Blank & Spiked Matrix (see Tissue QA)						TC-01-PCB-1	TC-01-PCB-1	TC-01-PCB-1
144/135	ND	0.0779	ND	0.0741	ND	0.0844	Exceeds tissue residue guideline for mammalian consumption (see Appendix A).								
149/139	0.223	0.0779	ND	0.0741	0.0867	0.0844	NOTE: Sample per site per exposure period is a composite of hepatopancreas tissue from 24 crayfish.								
134/143	ND	0.0779	ND	0.0741	ND	0.0844	* = Peak detected, but did not meet quantification criteria.								
131/142	ND	0.0779	ND	0.0741	ND	0.0844	** = Total standardized to highest detection limit.								
146	1.99	0.0779	1.69	0.0741	1.98	0.0844	ND = Not detected.								
153	13.2	0.0972	11.5	0.0925	14.6	0.105									

5.2.3 Pesticides

5.2.3.1 Organochlorines

Cutthroat Trout

Table 76: Organochlorine concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

Organochlorine compounds	Spring 2000											
	Food		Control		Control (replicate)		Ref		Ref (lab split)		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	0.15	0.0015	0.07	0.0019	0.066	0.0024	0.075	0.0038	0.047	0.0023	0.22	0.0018
1,3/1,4-Dichlorobenzene	4	0.0014	0.45	0.0019	0.5	0.0021	0.58	0.0037	0.47	0.0022	0.85	0.0018
1,2,3-Trichlorobenzene	0.084	0.0021	0.008	0.0026	0.012*	0.0033	0.011	0.0043	0.007	0.0026	0.011	0.0026
1,2,4-Trichlorobenzene	0.31	0.002	0.084	0.0024	0.11	0.003	0.12	0.0039	0.096	0.0024	0.12	0.0024
1,3,5-Trichlorobenzene	0.007	0.0021	ND	0.0025	ND	0.0031	ND	0.0041	ND	0.0025	0.006*	0.0025
1,2,3,4-Tetrachlorobenzene	0.11	0.0024	0.006*	0.0031	0.006*	0.0027	0.013	0.0028	0.013	0.0033	0.014	0.0019
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.042	0.0022	0.003*	0.0029	0.005	0.0024	0.007	0.0026	0.006*	0.0031	0.014	0.0018
Pentachlorobenzene	0.21	0.003	0.016*	0.0036	0.016*	0.0061	0.031	0.0041	0.03*	0.0037	0.14	0.0033
Hexachlorobenzene	2.4	0.0056	0.28	0.0064	0.31	0.0063	0.43	0.0088	0.43	0.0072	0.44	0.0055
Hexachlorobutadiene	0.006	0.0017	0.002	0.0019	ND	0.003	ND	0.0018	ND	0.0021	ND	0.0013
Aldrin	0.018	0.011	ND	0.013	ND	0.012	ND	0.011	ND	0.019	ND	0.0092
Dieldrin	1.8	0.069	0.12	0.025	ND	0.035	0.17	0.011	0.16	0.017	0.41	0.020
Endrin	0.18	0.13	ND	0.046	ND	0.058	ND	0.023	ND	0.035	ND	0.035
Chlordane, alpha (cis)	1.9	0.044	0.32*	0.038	0.36	0.054	0.4	0.041	0.25*	0.02	0.42	0.027
Chlordane, gamma (trans)	0.39	0.04	0.06*	0.034	0.064*	0.05	0.088*	0.037	0.063*	0.018	0.098	0.024
Chlordane, oxy-	0.33*	0.04	0.062*	0.048	ND	0.046	0.095*	0.042	0.12	0.068	0.11	0.034
o,p'-DDD	1	0.05	ND	0.062	ND	0.14	0.081	0.069	ND	0.079	0.062	0.056
p,p'-DDD	5.7	0.06	0.53	0.075	0.57	0.16	0.84	0.083	0.29	0.095	0.59	0.067
o,p'-DDE	0.58	0.048	0.11	0.077	0.12	0.085	0.098	0.072	ND	0.11	0.094*	0.07
p,p'-DDE	36	0.064	4.3	0.1	4.6	0.11	5.9	0.096	4.6	0.14	5.9	0.093
o,p'-DDT	0.59	0.071	ND	0.13	ND	0.13	0.15	0.094	ND	0.12	0.14*	0.12
p,p'-DDT	1.4	0.099	0.33	0.18	0.31	0.15	0.43	0.13	0.33	0.17	0.32	0.17
Endosulphan (I), alpha-	0.09	0.059	ND	0.020	ND	0.030	0.090	0.012	0.080	0.017	0.080	0.021
Endosulphan (II), beta-	ND	0.08	ND	0.03	ND	0.050	ND	0.020	ND	0.020	0.15	0.028
Endosulphan Sulphate	0.57	0.1	ND	0.04	ND	0.060	0.10	0.019	0.10	0.027	0.30	0.034
HCH, alpha-	1.5	0.028	ND	0.02	ND	0.029	0.058	0.023	0.036*	0.029	0.051*	0.023
HCH, beta-	1.4	0.048	ND	0.034	ND	0.048	ND	0.04	ND	0.049	ND	0.038
HCH, gamma-	0.46	0.032	ND	0.023	ND	0.033	0.033	0.027	ND	0.033	0.051	0.026
HCH, delta-	ND	0.092	ND	0.035	ND	0.046	ND	0.012	ND	0.023	0.058	0.028
Heptachlor	ND	0.0088	ND	0.027	ND	0.027	ND	0.024	ND	0.035	ND	0.02
Heptachlor Epoxide	0.53	0.073	0.023	0.022	ND	0.035	0.046	0.013	0.046	0.019	0.14	0.021
Methoxychlor	0.58	0.27	ND	0.092	ND	0.12	ND	0.046	ND	0.069	ND	0.081
Mirex	0.098	0.012	0.027*	0.011	0.028*	0.0059	0.031*	0.013	0.03*	0.01	0.029*	0.0051
Nonachlor, cis-	0.78	0.055	0.17*	0.068	0.15	0.031	0.19*	0.07	0.28	0.053	0.17	0.043
Nonachlor, trans-	2.3	0.042	0.4	0.036	0.39	0.053	0.59	0.04	0.48	0.02	0.52	0.026
Total Chlorobenzene**	7.313		0.914		1.025		1.267		1.099		1.815	
Total Chlordane**	2.620		0.380		0.424		0.583		0.433		0.628	
Total DDD/DDE/DDT**	45.270		5.270		5.600		7.320		5.220		6.950	
Total Endosulphan**	0.66		ND		ND		0.19		0.18		0.53	
Total HCH**	3.360		ND		ND		0.058		0.036		0.102	
Total Organochlorine concentration**	65.515		7.161		7.617		10.445		7.964		11.294	
% Lipid		18.0		3.4		3.5		3.7		3.7		3.3
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)		TC-00-OC-1		TC-00-OC-1		TC-00-OC-2		TC-00-OC-1		TC-00-OC-1		TC-00-OC-1

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 76 (cont'd): Organochlorine concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

Organochlorine compounds	Fall 2000									
	Food		Control		Control (replicate)		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	0.84	0.0028	0.057	0.0012	0.096	0.0015	0.092	0.003	0.12	0.0034
1,3/1,4-Dichlorobenzene	6.8	0.0027	0.92	0.0011	1.1	0.0013	1.1	0.003	0.94	0.003
1,2,3-Trichlorobenzene	0.047	0.0021	0.007*	0.0015	0.008*	0.0031	0.008	0.0036	0.012*	0.0054
1,2,4-Trichlorobenzene	0.32	0.0019	0.11	0.0014	0.14*	0.0028	0.12	0.0033	0.18	0.0049
1,3,5-Trichlorobenzene	ND	0.002	0.003*	0.0015	ND	0.003	ND	0.0035	ND	0.0051
1,2,3,4-Tetrachlorobenzene	0.062	0.0033	0.009	0.0018	0.008	0.0017	0.011	0.0044	0.012	0.0046
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.064	0.003	0.005	0.0016	0.005*	0.0016	0.01*	0.0041	0.016	0.0042
Pentachlorobenzene	0.17	0.0049	0.036*	0.0026	0.036*	0.0063	0.032	0.0045	0.11	0.0058
Hexachlorobenzene	2.5	0.0083	0.77	0.0039	0.73	0.0098	0.71	0.0083	0.68	0.0089
Hexachlorobutadiene	0.005*	0.0018	ND	0.0011	ND	0.0025	ND	0.0024	ND	0.0045
Aldrin	ND	0.022	ND	0.0088	ND	0.02	ND	0.019	ND	0.014
Dieldrin	1.4	0.043	0.23	0.016	0.24	0.046	0.17	0.019	0.30	0.14
Endrin	0.1	0.08	ND	0.023	ND	0.081	ND	0.035	ND	0.25
Chlordane, alpha (cis)	3	0.068	0.66*	0.031	0.62	0.049	0.63	0.058	0.59	0.041
Chlordane, gamma (trans)	0.63	0.062	0.097	0.028	0.11	0.045	0.15*	0.052	0.16	0.038
Chlordane, oxy-	0.4	0.08	0.28*	0.033	ND	0.075	0.16*	0.07	0.08*	0.051
o,p'-DDD	1.3	0.083	0.15	0.068	0.12	0.094	0.16	0.097	0.12	0.12
p,p'-DDD	7.8	0.099	1.5	0.08	1.5	0.11	1.6	0.12	1.4	0.14
o,p'-DDE	0.51	0.073	0.099	0.08	ND	0.13	0.096*	0.069	ND	0.1
p,p'-DDE	47	0.097	11	0.1	9.3	0.16	11	0.091	9.7*	0.13
o,p'-DDT	0.65	0.12	0.19	0.11	ND	0.13	0.14	0.13	0.21*	0.18
p,p'-DDT	1.6	0.17	0.51	0.14	0.42	0.17	0.46	0.18	0.42	0.24
Endosulphan (I), alpha-	ND	0.05	ND	0.020	ND	0.060	ND	0.020	ND	0.15
Endosulphan (II), beta-	ND	0.06	ND	0.030	ND	0.080	ND	0.030	ND	0.20
Endosulphan Sulphate	0.13	0.077	ND	0.030	ND	0.10	ND	0.040	ND	0.26
HCH, alpha-	1.1	0.029	ND	0.017	ND	0.039	0.026	0.019	0.06*	0.028
HCH, beta-	1.2	0.05	ND	0.028	ND	0.065	ND	0.033	ND	0.047
HCH, gamma-	0.33	0.033	ND	0.019	ND	0.045	ND	0.022	0.046*	0.033
HCH, delta-	0.069	0.061	ND	0.023	ND	0.069	ND	0.023	ND	0.20
Heptachlor	0.093*	0.027	ND	0.012	0.049	0.028	ND	0.033	ND	0.026
Heptachlor Epoxide	0.39	0.046	ND	0.023	ND	0.046	0.035	0.018	ND	0.15
Methoxychlor	ND	0.16	ND	0.058	ND	0.17	ND	0.069	ND	0.51
Mirex	0.13	0.017	0.05	0.0039	0.045*	0.0073	0.057*	0.0064	0.066	0.0051
Nonachlor, cis-	0.92	0.098	0.27	0.022	0.29	0.038	0.37*	0.031	0.37	0.025
Nonachlor, trans-	3.4	0.066	0.83	0.03	0.91	0.048	0.9	0.056	0.96	0.041
Total Chlorobenzene**	10.803		1.914		2.123		2.083		2.070	
Total Chlordane**	4.030		1.037		0.730		0.940		0.830	
Total DDD/DDE/DDT**	58.860		13.350		11.340		13.220		11.850	
Total Endosulphan**	0.13		ND		ND		ND		ND	
Total HCH**	2.699		ND		ND		ND		0.106	
Total Organochlorine concentration**	82.960		17.681		15.727		17.740		16.552	
% Lipid	17.0		3.1		3.0		3.0		2.9	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-OC-1		TC-00-OC-2		TC-00-OC-2		TC-00-OC-1		TC-00-OC-2	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period (Food not included).

ND = Not detected.

Table 76 (cont'd): Organochlorine concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

Organochlorine compounds	Fall 2001								Mean of 3 exposure periods			
	Food		Control		Ref		d/s Urban		Food	Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.
1,2-Dichlorobenzene	0.215*	0.0126	0.145	0.0840	0.132	0.0553	0.120	0.0587	0.4017	0.0907	0.0997	0.1533
1,3/1,4-Dichlorobenzene	11.847*	0.0151	1.84	0.0938	0.7392	0.0618	0.9372	0.0655	7.5490	1.0700	0.8064	0.9091
1,2,3-Trichlorobenzene	ND	0.180	ND	0.0533	ND	0.0470	ND	0.0254	0.0437	0.0050	0.0063	0.0077
1,2,4-Trichlorobenzene	ND	0.180	0.165	0.0536	0.150	0.0473	0.136	0.0256	0.2100	0.1197	0.1300	0.1453
1,3,5-Trichlorobenzene	ND	0.178	ND	0.0535	ND	0.0472	ND	0.0255	0.0023	0.0010	ND	0.0020
1,2,3,4-Tetrachlorobenzene	0.0605	0.0067	ND	0.0273	ND	0.0256	ND	0.0112	0.0775	0.0050	0.0080	0.0087
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.0527	0.0066	ND	0.0264	ND	0.0249	ND	0.0108	0.0529	0.0027	0.0057	0.0100
Pentachlorobenzene	0.112	0.0105	ND	0.0300	0.0245*	0.0244	0.0597	0.0126	0.1640	0.0173	0.0292	0.1032
Hexachlorobenzene	0.575	0.0160	0.308	0.0267	0.259	0.0219	0.231	0.0115	1.8250	0.4527	0.4663	0.4503
Hexachlorobutadiene	ND	0.0067	not analyzed		not analyzed		not analyzed		0.0037	0.0010	ND	ND
Aldrin	ND	0.438	ND	0.0711	ND	0.0739	ND	0.0597	0.0060	ND	ND	ND
Dieldrin	0.584	0.0513	0.127	0.113	ND	0.0554	0.129	0.0960	1.4710	0.1267	0.1133	0.2797
Endrin	0.0970	0.0580	ND	0.207	ND	0.102	ND	0.176	0.2618	ND	ND	ND
Chlordane, alpha (cis)	0.290	0.0347	0.171	0.0339	0.151	0.0284	0.124	0.0119	1.7300	0.3837	0.3937	0.3780
Chlordane, gamma (trans)	0.0967	0.0284	0.0347	0.0278	0.0426	0.0233	0.0410	0.0098	0.3722	0.0639	0.0935	0.0997
Chlordane, oxy-	ND	0.0984	ND	0.105	ND	0.0970	0.118*	0.118	0.2433	0.1140	0.0850	0.1027
o,p'-DDD	ND	0.174	0.0434	0.0287	0.0347	0.0269	0.0310	0.0155	0.7667	0.0645	0.0919	0.0710
p,p'-DDD	0.611	0.184	0.360	0.0316	0.293	0.0296	0.263*	0.0170	4.7037	0.7967	0.9110	0.7510
o,p'-DDE	ND	0.180	ND	0.0494	ND	0.0249	0.0179	0.0101	0.3633	0.0697	0.0647	0.0373
p,p'-DDE	2.57	0.240	1.36	0.0658	1.25	0.0331	1.21	0.0134	28.5233	5.5533	6.0500	5.6033
o,p'-DDT	0.852*	0.190	0.0363	0.0324	ND	0.0304	0.0252	0.0175	0.6973	0.0754	0.0967	0.1251
p,p'-DDT	0.387*	0.224	0.125	0.0414	0.115	0.0388	0.112	0.0223	1.1290	0.3217	0.3350	0.2840
Endosulphan (I), alpha-	ND	0.0306	ND	0.0979	ND	0.0560	ND	0.0804	0.1250	ND	0.0300	0.0267
Endosulphan (II), beta-	ND	0.0539	ND	0.148	ND	0.0909	ND	0.116	ND	ND	ND	0.0500
Endosulphan Sulphate	ND	0.0749	ND	0.206	ND	0.127	ND	0.162	0.3175	ND	0.0333	0.1000
HCH, alpha-	ND	0.998	ND	0.0655	ND	0.0750	ND	0.0487	0.8667	ND	0.0280	0.0370
HCH, beta-	ND	0.506	ND	0.0867	ND	0.107	ND	0.0816	0.8667	ND	ND	ND
HCH, gamma-	ND	1.19	ND	0.0777	ND	0.0889	ND	0.0577	0.2633	ND	0.0110	0.0323
HCH, delta-	ND	0.225	ND	0.367	ND	0.111	ND	0.241	0.0173	0.0117	ND	0.0193
Heptachlor	2.73*	0.791	ND	0.143	ND	0.0823	ND	0.0428	0.9410	ND	ND	ND
Heptachlor Epoxide	ND	0.0518	ND	0.0930	ND	0.0456	ND	0.0791	0.3400	ND	0.0270	0.0467
Methoxychlor	ND	0.334	ND	0.562	ND	0.276	ND	0.479	0.7450	ND	ND	ND
Mirex	ND	0.0981	ND	0.0513	ND	0.0413	ND	0.0189	0.0760	0.0257	0.0293	0.0317
Nonachlor, cis-	0.0885	0.0298	0.0796	0.0203	0.0769	0.0159	0.0635	0.0102	0.5962	0.1732	0.2123	0.2012
Nonachlor, trans-	0.251	0.0262	0.209	0.0181	0.193	0.0141	0.167	0.0090	1.9837	0.4797	0.5610	0.5490
Total Chlorobenzene**	12.862		2.458		1.280		1.484		10.3261	1.7620	1.5434	1.7897
Total Chlordane**	0.387		0.206		0.194		0.165		2.3456	0.5409	0.5722	0.5410
Total DDD/DDE/DDT**	4.420		1.888		1.693		1.585		36.1833	6.8361	7.4109	6.7950
Total Endosulphan**	ND		ND		ND		ND		0.2633	ND	0.0633	0.1767
Total HCH**	ND		ND		ND		ND		2.0197	ND	0.0193	0.0693
Total Organochlorine concentration**	21.419		4.968		3.436		3.593		56.631	9.937	10.540	10.480
% Lipid	26.0		3.0		3.6		3.2		20.33	3.17	3.43	3.13
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-OC-2		TC-01-OC-1		TC-01-OC-1		TC-01-OC-1		-	-	-	-

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period (Food not included).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 77: Organochlorine concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

Organochlorine compounds	Spring 2000						Fall 2000					
	Control		Ref		d/s Urban		Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	0.58	0.0023	0.15	0.0038	0.08	0.0021	0.15	0.0044	0.25*	0.0077	0.28	0.0064
1,3/1,4-Dichlorobenzene	1.6	0.002	0.61	0.0033	0.22	0.0018	0.49	0.0038	0.62	0.0066	0.79	0.0055
1,2,3-Trichlorobenzene	0.011	0.0033	0.016	0.0075	0.007*	0.0037	0.011*	0.0057	ND	0.01	0.017*	0.0066
1,2,4-Trichlorobenzene	0.18	0.0032	0.19	0.0067	0.085	0.0035	0.17	0.0055	0.26*	0.0099	0.21	0.0063
1,3,5-Trichlorobenzene	ND	0.0032	ND	0.0071	ND	0.0035	ND	0.0055	ND	0.01	ND	0.0063
1,2,3,4-Tetrachlorobenzene	0.005	0.0029	0.01	0.0047	0.007*	0.0036	0.007	0.0059	0.009	0.0073	0.011	0.0054
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.003*	0.0027	0.006	0.0042	0.004	0.0033	ND	0.0053	0.007	0.0067	0.006	0.0049
Pentachlorobenzene	ND	0.0052	0.009	0.0068	0.006*	0.0037	0.009	0.0082	ND	0.015	ND	0.011
Hexachlorobenzene	0.1*	0.0069	0.098	0.011	0.072*	0.0047	0.12	0.022	0.21*	0.02	0.18*	0.013
Hexachlorobutadiene	ND	0.0018	ND	0.0049	ND	0.0027	ND	0.0026	ND	0.0063	ND	0.0042
Aldrin	ND	0.025	0.032*	0.019	ND	0.014	ND	0.069	ND	0.047	ND	0.032
Dieldrin	0.023	0.013	ND	0.092	0.023	0.009	ND	0.023	0.046	0.020	0.046	0.023
Endrin	ND	0.035	ND	0.16	ND	0.012	ND	0.046	ND	0.035	ND	0.046
Chlordane, alpha (cis)	ND	0.059	ND	0.056	ND	0.044	ND	0.058	ND	0.14	ND	0.12
Chlordane, gamma (trans)	ND	0.056	ND	0.052	ND	0.042	ND	0.056	ND	0.14	ND	0.11
Chlordane, oxy-	ND	0.092	ND	0.071	ND	0.051	ND	0.12	ND	0.17	ND	0.12
op'-DDD	ND	0.088	ND	0.15	ND	0.094	ND	0.19	ND	0.21	ND	0.19
pp'-DDD	ND	0.1	ND	0.18	ND	0.11	ND	0.22	ND	0.24	ND	0.22
op'-DDE	ND	0.18	ND	0.14	ND	0.13	ND	0.2	ND	0.3	ND	0.22
pp'-DDE	0.13	0.1	0.21	0.17	0.24*	0.21	0.16*	0.14	ND	0.26	0.28*	0.22
op'-DDT	ND	0.13	ND	0.2	ND	0.13	ND	0.24	ND	0.27	ND	0.28
pp'-DDT	ND	0.19	ND	0.2	ND	0.13	ND	0.2	ND	0.4	ND	0.2
Endosulphan (I), alpha-	ND	0.020	ND	0.11	ND	0.008	ND	0.030	ND	0.020	ND	0.020
Endosulphan (II), beta-	ND	0.02	ND	0.15	ND	0.010	ND	0.040	ND	0.030	ND	0.030
Endosulphan Sulphate	ND	0.03	ND	0.19	ND	0.010	ND	0.050	ND	0.030	ND	0.040
HCH, alpha-	ND	0.045	ND	0.057	ND	0.023	ND	0.048	ND	0.084	ND	0.067
HCH, beta-	ND	0.055	ND	0.096	ND	0.028	ND	0.058	ND	0.1	ND	0.082
HCH, gamma-	ND	0.079	ND	0.067	ND	0.04	ND	0.083	ND	0.15	ND	0.12
HCH, delta-	0.035	0.021	ND	0.14	0.023	0.009	0.058	0.042	0.058	0.027	0.058	0.031
Heptachlor	ND	0.056	ND	0.032	ND	0.034	ND	0.071	ND	0.092	ND	0.07
Heptachlor Epoxide	ND	0.019	ND	0.10	ND	0.008	ND	0.028	ND	0.021	ND	0.024
Methoxychlor	ND	0.058	ND	0.35	ND	0.035	ND	0.10	ND	0.069	ND	0.081
Mirex	ND	0.01	ND	0.011	ND	0.0079	ND	0.02	ND	0.02	ND	0.032
Nonachlor, cis-	ND	0.049	ND	0.095	ND	0.038	ND	0.069	ND	0.11	ND	0.14
Nonachlor, trans-	ND	0.055	ND	0.056	ND	0.04	ND	0.054	ND	0.13	ND	0.11
Total Chlorobenzene**	2.476		1.089		0.464		0.941		1.356		1.488	
Total Chlordane**	ND		ND		ND		ND		ND		ND	
Total DDD/DDE/DDT**	ND		ND		ND		ND		ND		ND	
Total Endosulphan**	ND		ND		ND		ND		ND		ND	
Total HCH**	ND		ND		ND		0.058		0.058		0.058	
Total Organochlorine concentration**	2.476		1.121		0.464		0.999		1.460		1.592	
% Lipid	0.40		0.60		0.40		0.60		0.50		0.60	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-OC-3		TC-00-OC-2		TC-00-OC-3		TC-00-OC-3		TC-00-OC-3		TC-00-OC-3	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

ND = Not detected.

Table 77 (cont'd): Organochlorine concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

Organochlorine compounds	Fall 2001						Mean of 3 exposure periods		
	Control		Ref		d/s Urban		Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
1,2-Dichlorobenzene	0.217	0.0678	0.163	0.0448	0.134	0.0428	0.3157	0.1877	0.1647
1,3/1,4-Dichlorobenzene	3*	0.0758	0.6723	0.0501	1.493*	0.0474	1.6967	0.6341	0.8343
1,2,3-Trichlorobenzene	ND	0.0345	ND	0.0221	ND	0.0173	0.0073	0.0053	0.0080
1,2,4-Trichlorobenzene	0.158	0.0347	0.165	0.0223	0.105	0.0175	0.1693	0.2050	0.1333
1,3,5-Trichlorobenzene	ND	0.0346	ND	0.0222	ND	0.0175	ND	ND	ND
1,2,3,4-Tetrachlorobenzene	ND	0.0097	ND	0.0103	ND	0.0114	0.0040	0.0063	0.0060
1,2,3,5/1,2,4,5-Tetrachlorobenzene	ND	0.0095	ND	0.0100	ND	0.0111	0.0010	0.0043	0.0033
Pentachlorobenzene	ND	0.0108	ND	0.0114	ND	0.0102	0.0030	0.0030	0.0020
Hexachlorobenzene	0.0364	0.0097	0.0288	0.0111	0.0322	0.0055	0.0855	0.1123	0.0947
Hexachlorobutadiene	not analyzed		not analyzed		not analyzed		ND	ND	ND
Aldrin	ND	0.0461	0.0434*	0.0402	0.0503*	0.0376	ND	0.0251	0.0168
Dieldrin	ND	0.0375	ND	0.0363	ND	0.0313	0.0077	0.0153	0.0230
Endrin	ND	0.0687	ND	0.0665	ND	0.0537	ND	ND	ND
Chlordane, alpha (cis)	ND	0.0109	ND	0.0075	ND	0.0146	ND	ND	ND
Chlordane, gamma (trans)	ND	0.0090	ND	0.0062	ND	0.0121	ND	ND	ND
Chlordane, oxy-	0.0626	0.0432	0.0747	0.0460	ND	0.0891	0.0209	0.0249	ND
op'-DDD	ND	0.0125	ND	0.0097	ND	0.0120	ND	ND	ND
pp'-DDD	ND	0.0138	ND	0.0107	ND	0.0129	ND	ND	ND
op'-DDE	ND	0.0069	ND	0.0067	ND	0.0061	ND	ND	ND
pp'-DDE	0.338	0.0092	0.0809	0.0089	0.109	0.0081	0.2093	0.0970	0.2097
op'-DDT	ND	0.0142	ND	0.0109	ND	0.0136	ND	ND	ND
pp'-DDT	ND	0.0181	ND	0.0140	ND	0.0170	ND	ND	ND
Endosulphan (I), alpha-	ND	0.0288	ND	0.0328	ND	0.0277	ND	ND	ND
Endosulphan (II), beta-	ND	0.0533	ND	0.0516	ND	0.0397	ND	ND	ND
Endosulphan Sulphate	ND	0.0745	ND	0.0722	ND	0.0531	ND	ND	ND
HCH, alpha-	ND	0.0545	ND	0.0638	ND	0.0802	ND	ND	ND
HCH, beta-	ND	0.0937	ND	0.0837	ND	0.0827	ND	ND	ND
HCH, gamma-	ND	0.0646	ND	0.0757	ND	0.0956	ND	ND	ND
HCH, delta-	ND	0.132	ND	0.185	ND	0.191	0.0310	0.0193	0.0270
Heptachlor	ND	0.0448	0.0476	0.0446	ND	0.0673	ND	0.0159	ND
Heptachlor Epoxide	ND	0.0309	ND	0.0299	ND	0.0269	ND	ND	ND
Methoxychlor	ND	0.187	ND	0.181	ND	0.139	ND	ND	ND
Mirex	ND	0.0149	ND	0.0224	ND	0.0212	ND	ND	ND
Nonachlor, cis-	0.0166	0.0098	ND	0.0042	ND	0.0069	0.0055	ND	ND
Nonachlor, trans-	0.0173*	0.0087	ND	0.0037	ND	0.0062	0.0058	ND	ND
Total Chlorobenzene**	3.411		1.029		1.764		2.2761	1.1580	1.2387
Total Chlordane**	ND		ND		ND		ND	ND	ND
Total DDD/DDE/DDT**	0.338		0.081		0.109		0.1127	0.0270	0.0363
Total Endosulphan**	ND		ND		ND		ND	ND	ND
Total HCH**	ND		ND		ND		0.0193	0.0193	0.0193
Total Organochlorine concentration**	3.783		1.110		1.873		2.419	1.230	1.310
% Lipid	1.1		0.4		0.5		0.71	0.55	0.50
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-OC-1		TC-01-OC-1		TC-01-OC-1		-	-	-

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 78: Organochlorine concentrations (ng/g) in crayfish hepatopancreas exposed to Yorkson Creek water during one exposure period.

Organochlorine compounds	Fall 2001					
	Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	0.659	0.268	0.627	0.373	0.739	0.281
1,3/1,4-Dichlorobenzene	6.136*	0.296	2.455	0.413	2.391*	0.311
1,2,3-Trichlorobenzene	ND	0.129	ND	0.163	ND	0.288
1,2,4-Trichlorobenzene	1.00	0.131	0.905	0.165	0.949	0.292
1,3,5-Trichlorobenzene	ND	0.131	ND	0.165	ND	0.293
1,2,3,4-Tetrachlorobenzene	ND	0.0908	ND	0.0652	ND	0.0697
1,2,3,5/1,2,4,5-Tetrachlorobenzene	ND	0.0881	ND	0.0632	ND	0.0675
Pentachlorobenzene	0.134*	0.0839	ND	0.0669	0.121*	0.0803
Hexachlorobenzene	0.441	0.0978	0.420	0.0798	0.342	0.129
Hexachlorobutadiene	not analyzed		not analyzed		not analyzed	
Aldrin	ND	0.329	0.400*	0.242	ND	0.384
Dieldrin	ND	0.265	ND	0.658	ND	0.672
Endrin	ND	0.455	ND	1.37	ND	1.07
Chlordane, alpha (cis)	ND	0.106	ND	0.142	ND	0.133
Chlordane, gamma (trans)	ND	0.0875	ND	0.118	ND	0.110
Chlordane, oxy-	ND	0.606	ND	0.965	ND	0.941
op'-DDD	ND	0.104	ND	0.0867	ND	0.154
pp'-DDD	0.142	0.113	ND	0.0936	ND	0.166
op'-DDE	ND	0.0786	ND	0.0534	ND	0.0952
pp'-DDE	22.1	0.104	15.2	0.0709	17.1	0.126
op'-DDT	ND	0.118	ND	0.0985	ND	0.175
pp'-DDT	ND	0.148	ND	0.123	ND	0.219
Endosulphan (I), alpha-	ND	0.234	ND	0.650	ND	0.742
Endosulphan (II), beta-	ND	0.338	ND	1.19	ND	1.11
Endosulphan Sulphate	ND	0.452	ND	1.90	ND	1.25
HCH, alpha-	ND	0.762	ND	0.536	ND	0.520
HCH, beta-	ND	0.749	ND	0.838	ND	0.728
HCH, gamma-	ND	0.909	ND	0.639	ND	0.620
HCH, delta-	ND	0.837	ND	1.12	ND	1.14
Heptachlor	ND	0.958	9.09*	0.379	ND	0.486
Heptachlor Epoxide	ND	0.228	ND	0.475	ND	0.549
Methoxychlor	ND	1.17	ND	6.81	ND	2.36
Mirex	0.320	0.187	0.241	0.209	0.339	0.337
Nonachlor, cis-	0.869	0.0802	0.725	0.0637	0.723	0.0680
Nonachlor, trans-	1.05	0.0716	0.747	0.0568	0.732	0.0607
Total Chlorobenzene**	7.711		3.780		4.542	
Total Chlordane**	ND		ND		ND	
Total DDD/DDE/DDT**	22.100		15.200		17.100	
Total Endosulphan**	ND		ND		ND	
Total HCH**	ND		ND		ND	
Total Organochlorine concentration**	31.730		29.542		23.097	
% Lipid	53.0		30.0		32.0	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-OC-1		TC-01-OC-1		TC-01-OC-1	

NOTE: Sample per site per exposure period is a composite of hepatopancreas tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit.

ND = Not detected.

Crayfish

Table 81: Detected pesticide concentrations ($\mu\text{g/g}$) in crayfish muscle tissue exposed to Yorkson Creek water during two exposure periods (see Table 77 for complete list of compounds analyzed and corresponding detection limits).

Pesticide compounds	Spring 2000				Fall 2000					
	Control		Ref		Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aldicarb	-	-	0.02	0.01	-	-	-	-	-	-
Aldicarb Sulfoxide	-	-	-	-	-	-	-	-	0.04	0.01
Methomyl	0.02	0.01	0.02	0.01	0.02	0.01	0.06	0.01	0.05	0.01
Total pesticide concentration	0.02		0.04		0.02		0.06		0.09	
% Lipid	0.4		0.6		0.6		0.5		0.6	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PEST		TC-00-PEST		TC-00-PEST		TC-00-PEST		TC-00-PEST	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

5.2.4 Polycyclic Aromatic Hydrocarbons

Cutthroat Trout

Table 82: Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

Polycyclic aromatic hydrocarbons	Spring 2000											
	Food		Control		Control (replicate)		Ref		Ref (lab split)		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	9.1	0.037	1.1	0.027	1.4	0.014	0.74	0.013	0.77	0.0085	1.2	0.011
Acenaphthylene ^{1P}	0.48	0.012	0.074*	0.011	0.12	0.0054	0.064	0.016	0.056*	0.018	0.11	0.0037
Acenaphthene ^{1P}	2.1	0.042	2*	0.027	2.8*	0.012	0.36*	0.017	1.2*	0.0074	2.5*	0.04
Fluorene ^{1P}	2.2	0.038	0.15	0.019	0.2	0.016	0.13	0.013	0.16	0.0022	0.44	0.011
Phenanthrene ^{1P}	6.6	0.17	0.54	0.01	0.52	0.013	0.37	0.013	0.39	0.013	1.1	0.013
Anthracene ^{1P}	0.89	0.25	0.057	0.021	0.036	0.018	0.036	0.015	0.037*	0.014	0.084	0.018
Fluoranthene ^{2P}	2.5	0.039	0.17*	0.014	0.14	0.011	0.11	0.0087	0.1	0.012	0.24	0.02
Pyrene ^{2P}	2.1	0.039	0.16*	0.008	0.12*	0.01	0.079*	0.0041	0.089*	0.023	0.16*	0.039
Benz(a)anthracene ^{2P}	0.43*	0.035	0.0084*	0.0077	ND	0.012	ND	0.0061	0.01	0.0084	ND	0.019
Chrysene ^{2P}	0.7	0.034	0.018*	0.011	0.025	0.0074	0.025	0.0087	0.021	0.02	0.059	0.0059
Benzofluoranthenes ^{2P}	0.41	0.067	ND	0.024	0.017	0.013	0.033	0.011	0.035	0.02	0.021	0.017
Benzo(a)pyrene ^{2P}	0.15*	0.11	ND	0.031	ND	0.017	ND	0.014	ND	0.048	ND	0.024
Benzo(e)pyrene ^{2P}	1.3*	0.066	0.029*	0.009	ND	0.021	0.038*	0.0038	ND	0.045	0.015*	0.0045
Perylene ^{2P}	0.26	0.048	ND	0.32	0.027	0.018	0.019	0.0068	0.016*	0.014	0.028	0.0042
Dibenz(ah)anthracene ^{2P}	ND	0.08	ND	0.019	ND	0.045	ND	0.04	ND	0.025	ND	0.022
Benzo(ghi)perylene ^{2P}	1.5*	0.029	ND	0.0096	ND	0.015	ND	0.015	ND	0.0098	0.014*	0.011
Indeno(1,2,3,cd)pyrene ^{2P}	0.13*	0.076	ND	0.013	ND	0.026	ND	0.012	0.0077*	0.0059	0.024*	0.013
C1-Naphthalene ^A	45	0.17	1.8	0.016	2	0.0084	1	0.24	1.1	0.0068	1.7	0.0098
C2-Naphthalene ^A	25	0.072	1.9	0.02	1.6	0.0072	1	0.0045	1.2	0.0093	3.3	0.027
C3-Naphthalene ^A	25	0.29	1	0.0097	1.1	0.0069	0.77	0.015	0.63	0.0085	2.5	0.014
C4-Naphthalene ^A	54	0.069	4.5	0.019	0.094	0.0056	1.5	0.0054	16	0.019	7.2	0.013
C1-Phenanthrene/Anthracene ^A	12	0.14	1.5	0.017	0.6	0.014	0.76	0.032	0.61	0.011	1	0.015
C2-Phenanthrene/Anthracene ^A	11	0.11	0.55	0.027	0.42	0.012	0.47	0.013	0.57	0.011	0.7	0.015
C3-Phenanthrene/Anthracene ^A	3.9	0.064	0.24	0.024	0.049	0.0051	0.18	0.049	0.23	0.011	0.23	0.021
C4-Phenanthrene/Anthracene ^A	5.1	0.094	2.1	0.019	0.29	0.011	0.85	0.0083	0.3	0.0037	0.47	0.026
Retene	1.6	0.21	0.41	0.024	0.12	0.022	0.32	0.032	0.31	0.018	ND	0.42
Dibenzothiophene	1.6	0.0078	0.12	0.0089	0.11*	0.016	0.044*	0.0085	0.047*	0.012	0.23	0.016
C1-Dibenzothiophenes	1.1	0.2	0.54	0.011	0.63	0.022	0.47	0.014	0.36	0.0091	1.1	0.013
C2-Dibenzothiophenes	7.3	0.19	0.75	0.074	0.91	0.15	0.71	0.041	0.61	0.052	1.4	0.021
Total Parent ^(P) LPAH**	21.370		3.921		5.076		1.700		2.613		5.434	
Total Parent ^(P) HPAH**	9.480		0.330		0.285		0.247		0.245		0.459	
Total Alkylated ^{(A)**}	181.0		13.590		6.059		5.030		20.640		17.100	
Total Dibenzothiophene**	10.0		1.410		1.650		1.224		1.017		2.730	
Total PAH concentration**	223.45		19.25		13.07		8.20		24.52		25.72	
% Lipid	18.0		3.4		3.5		3.7		3.7		3.3	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PAH-1		TC-00-PAH-1		TC-00-PAH-2		TC-00-PAH-1		TC-00-PAH-1		TC-00-PAH-1	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period. (Food not included).

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

Table 82 (cont'd): Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

Polycyclic aromatic hydrocarbons	Fall 2000									
	Food		Control		Control (replicate)		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	13	0.051	1.3	0.0048	1.8	0.018	1.4	0.017	1.5	0.012
Acenaphthylene ^{1P}	0.84	0.035	0.084*	0.0094	0.13	0.0057	0.098	0.008	0.17	0.02
Acenaphthene ^{1P}	1.8	0.068	1.8*	0.012	0.69*	0.016	0.62*	0.01	0.38	0.018
Fluorene ^{1P}	2.7	0.095	0.15	0.0059	0.14	0.012	0.091	0.019	0.27	0.0055
Phenanthrene ^{1P}	6.6	0.13	0.46	0.0075	0.49	0.0067	0.36	0.0035	0.45	0.019
Anthracene ^{1P}	0.99	0.11	0.031*	0.017	0.035	0.019	0.046	0.0063	0.059	0.038
Fluoranthene ^{2P}	2.1	0.15	0.12	0.0086	0.13	0.0093	0.11	0.012	0.15	0.0038
Pyrene ^{2P}	1.7	0.15	0.084*	0.0087	0.1*	0.0099	0.11*	0.014	0.092*	0.013
Benz(a)anthracene ^{2P}	0.46*	0.066	ND	0.016	ND	0.01	ND	0.021	ND	0.0077
Chrysene ^{2P}	0.89	0.1	0.028	0.014	0.027	0.019	ND	0.037	0.029	0.0043
Benzofluoranthenes ^{2P}	0.59	0.084	0.01*	0.0093	ND	0.014	0.015*	0.011	ND	0.0073
Benzo(a)pyrene ^{2P}	ND	0.065	ND	0.023	ND	0.015	ND	0.021	ND	0.022
Benzo(e)pyrene ^{2P}	0.086*	0.024	0.044*	0.0044	ND	0.017	0.018*	0.0072	ND	0.0067
Perylene ^{2P}	0.61*	0.094	0.011	0.009	ND	0.015	ND	0.0098	0.026	0.014
Dibenz(ah)anthracene ^{2P}	ND	0.18	ND	0.0093	ND	0.043	ND	0.047	ND	0.03
Benzo(ghi)perylene ^{2P}	1.2*	0.043	ND	0.008	ND	0.017	ND	0.014	ND	0.017
Indeno(1,2,3,cd)pyrene ^{2P}	0.15*	0.036	ND	0.012	ND	0.03	ND	0.023	ND	0.025
C1-Naphthalene ^A	53	0.14	1.8	0.0053	2.4	0.0066	1.6	0.29	2.8	0.0061
C2-Naphthalene ^A	14	0.1	1.1	0.0067	1.4	0.008	1.3	0.021	2.4	0.014
C3-Naphthalene ^A	19	0.35	0.75	0.0071	0.8	0.003	6.2	0.0071	1.9	0.013
C4-Naphthalene ^A	63	0.061	0.071	0.0015	0.072	0.014	0.067	0.022	13	0.082
C1-Phenanthrene/Anthracene ^A	11	0.12	0.6	0.017	0.42	0.014	0.6	0.03	0.5	0.027
C2-Phenanthrene/Anthracene ^A	8.5	0.13	0.32	0.0072	0.33	0.0096	0.59	0.011	0.29	0.022
C3-Phenanthrene/Anthracene ^A	3.3	0.18	0.091	0.027	0.069	0.0053	0.21	0.0065	0.13	0.012
C4-Phenanthrene/Anthracene ^A	7.9	0.19	0.46	0.011	0.37	0.0091	0.49	0.012	0.36	0.015
Retene	1.5	0.14	0.11	0.03	0.11	0.024	0.38	0.031	0.11	0.033
Dibenzothiophene	0.96*	0.044	0.096	0.0034	0.089*	0.01	0.031*	0.0052	0.067	0.01
C1-Dibenzothiophenes	ND	0.34	0.19	0.017	0.15	0.011	0.19	0.013	0.26	0.016
C2-Dibenzothiophenes	9.5	0.46	0.38	0.041	0.18	0.021	0.17	0.024	0.53	0.057
Total Parent ^(P) LPAH**	25.930		3.794		3.250		2.615		2.829	
Total Parent ^(P) HPAH**	7.786		0.248		0.230		0.238		0.268	
Total Alkylated ^{(A)**}	179.700		5.121		5.789		10.990		21.380	
Total Dibenzothiophene**	10.460		0.666		0.419		0.391		0.857	
Total PAH concentration**	225.38		9.94		9.80		14.61		25.44	
% Lipid	17.0		3.1		3.0		3.0		2.9	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PAH-1		TC-00-PAH-2		TC-00-PAH-2		TC-00-PAH-1		TC-00-PAH-3	

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period. (Food not included).

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

Table 82 (cont'd): Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during each exposure period.

Polycyclic aromatic hydrocarbons	Fall 2001										Mean of 3 exposure periods			
	Food		Control		Control (lab split)		Ref		d/s Urban		Food	Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.	Conc.
Naphthalene ^{1P}	23.5	0.524	0.795	0.0584	0.829	0.0398	0.811	0.0462	1.03	0.0488	15.200	1.065	0.984	1.243
Acenaphthylene ^{1P}	2.10	0.556	ND	0.0689	0.0438*	0.0397	ND	0.0834	0.107*	0.0693	1.140	0.053	0.054	0.129
Acenaphthene ^{1P}	1.91	0.635	0.185	0.0986	0.286	0.0933	5.32*	0.132	1.53*	0.119	1.937	1.328	2.100	1.470
Fluorene ^{1P}	3.02	0.494	0.0687*	0.0569	0.0915*	0.0510	0.143*	0.0522	0.248*	0.0717	2.640	0.123	0.121	0.319
Phenanthrene ^{1P}	11.4	0.301	0.397	0.0585	0.353	0.0382	0.218	0.0530	0.479	0.0482	8.200	0.466	0.316	0.676
Anthracene ^{1P}	1.24	0.323	ND	0.0632	ND	0.0413	ND	0.0573	ND	0.0522	1.040	0.029	0.027	0.048
Fluoranthene ^{2P}	1.48	0.177	0.166	0.0229	0.120	0.0383	ND	0.101	0.302*	0.0395	2.027	0.152	0.073	0.231
Pyrene ^{2P}	2.12*	0.171	0.0947*	0.0224	0.150*	0.0374	ND	0.0990	0.129*	0.0384	1.973	0.113	0.063	0.127
Benz(a)anthracene ^{2P}	0.429*	0.283	ND	0.0215	ND	0.0291	ND	0.0512	ND	0.0364	0.440	0.003	ND	ND
Chrysene ^{2P}	1.40	0.288	0.0507*	0.0290	0.0453*	0.0376	ND	0.0677	0.0867*	0.0350	0.997	0.032	0.008	0.058
Benzofluoranthenes ^{2P}	ND	0.466	ND	0.0727	ND	0.0320	ND	0.0816	ND	0.0824	0.333	0.003	0.016	0.007
Benzo(a)pyrene ^{2P}	ND	0.353	ND	0.0503	ND	0.0252	ND	0.0703	ND	0.0562	0.050	ND	ND	ND
Benzo(e)pyrene ^{2P}	ND	0.333	ND	0.0458	ND	0.0233	ND	0.0650	ND	0.0515	0.462	0.024	0.019	0.005
Perylene ^{2P}	ND	0.500	ND	0.0587	ND	0.0258	ND	0.0768	ND	0.0623	0.290	0.004	0.006	0.018
Dibenz(ah)anthracene ^{2P}	ND	0.382	ND	0.0459	ND	0.0291	ND	0.0318	ND	0.0793	ND	ND	ND	ND
Benzo(ghi)perylene ^{2P}	ND	0.523	0.0929*	0.0377	ND	0.0875	ND	0.0723	0.0573*	0.0323	0.900	0.031	ND	0.024
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.661	ND	0.0441	ND	0.0766	ND	0.0639	ND	0.0369	0.093	ND	ND	0.008
C1-Naphthalene ^A	21.7	1.08	0.822	0.203	0.848	0.116	0.585	0.122	1.12	0.109	39.900	1.474	1.062	1.873
C2-Naphthalene ^A	37.3	0.480	1.09	0.176	0.958	0.0736	0.690	0.0721	1.68	0.106	25.433	1.363	0.997	2.460
C3-Naphthalene ^A	90.8	1.31	9.47	0.121	7.06	0.0859	4.97	0.0740	2.37	0.0698	44.933	3.740	3.980	2.257
C4-Naphthalene ^A	96.0	0.932	3.18	0.102	15.4	0.192	12.0	0.260	4.34	0.132	71.000	2.584	4.522	8.180
C1-Phenanthrene/Anthracene ^A	15.1	0.657	0.489	0.0786	0.372	0.0743	0.415	0.0884	1.01	0.0975	12.700	0.863	0.592	0.837
C2-Phenanthrene/Anthracene ^A	23.3	0.511	0.710	0.0734	0.459	0.196	0.526	0.178	4.79	0.284	14.267	0.527	0.529	1.927
C3-Phenanthrene/Anthracene ^A	8.75	0.547	0.168	0.0607	0.234	0.0640	0.301	0.0751	0.280	0.0493	5.317	0.166	0.230	0.213
C4-Phenanthrene/Anthracene ^A	15.0	1.04	1.52	0.120	1.35	0.0715	1.13	0.0867	11.1	0.109	9.333	1.360	0.823	3.977
Retene	ND	1.04	0.232	0.120	0.183	0.0715	0.146	0.0867	0.134	0.109	1.033	0.251	0.282	0.081
Dibenzothiophene	1.19*	0.519	ND	0.0687	ND	0.0578	0.0658*	0.0546	0.0739*	0.0550	1.250	0.072	0.047	0.124
C1-Dibenzothiophenes	6.87	0.685	1.40	0.0995	0.118	0.0378	0.361	0.0542	0.468	0.0993	2.657	0.710	0.340	0.609
C2-Dibenzothiophenes	10.0	1.18	1.47	0.133	0.929	0.0579	0.788	0.133	0.883	0.190	8.933	0.867	0.556	0.938
Total Parent ^(P) LPAH**	43.170		1.377		1.560		6.492		3.394		30.157	3.031	3.602	3.886
Total Parent ^(P) HPAH**	5.429		0.259		0.270		ND		0.518		7.565	0.279	0.162	0.415
Total Alkylated ^{(A)**}	307.950		17.449		26.681		20.617		26.690		222.883	12.053	12.212	21.723
Total Dibenzothiophene**	18.060		2.870		1.047		1.149		1.425		12.840	1.649	0.921	1.671
Total PAH concentration**	374.61		22.19		29.74		28.40		32.16		274.478	17.126	17.072	27.774
% Lipid		26.0		3.0		3.0		3.6		3.2	20.33	3.17	3.43	3.13
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)		TC-01-PAH		TC-01-PAH		TC-01-PAH		TC-01-PAH		TC-01-PAH	-	-	-	-

NOTE: Sample per site per exposure period is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period. (Food not included).

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish

Table 83: Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

Polycyclic aromatic hydrocarbons	Spring 2000						Fall 2000					
	Control		Ref		d/s Urban		Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	1.3	0.008	1.4	0.013	0.96	0.0038	1.5	0.013	1.5	0.031	1.7	0.017
Acenaphthylene ^{1P}	0.093	0.011	0.084	0.02	0.082	0.0046	0.092	0.015	0.091	0.014	0.091	0.02
Acenaphthene ^{1P}	0.039	0.021	0.042	0.026	0.048	0.013	0.084	0.019	0.071	0.026	0.097	0.04
Fluorene ^{1P}	0.069	0.016	0.081	0.02	0.076	0.018	0.12	0.02	0.096	0.027	0.12	0.026
Phenanthrene ^{1P}	0.3	0.0065	0.36	0.0087	0.32	0.011	0.41	0.01	0.38	0.015	0.5	0.019
Anthracene ^{1P}	0.028	0.016	0.041	0.018	0.029*	0.014	0.036	0.014	ND	0.052	0.043	0.034
Fluoranthene ^{2P}	0.11	0.014	0.13	0.011	0.13	0.014	0.14	0.0076	0.16	0.027	0.22	0.013
Pyrene ^{2P}	0.12	0.014	0.14	0.01	0.19	0.0038	0.15	0.015	0.17	0.026	0.28	0.021
Benz(a)anthracene ^{2P}	ND	0.012	0.013*	0.013	0.019	0.011	ND	0.023	ND	0.028	0.021*	0.018
Chrysene ^{2P}	ND	0.025	0.035	0.016	0.071	0.0072	ND	0.033	0.035	0.021	0.059	0.046
Benzofluoranthenes ^{2P}	ND	0.012	ND	0.02	0.051	0.0068	0.021	0.016	ND	0.028	ND	0.041
Benzo(a)pyrene ^{2P}	ND	0.012	ND	0.021	0.0075*	0.0075	ND	0.022	ND	0.021	ND	0.049
Benzo(e)pyrene ^{2P}	ND	0.0095	ND	0.014	0.015	0.011	ND	0.014	ND	0.012	ND	0.033
Perylene ^{2P}	ND	0.029	0.034	0.024	0.039	0.016	ND	0.026	ND	0.03	ND	0.062
Dibenz(ah)anthracene ^{2P}	ND	0.042	ND	0.093	ND	0.038	ND	0.054	ND	0.04	ND	0.16
Benzo(ghi)perylene ^{2P}	ND	0.028	ND	0.045	ND	0.017	ND	0.052	ND	0.049	ND	0.028
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.026	ND	0.018	ND	0.042	ND	0.052	ND	0.04	ND	0.033
C1-Naphthalene ^A	1.2	0.009	1.3	0.0077	0.94	0.0052	1.7	0.027	1.4	0.03	1.8	0.017
C2-Naphthalene ^A	0.72	0.019	0.74	0.018	0.82	0.018	1.2	0.032	1.3	0.039	1.6	0.055
C3-Naphthalene ^A	0.33	0.015	0.36	0.025	0.59	0.0067	0.5	0.012	0.45	0.026	0.68	0.026
C4-Naphthalene ^A	ND	0.021	ND	0.026	ND	0.016	ND	0.03	0.068	0.028	ND	0.024
C1-Phenanthrene/Anthracene ^A	0.37	0.019	0.45	0.03	0.67	0.014	0.44	0.015	0.68	0.038	0.81	0.067
C2-Phenanthrene/Anthracene ^A	0.3	0.0051	0.39	0.0082	0.46	0.025	0.44	0.015	0.55	0.047	0.74	0.013
C3-Phenanthrene/Anthracene ^A	0.11	0.033	0.16	0.02	0.15	0.012	0.12	0.017	0.27	0.015	0.26	0.023
C4-Phenanthrene/Anthracene ^A	0.05	0.019	0.082	0.017	0.055	0.0074	0.13	0.015	0.5	0.03	0.3	0.02
Retene	0.071	0.018	0.15	0.048	0.11	0.023	0.11	0.06	0.18	0.072	0.28	0.11
Dibenzothiophene	ND	0.016	0.024*	0.0065	0.039*	0.013	0.037*	0.019	ND	0.0079	0.034*	0.023
C1-Dibenzothiophenes	0.11	0.015	0.13	0.015	0.13	0.023	0.11	0.012	0.16	0.012	0.16	0.034
C2-Dibenzothiophenes	0.06	0.019	0.067	0.02	0.19	0.034	ND	0.018	ND	0.029	ND	0.055
Total Parent ^(P) LPAH**	1.790		1.966		1.515		2.206		2.138		2.508	
Total Parent ^(P) HPAH**	0.230		0.339		0.500		0.290		0.330		0.559	
Total Alkylated ^{(A)**}	3.080		3.482		3.685		4.530		5.218		6.190	
Total Dibenzothiophene**	0.170		0.221		0.359		0.147		0.160		0.160	
Total PAH concentration**	5.34		6.16		6.17		7.28		8.03		9.70	
% Lipid	0.4		0.6		0.4		0.6		0.5		0.6	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-00-PAH-2		TC-00-PAH-2		TC-00-PAH-2		TC-00-PAH-3		TC-00-PAH-3		TC-00-PAH-3	

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

Table 83 (cont'd): Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in crayfish muscle tissue exposed to Yorkson Creek water during each exposure period.

Polycyclic aromatic hydrocarbons	Fall 2001						Mean of 3 exposure periods		
	Control		Ref		d/s Urban		Control	Ref	d/s Urban
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	Conc.	Conc.
Naphthalene ^{1P}	1.71	0.165	0.877	0.103	0.874	0.0515	1.503	1.259	1.178
Acenaphthylene ^{1P}	ND	0.0626	ND	0.136	ND	0.0468	0.062	0.058	0.058
Acenaphthene ^{1P}	0.138*	0.114	ND	0.134	ND	0.0777	0.087	0.038	0.048
Fluorene ^{1P}	ND	0.101	ND	0.0867	0.0800*	0.0525	0.063	0.059	0.092
Phenanthrene ^{1P}	0.732	0.0551	0.353	0.0764	0.325	0.0435	0.481	0.364	0.382
Anthracene ^{1P}	0.0790*	0.0596	ND	0.0827	ND	0.0470	0.048	0.014	0.024
Fluoranthene ^{2P}	1.19	0.0505	0.108	0.0435	0.105	0.0337	0.480	0.133	0.152
Pyrene ^{2P}	1.40	0.0491	0.0950	0.0423	0.164	0.0328	0.557	0.135	0.211
Benz(a)anthracene ^{2P}	0.0852*	0.0373	ND	0.0754	ND	0.0278	0.028	0.004	0.013
Chrysene ^{2P}	0.195*	0.0425	ND	0.0463	0.0664	0.0333	0.065	0.023	0.065
Benzofluoranthenes ^{2P}	ND	0.511	ND	0.125	ND	0.0903	0.007	ND	0.017
Benzo(a)pyrene ^{2P}	ND	0.356	ND	0.0937	ND	0.0717	ND	ND	0.003
Benzo(e)pyrene ^{2P}	ND	0.327	ND	0.0859	ND	0.0657	ND	ND	0.005
Perylene ^{2P}	ND	0.406	ND	0.0985	ND	0.0808	ND	0.011	0.013
Dibenz(ah)anthracene ^{2P}	ND	0.0643	ND	0.146	ND	0.0713	ND	ND	ND
Benzo(ghi)perylene ^{2P}	ND	0.101	0.175*	0.0783	0.0903*	0.0595	ND	0.058	0.030
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.0986	ND	0.0915	ND	0.0598	ND	ND	ND
C1-Naphthalene ^A	0.970	0.211	0.556	0.282	0.524	0.195	1.290	1.085	1.088
C2-Naphthalene ^A	0.884	0.142	0.477	0.278	0.450	0.127	0.935	0.839	0.957
C3-Naphthalene ^A	0.420	0.110	ND	0.150	0.323	0.0870	0.417	0.270	0.531
C4-Naphthalene ^A	ND	0.184	ND	0.136	ND	0.0958	ND	0.023	ND
C1-Phenanthrene/Anthracene ^A	0.748	0.0723	0.298	0.110	0.395	0.0778	0.519	0.476	0.625
C2-Phenanthrene/Anthracene ^A	1.11	0.126	ND	0.290	0.379	0.0809	0.617	0.313	0.526
C3-Phenanthrene/Anthracene ^A	0.830	0.101	ND	0.0745	0.192	0.0483	0.353	0.143	0.201
C4-Phenanthrene/Anthracene ^A	12.9	0.164	0.767	0.128	2.49	0.0798	4.360	0.450	0.948
Retene	0.283	0.164	0.128	0.128	0.123	0.0798	0.155	0.153	0.171
Dibenzothiophene	0.103*	0.0798	ND	0.0862	ND	0.0653	0.047	0.008	0.024
C1-Dibenzothiophenes	0.260	0.0708	ND	0.0926	0.0730	0.0588	0.160	0.097	0.121
C2-Dibenzothiophenes	0.438	0.136	ND	0.0245	0.0908	0.0823	0.166	0.022	0.094
Total Parent ^(P) LPAH**	2.580		1.230		1.199		2.192	1.778	1.741
Total Parent ^(P) HPAH**	2.870		0.378		0.335		1.130	0.349	0.465
Total Alkylated ^{(A)**}	17.862		2.098		4.753		8.491	3.599	4.876
Total Dibenzothiophene**	0.801		ND		ND		0.373	0.127	0.173
Total PAH concentration**	24.40		3.71		6.29		12.339	5.965	7.385
% Lipid	1.1		0.4		0.5		0.70	0.50	0.50
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PAH		TC-01-PAH		TC-01-PAH		-	-	-

NOTE: Sample per site per exposure period is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected. Considered a zero value for statistical calculations.

Crayfish Hepatopancreas

Table 84: Polycyclic aromatic hydrocarbon (PAH) concentrations (ng/g) in crayfish hepatopancreas exposed to Yorkson Creek water during one exposure period.

Polycyclic aromatic hydrocarbons	Fall 2001					
	Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene ^{1P}	11.7	0.324	3.64	0.437	3.80	1.31
Acenaphthylene ^{1P}	0.904*	0.331	ND	0.523	ND	0.414
Acenaphthene ^{1P}	4.36	0.622	ND	0.364	0.314	0.288
Fluorene ^{1P}	4.33	0.848	ND	0.366	0.336*	0.252
Phenanthrene ^{1P}	9.72	0.352	1.59	0.323	1.88	0.181
Anthracene ^{1P}	1.73	0.374	ND	0.349	ND	0.196
Fluoranthene ^{2P}	20.6	0.320	0.472*	0.104	1.11	0.189
Pyrene ^{2P}	20.7	0.311	0.605	0.101	1.55	0.182
Benz(a)anthracene ^{2P}	0.906*	0.392	ND	0.145	ND	0.226
Chrysene ^{2P}	2.92	0.511	ND	0.251	0.536*	0.272
Benzofluoranthenes ^{2P}	16.1	2.35	ND	0.656	ND	0.602
Benzo(a)pyrene ^{2P}	6.65*	1.80	ND	0.476	ND	0.434
Benzo(e)pyrene ^{2P}	3.48*	1.65	ND	0.436	0.462*	0.399
Perylene ^{2P}	2.20	1.93	ND	0.509	ND	0.459
Dibenz(ah)anthracene ^{2P}	ND	0.367	ND	0.448	ND	0.363
Benzo(ghi)perylene ^{2P}	ND	0.729	0.484*	0.219	0.408*	0.291
Indeno(1,2,3,cd)pyrene ^{2P}	ND	0.646	ND	0.231	ND	0.325
C1-Naphthalene ^A	8.60	0.656	2.42	0.708	2.59	0.281
C2-Naphthalene ^A	16.5	0.569	9.76	0.988	9.32	0.541
C3-Naphthalene ^A	7.38	0.690	2.48	0.684	5.72	0.425
C4-Naphthalene ^A	39.7	1.02	11.5	1.03	6.81	0.656
C1-Phenanthrene/Anthracene ^A	9.77	0.718	2.38	0.431	4.82	0.507
C2-Phenanthrene/Anthracene ^A	7.46	0.722	2.06	0.296	5.84	0.414
C3-Phenanthrene/Anthracene ^A	5.10	0.958	1.48	0.483	1.61	0.813
C4-Phenanthrene/Anthracene ^A	10.3	4.90	6.98	0.664	15.2	0.509
Retene	ND	4.90	2.40	0.664	1.03	0.509
Dibenzothiophene	1.04*	0.357	ND	0.353	0.367*	0.251
C1-Dibenzothiophenes	2.87	0.416	1.61	0.568	1.82	0.490
C2-Dibenzothiophenes	3.53	1.25	2.10	0.617	2.68	0.514
Total Parent ^(P) LPAH**	32.744		5.230		5.680	
Total Parent ^(P) HPAH**	73.556		1.077		2.660	
Total Alkylated ^{(A)**}	104.810		39.060		51.910	
Total Dibenzothiophene**	7.440		3.710		4.867	
Total PAH concentration**	218.55		49.08		65.12	
% Lipid	53.0		30.0		28.0	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PAH		TC-01-PAH		TC-01-PAH	

NOTE: Sample per site is a composite of hepatopancreas tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit per exposure period.

¹ = LPAH = Low molecular weight (<200).

² = HPAH = High molecular weight (>200).

ND = Not detected.

5.2.5 Polybrominated Diphenyl Ethers

Cutthroat Trout

Table 85: Polybrominated diphenyl ether (PBDE) concentrations (pg/g) in commercial fish food and in cutthroat trout muscle tissue exposed to Yorkson Creek water during one exposure period.

Polybrominated diphenyl ethers	Fall 2001							
	Food		Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	33.0	ND	26.0	ND	30.0	ND	32.0
3-MonoBDE (2)	ND	33.0	ND	26.0	ND	30.0	ND	32.0
4-MonoBDE (3)	ND	33.0	ND	26.0	ND	30.0	ND	32.0
2,4-DiBDE (7)	ND	1.50	ND	1.09	ND	1.22	ND	1.35
2,4'/3,3'-DiBDE (8/11)	ND	1.50	ND	1.09	ND	1.22	ND	1.35
2,6-DiBDE (10)	ND	1.50	ND	1.09	ND	1.22	ND	1.35
3,4-DiBDE (12)	ND	1.50	ND	1.09	ND	1.22	ND	1.35
3,4'-DiBDE (13)	ND	1.50	ND	1.09	ND	1.22	ND	1.35
4,4'-DiBDE (15)	ND	1.50	ND	1.09	ND	1.22	ND	1.35
2,2',4-TriBDE (17)	4.73	3.31	ND	2.85	ND	2.95	ND	3.07
2,3',4-TriBDE (25)	ND	3.10	ND	2.69	ND	2.79	ND	2.90
2,4,4'/2',3,4-TriBDE (28/33)	14.5	2.91	5.78	2.55	7.23	2.64	7.27	2.75
2,4,6-TriBDE (30)	ND	3.10	ND	2.69	ND	2.79	ND	2.90
2,4',6-TriBDE (32)	ND	3.10	ND	2.69	ND	2.79	ND	2.90
3,3',4-TriBDE (35)	ND	3.10	ND	2.69	ND	2.79	ND	2.90
3,4,4'-TriBDE (37)	ND	3.10	ND	2.69	ND	2.79	ND	2.90
2,2',4,4'-TetraBDE (47)	252	1.33	116	1.13	118	1.54	137	1.39
2,2',4,5'-TetraBDE (49)	29.8	1.76	18.8	1.42	18.3	2.00	18.3	1.80
2,3',4,4'-TetraBDE (66)	10.0	2.44	5.43*	1.94	5.13	2.74	6.39*	2.47
2,3',4',6-TetraBDE (71)	4.29	1.76	ND	1.42	ND	2.00	ND	1.80
2,4,4',6-TetraBDE (75)	ND	1.78	ND	1.41	ND	1.99	ND	1.80
3,3',4,4'-TetraBDE (77)	ND	1.76	ND	1.42	ND	2.00	ND	1.80
2,2',3,4,4'-PentaBDE (85)	ND	3.17	ND	2.23	ND	2.43	ND	3.09
2,2',4,4',5-PentaBDE (99)	86.9	2.61	37.9*	1.66	34.4	1.78	55.4	2.28
2,2',4,4',6-PentaBDE (100)	44.8	1.53	22.0	1.12	20.6*	1.16	26.7	1.40
2,3,3',4,4'-PentaBDE (105)	ND	2.26	ND	1.57	ND	1.66	ND	2.07
2,3,4,5,6-PentaBDE (116)	ND	2.26	ND	1.57	ND	1.66	ND	2.07
2,3',4,4',6-PentaBDE (119)	ND	2.26	ND	1.57	ND	1.66	ND	2.07
3,3',4,4',5-PentaBDE (126)	ND	2.26	ND	1.57	ND	1.66	ND	2.07
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	ND	4.62	ND	3.70	ND	3.65	ND	4.40
2,2',3,4,4',6'-HexaBDE (140)	ND	3.75	ND	3.03	ND	2.99	ND	3.62
2,2',4,4',5,5'-HexaBDE (153)	12.6	4.58	6.17*	3.91	4.98*	3.77	9.22*	4.72
2,2',4,4',5,6'-HexaBDE (154)	13.0	2.61	6.92	2.12	9.49	2.13	7.97	2.58
2,2',4,4',6,6'-HexaBDE (155)	ND	3.75	3.89	3.03	ND	2.99	4.72	3.62
2,2',3,4,4',5,6-HeptaBDE (181)	ND	13.8	ND	5.75	ND	5.45	ND	5.21
2,2',3,4,4',5',6-HeptaBDE (183)	ND	10.2	ND	4.33	12.2*	4.11	ND	3.92
2,3,3',4,4',5,6-HeptaBDE (190)	ND	21.3	ND	8.55	ND	8.11	ND	7.75
2,2',3,3',4,4',5,5',6-NonaBDE (206)	177	40.3	ND	7.54	ND	6.95	ND	8.87
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	160*	40.3	ND	7.54	ND	6.95	ND	8.87
2,2',3,3',4,5,5',6,6'-NonaBDE (208)	85.1*	40.3	ND	7.54	ND	6.95	ND	8.87
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	6910	50.0	ND	149	113	42.5	138*	98.9
Total MonoBDE**	ND		ND		ND		ND	
Total DiBDE**	ND		ND		ND		ND	
Total TriBDE**	19.23		5.78		7.23		7.27	
Total TetraBDE**	296.09		140.23		141.43		161.69	
Total PentaBDE**	131.7		59.9		55.0		82.1	
Total HexaBDE**	25.60		16.98		14.47		21.91	
Total HeptaBDE**	ND		ND		12.2		ND	
Total NonaBDE**	422.1		ND		ND		ND	
Total DecaBDE**	6910		ND		ND		ND	
Total PBDE concentration**	7804.72		222.89		230.33		272.97	
% Lipid		26.0		3.0		3.6		3.2
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)		TC-01-PBDE		TC-01-PBDE		TC-01-PBDE		TC-01-PBDE

NOTE: Sample per site is a composite of epaxial muscle tissue from 24-26 cutthroat trout.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit (Food not included).

ND = Not detected.

Crayfish

Table 86: Polybrominated diphenyl ether (PBDE) concentrations (pg/g) in crayfish muscle tissue exposed to Yorkson Creek water during one exposure period.

Polybrominated diphenyl ethers	Fall 2001					
	Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	33.0	ND	28.0	ND	37.0
3-MonoBDE (2)	ND	33.0	ND	28.0	ND	37.0
4-MonoBDE (3)	ND	33.0	ND	28.0	ND	37.0
2,4-DiBDE (7)	ND	1.20	ND	1.15	ND	1.44
2,4'/3,3'-DiBDE (8/11)	ND	1.20	ND	1.15	ND	1.44
2,6-DiBDE (10)	ND	1.20	ND	1.15	ND	1.44
3,4-DiBDE (12)	ND	1.20	ND	1.15	ND	1.44
3,4'-DiBDE (13)	ND	1.20	ND	1.15	ND	1.44
4,4'-DiBDE (15)	ND	1.20	ND	1.15	ND	1.44
2,2',4-TriBDE (17)	ND	2.81	ND	2.40	ND	3.36
2,3',4-TriBDE (25)	ND	2.65	ND	2.40	ND	3.15
2,4,4'/2',3,4-TriBDE (28/33)	7.16	2.51	ND	2.40	ND	2.96
2,4,6-TriBDE (30)	ND	2.65	ND	2.40	ND	3.15
2,4',6-TriBDE (32)	ND	2.65	ND	2.40	ND	3.15
3,3',4-TriBDE (35)	ND	2.65	ND	2.40	ND	3.15
3,4,4'-TriBDE (37)	ND	2.65	ND	2.40	ND	3.15
2,2',4,4'-TetraBDE (47)	97.7	1.32	9.68	1.32	18.3	1.77
2,2',4,5'-TetraBDE (49)	ND	1.69	ND	1.69	ND	2.35
2,3',4,4'-TetraBDE (66)	ND	2.30	ND	2.31	ND	3.26
2,3',4',6-TetraBDE (71)	ND	1.69	ND	1.69	ND	2.35
2,4,4',6-TetraBDE (75)	ND	1.68	ND	1.68	ND	2.37
3,3',4,4'-TetraBDE (77)	ND	1.69	ND	1.69	ND	2.35
2,2',3,4,4'-PentaBDE (85)	ND	2.35	ND	2.35	ND	2.28
2,2',4,4',5-PentaBDE (99)	24.8	1.88	8.72	1.86	13.0	1.78
2,2',4,4',6-PentaBDE (100)	7.95	1.11	1.98*	1.25	3.12	1.02
2,3,3',4,4'-PentaBDE (105)	ND	1.65	ND	1.72	ND	1.56
2,3,4,5,6-PentaBDE (116)	ND	1.65	ND	1.72	ND	1.56
2,3',4,4',6-PentaBDE (119)	ND	1.65	ND	1.72	ND	1.56
3,3',4,4',5-PentaBDE (126)	ND	1.65	ND	1.72	ND	1.56
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	ND	3.35	ND	2.85	ND	4.94
2,2',3,4,4',6'-HexaBDE (140)	ND	2.74	ND	2.60	ND	4.06
2,2',4,4',5,5'-HexaBDE (153)	4.84*	3.42	4.02*	3.90	ND	5.22
2,2',4,4',5,6'-HexaBDE (154)	3.42	1.97	ND	2.19	ND	2.83
2,2',4,4',6,6'-HexaBDE (155)	ND	2.74	ND	2.60	ND	4.06
2,2',3,4,4',5,6-HeptaBDE (181)	ND	4.21	ND	5.04	ND	7.12
2,2',3,4,4',5',6-HeptaBDE (183)	ND	3.17	ND	3.80	ND	5.27
2,3,3',4,4',5,6-HeptaBDE (190)	ND	6.27	ND	7.50	ND	11.0
2,2',3,3',4,4',5,5',6-NonaBDE (206)	ND	9.18	ND	12.4	ND	21.0
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	ND	9.18	ND	12.4	ND	21.0
2,2',3,3',4,5,5',6,6'-NonaBDE (208)	ND	9.18	ND	12.4	ND	21.0
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	660	42.1	674	68.3	827	81.4
Total MonoBDE**	ND		ND		ND	
Total DiBDE**	ND		ND		ND	
Total TriBDE**	7.16		ND		ND	
Total TetraBDE**	97.70		9.68		18.30	
Total PentaBDE**	32.75		10.70		16.12	
Total HexaBDE**	3.42		ND		ND	
Total HeptaBDE**	ND		ND		ND	
Total NonaBDE**	ND		ND		ND	
Total DecaBDE**	660		674		827	
Total PBDE concentration**	801.03		694.38		861.42	
% Lipid	1.1		0.4		0.5	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PBDE		TC-01-PBDE		TC-01-PBDE	

NOTE: Sample per site is a composite of abdominal muscle tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit.

ND = Not detected.

Crayfish Hepatopancreas

Table 87: Polybrominated diphenyl ether (PBDE) concentrations (pg/g) in crayfish hepatopancreas exposed to Yorkson Creek water during one exposure period.

Polybrominated diphenyl ethers	Fall 2001					
	Control		Ref		d/s Urban	
	Conc.	DL	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	300	ND	300	ND	250
3-MonoBDE (2)	ND	300	ND	300	ND	250
4-MonoBDE (3)	ND	300	ND	300	ND	250
2,4-DiBDE (7)	ND	12.8	ND	12.4	ND	11.5
2,4'/3,3'-DiBDE (8/11)	ND	12.8	ND	12.4	ND	11.5
2,6-DiBDE (10)	ND	12.8	ND	12.4	ND	11.5
3,4-DiBDE (12)	ND	12.8	ND	12.4	ND	11.5
3,4'-DiBDE (13)	ND	12.8	ND	12.4	ND	11.5
4,4'-DiBDE (15)	52.2	12.8	ND	12.4	12.4*	11.5
2,2',4-TriBDE (17)	ND	32.7	ND	24.9	ND	27.4
2,3',4-TriBDE (25)	ND	30.6	ND	23.3	ND	25.7
2,4,4'/2',3,4-TriBDE (28/33)	271	28.8	66.6	21.9	108	24.1
2,4,6-TriBDE (30)	ND	30.6	ND	23.3	ND	25.7
2,4',6-TriBDE (32)	ND	30.6	ND	23.3	ND	25.7
3,3',4-TriBDE (35)	ND	30.6	ND	23.3	ND	25.7
3,4,4'-TriBDE (37)	ND	30.6	ND	23.3	ND	25.7
2,2',4,4'-TetraBDE (47)	3030	14.6	848	10.3	1450	11.9
2,2',4,5'-TetraBDE (49)	ND	19.1	ND	13.2	ND	15.3
2,3',4,4'-TetraBDE (66)	72.8	26.4	22.5*	18.2	33.2*	21.0
2,3',4',6-TetraBDE (71)	ND	19.1	ND	13.2	ND	15.3
2,4,4',6-TetraBDE (75)	ND	19.2	ND	13.3	ND	15.3
3,3',4,4'-TetraBDE (77)	ND	19.1	ND	13.2	ND	15.3
2,2',3,4,4'-PentaBDE (85)	ND	22.9	ND	26.4	ND	26.3
2,2',4,4',5-PentaBDE (99)	510	16.6	385	18.3	569	18.5
2,2',4,4',6-PentaBDE (100)	279	9.43	240	12.1	299	12.2
2,3,3',4,4'-PentaBDE (105)	ND	14.7	ND	17.6	ND	17.7
2,3,4,5,6-PentaBDE (116)	ND	14.7	ND	17.6	ND	17.7
2,3',4,4',6-PentaBDE (119)	17.9*	14.7	ND	17.6	19.0*	17.7
3,3',4,4',5-PentaBDE (126)	ND	14.7	ND	17.6	ND	17.7
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	ND	35.5	ND	47.4	ND	40.1
2,2',3,4,4',6'-HexaBDE (140)	ND	28.8	ND	38.7	ND	33.4
2,2',4,4',5,5'-HexaBDE (153)	120	36.0	133	49.8	186	40.4
2,2',4,4',5,6'-HexaBDE (154)	182	19.9	171	27.0	182	25.4
2,2',4,4',6,6'-HexaBDE (155)	ND	28.8	ND	38.7	ND	33.4
2,2',3,4,4',5,6-HeptaBDE (181)	ND	57.2	ND	47.0	ND	52.8
2,2',3,4,4',5',6-HeptaBDE (183)	ND	42.3	70.2	34.8	116*	39.1
2,3,3',4,4',5,6-HeptaBDE (190)	ND	88.1	ND	72.4	ND	81.3
2,2',3,3',4,4',5,5',6-NonaBDE (206)	ND	81.9	ND	108	143	122
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	ND	81.9	131*	108	275	122
2,2',3,3',4,5,5',6,6'-NonaBDE (208)	ND	81.9	ND	108	563	122
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	1370*	465	2700*	714	5260	471
Total MonoBDE**	ND		ND		ND	
Total DiBDE**	52.2		ND		ND	
Total TriBDE**	271.0		66.6		108.0	
Total TetraBDE**	3102.8		848.0		1483.2	
Total PentaBDE**	789.0		625.0		868.0	
Total HexaBDE**	302		304		368	
Total HeptaBDE**	ND		70.2		116.0	
Total NonaBDE**	ND		131		981	
Total DecaBDE**	1370		2700		5260	
Total PBDE concentration**	5887.0		4744.8		9184.2	
% Lipid	53.0		30.0		28.0	
Corresponding Lab Blank & Spiked Matrix (see Tissue QA)	TC-01-PBDE		TC-01-PBDE		TC-01-PBDE	

NOTE: Sample per site is a composite of hepatopancreas tissue from 24 crayfish.

* = Peak detected, but did not meet quantification criteria.

** = Totals standardized to highest detection limit.

ND = Not detected.

5.3 Biological Indicators

5.3.1 Fish Growth

Table 88: Summary of size, condition factor and somatic indices of cutthroat trout exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Statistic	Initial Weight (g)	Final Weight (g)	% Weight Growth	Initial Length (cm)	Final Length (cm)	% Length Growth	Gutted Weight (g)	Liver Weight (g)	Gonad Weight (g)
Spring 2000	Control (n=24)	mean	63.63	-	-	17.76	-	-	54.58	0.66	0.62
		SD	12.83	-	-	0.97	-	-	10.90	0.17	1.08
		min	50.0	-	-	16.0	-	-	37.41	0.44	0.06
		max	91.6	-	-	19.8	-	-	80.65	1.16	3.70
	Ref (n=24)	mean	71.40	77.15	8.14	18.85	19.51	3.46	67.99	0.99	0.16
		SD	18.20	24.08	18.47	1.71	2.08	4.35	21.47	0.58	0.09
		min	35.6	43.0	-19.4	15.3	15.5	-5.8	35.50	0.27	0.04
		max	108.4	131.4	48.2	21.8	23.1	11.3	112.56	2.35	0.46
	d/s Urban (n=23)	mean	66.14	64.58	-2.68	18.48	19.00	2.84	57.87	0.62	0.30
		SD	11.63	16.26	14.49	1.06	1.24	3.72	13.98	0.34	0.58
		min	42.0	35.7	-32.3	16.3	16.4	-4.2	34.47	0.20	0.03
		max	89.6	94.3	22.1	20.0	21.0	10.1	85.44	1.35	2.70
Fall 2000	Control (n=24)	mean	37.47	-	-	15.06	-	-	31.35	0.41	0.07
		SD	7.96	-	-	0.99	-	-	6.52	0.09	0.06
		min	25.6	-	-	13.0	-	-	21.88	0.25	0.02
		max	58.2	-	-	17.0	-	-	46.39	0.58	0.19
	Ref (n=24)	mean	25.06	31.47	30.95	13.25	14.04	5.80	26.49	0.39	0.06
		SD	8.71	9.29	28.06	1.29	1.68	5.00	8.36	0.13	0.02
		min	10.2	14.2	-18.7	11.0	11.0	-1.8	13.33	0.13	0.02
		max	41.0	53.0	91.0	15.2	17.5	15.1	46.10	0.67	0.10
	d/s Urban (n=26)	mean	27.70	32.94	19.68	13.42	14.41	7.24	28.31	0.41	0.06
		SD	10.69	14.14	30.07	1.45	1.96	6.20	11.72	0.19	0.03
		min	11.4	10.4	-37.2	10.4	10.5	-5.7	8.85	0.10	0.01
		max	51.6	59.0	105.3	15.9	18.5	16.4	53.72	0.71	0.10
Fall 2001	Control (n=26)	mean	21.85	-	-	12.35	-	-	17.70	0.25	0.04
		SD	3.52	-	-	0.73	-	-	3.11	0.11	0.02
		min	16.6	-	-	10.8	-	-	13.14	0.10	0.01
		max	31.9	-	-	13.8	-	-	26.29	0.68	0.09
	Ref (n=24)	mean	16.20	19.12	17.77	11.38	12.22	7.42	16.05	0.26	0.03
		SD	3.09	4.56	14.62	0.68	0.87	3.49	3.87	0.07	0.01
		min	10.8	11.4	-7.5	10.2	10.7	0.9	9.70	0.13	0.01
		max	26.4	32.7	48.1	13.3	14.6	15.2	27.77	0.39	0.05
	d/s Urban (n=13)	mean	16.95	19.32	16.82	11.46	12.47	9.06	17.68	0.32	0.04
		SD	3.93	4.37	25.24	0.89	0.86	6.71	4.02	0.07	0.02
		min	9.4	13.2	-12.4	9.4	11.4	1.8	11.49	0.23	0.01
		max	22.6	26.8	81.9	12.5	14.0	25.5	24.38	0.48	0.06
d/s Urban oxygenated (n=13)	mean	15.55	20.55	34.69	11.25	12.64	12.61	16.63	0.26	0.04	
	SD	4.06	4.64	21.99	1.00	0.96	5.29	3.71	0.08	0.02	
	min	9.8	13.0	0.0	9.7	11.1	4.3	11.45	0.10	0.01	
	max	23.8	28.6	77.6	12.9	14.1	21.2	22.95	0.38	0.08	
All exposures	Control	mean	40.98	-	-	15.06	-	-	34.55	0.44	0.25
	Ref	mean	37.55	42.58	18.95	14.49	15.26	5.56	36.84	0.55	0.08
	d/s Urban	mean	36.93	38.94	11.27	14.45	15.30	6.38	34.62	0.45	0.13

n = Sample size.

Table 88 (cont'd): Summary of size, condition factor and somatic indices of cutthroat trout exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Statistic	Initial Condition Factor	Final Condition Factor	% change in Condition Factor	HSI	GSI	K
Spring 2000	Control (n=24)	mean	1.12	-	-	1.02	0.85	0.91
		SD	0.10	-	-	0.15	1.36	0.06
		min	0.97	-	-	0.69	0.11	0.83
		max	1.34	-	-	1.31	4.21	1.03
	Ref (n=24)	mean	1.05	1.01	-2.52	1.18	0.20	0.83
		SD	0.13	0.10	13.95	0.38	0.09	0.06
		min	0.82	0.86	-26.65	0.68	0.04	0.73
		max	1.35	1.24	24.28	1.84	0.43	0.94
	d/s Urban (n=23)	mean	1.04	0.92	-10.61	0.90	0.39	0.80
		SD	0.07	0.10	11.71	0.32	0.65	0.06
		min	0.88	0.78	-32.29	0.39	0.06	0.69
		max	1.15	1.11	22.29	1.48	2.92	0.94
Fall 2000	Control (n=24)	mean	1.08	-	-	1.11	0.20	0.88
		SD	0.08	-	-	0.14	0.15	0.05
		min	0.92	-	-	0.87	0.05	0.79
		max	1.22	-	-	1.42	0.54	0.98
	Ref (n=24)	mean	1.04	1.12	10.85	1.30	0.20	0.88
		SD	0.16	0.13	24.33	0.36	0.09	0.06
		min	0.71	0.86	-18.70	0.71	0.10	0.75
		max	1.35	1.44	69.52	2.31	0.51	0.99
	d/s Urban (n=26)	mean	1.10	1.04	-3.53	1.25	0.18	0.83
		SD	0.17	0.18	20.41	0.31	0.06	0.14
		min	0.66	0.59	-43.58	0.87	0.07	0.18
		max	1.35	1.46	54.22	2.30	0.32	0.96
Fall 2001	Control (n=26)	mean	1.15	-	-	1.11	0.19	0.93
		SD	0.07	-	-	0.39	0.11	0.05
		min	1.06	-	-	0.49	0.04	0.86
		max	1.32	-	-	2.57	0.52	1.06
	Ref (n=24)	mean	1.09	1.03	-5.44	1.38	0.14	0.86
		SD	0.04	0.07	4.95	0.19	0.09	0.05
		min	1.01	0.91	-14.20	0.96	0.03	0.76
		max	1.17	1.22	5.07	1.72	0.44	0.94
	d/s Urban (n=13)	mean	1.10	0.98	-11.09	1.35	0.21	0.84
		SD	0.05	0.05	4.76	0.37	0.11	0.04
		min	1.01	0.89	-20.97	0.67	0.05	0.77
		max	1.16	1.07	-4.64	2.05	0.40	0.91
d/s Urban oxygenated (n=13)	mean	1.07	1.00	-6.48	1.56	0.18	0.86	
	SD	0.08	0.07	4.13	0.29	0.08	0.05	
	min	0.95	0.85	-12.48	1.21	0.06	0.76	
	max	1.25	1.13	-9.30	2.23	0.33	0.95	
All exposures	Control	mean	1.11	-	-	1.08	0.41	0.91
	Ref	mean	1.06	1.05	0.96	1.29	0.18	0.86
	d/s Urban	mean	1.08	0.98	-8.41	1.16	0.26	0.82

Condition Factor = (final weight/final length³)x100
 HSI = Hepatosomatic Index = (liver weight/final weight)x100
 n = Sample size.

K = Condition Factor using gutted weight.
 GSI = Gonadosomatic Index = (gonad weight/final weight)x100

5.3.2 Crayfish Measurements

Table 89: Summary of size of crayfish exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Statistic	FEMALE			MALE		
			Total Length	Post-Orbital Length	Total Weight	Total Length	Post-Orbital Length	Total Weight
Spring 2000	Control	mean	95.02	35.15	31.89	91.35	35.41	32.16
		SD	12.84	5.28	12.87	9.90	3.72	11.93
		min	71.6	26.0	12.9	76.6	29.8	16.7
		max	111.9	42.9	55.2	104.3	40.4	49.9
	Ref	mean	92.15	34.02	28.10	87.34	33.50	27.52
		SD	13.55	5.05	12.88	10.78	4.73	14.55
		min	70.2	26.5	11.3	74.2	28.1	13.3
		max	110.0	41.7	47.5	106.6	42.0	56.2
	d/s Urban	mean	97.97	35.88	33.10	91.96	36.47	32.30
		SD	10.90	3.97	12.01	7.41	3.44	11.83
		min	82.4	30.0	17.2	75.6	28.4	16.6
		max	113.1	41.1	48.9	101.2	41.0	56.9
Fall 2000	Control	mean	79.01	28.98	16.89	84.51	32.34	21.75
		SD	5.04	2.31	4.04	8.02	3.54	5.46
		min	69.7	25.5	12.0	73.7	27.3	14.0
		max	88.3	33.0	25.2	104.1	41.5	35.2
	Ref	mean	81.68	29.71	18.10	84.73	32.30	23.22
		SD	6.39	2.30	5.01	5.57	2.08	5.19
		min	74.4	26.6	13.2	76.1	28.3	15.2
		max	95.3	34.4	29.6	91.1	35.5	31.3
	d/s Urban	mean	80.27	29.28	16.64	82.68	31.39	21.81
		SD	6.55	2.41	3.72	4.79	1.68	3.13
		min	71.5	26.5	12.4	76.7	29.6	19.1
		max	94.6	35.1	24.0	93.1	35.3	29.1
Fall 2001	Control	mean	85.16	30.63	20.13	75.74	28.34	16.31
		SD	9.51	3.40	8.66	4.81	2.03	3.80
		min	76.3	27.2	11.7	65.5	24.5	10.9
		max	109.9	39.0	43.2	83.0	30.8	22.0
	Ref	mean	91.91	33.59	27.09	81.15	30.36	20.62
		SD	11.19	4.09	8.88	5.83	2.64	4.88
		min	77.5	28.0	14.3	68.0	25.0	12.3
		max	108.7	40.1	42.1	88.7	35.1	29.1
	d/s Urban	mean	95.24	34.42	29.23	90.22	34.50	30.39
		SD	12.33	4.61	10.98	6.96	2.54	6.33
		min	75.9	27.2	14.1	80.7	31.5	21.5
		max	114.0	42.6	49.6	102.0	37.8	40.1
All studies	All sites	measurement error	+/- 1.56	+/- 0.32	+/- 0.56	+/- 1.63	+/- 0.66	+/- 0.50

NOTE: Sample size (n) per site per exposure period is 24.

5.3.3 Fish Health Assessment Index

Table 90: Health assessments (percent occurrence) and index (HAI) of cutthroat trout exposed to Yorkson Creek water during each exposure period.

		Fins			Eyes		Gills			Opercula			Bile				Liver				
		Normal	Light Erosion	Severe Erosion	Normal	Opaque (one or both)	Normal	Frayed	Pale	Normal	Slight shortening	Severe shortening	Yellow; bladder part-full	Yellow; bladder full	Light green	Dark green	Normal (red)	Fatty (light brown)	Nodules	Focal discolouration	General discolouration
Spring 2000	Control (n=24)	21	58	21	100	0	92	8	0	71	29	0	33	67	0	0	100	0	0	0	0
	Ref (n=24)	75	17	8	100	0	100	0	0	92	4	4	42	25	4	29	96	4	0	0	0
	d/s-Urban (n=24)	42	54	4	96	4	96	4	0	92	8	0	14	23	9	54	96	0	0	4	0
Fall 2000	Control (n=24)	25	75	0	100	0	100	0	0	92	4	4	29	67	4	0	100	0	0	0	0
	Ref (n=24)	88	12	0	100	0	100	0	0	79	21	0	42	54	0	4	96	4	0	0	0
	d/s-Urban (n=26)	65	35	0	100	0	100	0	0	42	54	4	42	54	4	0	84	8	4	4	0
Fall 2001	Control (n=24)	85	15	0	100	0	100	0	0	96	4	0	65	35	0	0	96	4	0	0	0
	Ref (n=24)	96	4	0	100	0	100	0	0	92	8	0	83	0	17	0	100	0	0	0	0
	d/s-Urban (n=13)	100	0	0	100	0	100	0	0	92	8	0	69	31	0	0	100	0	0	0	0
	d/s-Urban -oxygenated (n=13)	100	0	0	100	0	100	0	0	85	15	0	69	31	0	0	100	0	0	0	0

		Mesenteric Fat					Spleen					Hindgut		Kidney		HAI				
		None	Slight (< 50%)	Moderate (~50%)	Fatty (>50%)	Very fatty (100%)	Normal (black)	Normal (red)	Normal (granular)	Nodular	Enlarged	Other	Normal	Slight inflammation	Normal	Other	Mean	Standard deviation	Minimum	Maximum
Spring 2000	Control (n=24)	0	4	63	25	8	4	96	0	0	0	0	96	4	100	0	5.8	8.8	0	30
	Ref (n=24)	0	13	29	29	29	12	38	54	0	0	0	100	0	100	0	2.5	7.4	0	30
	d/s-Urban (n=24)	0	0	29	42	29	8	83	13	0	0	0	100	0	100	0	4.6	10.2	0	30
Fall 2000	Control (n=24)	0	25	33	38	4	0	88	4	0	8	100	0	100	0	3.7	9.2	0	30	
	Ref (n=24)	4	12	42	38	4	0	75	21	4	0	100	0	100	0	4.6	8.8	0	30	
	d/s-Urban (n=26)	0	23	54	19	4	4	58	38	0	0	0	100	0	100	0	9.6	14.8	0	50
Fall 2001	Control (n=24)	0	27	31	38	4	4	96	0	0	0	100	0	100	0	1.5	6.1	0	40	
	Ref (n=24)	4	21	42	21	12	0	83	17	0	0	100	0	100	0	0.8	2.8	0	10	
	d/s-Urban (n=13)	0	15	31	39	15	0	46	54	0	0	0	100	0	100	0	0.8	2.8	0	10
	d/s-Urban -oxygenated (n=13)	0	0	54	46	0	0	100	0	0	0	0	100	0	100	0	1.5	3.7	0	10

NOTE: HAI calculated without fin assessment. HAI based on Adams et al. (1993). Percentages are based on the number of fish exposed. Percentages for a tissue type that exceed 100 represent tissue samples that had more than one observation/irregularity present.
n = Sample size.

5.3.4 Histology

Cutthroat Trout

Table 91: Histological assessments (percent occurrence) of cutthroat trout exposed to Yorkson Creek water during two exposure periods.

		Gonads			Hingut	Pyloric Caeca	Spleen		Gill					Liver				Head Kidney	
		Male	Female	Unknown	Normal	Normal	Normal	Hemosiderin	Normal	Hyperpasia	Epithelial Lifting	Hypertrophy	Anuerysm	Normal	Inflammatory Focus	Regenerative tissue	Vacuolated	Melanin	IRND (mean +/- SD)
Fall 2000	Control	54	21	25	100	100	96	4	21	71	8	not examined	8	71	4	8	100	21	not measured
	Ref	29	38	33	100	100	42	50	79	21	0	not examined	0	33	67	0	100	21	
	d/s-Urban	50	23	27	100	100	62	34	50	42	4	not examined	12	35	19	0	100	54	
Spring 2000	Control	42	38	20	100	100	100	0	58	42	0	not examined	8	96	0	0	4	not examined	not measured
	Ref	46	42	12	100	100	46	54	42	58	0	not examined	4	17	79	0	46	not examined	
	d/s-Urban	58	33	9	100	100	100	0	67	33	4	not examined	0	79	12	0	17	not examined	

NOTE: Percentages are based on the number of fish exposed. Some tissues may not have been examined for all samples. Therefore percentages that do not add up to 100 for a tissue type indicate that some tissue samples are missing. Percentages for a tissue type that exceed 100 represent tissue samples that had more than one observation/irregularity present. Sample size (n) per site per exposure period is 24 except in Fall 2000 at our d/s-Urban site (n=26).

Crayfish

Table 92: Histological assessments (percent occurrence) of crayfish exposed to Yorkson Creek water during two exposure periods.

		Gonads		Seminiferous Tubules			Oogenesis		Hepatopancreas					Hepatopancreas (R-cell vacuolation)			Hepatopancreas (Nuclear diameter)			
		Male	Female	Spermatids present	Arrested spermatogenesis	Synchronous spermatogenesis	Early	Mature	B-cell no. > F-cell no.	B-cell no. < F-cell no.	B-cell no. = F-cell no.	Granulocytes	Necrosis	No vacoules	Moderately vacuolated	Extremely vacuolated	Mean	Standard deviation	Minimum	Maximum
Fall 2000	Control	54	46	85	8	23	36	82	63	37	0	42	83	0	4	96	not measured			
	Ref	50	50	92	91	82	25	75	83	17	0	0	96	0	13	87	not measured			
	d/s-Urban	50	50	100	50	58	67	58	50	50	0	4	92	0	0	100	not measured			
Spring 2000	Control	50	50	33	25	83	100	25	42	58	0	33	not examined	4	8	88	not measured			
	Ref	50	50	8	33	75	100	8	67	33	0	17	not examined	4	4	92	not measured			
	d/s-Urban	47	53	100	100	89	100	20	58	42	0	26	not examined	0	10	90	not measured			

NOTE: Percentages are based on the number of crayfish exposed. Some tissues may not have been examined for all samples. Therefore percentages that do not add up to 100 for a tissue type indicate that some tissue samples are missing. Percentages for a tissue type that exceed 100 represent tissue samples that had more than one observation/irregularity present. Sample size (n) per site per exposure period is 24 except in Spring 2000 at our d/s Urban site (n=19). A smaller sample size was observed due to the fact that some crayfish died during the Spring 2000 exposure period.

5.3.5 Mixed Function Oxidase

Cutthroat Trout

Table 93: Summary of mixed function oxidase (MFO) activity in cutthroat trout liver exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Statistic	GST (nmol/min/mg)	P450 (nmol/mg)	EROD (pmol/min/mg)
Spring 2000	Control (n=24)	mean	202.984	0.100	11.813
		SD	24.673	0.069	8.891
		min	174.77	ND	ND
		max	284.75	0.25	27.80
	Ref (n=24)	mean	213.219	0.133	14.208
		SD	38.042	0.089	7.940
		min	137.80	ND	ND
		max	289.30	0.29	31.70
	d/s Urban (n=23)	mean	216.096	0.240	29.057
		SD	52.309	0.133	11.874
		min	161.37	ND	12.10
		max	389.40	0.55	55.80
Fall 2000	Control (n=24)	mean	173.867	0.107	10.771
		SD	39.420	0.062	7.128
		min	114.40	ND	ND
		max	243.30	0.24	32.64
	Ref (n=23)	mean	200.883	0.097	8.023
		SD	49.028	0.085	3.210
		min	131.10	ND	4.04
		max	293.30	0.33	20.23
	d/s Urban (n=26)	mean	221.104	0.231	37.739
		SD	48.524	0.166	21.720
		min	152.90	ND	ND
		max	352.80	0.60	88.63
Fall 2001	Control (n=26)	mean	197.896	0.087	11.212
		SD	55.755	0.069	7.122
		min	107.20	ND	ND
		max	313.70	0.24	25.80
	Ref (n=24)	mean	199.921	0.094	12.629
		SD	63.909	0.059	8.675
		min	101.50	ND	ND
		max	300.20	0.21	26.40
	d/s Urban (n=13)	mean	214.138	0.265	30.915
		SD	73.054	0.130	12.194
		min	101.00	0.09	11.50
		max	375.20	0.50	55.60
d/s Urban oxygenated (n=13)	mean	223.846	0.262	31.331	
	SD	54.372	0.134	9.368	
	min	131.30	0.09	12.50	
	max	325.40	0.45	45.30	
All exposures	Control	mean	191.582	0.098	11.265
	Ref	mean	204.674	0.108	11.620
	d/s Urban	mean	217.113	0.245	32.570

GST = Glutathione-S-transferase.

P450 = Cytochrome system.

EROD = 7-ethoxyresorufin-O-deethylase.

ND = Not detected. Considered a zero value for statistical calculations.

n = Sample size.

Crayfish

Table 94: Summary of mixed function oxidase (MFO) activity in crayfish hepatopancreas exposed to Yorkson Creek water during each exposure period.

Exposure Period	Site	Statistic	GST (nmol/min/mg)	P450 (nmol/mg)	EROD (pmol/min/mg)
Spring 2000	Control (n=24)	mean	80.542	0.075	2.192
		SD	35.564	0.059	1.760
		min	18.75	ND	ND
		max	161.99	0.21	5.94
	Ref (n=24)	mean	139.146	0.079	2.102
		SD	81.500	0.066	1.495
		min	37.40	ND	ND
		max	339.58	0.21	4.59
	d/s Urban (n=19)	mean	146.445	0.132	2.632
		SD	73.786	0.078	2.365
		min	54.30	ND	ND
		max	359.81	0.27	6.98
Fall 2000	Control (n=24)	mean	139.614	0.086	2.122
		SD	72.286	0.069	1.597
		min	29.22	ND	ND
		max	347.28	0.24	5.96
	Ref (n=22)	mean	118.122	0.055	1.276
		SD	44.951	0.046	0.838
		min	46.72	ND	ND
		max	202.70	0.15	2.71
	d/s Urban (n=23)	mean	95.477	0.132	4.663
		SD	35.884	0.092	3.690
		min	54.93	ND	ND
		max	196.57	0.27	12.67
Fall 2001	Control (n=24)	mean	129.010	0.049	1.497
		SD	62.354	0.056	1.097
		min	20.23	ND	ND
		max	258.90	0.21	4.30
	Ref (n=23)	mean	138.303	0.081	1.593
		SD	68.988	0.075	1.373
		min	44.80	ND	ND
		max	327.20	0.25	5.74
	d/s Urban (n=12)	mean	145.379	0.218	2.803
		SD	88.145	0.142	3.629
		min	0.00	ND	ND
		max	324.10	0.54	13.28
d/s Urban oxygenated (n=12)	mean	158.675	0.228	4.676	
	SD	91.313	0.160	4.600	
	min	51.30	ND	0.84	
	max	370.50	0.58	12.95	
All exposures	Control	mean	116.389	0.070	1.937
	Ref	mean	131.857	0.072	1.657
	d/s Urban	mean	129.100	0.160	3.366

GST = Glutathione-S-transferase.

P450 = Cytochrome system.

EROD = 7-ethoxyresorufin-O-deethylase.

ND = Not detected. Considered a zero value for statistical calculations.

n = Sample size.

5.3.6 Hepatopancreas Biochemical Indicators

Table 95: Biochemical indicators of contaminant exposure analyzed in crayfish hepatopancreas exposed to Yorkson Creek water during two exposure periods.

Exposure Period	Site	DNA strand breaks	Labile zinc (Zn)	Lipid peroxidase	Metallothionein
Fall 2000	Ref (n=18)	1.00	1.00	1.00	1.00
	d/s Urban (n=13)	0.73	0.95	0.57	1.27
Fall 2001	Ref (n=16)	1.00	1.00	1.00	1.00
	d/s Urban (n=12)	0.71	1.37	0.27	0.60
	d/s Urban oxygenated (n=12)	1.16	2.77	0.92	1.16

NOTE: All mean values are normalized to Reference site. Results considered significant if normalized value greater than 2.

n = Sample size.

5.3.7 Egg Mortality, Hatching & Gene Expression

Table 96: Summary of mortality of rainbow trout eggs and alevins exposed to Yorkson Creek water during two exposure periods.

Exposure Period	Site	Statistic	% Egg Mortality	% Alevin Mortality
Fall 2000	Ref (n=4)	mean	2.5	0.8
		SD	2.4	1.0
		min	0	0
		max	5.0	2.0
	d/s Urban (n=4)	mean	2.0	0.8
		SD	0.9	1.0
		min	1.0	0
		max	3.1	2.1
Fall 2001	Ref (n=8)	mean	3.2	3.0
		SD	2.1	4.7
		min	0	0
		max	5.9	13.5
	d/s Urban (n=8)	mean	4.4	28.1
		SD	2.7	41.3
		min	1.8	0
		max	8.5	98.2

n = Number of exposed egg baskets. Each basket contained approximately 100 eggs.

Table 97: Hatching rate and success of rainbow trout eggs exposed to Yorkson Creek water during fall 2001.

Day	% Hatched	
	Ref	d/s Urban
1	0	0
3	0	0
5	0	0
7	0	0
9	0	0
11	0	0
13	0.1	4.7
15	0.1	25.6
17	0.1	56.8
19	0.1	84.7
21	8.3	96.4
23	55.2	96.4
25	96.8	96.4
27	97.1	96.4
29	97.2	96.4
31	97.2	96.4
33	97.2	96.4
35	97.2	96.4
37	97.2	96.4

Table 98: Gene expression in rainbow trout alevins exposed to Yorkson Creek water during one exposure period.

Gene #	Gene ID	Fall 2001 d/s Urban
27	α -globin	3.97
29	α -tubulin	1.16
31	apolipoprotein A-I-2	3.15
36	ATPaseb	NQ
39	β -globin2	1.36
40	β -globin	4.47
47	a21collagen	2.40
52	carbonyl reductase/20bHDA (CR-20bHDA)	NQ
57	cystatin	1.59
58	cytochrome c oxidase subunit VIA	NQ
69	fatty acid binding protein (H-FABP)	2.98
70	inhibitor of DNA binding/differentiation(Id1)	NQ
71	inhibitor of DNA binding/differentiation(Id2)	NQ
90	myc	NQ
93	NADH-dehydrogenase (subunit 6)	NQ
114	secreted protein, acidic, rich in cys (SPARC)	2.87
126	vitellogenin receptor (vtgR)	NQ
130	metallothionein	2.63
131	ubiquitin	2.33
135	arginase	NQ
139	myostatin	NQ
142	myosin heavy chain fast (MHCfast)	3.22
143	myosin heavy chain slow (MHCslow)	2.27
144	retinol binding protein	3.87
147	α -actin	5.70
160	glutamine synthetase GS-3	3.60
163	cytp450 2K5	NQ
174	heat shock protein 90 (hsp90)	2.86
176	pyruvate kinase	NQ
179	glutamate dehydrogenase	NQ
180	18S rRNA	1.68
Lamda Q	-	1.00

NOTE: Each gene array run in triplicate. All gene expression values are an average of 3 and are normalized to Reference site. Results considered significant if normalized value greater than 2.

Sample size per site is: Ref (70) and d/s Urban (110).

NQ = Not quantifiable.

5.4 Water Quality Gradient in Yorkson Creek

5.4.1 Water Chemistry

Table 99: Summary of daily temperature and dissolved oxygen (DO) levels in Yorkson Creek during fall 2001.

Exposure Period	Site	Statistic	Temperature (°C)	DO (% saturation)	DO (mg/L)
Fall 2001	Yorkson A	mean	8.63	94.86	11.070
		(SD)	1.52	4.38	0.590
		min	5.8	88.5	9.97
		max	10.1	99.9	11.98
	Yorkson B	mean	8.94	67.51	7.884
		(SD)	1.52	11.33	1.445
		min	5.8	53.4	5.99
		max	10.4	79.3	9.94
	Yorkson C	mean	9.04	73.89	8.563
		(SD)	1.45	5.59	0.779
		min	6.2	65.2	7.33
		max	10.5	80.5	9.60
	Yorkson D	mean	8.78	43.31	5.063
		(SD)	1.26	13.33	1.610
		min	6.6	23.8	2.68
		max	10.2	60.0	7.48

NOTE: Sample size (n) per site is 8.

Seasonal mean below guideline for freshwater aquatic life (see Appendix A).

Table 100: Summary of water chemistry and major ion concentrations (mg/L) in Yorkson Creek during fall 2001.

Exposure Period	Site	Statistic	Alkalinity	Conductivity (µS/cm)	pH (relative units)	Hardness (Ca + Mg)	Calcium (Ca)
Fall 2001	Yorkson A	mean	30.51	101.5	7.334	33.71	8.76
		(SD)	5.75	25.0	0.091	7.29	1.71
		min	24.2	79	7.20	27.1	7.2
		max	39.3	140	7.47	45.4	11.5
	Yorkson B	mean	35.35	110.8	7.136	37.59	9.95
		(SD)	7.76	22.9	0.153	7.75	1.86
		min	25.9	81	6.90	26.6	7.1
		max	46.3	142	7.41	49.2	12.5
	Yorkson C	mean	36.15	115.5	7.146	38.20	10.04
		(SD)	6.24	21.1	0.193	5.11	1.16
		min	28.2	86	6.83	32.2	8.7
		max	45.3	144	7.48	47.1	12.0
	Yorkson D	mean	42.29	128.8	7.061	43.56	11.25
		(SD)	8.50	27.5	0.248	8.17	2.01
		min	30.0	87	6.77	32.7	8.7
		max	55.2	168	7.49	57.2	14.9
Detection limit			0.5	2	0.01	0.4	0.1

NOTE: Sample size (n) per site is 8.

Table 100 (cont'd): Summary of water chemistry and major ion concentrations (mg/L) in Yorkson Creek during fall 2001.

Exposure Period	Site	Statistic	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Silicon (Si)
Fall 2001	Yorkson A	mean	2.86	2.81	6.13	3.996
		(SD)	0.72	0.60	2.16	0.401
		min	2.2	1.9	4.5	3.31
		max	4.0	3.9	10.3	4.62
	Yorkson B	mean	3.10	2.31	6.54	4.468
		(SD)	0.76	0.40	1.74	0.940
		min	2.2	1.7	4.3	3.13
		max	4.4	2.9	9.3	5.80
	Yorkson C	mean	3.20	2.18	7.09	4.419
		(SD)	0.57	0.28	1.88	0.853
		min	2.5	1.8	4.9	3.56
		max	4.2	2.6	10.5	5.65
	Yorkson D	mean	3.76	2.18	7.74	4.409
		(SD)	0.80	0.24	1.93	1.005
		min	2.7	2.0	5.0	3.07
		max	4.9	2.6	10.5	6.27
Detection limit			0.1	0.1	0.1	0.05

NOTE: Sample size (n) per site is 8.

5.4.2 Nutrients

Table 101: Summary of nutrient concentrations (mg/L) in Yorkson Creek during fall 2001.

Exposure Period	Site	Statistic	Ammonia	Nitrite	Nitrite and Nitrate	Total Nitrogen	Ortho - Phosphate	Total Phosphorus	Total Dissolved Phosphorus
Fall 2001	Yorkson A	mean	0.0348	0.0064	1.1015	1.565	0.0260	0.0761	0.0485
		SD	0.0319	0.0013	0.2935	0.233	0.0026	0.0274	0.0013
		min	0.011	0.004	0.582	1.27	0.023	0.037	0.047
		max	0.110	0.008	1.520	1.83	0.029	0.121	0.050
	Yorkson B	mean	0.0253	0.0045	0.9401	1.331	0.0168	0.0590	0.0393
		SD	0.0135	0.0009	0.2644	0.230	0.0038	0.0135	0.0056
		min	0.013	0.003	0.451	0.92	0.013	0.044	0.031
		max	0.056	0.006	1.280	1.60	0.020	0.080	0.043
	Yorkson C	mean	0.0270	0.0045	0.9224	1.293	0.0105	0.0519	0.0240
		SD	0.0088	0.0008	0.2937	0.251	0.0019	0.0194	0.0070
		min	0.017	0.003	0.489	0.85	0.008	0.029	0.017
		max	0.039	0.005	1.450	1.56	0.012	0.084	0.030
	Yorkson D	mean	0.0353	0.0036	0.6153	1.113	0.0128	0.0506	0.0315
		SD	0.0298	0.0011	0.1898	0.211	0.0039	0.0120	0.0105
		min	0.014	0.003	0.394	0.81	0.009	0.029	0.021
		max	0.107	0.006	0.990	1.51	0.017	0.067	0.044
Detection limit			0.005	0.002	0.002	0.02	0.001	0.002	0.002

NOTE: Sample size (n) per site is 8.

5.4.3 Bacteriological Parameters

Table 102: Summary of bacteriological counts (MPN/100mL) in Yorkson Creek during fall 2001.

Exposure Period	Site	Statistic	<i>E.coli</i>	Fecal Coliforms	Total Coliforms
Fall 2001	Yorkson A	geometric mean	278	333	923
		min	25	60	72
		max	1700	1700	14000
	Yorkson B	geometric mean	290	350	1703
		min	33	77	82
		max	11000	11000	22000
	Yorkson C	geometric mean	281	323	791
		min	57	70	98
		max	3300	3300	24000
	Yorkson D	geometric mean	90	95	296
		min	8	8	18
		max	1300	1300	4900

NOTE: Sample size (n) per site is 8.

	Exceeds guideline for irrigation (see Appendix A).
	Exceeds BC criteria for recreation (see Appendix A).
	Exceeds guideline for irrigation and recreation (see Appendix A).

5.4.4 Trace Metals

Table 103: Summary of metal concentrations (mg/L) and guideline exceedances in Yorkson Creek during fall 2001. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Statistic	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)
Fall 2001	Yorkson A	mean	0.4808	0.00051	0.01474	ND	0.00003	0.00113	0.00029
		SD	0.2651	0.00012	0.00190	ND	0.00005	0.00050	0.00010
		min	0.225	0.0003	0.0124	ND	ND	0.0005	0.0002
		max	1.090	0.0007	0.0186	ND	0.0001	0.0019	0.0005
		# exceedances	8	0	0	0	0	0	0
		Yorkson B	mean	0.4564	0.00060	0.01329	ND	0.00004	0.00125
	SD		0.2784	0.00005	0.00086	ND	0.00005	0.00084	0.00009
	min		0.204	0.0005	0.0117	ND	ND	0.0005	0.0001
	max		1.040	0.0007	0.0145	ND	0.0001	0.0030	0.0004
	# exceedances		8	0	0	0	0	1	0
	Yorkson C		mean	0.5354	0.00048	0.01284	ND	0.00003	0.00120
		SD	0.4211	0.00012	0.00346	ND	0.00005	0.00078	0.00021
		min	0.127	0.0003	0.0082	ND	ND	0.0002	0.0001
		max	1.310	0.0006	0.0195	ND	0.0001	0.0028	0.0007
		# exceedances	8	0	0	0	0	1	0
		Yorkson D	mean	0.2488	0.00038	0.01286	ND	0.00001	0.00093
	SD		0.1251	0.00009	0.00197	ND	0.00004	0.00055	0.00009
	min		0.117	0.0002	0.0098	ND	ND	0.0005	0.0001
	max		0.536	0.0005	0.0160	ND	0.0001	0.0021	0.0003
	# exceedances		8	0	0	0	0	1	0
Detection limit			0.002	0.0001	0.0002	0.05	0.0001	0.0002	0.0001

NOTE: Sample size (n) per site is 8.

ND = Not detected. Considered a zero value for statistical calculations.

	Seasonal mean exceeds guideline for freshwater aquatic life (see Appendix A).
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Table 103 (cont'd): Summary of metal concentrations (mg/L) and guideline exceedances in Yorkson Creek during fall 2001. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Statistic	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)
Fall 2001	Yorkson A	mean	0.00278	0.51063	0.00043	0.00030	0.01639	0.0020	0.00044
		SD	0.00049	0.19942	0.00060	0.00016	0.01107	0.0028	0.00040
		min	0.0020	0.2520	ND	0.0001	0.0059	ND	0.0001
		max	0.0035	0.9270	0.0017	0.0006	0.0349	0.006	0.0013
		# exceedances	7	7	1	no guideline	0	0	0
	Yorkson B	mean	0.00274	0.63738	0.00038	0.00034	0.03750	0.0008	0.00038
		SD	0.00067	0.21412	0.00029	0.00012	0.01874	0.0021	0.00022
		min	0.0017	0.4130	ND	0.0002	0.0169	ND	0.0002
		max	0.0034	1.0700	0.0008	0.0006	0.0728	0.006	0.0008
		# exceedances	6	8	0	no guideline	0	0	0
	Yorkson C	mean	0.00249	0.75475	0.00029	0.00049	0.04556	ND	0.00045
		SD	0.00093	0.32991	0.00046	0.00024	0.01917	ND	0.00035
		min	0.0013	0.4530	ND	0.0002	0.0234	ND	0.0001
		max	0.0041	1.2700	0.0012	0.0010	0.0817	ND	0.0012
		# exceedances	5	8	1	no guideline	0	0	0
	Yorkson D	mean	0.00195	0.72575	0.00009	0.00029	0.06324	0.0015	0.00036
		SD	0.00050	0.20434	0.00018	0.00022	0.04093	0.0028	0.00028
		min	0.0013	0.5040	ND	ND	0.0279	ND	0.0001
		max	0.0029	1.1300	0.0005	0.0007	0.1500	0.006	0.0009
		# exceedances	2	8	0	no guideline	0	0	0
Detection limit			0.0002	0.0004	0.0002	0.0001	0.0001	0.005	0.0001

Exposure Period	Site	Statistic	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Vanadium (V)	Zinc (Zn)
Fall 2001	Yorkson A	mean	0.00096	0.00009	0.00003	0.05468	0.00145	0.00613
		SD	0.00039	0.00006	0.00005	0.01048	0.00051	0.00268
		min	0.0006	ND	ND	0.0426	0.0009	0.0029
		max	0.0018	0.0002	0.0001	0.0719	0.0026	0.0113
		# exceedances	0	0	0	no guideline	no guideline	0
	Yorkson B	mean	0.00093	0.00005	0.00001	0.06014	0.00144	0.01174
		SD	0.00040	0.00005	0.00004	0.01320	0.00053	0.00818
		min	0.0003	ND	ND	0.0428	0.0008	0.0032
		max	0.0015	0.0001	0.0001	0.0768	0.0024	0.0290
		# exceedances	0	0	0	no guideline	no guideline	0
	Yorkson C	mean	0.00093	0.00006	0.00005	0.05754	0.00153	0.00478
		SD	0.00050	0.00005	0.00008	0.01242	0.00087	0.00390
		min	0.0004	ND	ND	0.0424	0.0006	0.0013
		max	0.0020	0.0001	0.0002	0.0786	0.0032	0.0136
		# exceedances	0	0	1	no guideline	no guideline	0
	Yorkson D	mean	0.00073	0.00003	0.00004	0.06813	0.00085	0.00359
		SD	0.00023	0.00005	0.00007	0.01461	0.00035	0.00087
		min	0.0005	ND	ND	0.0488	0.0004	0.0022
		max	0.0011	0.0001	0.0002	0.0880	0.0016	0.0052
		# exceedances	0	0	1	no guideline	no guideline	0
Detection limit			0.0002	0.0001	0.0001	0.0001	0.0001	0.0002

NOTE: Sample size (n) per site is 8.

ND = Not detected. Considered a zero value for statistical calculations.

Seasonal mean exceeds guideline for freshwater aquatic life (see Appendix A).

6.0 Data Tables - Analytical Quality Assurance and Control

6.1 Water QA

6.1.1 Water Chemistry

Table 104: Water chemistry and major ion concentrations (mg/L) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	Alkalinity	Conductivity (μ S/cm)	pH (relative units)	Hardness (Ca + Mg)	Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Silicon (Si)
Fall 1999	Ref	sample 12	79.6	231	7.85	114.0	40.9	2.9	0.4	2.7	4.00
		replicate 1	79.6	231	7.41	113.0	40.6	2.9	0.5	2.7	3.97
		replicate 2	79.6	231	7.85	111.0	39.6	2.9	0.5	2.7	3.95
		C.V.	0.0%	0.0%	3.3%	1.4%	1.7%	0.0%	12.4%	0.0%	0.6%
		sample 14	45.2	133	7.66	57.3	20.4	1.5	0.4	1.6	3.03
		replicate 1	45.4	133	7.69	57.0	20.4	1.5	0.3	1.6	3.02
		replicate 2	45.4	133	7.70	56.9	20.4	1.5	0.3	1.6	3.02
		C.V.	0.3%	0.0%	0.3%	0.4%	0.0%	0.0%	17.3%	0.0%	0.2%
		replicate 3 (time)	45.2	130	7.72	58.5	20.9	1.5	0.3	1.6	3.08
		replicate 4 (time)	45.2	131	7.69	59.3	21.2	1.5	0.3	1.7	3.13
		C.V.	0.0%	1.2%	0.4%	1.7%	1.9%	0.0%	17.3%	3.5%	1.6%
		sample 25	62.1	180	7.84	85.8	30.7	2.2	0.4	2.3	3.83
	replicate 1	62.0	180	7.75	85.4	30.6	2.2	0.3	2.3	3.82	
	replicate 2	62.1	181	7.83	85.1	30.5	2.2	0.3	2.3	3.81	
	C.V.	0.1%	0.3%	0.6%	0.4%	0.3%	0.0%	17.3%	0.0%	0.3%	
	replicate 3 (time)	62.6	182	7.56	86.5	31.0	2.2	0.3	2.3	3.84	
	replicate 4 (time)	62.5	184	7.54	85.2	30.5	2.2	0.4	2.3	3.83	
	C.V.	0.4%	1.1%	2.2%	0.8%	0.8%	0.0%	15.7%	0.0%	0.2%	
	mid Ag	sample 12	84.1	257	8.09	125.0	44.4	3.4	0.7	3.6	4.52
	replicate 1	83.7	257	7.63	122.0	43.3	3.4	0.7	3.6	4.49	
	replicate 2	84.3	258	7.61	123.0	43.5	3.4	0.7	3.6	4.49	
	C.V.	0.4%	0.2%	3.5%	1.2%	1.3%	0.0%	0.0%	0.0%	0.4%	
	sample 14	54.5	185	7.39	79.1	28.0	2.2	0.5	2.3	3.80	
	replicate 1	54.5	186	7.38	79.1	27.9	2.3	0.6	2.4	3.79	
replicate 2	54.5	185	7.42	78.8	27.8	2.3	0.6	2.3	3.77		
C.V.	0.0%	0.3%	0.3%	0.2%	0.4%	2.5%	10.2%	2.5%	0.4%		
replicate 3 (time)	54.4	181	7.39	81.4	28.9	2.3	0.5	2.4	3.89		
replicate 4 (time)	54.4	182	7.37	81.9	29.0	2.3	0.5	2.4	3.90		
C.V.	0.1%	1.1%	0.2%	1.8%	1.9%	2.5%	0.0%	2.4%	1.4%		
sample 25	74.5	222	7.84	104.0	36.8	3.0	0.6	3.3	4.51		
replicate 1	74.1	222	7.58	104.0	36.7	3.0	0.5	3.3	4.50		
replicate 2	74.1	222	7.59	104.0	36.7	3.0	0.5	3.3	4.52		
C.V.	0.3%	0.0%	1.9%	0.0%	0.2%	0.0%	10.8%	0.0%	0.2%		
replicate 3 (time)	74.4	223	7.43	106.0	37.4	3.0	0.5	3.3	4.57		
replicate 4 (time)	74.4	224	7.46	106.0	37.4	3.0	0.5	3.2	4.54		
C.V.	0.1%	0.4%	3.0%	1.1%	0.9%	0.0%	10.8%	1.8%	0.7%		
d/s Ag	sample 12	116.0	306	7.54	151.0	49.0	7.0	2.5	4.3	6.89	
replicate 1	116.0	306	7.61	151.0	48.9	6.9	2.4	4.2	6.87		
replicate 2	116.0	305	7.54	147.0	47.7	6.9	2.3	4.2	6.80		
C.V.	0.0%	0.2%	0.5%	1.5%	1.5%	0.8%	4.2%	1.4%	0.7%		

NOTE: Replicate (time) samples were submitted for analysis two days post-sampling.

C.V. = Coefficient of variation.

Table 104 (cont'd): Water chemistry and major ion concentrations (mg/L) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	Alkalinity	Conductivity (μ S/cm)	pH (relative units)	Hardness (Ca + Mg)	Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Silicon (Si)		
Fall 1999	d/s Ag	sample 14	66.8	234	7.42	95.4	30.9	4.4	4.4	3.2	4.93		
		replicate 1	67.0	234	7.49	95.5	30.9	4.5	4.5	3.2	4.98		
		replicate 2	66.8	234	7.39	94.9	30.8	4.4	4.4	3.2	4.93		
		C.V.	0.2%	0.0%	0.7%	0.3%	0.2%	1.3%	1.3%	0.0%	0.6%		
		replicate 3 (time)	66.7	229	7.38	98.2	31.9	4.5	4.5	3.3	5.10		
		replicate 4 (time)	67.0	230	7.42	98.4	32.0	4.5	4.5	3.3	5.10		
		C.V.	0.2%	1.1%	0.3%	1.7%	1.9%	1.3%	1.3%	1.8%	1.9%		
		sample 25	99.3	266	7.58	127.0	41.6	5.7	1.9	4.1	6.31		
		replicate 1	99.1	266	7.56	127.0	41.2	5.6	1.9	4.1	6.30		
		replicate 2	99.6	266	7.62	126.0	41.2	5.6	1.9	4.1	6.27		
		C.V.	0.3%	0.0%	0.4%	0.5%	0.6%	1.0%	0.0%	0.0%	0.3%		
		replicate 3 (time)	99.9	265	7.52	127.0	41.6	5.6	1.8	4.1	6.29		
		replicate 4 (time)	99.4	268	7.55	126.0	41.2	5.6	1.9	4.1	6.26		
		C.V.	0.3%	0.6%	0.4%	0.5%	0.6%	1.0%	3.1%	0.0%	0.4%		
		Spring 2000	Ref	sample 11	46.3	132	7.59	61.6	22.1	1.6	0.2	1.7	3.12
				replicate 1	46.4	138	7.67	61.5	22.0	1.6	0.3	1.7	3.10
replicate 2	46.4			137	7.63	61.6	22.1	1.6	0.2	1.7	3.13		
C.V.	0.1%			2.4%	0.5%	0.1%	0.3%	0.0%	24.7%	0.0%	0.5%		
sample 26	41.1			123	7.70	55.7	20.0	1.4	0.2	1.6	3.19		
replicate 1	40.4			122	7.69	56.0	20.1	1.4	0.2	1.6	3.20		
replicate 2	40.4			122	7.68	56.1	20.1	1.4	0.3	1.6	3.21		
C.V.	1.0%			0.5%	0.1%	0.4%	0.3%	0.0%	24.7%	0.0%	0.3%		
mid Ag	sample 11			58.8	177	7.66	79.4	28.2	2.2	0.3	2.4	3.51	
	replicate 1			58.8	176	7.69	79.2	28.1	2.2	0.3	2.4	3.49	
	replicate 2			58.8	176	7.69	79.5	28.2	2.2	0.3	2.4	3.50	
	C.V.			0.0%	0.3%	0.2%	0.2%	0.2%	0.0%	0.0%	0.0%	0.3%	
	sample 26		53.6	165	7.55	75.9	26.8	2.2	0.3	2.2	3.72		
	replicate 1		53.5	163	7.50	76.0	26.8	2.2	0.4	2.3	3.72		
	replicate 2		53.8	165	7.57	75.7	26.8	2.2	0.3	2.3	3.70		
	C.V.		0.3%	0.7%	0.5%	0.2%	0.0%	0.0%	17.3%	2.5%	0.3%		
	d/s Ag		sample 11	96.5	252	7.71	118.0	38.8	5.0	1.1	3.4	4.87	
			replicate 1	96.4	252	7.75	118.0	39.0	5.0	1.1	3.4	4.91	
			replicate 2	96.3	251	7.69	118.0	39.0	5.1	1.1	3.4	4.89	
			C.V.	0.1%	0.2%	0.4%	0.0%	0.3%	1.1%	0.0%	0.0%	0.4%	
sample 26			94.5	252	7.60	120.0	39.2	5.5	1.1	3.6	5.62		
replicate 1			94.9	250	7.68	121.0	39.4	5.5	1.1	3.6	5.64		
replicate 2			95.0	250	7.64	121.0	39.4	5.5	1.1	3.6	5.65		
C.V.			0.3%	0.5%	0.5%	0.5%	0.3%	0.0%	0.0%	0.0%	0.3%		
d/s Urban			sample 11	54.3	181	7.09	53.9	14.1	4.5	1.5	13.2	5.02	
			replicate 1	54.3	182	7.11	54.5	14.2	4.6	1.5	13.4	5.09	
			replicate 2	53.9	180	7.16	54.4	14.2	4.6	1.5	13.4	5.08	
			C.V.	0.4%	0.6%	0.5%	0.6%	0.4%	1.3%	0.0%	0.9%	0.7%	
	sample 26	64.5	198	7.01	64.2	16.5	5.6	1.3	13.9	5.29			
	replicate 1	64.6	196	7.04	64.2	16.5	5.6	1.4	13.8	5.28			
	replicate 2	64.5	195	7.19	64.4	16.6	5.6	1.4	14.0	5.30			
	C.V.	0.1%	0.8%	1.4%	0.2%	0.3%	0.0%	4.2%	0.7%	0.2%			

NOTE: Replicate (time) samples were submitted for analysis two days post-sampling.

C.V. = Coefficient of variation.

Table 104 (cont'd): Water chemistry and major ion concentrations (mg/L) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	Alkalinity	Conductivity (μ S/cm)	pH (relative units)	Hardness (Ca + Mg)	Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Silicon (Si)
Fall 2000	Ref	sample 12	63.9	178	7.88	84.8	30.2	2.3	0.3	2.2	3.61
		replicate 1	61.5	176	7.24	84.3	30.0	2.3	0.3	2.2	3.61
		replicate 2	61.6	176	7.24	84.3	30.1	2.2	0.2	2.2	3.61
		C.V.	2.2%	0.7%	5.0%	0.3%	0.3%	2.5%	21.7%	0.0%	0.0%
	sample 22	sample 22	85.4	236	7.72	123.0	43.5	3.4	0.4	3.1	4.04
		replicate 1	85.7	243	7.81	122.0	43.2	3.3	0.4	2.9	4.00
		replicate 2	85.9	243	7.81	121.0	43.0	3.3	0.4	3.0	4.00
		C.V.	0.3%	1.7%	0.7%	0.8%	0.6%	1.7%	0.0%	3.3%	0.6%
	mid Ag	sample 12	70.3	209	7.15	99.4	35.1	2.9	0.4	2.8	4.13
		replicate 1	70.6	206	7.22	99.0	35.0	2.8	0.4	2.9	4.12
		replicate 2	70.6	208	7.25	98.6	34.8	2.8	0.4	2.8	4.10
		C.V.	0.2%	0.7%	0.7%	0.4%	0.4%	2.0%	0.0%	2.0%	0.4%
	sample 22	sample 22	92.2	264	7.69	131.0	46.2	3.8	0.5	3.6	4.52
		replicate 1	92.5	264	7.74	132.0	46.3	3.8	0.5	3.6	4.53
		replicate 2	92.5	266	7.74	132.0	46.5	3.8	0.4	3.6	4.54
		C.V.	0.2%	0.4%	0.4%	0.4%	0.3%	0.0%	12.4%	0.0%	0.2%
	d/s Ag	sample 12	112.0	291	7.42	143.1	45.9	6.9	1.4	4.3	6.81
		replicate 1	112.0	293	7.45	142.5	45.7	6.9	1.6	4.2	6.80
		replicate 2	112.0	292	7.46	143.0	45.9	6.9	1.5	4.2	6.83
		C.V.	0.0%	0.3%	0.3%	0.2%	0.3%	0.0%	6.7%	1.4%	0.2%
	sample 22	sample 22	129.6	322	7.75	161.0	51.2	8.1	1.5	4.7	7.41
		replicate 1	130.3	319	7.78	162.0	51.5	8.1	1.4	4.7	7.42
		replicate 2	130.0	320	7.81	163.0	51.8	8.1	1.4	4.8	7.43
		C.V.	0.3%	0.5%	0.4%	0.6%	0.6%	0.0%	4.0%	1.2%	0.1%
d/s Urban	sample 12	60.4	244	6.81	68.0	17.0	6.2	2.3	20.9	6.02	
	replicate 1	60.6	244	6.84	67.9	17.0	6.2	2.3	20.9	6.04	
	replicate 2	60.3	241	6.84	67.9	17.0	6.2	2.3	20.9	6.03	
	C.V.	0.3%	0.7%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	
sample 22	sample 22	72.1	335	7.21	80.3	19.6	7.6	2.5	34.7	6.66	
	replicate 1	72.4	333	7.10	80.7	19.6	7.7	2.6	34.8	6.68	
	replicate 2	73.3	340	7.18	80.7	19.7	7.6	2.6	34.8	6.70	
	C.V.	0.9%	1.1%	0.8%	0.3%	0.3%	0.8%	2.2%	0.2%	0.3%	
Fall 2001	Ref	sample 8	83.1	230	7.90	100.8	35.8	2.8	0.4	2.6	3.44
		replicate 1	82.4	230	7.92	97.0	34.5	2.7	0.4	2.5	3.35
		replicate 2	82.6	232	7.93	96.3	34.1	2.7	0.4	2.5	3.31
		C.V.	0.4%	0.5%	0.2%	2.5%	2.6%	2.1%	0.0%	2.3%	2.0%
	sample 19	sample 19	50.1	143	7.70	71.7	25.6	1.9	0.3	2.0	3.62
		replicate 1	50.4	143	7.74	71.3	25.5	1.9	0.3	2.0	3.58
		replicate 2	50.2	143	7.73	58.3	20.8	1.6	0.3	1.8	3.08
		C.V.	0.3%	0.0%	0.3%	11.4%	11.4%	9.6%	0.0%	6.0%	8.8%
	mid Ag	sample 8	59.1	233	7.78	102.3	36.2	2.9	0.4	2.8	3.58
		replicate 1	81.7	235	7.88	99.6	35.2	2.9	0.4	2.8	3.50
		replicate 2	81.5	237	7.89	100.1	35.4	2.8	0.4	2.7	3.51
		C.V.	17.5%	0.9%	0.8%	1.4%	1.5%	2.0%	0.0%	2.1%	1.2%
	sample 19	sample 19	58.4	184	7.45	91.4	32.3	2.6	0.4	2.9	4.28
		replicate 1	60.1	184	7.64	92.8	32.8	2.7	0.4	2.9	4.32
		replicate 2	59.1	184	7.54	76.0	26.8	2.2	0.4	2.6	3.65
		C.V.	1.4%	0.0%	1.3%	10.7%	10.9%	10.6%	0.0%	6.2%	9.2%

C.V. = Coefficient of variation.

Table 104 (cont'd): Water chemistry and major ion concentrations (mg/L) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	Alkalinity	Conductivity (µS/cm)	pH (relative units)	Hardness (Ca + Mg)	Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Silicon (Si)
Fall 2001	d/s Ag	sample 8	124.2	312	7.90	134.8	43.4	6.4	2.1	4.1	5.60
		replicate 1	123.7	311	7.88	136.8	44.1	6.5	2.1	4.2	5.63
		replicate 2	124.0	308	7.93	133.8	43.1	6.4	2.2	4.2	5.53
		C.V.	0.2%	0.7%	0.3%	1.1%	1.2%	0.9%	2.7%	1.4%	0.9%
		sample 19	90.7	269	7.57	136.0	44.3	6.2	3.3	4.7	6.64
		replicate 1	91.3	271	7.72	134.2	43.7	6.1	3.3	4.6	6.60
	replicate 2	91.3	271	7.65	111.1	36.2	5.0	2.9	4.1	5.58	
	C.V.	0.4%	0.4%	1.0%	10.9%	10.9%	11.5%	7.3%	7.2%	9.6%	
	d/s Urban	sample 8	43.8	157	7.55	45.1	11.5	4.0	2.7	11.2	3.85
		replicate 1	41.3	155	7.12	44.2	11.1	4.0	2.7	10.9	3.92
		replicate 2	41.5	157	7.14	44.4	11.2	4.0	2.8	10.8	3.85
		C.V.	3.3%	0.7%	3.3%	1.1%	1.8%	0.0%	2.1%	1.9%	1.0%
		sample 19	41.4	149	7.08	47.7	12.6	3.9	2.5	13.5	4.68
		replicate 1	40.8	149	7.15	47.8	12.7	3.9	2.5	13.6	4.68
	replicate 2	40.4	148	7.22	40.1	10.6	3.3	2.3	12.1	3.99	
	C.V.	1.2%	0.4%	1.0%	9.8%	9.9%	9.4%	4.7%	6.4%	9.0%	

C.V. = Coefficient of variation.

6.1.2 Nutrients

Table 105: Nutrient concentrations (mg/L) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	Ammonia	Nitrite	Nitrite and Nitrate	Total Nitrogen	Ortho - Phosphate	Total Phosphorus	Total Dissolved Phosphorus
Fall 1999	Ref	sample 12	ND	0.002	0.329	0.39	0.001	0.007	0.004
		replicate 1	ND	0.002	0.333	0.42	0.001	0.009	0.006
		replicate 2	0.006	0.003	0.336	0.41	0.001	0.006	0.005
		C.V.	173.2%	24.7%	1.1%	3.8%	0.0%	20.8%	20.0%
		sample 14	ND	0.004	0.290	0.37	0.001	0.004	ND
		replicate 1	ND	0.005	0.290	0.37	0.001	0.002	ND
		replicate 2	ND	0.004	0.287	0.39	ND	0.003	ND
		C.V.	0.0%	13.3%	0.6%	3.1%	86.6%	33.3%	0.0%
		replicate 3 (time)	ND	0.003	0.276	0.35	0.001	0.012	0.004
		replicate 4 (time)	ND	0.003	0.291	0.37	0.001	0.010	0.004
		C.V.	0.0%	17.3%	2.9%	3.2%	0.0%	48.0%	86.6%
		sample 25	ND	0.004	0.352	0.41	0.002	0.008	0.005
		replicate 1	ND	0.004	0.352	0.40	0.002	0.009	0.009
		replicate 2	ND	0.004	0.352	0.40	0.001	0.008	0.005
		C.V.	0.0%	0.0%	0.0%	1.4%	34.6%	6.9%	36.5%
		replicate 3 (time)	ND	0.003	0.346	0.37	ND	0.008	0.007
		replicate 4 (time)	ND	0.003	0.343	0.38	ND	0.009	0.007
		C.V.	0.0%	17.3%	1.3%	5.4%	173.2%	6.9%	18.2%

NOTE: Replicate (time) samples were submitted for analysis two days post-sampling.

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 105 (cont'd): Nutrient concentrations (mg/L) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	Ammonia	Nitrite	Nitrite and Nitrate	Total Nitrogen	Ortho - Phosphate	Total Phosphorus	Total Dissolved Phosphorus
Fall 1999	mid Ag	sample 12	0.019	0.004	0.363	0.52	0.003	0.011	0.007
		replicate 1	0.018	0.004	0.360	0.53	0.003	0.012	0.007
		replicate 2	0.018	0.004	0.360	0.51	0.003	0.011	0.010
		C.V.	3.1%	0.0%	0.5%	1.9%	0.0%	5.1%	21.7%
		sample 14	0.018	0.005	0.837	1.10	0.002	0.013	ND
		replicate 1	0.020	0.005	0.862	1.10	0.003	0.011	0.003
		replicate 2	0.018	0.005	0.852	1.10	0.003	0.011	ND
		C.V.	6.2%	0.0%	1.5%	0.0%	21.7%	9.9%	173.2%
		replicate 3 (time)	0.015	0.004	0.839	1.09	0.003	0.019	0.007
		replicate 4 (time)	0.014	0.004	0.833	1.07	0.003	0.018	0.011
		C.V.	13.3%	13.3%	0.4%	1.4%	21.7%	19.3%	92.8%
		sample 25	0.014	0.005	0.534	0.70	0.002	0.016	0.008
		replicate 1	0.016	0.005	0.536	0.66	0.002	0.015	0.008
		replicate 2	0.015	0.004	0.533	0.68	0.002	0.015	0.008
	C.V.	6.7%	12.4%	0.3%	2.9%	0.0%	3.8%	0.0%	
	replicate 3 (time)	0.014	0.004	0.538	0.56	0.002	0.017	0.009	
	replicate 4 (time)	0.015	0.004	0.546	0.55	0.002	0.016	0.009	
	C.V.	4.0%	13.3%	1.1%	13.9%	0.0%	3.5%	6.7%	
	d/s Ag	sample 12	0.083	0.023	0.840	1.30	0.016	0.043	0.025
	replicate 1	0.082	0.023	0.850	1.40	0.016	0.049	0.026	
	replicate 2	0.082	0.024	0.840	1.40	0.016	0.045	0.025	
	C.V.	0.7%	2.5%	0.7%	4.2%	0.0%	6.7%	2.3%	
	sample 14	0.195	0.040	2.730	3.90	0.142	0.216	0.132	
	replicate 1	0.193	0.041	2.750	3.80	0.144	0.219	0.132	
	replicate 2	0.194	0.040	2.740	3.80	0.144	0.219	0.132	
	C.V.	0.5%	1.4%	0.4%	1.5%	0.8%	0.8%	0.0%	
	replicate 3 (time)	0.199	0.039	2.770	3.93	0.144	0.240	0.160	
	replicate 4 (time)	0.200	0.038	2.700	3.94	0.114	0.240	0.160	
C.V.	1.3%	2.6%	1.3%	0.5%	12.6%	6.0%	10.7%		
sample 25	0.065	0.021	1.210	1.63	0.017	0.046	0.027		
replicate 1	0.068	0.022	1.220	1.58	0.017	0.045	0.028		
replicate 2	0.068	0.022	1.210	1.63	0.018	0.044	0.028		
C.V.	2.6%	2.7%	0.5%	1.8%	3.3%	2.2%	2.1%		
replicate 3 (time)	0.067	0.019	1.210	1.53	0.019	0.046	0.030		
replicate 4 (time)	0.068	0.019	1.230	1.50	0.019	0.048	0.031		
C.V.	2.3%	5.9%	0.9%	4.4%	6.3%	2.5%	7.1%		
Spring 2000	Ref	sample 11	ND	ND	0.209	0.25	ND	0.008	0.003
		replicate 1	ND	ND	0.210	0.27	ND	0.005	0.004
		replicate 2	ND	ND	0.214	0.24	ND	0.008	0.004
		C.V.	0.0%	0.0%	1.3%	6.0%	0.0%	24.7%	15.7%
		sample 26	ND	ND	0.182	0.32	ND	0.004	ND
		replicate 1	ND	ND	0.184	0.30	ND	0.008	ND
		replicate 2	ND	ND	0.182	0.26	ND	0.004	0.003
		C.V.	0.0%	0.0%	0.6%	10.4%	0.0%	43.3%	173.2%

NOTE: Replicate (time) samples were submitted for analysis two days post-sampling.

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 105 (cont'd): Nutrient concentrations (mg/L) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	Ammonia	Nitrite	Nitrite and Nitrate	Total Nitrogen	Ortho - Phosphate	Total Phosphorus	Total Dissolved Phosphorus
Spring 2000	mid Ag	sample 11	0.007	ND	0.298	0.37	ND	0.011	0.006
		replicate 1	0.010	ND	0.296	0.36	ND	0.009	0.006
		replicate 2	0.007	ND	0.300	0.36	ND	0.010	0.005
		C.V.	21.7%	0.0%	0.7%	1.6%	0.0%	10.0%	10.2%
		sample 26	0.009	ND	0.276	0.45	ND	0.010	0.004
		replicate 1	0.011	ND	0.279	0.41	ND	0.012	0.004
	replicate 2	0.011	ND	0.277	0.44	ND	0.011	0.005	
	C.V.	11.2%	0.0%	0.6%	4.8%	0.0%	9.1%	13.3%	
	d/s Ag	sample 11	0.074	0.010	0.648	0.86	0.011	0.033	0.019
		replicate 1	0.064	0.010	0.649	0.85	0.010	0.033	0.019
		replicate 2	0.065	0.010	0.647	0.83	0.011	0.032	0.019
		C.V.	8.1%	0.0%	0.2%	1.8%	5.4%	1.8%	0.0%
		sample 26	0.064	0.013	0.684	0.95	0.011	0.041	0.017
		replicate 1	0.061	0.013	0.684	1.05	0.011	0.040	0.017
	replicate 2	0.064	0.013	0.675	0.99	0.093	0.038	0.017	
	C.V.	2.7%	0.0%	0.8%	5.1%	123.5%	3.9%	0.0%	
	d/s Urban	sample 11	0.047	0.006	0.650	0.92	0.008	0.037	0.022
		replicate 1	0.042	0.006	0.638	0.94	0.007	0.044	0.025
		replicate 2	0.044	0.006	0.646	0.93	0.008	0.043	0.034
		C.V.	5.7%	0.0%	0.9%	1.1%	7.5%	9.2%	23.1%
sample 26		0.058	0.004	0.393	0.94	0.010	0.043	0.031	
replicate 1		0.058	0.004	0.400	0.92	0.009	0.045	0.028	
replicate 2	0.058	0.004	0.396	0.94	0.010	0.040	0.030		
C.V.	0.0%	0.0%	0.9%	1.2%	6.0%	5.9%	5.1%		
Fall 2000	Ref	sample 12	ND	ND	0.23	0.28	ND	0.01	0.008
		replicate 1	ND	ND	0.242	0.28	ND	0.01	0.008
		replicate 2	ND	ND	0.241	0.29	ND	0.012	0.007
		C.V.	0.0%	0.0%	2.8%	2.0%	0.0%	10.8%	7.5%
		sample 22	ND	ND	0.373	0.45	ND	0.008	0.007
		replicate 1	0.005	ND	0.383	0.41	0.001	0.008	0.009
	replicate 2	0.007	ND	0.387	0.44	ND	0.009	0.007	
	C.V.	90.1%	0.0%	1.9%	4.8%	173.2%	6.9%	15.1%	
	mid Ag	sample 12	0.011	ND	0.327	0.4	ND	0.011	0.009
		replicate 1	0.011	0.002	0.325	0.41	ND	0.013	0.008
		replicate 2	0.011	ND	0.322	0.42	ND	0.012	0.01
		C.V.	0.0%	173.2%	0.8%	2.4%	0.0%	8.3%	11.1%
		sample 22	0.015	ND	0.418	0.51	ND	0.011	0.012
		replicate 1	0.015	ND	0.419	0.5	ND	0.011	0.009
	replicate 2	0.015	ND	0.42	0.5	ND	0.011	0.01	
	C.V.	0.0%	0.0%	0.2%	1.1%	0.0%	0.0%	14.8%	
	d/s Ag	sample 12	0.044	0.014	0.93	1.22	0.012	0.053	0.024
		replicate 1	0.041	0.015	0.955	1.13	0.011	0.05	0.025
		replicate 2	0.04	0.015	0.955	1.18	0.015	0.053	0.024
		C.V.	5.0%	3.9%	1.5%	3.8%	16.4%	3.3%	2.4%

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 105 (cont'd): Nutrient concentrations (mg/L) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	Ammonia	Nitrite	Nitrite and Nitrate	Total Nitrogen	Ortho - Phosphate	Total Phosphorus	Total Dissolved Phosphorus	
Fall 2000	d/s Ag	sample 22	0.071	0.015	1.03	1.3	0.005	0.073	0.021	
		replicate 1	0.071	0.015	1.03	1.3	0.005	0.073	0.023	
		replicate 2	0.072	0.015	1.04	1.28	0.005	0.07	0.018	
		C.V.	0.8%	0.0%	0.6%	0.9%	0.0%	2.4%	12.2%	
	d/s Urban	sample 12	0.057	0.004	0.534	0.96	0.010	0.053	0.038	
		replicate 1	0.055	0.004	0.545	1.08	0.012	0.052	0.037	
		replicate 2	0.055	0.005	0.540	1.06	0.010	0.051	0.040	
		C.V.	2.1%	13.3%	1.0%	6.2%	10.8%	1.9%	4.0%	
		sample 22	0.096	0.004	0.730	1.16	0.007	0.033	0.025	
		replicate 1	0.091	0.004	0.708	1.18	0.007	0.036	0.027	
		replicate 2	0.091	0.004	0.714	1.14	0.007	0.036	0.025	
		C.V.	3.1%	0.0%	1.6%	1.7%	0.0%	4.9%	4.5%	
		Fall 2001	Ref	sample 8	ND	ND	0.306	0.34	0.001	0.011
	replicate 1			ND	ND	0.293	0.36	0.001	0.006	0.002
	replicate 2			ND	ND	0.300	0.35	ND	0.009	ND
C.V.	0.0%			0.0%	2.2%	2.9%	86.6%	29.0%	86.6%	
sample 19	0.005			ND	0.216	0.22	ND	0.003	0.006	
replicate 1	0.007			ND	0.215	0.20	ND	0.009	0.002	
mid Ag	replicate 2		ND	ND	0.217	0.23	ND	0.003	ND	
	C.V.		90.1%	0.0%	0.5%	7.1%	0.0%	69.3%	114.6%	
	sample 8		ND	ND	0.318	0.36	0.002	0.010	0.004	
	replicate 1		0.008	ND	0.311	0.44	0.002	0.009	0.003	
	replicate 2		0.008	ND	0.310	0.51	0.002	0.008	0.003	
	C.V.		86.6%	0.0%	1.4%	17.2%	0.0%	11.1%	17.3%	
	sample 19		0.012	ND	0.780	0.81	0.001	0.009	0.003	
	replicate 1		0.012	ND	0.780	0.83	0.001	0.008	0.004	
	replicate 2		0.012	0.002	0.770	0.83	0.001	0.009	0.004	
	C.V.		0.0%	173.2%	0.7%	1.4%	0.0%	6.7%	15.7%	
	d/s Ag		sample 8	0.064	0.018	0.750	0.95	0.017	0.052	0.028
			replicate 1	0.061	0.018	0.740	0.93	0.017	0.053	0.029
replicate 2			0.066	0.018	0.740	0.96	0.019	0.053	0.029	
C.V.			4.0%	0.0%	0.8%	1.6%	6.5%	1.1%	2.0%	
sample 19			0.213	0.048	2.190	2.73	0.036	0.094	0.053	
replicate 1			0.210	0.048	2.170	2.70	0.036	0.098	0.053	
replicate 2			0.262	0.048	2.160	2.80	0.036	0.093	0.052	
C.V.			12.8%	0.0%	0.7%	1.9%	0.0%	2.8%	1.1%	
d/s Urban		sample 8	0.008	0.004	0.442	1.04	0.017	0.062	0.038	
		replicate 1	0.011	0.004	0.450	1.09	0.016	0.063	0.039	
		replicate 2	0.008	0.004	0.432	1.02	0.016	0.063	0.040	
		C.V.	19.2%	0.0%	2.0%	3.4%	3.5%	0.9%	2.6%	
	sample 19	0.013	0.004	0.567	1.01	0.012	0.055	0.030		
	replicate 1	0.036	0.004	0.590	1.23	0.012	0.067	0.030		
	replicate 2	0.028	0.004	0.570	1.06	0.012	0.067	0.029		
	C.V.	45.5%	0.0%	2.2%	10.5%	0.0%	11.0%	1.9%		

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

6.1.3 Bacteriological Parameters

Table 106: Bacteriological counts (MPN/100mL) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	<i>E. coli</i>	Fecal Coliforms	Total Coliforms	
Fall 1999	Ref	sample 12	18	23	350	
		replicate 1	17	17	920	
		replicate 2	5	5	350	
		C.V.	54.3%	61.1%	60.9%	
		sample 14	4	4	170	
		replicate 1	0	0	170	
		replicate 2	2	2	170	
		C.V.	100.0%	100.0%	0.0%	
		replicate 3 (time)	7	7	110	
		replicate 4 (time)	0	2	32	
		C.V.	95.8%	58.1%	66.5%	
		sample 25	2	2	110	
		replicate 1	4	4	26	
		replicate 2	2	2	170	
		C.V.	43.3%	43.3%	70.9%	
		replicate 3 (time)	5	5	34	
		replicate 4 (time)	5	5	22	
		C.V.	43.3%	43.3%	86.2%	
	mid Ag		sample 12	20	170	9200
			replicate 1	20	230	9200
			replicate 2	20	330	9200
			C.V.	0.0%	33.2%	0.0%
			sample 14	23	33	2200
			replicate 1	23	23	5400
			replicate 2	12	32	3500
			C.V.	32.8%	18.8%	43.5%
			replicate 3 (time)	23	23	2200
			replicate 4 (time)	49	49	3500
			C.V.	47.4%	37.5%	28.5%
			sample 25	8	13	540
			replicate 1	2	8	920
			replicate 2	0	5	920
			C.V.	124.9%	46.6%	27.7%
			replicate 3 (time)	12	25	1000
			replicate 4 (time)	2	7	220
			C.V.	68.6%	61.1%	66.8%
d/s Ag		sample 12	1100	1400	46000	
		replicate 1	110	330	16000	
		replicate 2	460	1300	16000	
		C.V.	90.2%	58.5%	66.6%	
		sample 14	5400	5400	54000	
		replicate 1	2100	4600	22000	
		replicate 2	3100	3100	16000	
		C.V.	47.9%	26.7%	66.6%	
		replicate 3 (time)	1700	3300	53000	
		replicate 4 (time)	4900	4900	54000	
		C.V.	50.2%	24.2%	1.1%	
		sample 25	230	330	45000	
		replicate 1	170	450	45000	
		replicate 2	70	350	54000	
		C.V.	51.6%	17.1%	10.8%	
		replicate 3 (time)	220	460	54000	
		replicate 4 (time)	110	540	54000	
		C.V.	35.7%	23.9%	10.2%	
Spring 2000	Ref	sample 11	4	4	24	
		replicate 1	0	0	11	
		replicate 2	0	0	40	
		C.V.	173.2%	173.2%	58.1%	

NOTE: Replicate (time) samples were submitted for analysis two days post-sampling.

C.V. = Coefficient of variation.

Table 106 (cont'd): Bacteriological counts (MPN/100mL) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	<i>E. coli</i>	Fecal Coliforms	Total Coliforms
Spring 2000	Ref	sample 26	5	5	21
		replicate 1	0	0	9
		replicate 2	0	0	22
		C.V.	173.2%	173.2%	41.7%
	mid Ag	sample 11	5	8	350
		replicate 1	8	8	170
		replicate 2	13	13	280
		C.V.	46.6%	29.9%	34.0%
		sample 26	23	23	3500
		replicate 1	13	13	730
		replicate 2	23	23	920
		C.V.	29.4%	29.4%	90.1%
	d/s Ag	sample 11	700	700	9500
		replicate 1	540	920	3500
		replicate 2	350	350	16000
		C.V.	33.1%	43.8%	64.7%
		sample 26	240	240	9200
		replicate 1	140	140	14000
		replicate 2	430	430	5400
		C.V.	54.6%	54.6%	45.2%
	d/s Urban	sample 11	450	500	930
		replicate 1	920	920	9200
		replicate 2	1100	1100	1700
		C.V.	40.8%	36.7%	115.9%
sample 26		2	13	1700	
replicate 1		5	110	1600	
replicate 2		17	17	1600	
C.V.		99.2%	117.6%	3.5%	
Fall 2000	Ref	sample 12	0	0	56
		replicate 1	0	0	12
		replicate 2	0	0	540
		C.V.	0.0%	0.0%	144.6%
		sample 22	79	79	79
		replicate 1	17	17	26
		replicate 2	130	130	280
		C.V.	75.1%	75.1%	104.4%
	mid Ag	sample 12	23	49	540
		replicate 1	49	130	2400
		replicate 2	17	49	1300
		C.V.	57.3%	61.5%	66.2%
		sample 22	22	22	920
		replicate 1	33	33	540
		replicate 2	7	7	920
		C.V.	63.2%	63.2%	27.7%
	d/s Ag	sample 12	240	240	2400
		replicate 1	70	920	7900
		replicate 2	110	350	4600
		C.V.	63.5%	72.5%	55.7%
		sample 22	79	130	920
		replicate 1	130	130	1600
		replicate 2	130	170	5400
		C.V.	26.1%	16.1%	91.5%
d/s Urban	sample 12	70	70	110	
	replicate 1	26	95	130	
	replicate 2	27	79	540	
	C.V.	61.3%	15.6%	93.3%	
	sample 22	0	0	1600	
	replicate 1	23	23	240	
	replicate 2	22	26	61	
	C.V.	86.7%	87.1%	132.8%	

C.V. = Coefficient of variation.

Table 106 (cont'd): Bacteriological counts (MPN/100mL) in replicate water samples.

Exposure Period	Site	Sample/ Statistic	<i>E. coli</i>	Fecal Coliforms	Total Coliforms	
Fall 2001	Ref	sample 8	1	1	15	
		replicate 1	1	1	5	
		replicate 2	4	6	8	
		C.V.	86.6%	108.3%	55.0%	
		sample 19	0	0	0	
		replicate 1	1	1	1	
	replicate 2	0	0	0		
	C.V.	173.2%	173.2%	173.2%		
	mid Ag	sample 8	16	19	200	
		replicate 1	11	14	125	
		replicate 2	14	24	30	
		C.V.	18.4%	26.3%	72.0%	
		sample 19	9	9	12	
		replicate 1	7	7	21	
	replicate 2	5	5	24		
	C.V.	28.6%	28.6%	32.9%		
	d/s Ag	sample 8				
		replicate 1	results not available (TNTC)			
		replicate 2	results not available (TNTC)			
		C.V.	-	-	-	
		sample 19	212	212	296	
		replicate 1	230	236	287	
	replicate 2	280	284	343		
	C.V.	14.6%	15.0%	9.7%		
d/s Urban	sample 8	0	0	120		
	replicate 1	25	32	160		
	replicate 2	6	6	132		
	C.V.	126.3%	134.3%	14.9%		
	sample 19	91	91	117		
	replicate 1	101	101	141		
replicate 2	75	75	93			
C.V.	14.7%	14.7%	20.5%			

C.V. = Coefficient of variation.

TNTC = Too numerable to count.

6.1.4 Trace Metals

Table 107: Metal concentrations (mg/L) in replicate water samples. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Sample/ Statistic	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)
Fall 1999	Ref	sample 12	0.017	0.0001	0.0230	ND	ND	ND	0.0001	ND	0.0206	ND
		replicate 1	0.016	0.0001	0.0228	ND	ND	ND	ND	0.0003	0.0212	ND
		replicate 2	0.017	ND	0.0231	ND	ND	0.0002	ND	0.0003	0.0200	ND
		C.V.	3.5%	86.6%	0.7%	0.0%	0.0%	173.2%	173.2%	86.6%	2.9%	0.0%
		sample 14	0.400	0.0001	0.0167	ND	0.0001	0.0003	0.0002	0.0010	0.5870	ND
		replicate 1	0.360	0.0001	0.0162	ND	0.0001	0.0003	0.0002	0.0010	0.5220	0.0002
		replicate 2	0.308	ND	0.0164	ND	0.0001	0.0003	0.0002	0.0009	0.4440	ND
		replicate 3	0.252	0.0001	0.0154	ND	0.0001	0.0003	0.0002	0.0008	0.3610	ND
		replicate 4	0.238	0.0001	0.0155	ND	0.0001	0.0002	0.0001	0.0008	0.3400	ND
		C.V.	21.9%	49.0%	3.6%	0.0%	0.0%	14.4%	22.3%	10.7%	23.0%	244.9%
		sample 25	0.047	0.0001	0.0182	ND	ND	ND	ND	0.0003	0.0588	ND
		replicate 1	0.045	0.0001	0.0182	ND	ND	ND	ND	0.0003	0.0555	0.0002
	replicate 2	0.047	0.0001	0.0184	ND	ND	ND	ND	0.0003	0.0573	0.0002	
	C.V.	2.5%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	86.6%	
	mid Ag	sample 12	0.053	0.0002	0.0253	ND	ND	ND	0.0003	0.0007	0.3080	ND
		replicate 1	0.052	0.0003	0.0256	ND	0.0001	0.0002	0.0003	0.0009	0.3050	ND
		replicate 2	0.049	0.0001	0.0259	ND	0.0001	ND	0.0003	0.0008	0.2990	0.0002
		C.V.	4.1%	50.0%	1.2%	0.0%	86.6%	173.2%	0.0%	12.5%	1.5%	173.2%
		sample 14	0.242	0.0002	0.0231	ND	0.0002	0.0003	0.0012	0.0018	0.4460	0.0004
		replicate 1	0.236	0.0001	0.0235	ND	0.0002	0.0003	0.0012	0.0018	0.4470	ND
		replicate 2	0.240	0.0001	0.0234	ND	0.0002	0.0003	0.0013	0.0018	0.4500	0.0002
		replicate 3	0.218	0.0001	0.0230	ND	0.0001	0.0004	0.0013	0.0017	0.4190	ND
		replicate 4	0.245	0.0001	0.0234	ND	0.0002	0.0004	0.0012	0.0033	0.4660	ND
		C.V.	4.2%	38.7%	0.9%	0.0%	22.3%	15.5%	4.2%	30.6%	3.4%	118.0%
		sample 25	0.138	0.0001	0.0246	ND	0.0001	ND	0.0008	0.0011	0.3460	ND
		replicate 1	0.153	0.0002	0.0247	ND	0.0001	ND	0.0008	0.0011	0.3680	ND
		replicate 2	0.148	0.0001	0.0249	ND	0.0001	0.0002	0.0008	0.0011	0.3600	0.0005
C.V.		5.2%	43.3%	0.6%	0.0%	0.0%	173.2%	0.0%	0.0%	3.1%	173.2%	
d/s Ag		sample 12	0.089	0.0003	0.0427	0.06	0.0002	0.0005	0.0003	0.0012	0.5880	ND
	replicate 1	0.088	0.0003	0.0435	ND	0.0001	0.0002	0.0003	0.0012	0.6030	ND	
	replicate 2	0.082	0.0004	0.0433	ND	0.0001	0.0002	0.0003	0.0012	0.5850	ND	
	C.V.	4.4%	17.3%	1.0%	173.2%	43.3%	57.7%	0.0%	0.0%	1.6%	0.0%	
	sample 14	0.356	0.0006	0.0391	ND	0.0002	0.0008	0.0009	0.0041	0.7600	0.0004	
	replicate 1	0.374	0.0005	0.0395	ND	0.0002	0.0010	0.0009	0.0050	0.9570	0.0005	
	replicate 2	0.368	0.0005	0.0399	ND	0.0002	0.0009	0.0009	0.0043	0.7830	0.0006	
	replicate 3	0.373	0.0005	0.0396	ND	0.0002	0.0009	0.0009	0.0042	0.7990	0.0006	
	replicate 4	0.373	0.0005	0.0398	ND	0.0002	0.0010	0.0008	0.0043	0.8010	0.0003	
	C.V.	2.3%	9.7%	0.9%	0.0%	0.0%	9.9%	4.6%	7.8%	9.2%	26.0%	
	sample 25	0.087	0.0003	0.0369	ND	0.0001	0.0003	0.0005	0.0015	0.4550	0.0002	
	replicate 1	0.089	0.0003	0.0372	ND	0.0001	0.0003	0.0005	0.0016	0.4670	ND	
	replicate 2	0.095	0.0002	0.0377	ND	0.0001	0.0003	0.0005	0.0016	0.4950	0.0003	
	C.V.	4.6%	21.7%	1.1%	0.0%	0.0%	0.0%	0.0%	3.7%	4.3%	91.7%	

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 107 (cont'd): Metal concentrations (mg/L) in replicate water samples. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Sample/ Statistic	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Vanadium (V)	Zinc (Zn)
Fall 1999	Ref	sample 12	0.0013	0.0021	ND	0.0012	ND	0.0012	0.0001	0.3160	0.0001	0.0003
		replicate 1	0.0012	0.0021	ND	0.0013	ND	0.0011	ND	0.3130	ND	0.0005
		replicate 2	0.0014	0.0023	ND	0.0014	0.0002	0.0010	0.0001	0.3160	0.0002	0.0004
		C.V.	7.7%	5.3%	0.0%	7.7%	173.2%	9.1%	86.6%	0.5%	100.0%	25.0%
		sample 14	0.0010	0.0161	0.005	0.0006	0.0003	0.0006	ND	0.1630	0.0009	0.0025
		replicate 1	0.0010	0.0144	0.005	0.0006	0.0004	0.0006	0.0006	0.1620	0.0008	0.0021
		replicate 2	0.0009	0.0124	ND	0.0006	0.0003	0.0007	ND	0.1640	0.0008	0.0018
		replicate 3	0.0009	0.0106	0.005	0.0007	0.0004	0.0007	0.0001	0.1620	0.0005	0.0016
		replicate 4	0.0008	0.0094	ND	0.0005	0.0002	0.0007	ND	0.1630	0.0005	0.0014
		C.V.	8.7%	21.5%	77.5%	10.5%	23.8%	8.4%	205.8%	0.5%	25.4%	23.3%
		sample 25	0.0010	0.0025	ND	0.0009	ND	0.0011	ND	0.2290	0.0001	0.0004
		replicate 1	0.0009	0.0024	0.009	0.0008	ND	0.0011	ND	0.2290	0.0001	0.0004
	replicate 2	0.0010	0.0024	ND	0.0008	ND	0.0011	ND	0.2310	0.0001	0.0004	
	C.V.	6.0%	2.4%	173.2%	6.9%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	
	mid Ag	sample 12	0.0014	0.0352	ND	0.0013	0.0005	0.0013	0.0001	0.3210	0.0001	0.0023
		replicate 1	0.0013	0.0357	ND	0.0013	0.0006	0.0014	ND	0.3240	0.0002	0.0024
		replicate 2	0.0013	0.0361	ND	0.0013	0.0006	0.0012	ND	0.3280	0.0002	0.0024
		C.V.	4.3%	1.3%	0.0%	0.0%	10.2%	7.7%	173.2%	1.1%	34.6%	2.4%
		sample 14	0.0012	0.0367	ND	0.0008	0.0024	0.0014	ND	0.2110	0.0005	0.0071
		replicate 1	0.0012	0.0370	0.005	0.0008	0.0021	0.0013	ND	0.2140	0.0004	0.0070
		replicate 2	0.0012	0.0369	ND	0.0007	0.0022	0.0014	ND	0.2130	0.0005	0.0070
		replicate 3	0.0012	0.0368	0.005	0.0008	0.0021	0.0014	0.0001	0.2100	0.0005	0.0067
		replicate 4	0.0013	0.0374	ND	0.0008	0.0021	0.0014	0.0001	0.2130	0.0005	0.0071
		C.V.	3.4%	0.7%	154.9%	5.2%	6.6%	3.0%	154.9%	0.7%	8.4%	2.2%
		sample 25	0.0016	0.0304	ND	0.0011	0.0013	0.0014	ND	0.2780	0.0004	0.0043
		replicate 1	0.0016	0.0306	ND	0.0012	0.0014	0.0015	0.0001	0.2790	0.0004	0.0046
	replicate 2	0.0015	0.0305	ND	0.0012	0.0014	0.0014	ND	0.2790	0.0004	0.0042	
	C.V.	3.7%	0.3%	0.0%	4.9%	4.2%	4.0%	173.2%	0.2%	0.0%	4.8%	
	d/s Ag	sample 12	0.0020	0.1460	0.008	0.0013	0.0009	0.0006	0.0001	0.3060	0.0004	0.0036
		replicate 1	0.0014	0.1480	ND	0.0012	0.0009	0.0006	0.0001	0.3130	0.0002	0.0035
replicate 2		0.0014	0.1450	ND	0.0012	0.0009	0.0007	0.0001	0.3110	0.0002	0.0034	
C.V.		21.7%	1.0%	173.2%	4.7%	0.0%	9.1%	0.0%	1.2%	43.3%	2.9%	
sample 14		0.0010	0.0797	0.005	0.0010	0.0033	0.0015	ND	0.2070	0.0010	0.0111	
replicate 1		0.0011	0.0808	0.005	0.0012	0.0035	0.0014	0.0001	0.2070	0.0012	0.0115	
replicate 2		0.0012	0.0819	0.007	0.0012	0.0036	0.0014	0.0001	0.2100	0.0011	0.0114	
replicate 3		0.0010	0.0807	ND	0.0011	0.0034	0.0015	ND	0.2080	0.0011	0.0111	
replicate 4		0.0011	0.0813	0.008	0.0012	0.0035	0.0014	0.0001	0.2090	0.0012	0.0113	
C.V.		7.7%	1.1%	55.1%	8.8%	3.5%	3.8%	109.5%	0.6%	8.1%	1.6%	
sample 25		0.0011	0.0772	ND	0.0011	0.0018	0.0009	ND	0.2660	0.0004	0.0045	
replicate 1		0.0013	0.0776	ND	0.0012	0.0019	0.0009	0.0001	0.2680	0.0004	0.0044	
replicate 2		0.0013	0.0826	ND	0.0011	0.0018	0.0009	ND	0.2700	0.0004	0.0046	
C.V.		9.4%	3.8%	0.0%	5.1%	3.1%	0.0%	173.2%	0.7%	0.0%	2.2%	

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 107 (cont'd): Metal concentrations (mg/L) in replicate water samples. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Sample/ Statistic	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)
Spring 2000	Ref	sample 11	0.057	ND	0.0149	ND	ND	0.0002	0.0001	0.0004	0.0568	ND
		replicate 1	0.058	0.0001	0.0149	ND	ND	ND	ND	0.0004	0.0620	ND
		replicate 2	0.057	0.0001	0.0147	ND	ND	ND	0.0001	0.0004	0.0593	0.0005
		C.V.	1.0%	86.6%	0.8%	0.0%	0.0%	173.2%	86.6%	0.0%	4.4%	173.2%
		sample 26	0.079	0.0001	0.0133	ND	ND	0.0002	ND	0.0003	0.1480	ND
		replicate 1	0.082	0.0001	0.0136	ND	ND	ND	ND	0.0004	0.0859	0.0003
		replicate 2	0.084	0.0001	0.0137	ND	0.0001	ND	0.0001	0.0004	0.0877	0.0002
		C.V.	3.1%	0.0%	1.5%	0.0%	173.2%	173.2%	173.2%	15.7%	33.0%	91.7%
		mid Ag	sample 11	0.106	0.0001	0.0189	ND	ND	ND	0.0002	0.0006	0.2270
	replicate 1	0.112	0.0001	0.0186	ND	ND	ND	0.0002	0.0006	0.2350	ND	
	replicate 2	0.109	0.0001	0.0187	ND	ND	0.0003	0.0001	0.0005	0.2300	ND	
	C.V.	2.8%	0.0%	0.8%	0.0%	0.0%	173.2%	34.6%	10.2%	1.8%	0.0%	
	sample 26	0.160	0.0001	0.0181	ND	0.0001	0.0014	0.0004	0.0007	0.3210	ND	
	replicate 1	0.173	0.0001	0.0189	ND	0.0001	ND	0.0004	0.0008	0.3530	ND	
	replicate 2	0.174	0.0001	0.0186	ND	0.0001	0.0002	0.0004	0.0009	0.3450	0.0003	
	C.V.	4.6%	0.0%	2.2%	0.0%	0.0%	142.0%	0.0%	12.5%	4.9%	173.2%	
	d/s Ag	sample 11	0.057	0.0001	0.0348	ND	ND	0.0004	0.0003	0.0007	0.4870	ND
	replicate 1	0.060	0.0002	0.0349	ND	ND	ND	0.0003	0.0008	0.4980	ND	
	replicate 2	0.056	0.0002	0.0350	ND	0.0001	ND	0.0003	0.0008	0.4930	ND	
	C.V.	3.6%	34.6%	0.3%	0.0%	173.2%	173.2%	0.0%	7.5%	1.1%	0.0%	
	sample 26	0.076	0.0002	0.0339	ND	0.0001	0.0005	0.0004	0.0011	0.5070	ND	
	replicate 1	0.076	0.0002	0.0344	ND	0.0001	ND	0.0004	0.0011	0.5330	ND	
	replicate 2	0.074	0.0002	0.0348	ND	0.0001	ND	0.0004	0.0012	0.5420	ND	
	C.V.	1.5%	0.0%	1.3%	0.0%	0.0%	173.2%	0.0%	5.1%	3.4%	0.0%	
d/s Urban	sample 11	0.166	0.0002	0.0132	ND	0.0001	0.0010	0.0003	0.0017	0.6780	0.0006	
replicate 1	0.173	0.0003	0.0129	ND	0.0001	0.0006	0.0002	0.0017	0.6800	ND		
replicate 2	0.166	0.0003	0.0132	ND	0.0001	0.0006	0.0002	0.0017	0.6780	0.0003		
C.V.	2.4%	21.7%	1.3%	0.0%	0.0%	31.5%	24.7%	0.0%	0.2%	100.0%		
sample 26	0.097	0.0003	0.0155	ND	0.0001	0.0009	0.0002	0.0016	0.8510	ND		
replicate 1	0.099	0.0003	0.0159	ND	0.0001	0.0004	0.0002	0.0017	0.9220	0.0003		
replicate 2	0.099	0.0003	0.0161	ND	0.0001	0.0002	0.0001	0.0016	0.9290	ND		
C.V.	1.2%	0.0%	1.9%	0.0%	0.0%	72.1%	34.6%	3.5%	4.8%	173.2%		

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 107 (cont'd): Metal concentrations (mg/L) in replicate water samples. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Sample/ Statistic	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Vanadium (V)	Zinc (Zn)
Spring 2000	Ref	sample 11	0.0010	0.0023	ND	0.0007	ND	0.0008	ND	0.1790	0.0002	0.0005
		replicate 1	0.0008	0.0025	0.005	0.0007	ND	0.0007	ND	0.1790	0.0002	0.0004
		replicate 2	0.0008	0.0022	ND	0.0007	0.0003	0.0008	ND	0.1760	0.0002	0.0005
		C.V.	13.3%	6.5%	173.2%	0.0%	173.2%	7.5%	0.0%	1.0%	0.0%	12.4%
		sample 26	0.0007	0.0032	ND	0.0005	0.0005	0.0007	ND	0.1460	0.0002	0.0004
		replicate 1	0.0007	0.0031	ND	0.0006	0.0002	0.0005	ND	0.1490	0.0003	0.0005
		replicate 2	0.0007	0.0032	ND	0.0005	0.0003	0.0005	ND	0.1490	0.0003	0.0006
		C.V.	0.0%	1.8%	0.0%	10.8%	45.8%	20.4%	0.0%	1.2%	21.7%	20.0%
	mid Ag	sample 11	0.0013	0.0122	ND	0.0011	0.0002	0.0009	ND	0.2270	0.0003	0.0013
		replicate 1	0.0011	0.0120	ND	0.0011	0.0003	0.0010	ND	0.2230	0.0003	0.0012
		replicate 2	0.0011	0.0119	ND	0.0010	0.0004	0.0010	ND	0.2250	0.0004	0.0012
		C.V.	9.9%	1.3%	0.0%	5.4%	33.3%	6.0%	0.0%	0.9%	17.3%	4.7%
		sample 26	0.0012	0.0165	ND	0.0008	0.0007	0.0009	ND	0.1960	0.0004	0.0017
		replicate 1	0.0012	0.0167	ND	0.0009	0.0007	0.0009	ND	0.2030	0.0005	0.0019
		replicate 2	0.0012	0.0161	ND	0.0009	0.0009	0.0009	ND	0.2000	0.0006	0.0019
		C.V.	0.0%	1.9%	0.0%	6.7%	15.1%	0.0%	0.0%	1.8%	20.0%	6.3%
	d/s Ag	sample 11	0.0014	0.1120	ND	0.0012	0.0005	0.0007	0.0001	0.2720	0.0003	0.0019
		replicate 1	0.0012	0.1100	ND	0.0012	0.0006	0.0008	ND	0.2720	0.0003	0.0019
		replicate 2	0.0012	0.1110	ND	0.0011	0.0006	0.0008	0.0001	0.2720	0.0003	0.0020
		C.V.	9.1%	0.9%	0.0%	4.9%	10.2%	7.5%	86.6%	0.0%	0.0%	3.0%
		sample 26	0.0013	0.1000	ND	0.0010	0.0011	0.0007	0.0001	0.2500	0.0003	0.0020
		replicate 1	0.0012	0.1010	ND	0.0012	0.0009	0.0007	ND	0.2540	0.0003	0.0020
		replicate 2	0.0011	0.1020	ND	0.0011	0.0013	0.0007	ND	0.2560	0.0004	0.0023
		C.V.	8.3%	1.0%	0.0%	9.1%	18.2%	0.0%	173.2%	1.2%	17.3%	8.2%
d/s Urban	sample 11	0.0006	0.1190	ND	0.0004	0.0009	ND	0.0001	0.0949	0.0008	0.0045	
	replicate 1	0.0004	0.1160	0.008	0.0004	0.0009	0.0001	ND	0.0927	0.0007	0.0043	
	replicate 2	0.0003	0.1150	0.007	0.0003	0.0008	0.0001	ND	0.0943	0.0008	0.0046	
	C.V.	35.3%	1.8%	87.2%	15.7%	6.7%	86.6%	173.2%	1.2%	7.5%	3.4%	
	sample 26	0.0012	0.1670	ND	0.0001	0.0012	0.0001	ND	0.1010	0.0007	0.0050	
	replicate 1	0.0013	0.1720	0.008	0.0003	0.0012	0.0001	0.0001	0.1040	0.0007	0.0041	
	replicate 2	0.0010	0.1720	0.007	0.0001	0.0010	0.0001	ND	0.1060	0.0006	0.0041	
	C.V.	13.1%	1.7%	87.2%	69.3%	10.2%	0.0%	173.2%	2.4%	8.7%	11.8%	

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 107 (cont'd): Metal concentrations (mg/L) in replicate water samples. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Sample/ Statistic	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)
Fall 2000	Ref	sample 12	0.035	0.0001	0.0179	ND	ND	ND	ND	0.0003	0.0370	ND
		replicate 1	0.035	0.0001	0.0178	ND	ND	ND	0.0001	0.0002	0.0379	ND
		replicate 2	0.036	0.0001	0.0177	ND	ND	ND	0.0001	0.0002	0.0363	ND
		C.V.	1.6%	0.0%	0.6%	0.0%	0.0%	0.0%	86.6%	24.7%	2.2%	0.0%
		sample 22	0.015	0.0001	0.0227	ND	ND	ND	ND	ND	0.0183	ND
		replicate 1	0.011	0.0001	0.0227	ND	ND	ND	ND	ND	0.0164	0.0007
		replicate 2	0.016	0.0002	0.0224	ND	ND	0.0003	0.0001	ND	0.0167	0.0004
		C.V.	18.9%	43.3%	0.8%	0.0%	0.0%	173.2%	173.2%	0.0%	6.0%	95.8%
		mid Ag	sample 12	0.048	0.0001	0.0215	ND	ND	ND	0.0003	0.0004	0.1620
	replicate 1	0.050	0.0001	0.0215	ND	ND	ND	0.0004	0.0004	0.1660	ND	
	replicate 2	0.056	0.0001	0.0216	ND	0.0001	0.0002	0.0004	0.0004	0.1670	ND	
	C.V.	8.1%	0.0%	0.3%	0.0%	173.2%	173.2%	15.7%	0.0%	1.6%	0.0%	
	sample 22	0.033	0.0001	0.0259	ND	ND	ND	0.0003	0.0002	0.1950	ND	
	replicate 1	0.027	0.0001	0.0256	ND	ND	ND	0.0001	ND	0.1860	ND	
	replicate 2	0.032	0.0001	0.0257	ND	ND	ND	0.0004	ND	0.1860	ND	
	C.V.	10.5%	0.0%	0.6%	0.0%	0.0%	0.0%	57.3%	173.2%	2.7%	0.0%	
	d/s Ag	sample 12	0.075	0.0003	0.0400	ND	0.0001	0.0002	0.0005	0.0008	0.5780	ND
	replicate 1	0.077	0.0003	0.0403	ND	0.0001	0.0002	0.0004	0.0009	0.5920	0.0003	
	replicate 2	0.076	0.0004	0.0398	ND	0.0001	0.0006	0.0004	0.0009	0.5940	ND	
	C.V.	1.3%	17.3%	0.6%	0.0%	0.0%	69.3%	13.3%	6.7%	1.5%	173.2%	
	sample 22	0.264	0.0002	0.0468	ND	0.0002	0.0003	0.0006	0.0010	1.1500	0.0003	
	replicate 1	0.232	0.0001	0.0470	ND	0.0002	0.0005	0.0005	0.0003	1.1400	0.0006	
	replicate 2	0.247	0.0001	0.0457	ND	0.0001	0.0004	0.0008	0.0007	1.1000	0.0006	
	C.V.	6.5%	43.3%	1.5%	0.0%	34.6%	25.0%	24.1%	52.7%	2.3%	34.6%	
d/s Urban	sample 12	0.113	0.0004	0.0176	ND	0.0001	0.0005	0.0002	0.0018	0.7770	0.0003	
replicate 1	0.110	0.0004	0.0176	ND	0.0001	0.0004	0.0002	0.0019	0.7560	ND		
replicate 2	0.110	0.0004	0.0177	ND	0.0001	0.0004	0.0002	0.0019	0.7540	ND		
C.V.	1.6%	0.0%	0.3%	0.0%	0.0%	13.3%	0.0%	3.1%	1.7%	173.2%		
sample 22	0.090	0.0002	0.0183	ND	ND	0.0003	0.0001	0.0011	0.6120	0.0004		
replicate 1	0.081	0.0002	0.0179	ND	0.0001	0.0004	0.0003	0.0010	0.5900	ND		
replicate 2	0.085	0.0002	0.0181	ND	0.0001	0.0004	0.0003	0.0010	0.6000	0.0002		
C.V.	5.3%	0.0%	1.1%	0.0%	86.6%	15.7%	49.5%	5.6%	1.8%	100.0%		

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 107 (cont'd): Metal concentrations (mg/L) in replicate water samples. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Sample/ Statistic	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Vanadium (V)	Zinc (Zn)
Fall 2000	Ref	sample 12	0.0010	0.0024	NA	0.0009	ND	0.0009	ND	0.2230	0.0002	0.0002
		replicate 1	0.0009	0.0023	ND	0.0009	ND	0.0009	ND	0.2210	0.0002	ND
		replicate 2	0.0010	0.0022	ND	0.0009	ND	0.0009	ND	0.2200	0.0004	0.0002
		C.V.	6.0%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	43.3%	86.6%
		sample 22	0.0003	0.0022	ND	0.0013	ND	0.0011	ND	0.3180	0.0001	ND
		replicate 1	0.0008	0.0021	ND	0.0011	0.0003	0.0013	ND	0.3190	0.0002	0.0002
	replicate 2	0.0017	0.0020	ND	0.0015	0.0003	0.0001	0.0001	0.3140	0.0003	0.0003	
	C.V.	76.0%	4.8%	0.0%	15.4%	86.6%	77.1%	173.2%	0.8%	50.0%	91.7%	
	mid Ag	sample 12	0.0012	0.0202	0.006	0.0011	0.0005	0.0011	ND	0.2520	0.0002	0.0014
		replicate 1	0.0012	0.0209	ND	0.0012	0.0005	0.0011	ND	0.2510	0.0002	0.0014
		replicate 2	0.0011	0.0204	ND	0.0012	0.0007	0.0011	ND	0.2520	0.0003	0.0016
		C.V.	4.9%	1.8%	173.2%	4.9%	20.4%	0.0%	0.0%	0.2%	24.7%	7.9%
		sample 22	0.0008	0.0279	ND	0.0015	0.0005	0.0012	ND	0.3340	0.0001	0.0016
		replicate 1	0.0007	0.0276	ND	0.0012	0.0002	0.0013	ND	0.3330	ND	0.0016
	replicate 2	0.0012	0.0274	ND	0.0014	0.0004	0.0012	ND	0.3320	0.0001	0.0016	
	C.V.	29.4%	0.9%	0.0%	11.2%	41.7%	4.7%	0.0%	0.3%	86.6%	0.0%	
	d/s Ag	sample 12	0.0013	0.1180	ND	0.0013	0.0012	0.0007	ND	0.2840	0.0005	0.0022
		replicate 1	0.0013	0.1180	ND	0.0013	0.0012	0.0007	ND	0.2850	0.0005	0.0023
		replicate 2	0.0013	0.1180	ND	0.0013	0.0010	0.0008	ND	0.2830	0.0004	0.0023
		C.V.	0.0%	0.0%	0.0%	0.0%	10.2%	7.9%	0.0%	0.4%	12.4%	2.5%
		sample 22	0.0009	0.1660	ND	0.0012	0.0012	0.0005	ND	0.3090	0.0008	0.0038
		replicate 1	0.0006	0.1670	ND	0.0011	0.0014	0.0007	ND	0.3130	0.0010	0.0038
	replicate 2	0.0014	0.1620	ND	0.0013	0.0013	0.0007	ND	0.3030	0.0008	0.0037	
	C.V.	41.8%	1.6%	0.0%	8.3%	7.7%	18.2%	0.0%	1.6%	13.3%	1.5%	
d/s Urban	sample 12	0.0007	0.0957	0.006	0.0002	0.0010	0.0001	ND	0.1030	0.0008	0.0031	
	replicate 1	0.0011	0.0936	NA	0.0001	0.0007	0.0001	ND	0.1050	0.0007	0.0061	
	replicate 2	0.0017	0.0919	0.005	0.0002	0.0010	0.0001	ND	0.1050	0.0008	0.0033	
	C.V.	43.1%	2.0%	12.9%	34.6%	19.2%	0.0%	0.0%	1.1%	7.5%	40.3%	
	sample 22	ND	0.1690	ND	ND	0.0010	0.0001	ND	0.1170	0.0004	0.0031	
	replicate 1	0.0003	0.1650	ND	0.0002	0.0010	0.0001	ND	0.1150	0.0006	0.0032	
replicate 2	0.0004	0.1670	0.005	0.0001	0.0010	0.0001	ND	0.1170	0.0006	0.0031		
C.V.	89.2%	1.2%	173.2%	100.0%	0.0%	0.0%	0.0%	1.0%	21.7%	1.8%		

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

NA = Not analyzed (damaged during shipping).

Table 107 (cont'd): Metal concentrations (mg/L) in replicate water samples. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Sample/ Statistic	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)
Fall 2001	Ref	sample 8	0.030	0.0001	0.0190	ND	ND	0.0072	0.0002	0.0006	0.0419	0.0002
		replicate 1	0.029	0.0001	0.0191	ND	ND	0.0019	ND	0.0004	0.0455	ND
		replicate 2	0.033	0.0001	0.0191	ND	ND	0.0007	ND	0.0004	0.0455	ND
		C.V.	6.8%	0.0%	0.3%	0.0%	0.0%	105.9%	173.2%	24.7%	4.7%	173.2%
		sample 19	0.055	ND	0.0142	ND	ND	ND	ND	0.0005	0.0568	ND
		replicate 1	0.056	0.0001	0.0146	ND	ND	0.0010	0.0001	0.0006	0.0578	ND
		replicate 2	0.064	0.0001	0.0145	ND	ND	0.0004	ND	0.0004	0.0619	ND
		C.V.	8.5%	86.6%	1.4%	0.0%	0.0%	107.9%	173.2%	20.0%	4.6%	0.0%
		mid Ag	sample 8	0.100	ND	0.0210	ND	ND	ND	0.0001	0.0006	0.2180
	replicate 1	0.104	0.0001	0.0208	ND	ND	ND	0.0002	0.0007	0.2200	ND	
	replicate 2	0.107	0.0001	0.0213	ND	ND	ND	0.0001	0.0006	0.2270	0.0005	
	C.V.	3.4%	86.6%	1.2%	0.0%	0.0%	0.0%	43.3%	9.1%	2.1%	107.9%	
	sample 19	0.109	ND	0.0205	ND	0.0001	0.0002	0.0008	0.0010	0.2050	ND	
	replicate 1	0.109	0.0002	0.0211	ND	0.0001	0.0010	0.0009	0.0013	0.2030	ND	
	replicate 2	0.127	0.0002	0.0216	ND	ND	0.0004	0.0010	0.0012	0.2200	ND	
	C.V.	9.0%	86.6%	2.6%	0.0%	86.6%	78.1%	11.1%	13.1%	4.4%	0.0%	
	d/s Ag	sample 8	0.319	0.0003	0.0426	ND	0.0001	0.0003	0.0005	0.0014	1.1400	0.0003
	replicate 1	0.316	0.0003	0.0429	ND	0.0001	0.0003	0.0005	0.0014	1.1700	0.0002	
	replicate 2	0.313	0.0003	0.0430	ND	0.0001	0.0004	0.0005	0.0014	1.1800	0.0003	
	C.V.	0.9%	0.0%	0.5%	0.0%	0.0%	17.3%	0.0%	0.0%	1.8%	21.7%	
	sample 19	0.145	0.0002	0.0397	ND	0.0001	0.0019	0.0007	0.0031	0.5260	ND	
	replicate 1	0.156	0.0003	0.0410	ND	0.0001	0.0015	0.0007	0.0034	0.5390	ND	
	replicate 2	0.141	0.0003	0.0412	ND	0.0001	0.0006	0.0007	0.0035	0.5280	ND	
	C.V.	5.3%	21.7%	2.0%	0.0%	0.0%	49.9%	0.0%	6.2%	1.3%	0.0%	
d/s Urban	sample 8	0.196	0.0005	0.0132	ND	ND	0.0012	0.0002	0.0024	0.6360	ND	
replicate 1	0.184	0.0004	0.0130	ND	0.0001	0.0011	0.0001	0.0023	0.6340	0.0002		
replicate 2	0.184	0.0004	0.0128	ND	ND	0.0007	0.0002	0.0024	0.6260	ND		
C.V.	3.7%	13.3%	1.5%	0.0%	173.2%	26.5%	34.6%	2.4%	0.8%	173.2%		
sample 19	0.257	0.0003	0.0140	ND	ND	0.0015	0.0002	0.0020	0.6860	ND		
replicate 1	0.271	0.0004	0.0142	ND	ND	0.0011	0.0003	0.0021	0.6820	ND		
replicate 2	0.261	0.0004	0.0140	ND	ND	0.0009	0.0002	0.0021	0.6690	ND		
C.V.	2.7%	15.7%	0.8%	0.0%	0.0%	26.2%	24.7%	2.8%	1.3%	0.0%		

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

Table 107 (cont'd): Metal concentrations (mg/L) in replicate water samples. (Be and Hg concentrations are in µg/L)

Exposure Period	Site	Sample/ Statistic	Lithium (Li)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Vanadium (V)	Zinc (Zn)
Fall 2001	Ref	sample 8	0.0016	0.0031	0.008	0.0022	ND	0.0011	0.0001	0.3020	0.0007	0.0006
		replicate 1	0.0013	0.0027	ND	0.0015	ND	0.0011	ND	0.2950	0.0003	ND
		replicate 2	0.0013	0.0026	ND	0.0013	ND	0.0011	0.0001	0.2910	0.0003	0.0002
		C.V.	12.4%	9.4%	173.2%	28.4%	0.0%	0.0%	86.6%	1.9%	53.3%	114.6%
		sample 19	0.0009	0.0032	ND	0.0008	ND	0.0007	0.0001	0.1740	ND	0.0009
		replicate 1	0.0010	0.0025	ND	0.0014	ND	0.0008	0.0001	0.1800	0.0003	0.0002
	replicate 2	0.0008	0.0026	ND	0.0010	ND	0.0008	ND	0.1760	0.0002	0.0003	
	C.V.	11.1%	13.7%	0.0%	28.6%	0.0%	7.5%	86.6%	1.7%	91.7%	81.1%	
	mid Ag	sample 8	0.0015	0.0127	ND	0.0010	0.0004	0.0011	ND	0.2920	0.0004	0.0012
		replicate 1	0.0015	0.0127	ND	0.0011	0.0002	0.0011	0.0001	0.2890	0.0004	0.0012
		replicate 2	0.0016	0.0129	ND	0.0011	0.0005	0.0011	0.0001	0.2970	0.0004	0.0011
		C.V.	3.8%	0.9%	0.0%	5.4%	41.7%	0.0%	86.6%	1.4%	0.0%	4.9%
		sample 19	0.0013	0.0227	ND	0.0009	0.0014	0.0011	ND	0.2140	0.0002	0.0043
		replicate 1	0.0015	0.0233	ND	0.0014	0.0017	0.0012	0.0002	0.2190	0.0006	0.0044
	replicate 2	0.0013	0.0238	ND	0.0012	0.0016	0.0012	0.0001	0.2230	0.0004	0.0045	
	C.V.	8.4%	2.4%	0.0%	21.6%	9.8%	4.9%	100.0%	2.1%	50.0%	2.3%	
	d/s Ag	sample 8	0.0018	0.1140	ND	0.0011	0.0010	0.0007	ND	0.3010	0.0010	0.0046
		replicate 1	0.0019	0.1170	ND	0.0011	0.0009	0.0007	ND	0.3050	0.0010	0.0046
		replicate 2	0.0019	0.1180	ND	0.0011	0.0010	0.0006	0.0001	0.3060	0.0009	0.0046
		C.V.	3.1%	1.8%	0.0%	0.0%	6.0%	8.7%	173.2%	0.9%	6.0%	0.0%
		sample 19	0.0014	0.0725	ND	0.0019	0.0023	0.0010	0.0001	0.2440	0.0006	0.0077
		replicate 1	0.0013	0.0755	ND	0.0019	0.0026	0.0011	0.0001	0.2500	0.0008	0.0081
	replicate 2	0.0014	0.0757	ND	0.0013	0.0025	0.0011	ND	0.2510	0.0005	0.0081	
	C.V.	4.2%	2.4%	0.0%	20.4%	6.2%	5.4%	86.6%	1.5%	24.1%	2.9%	
d/s Urban	sample 8	0.0002	0.0363	0.005	0.0004	0.0007	0.0001	ND	0.0654	0.0009	0.0038	
	replicate 1	0.0002	0.0355	ND	0.0004	0.0009	ND	ND	0.0647	0.0010	0.0037	
	replicate 2	0.0003	0.0361	ND	0.0002	0.0008	ND	0.0001	0.0632	0.0008	0.0038	
	C.V.	24.7%	1.2%	173.2%	34.6%	12.5%	173.2%	173.2%	1.7%	11.1%	1.5%	
	sample 19	0.0002	0.0484	0.007	0.0009	0.0006	ND	ND	0.0696	0.0009	0.0042	
	replicate 1	0.0003	0.0470	ND	0.0006	0.0008	0.0002	ND	0.0696	0.0010	0.0042	
replicate 2	0.0004	0.0476	ND	0.0004	0.0008	0.0002	ND	0.0690	0.0008	0.0041		
C.V.	33.3%	1.5%	173.2%	39.7%	15.7%	86.6%	0.0%	0.5%	11.1%	1.4%		

C.V. = Coefficient of variation.

ND = Not detected. Considered a zero value for statistical calculations.

6.1.5 Procedural Blanks

6.1.5.1 PCB Aroclors

Table 108: Concentration (ng/L) of PCB aroclors and recovery (%) of surrogate standards in each XAD-2 lab blank.

PCB Aroclors	Lab Blank					
	WQ-99-ARO		WQ-00-ARO		WQ-01-ARO	
	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	ND	0.0024	ND	0.0095	ND	0.0152
Aroclor 1254	ND	0.0027	ND	0.0075	ND	0.0435
Aroclor 1260	ND	0.0048	ND	0.0054	ND	0.0178
Surrogate Standards	% Recovery		% Recovery		% Recovery	
13C12-PCB 3	-	-	-	-	74	-
13C12-PCB 15	-	-	-	-	85	-
13C12-PCB 37	-	-	-	-	99	-
13C12-PCB 54	-	-	-	-	85	-
13C12-PCB 101	92	-	92	-	-	-
13C12-PCB 118	93	-	-	-	94	-
13C12-PCB 105	96	-	-	-	-	-
13C12-PCB 167	-	-	-	-	93	-
13C12-PCB 180	96	-	110	-	93	-
13C12-PCB 202	-	-	-	-	95	-
13C12-PCB 206	-	-	-	-	92	-
13C12-PCB 209	110	-	-	-	93	-

ND = Not detected.

6.1.5.2 PCB Congeners

Table 109: Concentration (ng/L) of PCB congeners and recovery (%) of surrogate standards in each XAD-2 lab blank.

PCB Congeners	Lab Blank					
	WQ-99-PCB		WQ-00-PCB		WQ-01-PCB	
	Conc.	DL	Conc.	DL	Conc.	DL
8/5	ND	0.00066	ND	0.017	ND	0.0000963
15	ND	0.0019	ND	0.017	0.000103*	0.0000843
19	ND	0.00018	ND	0.0006	ND	0.0000551
18	ND	0.00018	ND	0.0006	ND	0.0000551
17	ND	0.00018	ND	0.0006	ND	0.0000551
24/27	ND	0.00018	ND	0.0006	ND	0.0000551
16/32	ND	0.00018	ND	0.0003	ND	0.0000481
26	ND	0.00012	ND	0.0003	ND	0.0000481
25	ND	0.00012	ND	0.0003	ND	0.0000481
31/28	ND	0.00012	ND	0.0003	ND	0.0000481
33/20/21	ND	0.00012	ND	0.0003	ND	0.0000481
22	ND	0.00012	ND	0.0003	ND	0.0000481
45	ND	0.00013	ND	0.0003	ND	0.0000222
46	ND	0.00013	ND	0.0003	ND	0.0000222
52/73	ND	0.00013	ND	0.0003	0.000024*	0.0000222
49/43	ND	0.00014	ND	0.00031	0.000028*	0.0000222
47/48 /75	ND	0.00014	ND	0.0003	ND	0.0000222
44	ND	0.00014	ND	0.00031	0.000032*	0.0000222
42/59	ND	0.00014	ND	0.00031	ND	0.0000222
41/71/64/68	ND	0.00014	ND	0.00022	ND	0.0000222
40	ND	0.0002	ND	0.00022	ND	0.0000222
74/61	ND	0.0002	ND	0.00022	ND	0.0000222
70/76	ND	0.0002	ND	0.00022	ND	0.0000222
66/80	ND	0.00009	ND	0.00022	0.00003*	0.0000222
56/60	ND	0.00009	ND	0.00021	ND	0.0000227
95/93	ND	0.00008	ND	0.00021	ND	0.0000156
91	ND	0.00008	ND	0.00021	ND	0.0000156
84/92	ND	0.00008	ND	0.00021	ND	0.0000353
89/90/101	ND	0.00008	ND	0.00021	ND	0.0000353
99	ND	0.00008	0.00021*	0.00021	ND	0.0000353
83/108	ND	0.00011	ND	0.00019	ND	0.0000353
97/86	ND	0.00011	ND	0.00019	ND	0.0000353
87/115/116	ND	0.00011	ND	0.00019	ND	0.0000353

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

Table 109 (cont'd): Concentration (ng/L) of PCB congeners and recovery (%) of surrogate standards in each XAD-2 lab blank.

PCB Congeners	Lab Blank					
	WQ-99-PCB		WQ-00-PCB		WQ-01-PCB	
	Conc.	DL	Conc.	DL	Conc.	DL
85/120	ND	0.00011	ND	0.00019	ND	0.0000353
110	0.00012*	0.00011	ND	0.00019	ND	0.0000353
107/109	ND	0.00011	ND	0.00039	ND	0.0000413
106/118	ND	0.00007	ND	0.00026	0.000056	0.000036
114	ND	0.00011	ND	0.00039	0.000047	0.0000368
105/127	ND	0.00007	ND	0.00026	ND	0.0000379
136	ND	0.00019	ND	0.00022	ND	0.0000243
151	ND	0.00019	ND	0.00024	ND	0.0000304
144/135	ND	0.00019	ND	0.00024	ND	0.0000304
149/139	ND	0.00019	ND	0.00024	ND	0.0000304
134/143	ND	0.00019	ND	0.00024	ND	0.0000304
131/142	ND	0.00019	ND	0.00024	ND	0.0000304
146	ND	0.00011	ND	0.00024	ND	0.0000304
153	ND	0.00014	ND	0.00024	0.000048*	0.0000304
141	ND	0.00018	ND	0.00031	ND	0.0000304
130	ND	0.00017	ND	0.0003	ND	0.0000304
137	ND	0.00017	ND	0.0003	ND	0.0000304
138/163/164	ND	0.00017	ND	0.0003	ND	0.0000304
158/160	ND	0.00017	ND	0.0003	ND	0.0000304
129	ND	0.00017	ND	0.0003	ND	0.0000304
128	ND	0.0002	ND	0.0003	ND	0.0000304
156	ND	0.00025	ND	0.0003	0.000085*	0.0000306
157	ND	0.00025	ND	0.0003	0.00008*	0.0000314
179	ND	0.00029	ND	0.00027	ND	0.0000226
176	ND	0.00029	ND	0.00027	ND	0.0000226
178	ND	0.00029	ND	0.00027	ND	0.0000226
175	ND	0.00029	ND	0.00027	ND	0.0000226
187/182	ND	0.00029	ND	0.00027	0.000077	0.0000223
183	ND	0.00029	ND	0.00028	0.00004*	0.0000226
185	ND	0.00029	ND	0.00028	ND	0.0000226
174/181	ND	0.00029	ND	0.00028	ND	0.0000226
177	ND	0.00029	ND	0.00028	ND	0.0000226
171	ND	0.00035	ND	0.00024	ND	0.0000226
172/192	ND	0.0003	ND	0.00024	ND	0.0000226
180	ND	0.0003	ND	0.00024	0.000122*	0.0000259
193	ND	0.0003	0.00025*	0.00024	ND	0.0000226
191	ND	0.0003	ND	0.00024	ND	0.0000226
170/190	ND	0.00039	ND	0.00029	0.000095*	0.0000315
189	ND	0.00039	ND	0.00029	0.000106*	0.0000232
201	ND	0.00021	ND	0.0003	ND	0.0000303
197	ND	0.00031	ND	0.0003	ND	0.0000303
198	ND	0.00031	ND	0.0003	ND	0.0000303
199	ND	0.00031	ND	0.0003	ND	0.0000303
196/203	ND	0.00029	ND	0.0003	ND	0.0000303
195	ND	0.00029	ND	0.00066	ND	0.000028
194	ND	0.00025	ND	0.00066	ND	0.000028
205	ND	0.00025	ND	0.00066	0.000107*	0.0000195
208	ND	0.0001	ND	0.00027	0.000055*	0.000018
207	ND	0.0001	ND	0.00027	ND	0.0000207
206	ND	0.0001	ND	0.00027	0.000095	0.0000245
209	0.00005*	0.000047	0.00042	0.00037	0.0002	0.0000203
Surrogate Standards	% Recovery		% Recovery		% Recovery	
13C12-PCB 3	-	-	-	-	-	-
13C12-PCB 15	-	-	-	-	72	-
13C12-PCB 37	-	-	-	-	93	-
13C12-PCB 54	-	-	-	-	77	-
13C12-PCB 101	92	-	92	-	-	-
13C12-PCB 118	93	-	94	-	99	-
13C12-PCB 105	96	-	97	-	-	-
13C12-PCB 167	-	-	-	-	104	-
13C12-PCB 180	96	-	110	-	102	-
13C12-PCB 189	-	-	-	-	107	-
13C12-PCB 202	-	-	-	-	-	-
13C12-PCB 206	-	-	-	-	110	-
13C12-PCB 209	110	-	100	-	111	-

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

6.1.5.3 Organochlorines

Table 110: Concentration (ng/L) of organochlorines and recovery (%) of surrogate standards in each XAD-2 lab blank.

Organochlorine compounds	WQ-99-OC-1		WQ-99-OC-2		Lab Blank WQ-00-OC		WQ-01-OC		WQ-01-OC (replicate)	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	-	-	0.82	0.02	0.013	0.00071	ND	0.0080	-	-
1,3/1,4-Dichlorobenzene	-	-	2.11	0.027	0.034	0.0006	ND	0.0086	-	-
1,2,3-Trichlorobenzene	-	-	1.7	0.01	0.0012	0.00044	ND	0.0035	-	-
1,2,4-Trichlorobenzene	-	-	3.8	0.011	0.015	0.00041	0.0181	0.0035	-	-
1,3,5-Trichlorobenzene	-	-	0.038	0.01	ND	0.00043	ND	0.0035	-	-
1,2,3,4-Tetrachlorobenzene	-	-	0.06	0.0027	0.0012	0.00044	ND	0.0035	-	-
1,2,3,5/1,2,4,5-Tetrachlorobenzene	-	-	0.048	0.0025	0.0014*	0.00043	ND	0.0034	-	-
Pentachlorobenzene	-	-	0.0029	0.0027	0.0014*	0.00038	ND	0.0024	-	-
Hexachlorobenzene	-	-	ND	0.003	0.0068	0.00085	ND	0.0030	-	-
Hexachlorobutadiene	-	-	0.019	0.0027	ND	0.00056	ND	0.0031	-	-
Aldrin	-	-	ND	0.0038	ND	0.00074	ND	0.0087	-	-
Dieldrin	ND	0.0015	-	-	0.000036	0.00003	ND	0.0020	ND	0.0012
Endrin	ND	0.004	-	-	ND	0.00008	ND	0.0032	ND	0.0019
Chlordane, alpha (cis)	-	-	ND	0.0009	ND	0.0016	ND	0.0037	-	-
Chlordane, gamma (trans)	-	-	ND	0.001	ND	0.0014	ND	0.0032	-	-
Chlordane, oxy-	-	-	ND	0.01	ND	0.0023	ND	0.0199	-	-
o,p'-DDD	-	-	0.0022*	0.0012	ND	0.0027	ND	0.0057	-	-
p,p'-DDD	-	-	ND	0.0013	ND	0.003	ND	0.0075	-	-
o,p'-DDE	-	-	ND	0.0031	ND	0.0052	ND	0.0061	-	-
p,p'-DDE	-	-	ND	0.0027	ND	0.007	ND	0.0080	-	-
o,p'-DDT	-	-	ND	0.0014	ND	0.0024	ND	0.0073	-	-
p,p'-DDT	-	-	ND	0.0017	ND	0.0031	ND	0.0078	-	-
Endosulphan (I), alpha-	ND	0.0018	-	-	ND	0.00012	ND	0.0021	ND	0.0013
Endosulphan (II), beta-	ND	0.0021	-	-	ND	0.00049	ND	0.0035	ND	0.0020
Endosulphan Sulphate	ND	0.0022	-	-	0.00014*	0.000049	ND	0.0050	ND	0.0029
HCH, alpha-	-	-	ND	0.003	ND	0.0017	ND	0.0149	-	-
HCH, beta-	-	-	ND	0.0039	ND	0.0026	ND	0.0195	-	-
HCH, gamma-	-	-	0.0052	0.0052	ND	0.0018	ND	0.0181	-	-
HCH, delta-	ND	0.0019	-	-	ND	0.000038	0.0058	0.0012	0.270	0.0660
Heptachlor	-	-	ND	0.0097	ND	0.00093	ND	0.0195	-	-
Heptachlor Epoxide	ND	0.0016	-	-	ND	0.000037	ND	0.0021	ND	0.0013
Methoxychlor	ND	0.0046	-	-	ND	0.0002	ND	0.0140	ND	0.0083
Mirex	-	-	ND	0.0006	ND	0.00033	ND	0.0042	-	-
Nonachlor, cis-	-	-	ND	0.0005	ND	0.0017	ND	0.0034	-	-
Nonachlor, trans-	-	-	ND	0.0008	ND	0.0014	ND	0.0031	-	-
Surrogate Standards	% Recovery		% Recovery		% Recovery		% Recovery		% Recovery	
13C6-1,4-Dichlorobenzene	-	-	27	-	32	-	83	-	-	-
13C6-1,2,3-Trichlorobenzene	-	-	26	-	26	-	60	-	-	-
13C-1,2,3,4-Tetrachlorobenzene	-	-	23	-	32	-	60	-	-	-
13C6-Pentachlorobenzene	-	-	28	-	36	-	65	-	-	-
13C-Hexachlorobenzene	-	-	41	-	42	-	72	-	-	-
13C-HCH, beta-	-	-	-	-	-	-	81	-	-	-
13C-HCH, gamma-	-	-	59	-	73	-	95	-	-	-
13C-Heptachlor	-	-	-	-	-	-	78	-	-	-
13C-Aldrin	-	-	-	-	-	-	84	-	-	-
13C-Chlordane, trans-	-	-	-	-	-	-	99	-	-	-
13C-Nonachlor, trans-	-	-	-	-	-	-	96	-	-	-
13C-p,p'-DDE	-	-	94	-	89	-	100	-	-	-
13C-p,p'-DDT	-	-	88	-	108	-	91	-	-	-
13C-PCB 15	-	-	-	-	-	-	85	-	-	-
13C-PCB 101	92	-	-	-	87	-	-	-	-	-
d4-Endosulphan, alpha-	95	-	-	-	109	-	93	-	91	-
d4-Endosulphan, beta-	-	-	-	-	-	-	93	-	96	-

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

Table 111: Concentration (ng/L) of toxaphene and chlorobornane compounds and recovery (%) of surrogate standards in each XAD-2 lab blank.

	Lab Blank	
	WQ-99-TOX	
Toxaphene & Chlorobornane compounds	Conc.	DL
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane	ND	0.14
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane	ND	0.14
P3-GC/MS:Octachloro-Derivative	ND	0.026
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane	ND	0.25
P5-GC/MS:Nonachloro-Derivative	ND	0.067
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.11
P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.051
P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.24
P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.28
P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	ND	0.14
Total Toxaphene	ND	0.45
Surrogate Standard	% Recovery	
13C-PCB 180	97	

ND = Not detected.

6.1.5.4 Carbamates, Herbicides, Organophosphates, Organonitrogens and Triazines

Table 112: Concentration (µg/sample or µg/L) of pesticide compounds and recovery (%) of surrogate standards in each XAD-2 lab blank.

	Lab Blank			
	WQ-99-PEST (ug/sample)		WQ-00-PEST (ug/L)	
Pesticide compounds	Conc.	DL	Conc.	DL (range)
All compounds (refer to Table 12)	ND	0.01	ND	(0.01 - 0.8)
Surrogate Standards	% Recovery		% Recovery	
2,4-DPA (SS)	41		43	
Triphenyl Phosphate (SS)	47		65	

ND = Not detected.

6.1.5.5 Nonylphenol

Table 113: Concentration (ng/L) of nonylphenol and recovery (%) of surrogate standard in each XAD-2 lab blank.

	Lab Blank			
	WQ-00-NP		WQ-01-NP	
Compound	Conc.	DL	Conc.	DL
4-Nonylphenol	ND	0.02	1.38	0.0188
Surrogate Standards	% Recovery		% Recovery	
13C6-p-Nonylphenol	66		94	

ND = Not detected.

6.1.5.6 Polycyclic Aromatic Hydrocarbons

Table 114: Concentration (ng/L) of polycyclic aromatic hydrocarbons (PAH) and recovery (%) of surrogate standards in each XAD-2 lab blank.

	Lab Blank			
	WQ-00-PAH		WQ-01-PAH	
Polycyclic aromatic hydrocarbons	Conc.	DL	Conc.	DL
Naphthalene	0.031	0.0018	0.0604	0.0243
Acenaphthylene	0.003	0.0004	ND	0.0313
Acenaphthene	0.0015	0.0013	ND	0.0445
Fluorene	0.0026	0.0011	ND	0.0293
Phenanthrene	0.011	0.0013	ND	0.0156
Anthracene	0.0028	0.0013	ND	0.0169
Fluoranthene	0.0035	0.0018	ND	0.0129
Pyrene	0.0032	0.0019	ND	0.0126

ND = Not detected.

Table 114 (cont'd): Concentration (ng/L) of polycyclic aromatic hydrocarbons (PAH) and recovery (%) of surrogate standards in each XAD-2 lab blank.

Polycyclic aromatic hydrocarbons	Lab Blank			
	WQ-00-PAH		WQ-01-PAH	
	Conc.	DL	Conc.	DL
Benz(a)anthracene	0.0015*	0.0015	ND	0.0112
Chrysene	ND	0.0018	ND	0.0129
Benzofluoranthenes	ND	0.0012	ND	0.0420
Benzo(a)pyrene	ND	0.0012	ND	0.0326
Benzo(e)pyrene	ND	0.0019	ND	0.0296
Perylene	ND	0.0019	ND	0.0326
Dibenz(ah)anthracene	ND	0.0043	ND	0.0295
Benzo(ghi)perylene	ND	0.0032	ND	0.0275
Indeno(1,2,3,cd)pyrene	ND	0.0016	ND	0.0291
C1-Naphthalene	0.029	0.0012	ND	0.0559
C2-Naphthalene	0.036	0.0034	ND	0.0509
C3-Naphthalene	0.019	0.0018	ND	0.0445
C4-Naphthalene	0.01	0.0013	ND	0.0892
C1-Phenanthrene/Anthracene	0.016	0.0033	ND	0.0288
C2-Phenanthrene/Anthracene	ND	0.0017	ND	0.0299
C3-Phenanthrene/Anthracene	ND	0.0011	ND	0.0253
C4-Phenanthrene/Anthracene	ND	0.0014	ND	0.0388
Retene	0.015	0.0038	ND	0.0388
Dibenzothiophene	ND	0.0053	ND	0.0268
C1-Dibenzothiophenes	ND	0.0017	ND	0.0281
C2-Dibenzothiophenes	0.01	0.002	ND	0.0377
Surrogate Standards	% Recovery		% Recovery	
Naphthalene d-8	50		49	
Acenaphthylene d-8	50		44	
Phenanthrene d-10	51		57	
Fluoranthene d-10	61		63	
Benz[a]anthracene d-12	-		63	
Chrysene d-12	61		65	
Benzo[bk]fluoranthene d-12	57		61	
Benzo[a]pyrene d-12	89		61	
Perylene d-12	84		59	
Dibenz[ah]anthracene d-14	84		51	
Indeno[1,2,3-cd]pyrene d-12	-		54	
Benzo[ghi]perylene d-12	62		60	
2-Methylnaphthalene d-10	48		46	
2,6-Dimethylnaphthalene d-12	-		50	

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

6.1.5.7 Sterols

Table 115: Concentration (ng/L) of sterols and recovery (%) of surrogate standard in each XAD-2 lab blank.

Sterols	Lab Blank			
	WQ-00-STER		WQ-01-STER	
	Conc.	DL	Conc.	DL
Desogestrel	ND	0.17	ND	1.70
Mestranol	ND	0.0095	ND	0.150
Norethindrone	ND	0.077	ND	0.510
Estrone	0.013*	0.0072	ND	0.089
Equilin	ND	0.014	ND	0.280
Norgestrel	ND	0.069	ND	0.700
Testosterone	0.091*	0.032	ND	0.110
17a-Dihydroequilin	ND	0.022	ND	0.120
Ethinylestradiol	ND	0.039	ND	0.310
17a-Estradiol	0.023*	0.01	ND	0.039
17b-Estradiol	0.027*	0.0077	ND	0.026

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

Table 115 (cont'd): Concentration (ng/L) of sterols and recovery (%) of surrogate standard in each XAD-2 lab blank.

Sterols	Lab Blank			
	WQ-00-STER		WQ-01-STER	
	Conc.	DL	Conc.	DL
a-Zearalanol	ND	0.032	ND	1.00
Coprostanol	ND	0.031	ND	0.420
Epicoprostanol	ND	0.018	ND	0.300
Cholesterol	1.5	0.045	0.82	0.140
Cholestanol	ND	0.036	ND	0.210
Desmosterol	ND	0.081	ND	0.170
Campesterol	ND	0.11	ND	0.230
Ergosterol	ND	0.14	ND	0.220
Stigmasterol	ND	0.13	ND	1.00
b-Estradiol 3-benzoate	0.03*	0.015	ND	0.140
b-Sitosterol	0.14*	0.063	0.45*	0.150
Surrogate Standards	% Recovery		% Recovery	
d37-n-Octadecanol	80		61	

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

6.1.5.8 Polybrominated Diphenyl Ethers

Table 116: Concentration (pg/L) of polybrominated diphenyl ethers (PBDE) and recovery (%) of surrogate standards in each XAD-2 lab blank.

Polybrominated diphenyl ethers	Lab Blank			
	WQ-01-PBDE		WQ-01-PBDE (replicate)	
	Conc.	DL	Conc.	DL
2-MonoBDE (1)	ND	0.383	ND	0.217
3-MonoBDE (2)	ND	0.383	ND	0.217
4-MonoBDE (3)	ND	0.383	ND	0.217
2,4-DiBDE (7)	ND	0.0281	ND	0.0117
2,4'/3,3'-DiBDE (8/11)	0.040*	0.0281	ND	0.0117
2,6-DiBDE (10)	ND	0.0281	ND	0.0117
3,4-DiBDE (12)	0.084*	0.0281	0.017	0.0117
3,4'-DiBDE (13)	ND	0.0281	ND	0.0117
4,4'-DiBDE (15)	ND	0.0281	ND	0.0117
2,2',4-TriBDE (17)	ND	0.0493	ND	0.0124
2,3',4-TriBDE (25)	ND	0.0466	ND	0.0117
2,4,4'/2',3,4-TriBDE (28/33)	0.397*	0.0442	0.100*	0.0111
2,4,6-TriBDE (30)	ND	0.0466	ND	0.0117
2,4',6-TriBDE (32)	ND	0.0466	ND	0.0117
3,3',4-TriBDE (35)	ND	0.0466	ND	0.0117
3,4,4'-TriBDE (37)	ND	0.0466	ND	0.0117
2,2',4,4'-TetraBDE (47)	0.845	0.0857	0.063*	0.0299
2,2',4,5'-TetraBDE (49)	ND	0.107	ND	0.0376
2,3',4,4'-TetraBDE (66)	ND	0.142	ND	0.0500
2,3',4',6-TetraBDE (71)	ND	0.107	ND	0.0376
2,4,4',6-TetraBDE (75)	ND	0.107	ND	0.0375
3,3',4,4'-TetraBDE (77)	ND	0.107	ND	0.0376
2,2',3,4,4'-PentaBDE (85)	0.359*	0.0690	0.085*	0.0150
2,2',4,4',5-PentaBDE (99)	1.20	0.0578	0.050*	0.0126
2,2',4,4',6-PentaBDE (100)	0.227	0.0375	0.012*	0.0080
2,3,3',4,4'-PentaBDE (105)	ND	0.0517	ND	0.0111
2,3,4,5,6-PentaBDE (116)	ND	0.0517	ND	0.0111
2,3',4,4',6-PentaBDE (119)	ND	0.0517	ND	0.0111
3,3',4,4',5-PentaBDE (126)	ND	0.0517	ND	0.0111
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	0.127	0.0633	0.021*	0.0202
2,2',3,4,4',6'-HexaBDE (140)	ND	0.0561	ND	0.0179
2,2',4,4',5,5'-HexaBDE (153)	0.287	0.0653	0.042*	0.0208
2,2',4,4',5,6'-HexaBDE (154)	0.199	0.0447	0.024*	0.0143
2,2',4,4',6,6'-HexaBDE (155)	0.097*	0.0561	0.021*	0.0179

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

Table 116 (cont'd): Concentration (pg/L) of polybrominated diphenyl ethers (PBDE) and recovery (%) of surrogate standards in each XAD-2 lab blank.

Polybrominated diphenyl ethers	Lab Blank			
	WQ-01-PBDE		WQ-01-PBDE (replicate)	
	Conc.	DL	Conc.	DL
2,2',3,4,4',5,6-HeptaBDE (181)	ND	0.0762	ND	0.0247
2,2',3,4,4',5',6-HeptaBDE (183)	0.283	0.0598	0.046	0.0194
2,3,3',4,4',5,6-HeptaBDE (190)	0.171*	0.105	ND	0.0340
2,2',3,3',4,4',5,5',6-NonaBDE (206)	0.150*	0.0783	ND	0.0224
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	0.292*	0.0783	ND	0.0224
2,2',3,3',4,5,5',6,6'-NonaBDE (208)	0.180	0.0783	ND	0.0224
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	6.83	0.283	0.847	0.302
Surrogate Standards	% Recovery		% Recovery	
13C-4-MonoBDE	79		73	
13C-4,4'-DiBDE	100		88	
13C-2,4,4'-TriBDE	105		97	
13C-2,2',4,4'-TetraBDE	105		99	
13C-3,3',4,4'-TetraBDE	112		103	
13C-2,2',4,4',5-PentaBDE	108		104	
13C-2,2',4,4',6-PentaBDE	104		102	
13C-3,3',4,4',5-PentaBDE	111		105	
13C-2,2',4,4',5,5'-HexaBDE	106		101	
13C-2,2',4,4',5,6'-HexaBDE	107		101	
13C-2,2',3,4,4',5',6-HeptaBDE	107		87	
13C-2,2',3,3',4,4',5,5',6,6'-DecaBDE	48		12	

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

6.1.6 Spiked Matrix

6.1.6.1 PCB Aroclors

Table 117: Recovery (%) of PCB aroclors and surrogate standards in each XAD-2 spiked matrix.

PCB Aroclors	Spiked Matrix		
	WQ-99-ARO % Recovery	WQ-00-ARO % Recovery	WQ-01-ARO % Recovery
Aroclor 1242	82	71	
Aroclor 1254	91	100	no Aroclor spike
Aroclor 1260	102	110	
Surrogate Standards			
13C12-PCB 101	97	76	-
13C12-PCB 118	94	-	-
13C12-PCB 105	96	-	-
13C12-PCB 180	97	88	-
13C12-PCB 209	110	-	-

6.1.6.2 PCB Congeners

Table 118: Recovery (%) of PCB congeners and surrogate standards in each XAD-2 spiked matrix.

PCB Congeners	Spiked Matrix		
	WQ-99-PCB % Recovery	TC-00-PCB % Recovery	TC-01-PCB % Recovery
15	-	-	109
18	71	72	-
31/28	98	73	-
37	-	-	97
52/73	91	85	-
54	-	-	99
95/93	81	71	-
105/127	-	-	94
106/118	94	100	95
114	-	-	93
123	-	-	100
138/163/164	100	110	-
155	-	-	89
156	-	-	94
157	-	-	98
167	-	-	97
169	-	-	95
170/190	-	-	95
180	124	100	97
182/187	-	-	97
188	-	-	94
189	-	-	96
196/203	152	110	-
202	-	-	94
205	-	-	96
206	-	-	97
208	-	-	95
209	-	-	95
Surrogate Standards			
13C12-PCB 15	-	-	50
13C12-PCB 37	-	-	93
13C12-PCB 54	-	-	57
13C12-PCB 101	97	76	-
13C12-PCB 118	94	82	98
13C12-PCB 105	96	85	-
13C12-PCB 126	-	-	97
13C12-PCB 167	-	-	97
13C12-PCB 169	-	-	99
13C12-PCB 180	97	88	95
13C12-PCB 189	-	-	96
13C12-PCB 202	-	-	94
13C12-PCB 206	-	-	93
13C12-PCB 209	110	88	92

6.1.6.3 Organochlorines

Table 119: Recovery (%) of organochlorine compounds and surrogate standards in each XAD-2 spiked matrix.

Organochlorine compounds	Spiked Matrix			
	WQ-99-OC-1	WQ-99-OC-2	WQ-00-OC	WQ-01-OC
	% Recovery	% Recovery	% Recovery	% Recovery
1,2-Dichlorobenzene	-	NQ	67	105
1,3/1,4-Dichlorobenzene	-	NQ	54	106
1,2,3-Trichlorobenzene	-	NQ	96	138
1,2,4-Trichlorobenzene	-	NQ	87	384
1,3,5-Trichlorobenzene	-	NQ	89	84
1,2,3,4-Tetrachlorobenzene	-	121	98	101
1,2,3,5/1,2,4,5-Tetrachlorobenzene	-	99	91	102
Pentachlorobenzene	-	100	100	92
Hexachlorobenzene	-	81	110	89
Aldrin	-	86	71	86
Dieldrin	102	-	98	99
Endrin	129	-	82	104
Chlordane, alpha (cis)	-	94	110	92
Chlordane, gamma (trans)	-	98	91	91
Chlordane, oxy-	-	106	94	92
o,p'-DDD	-	111	98	87
p,p'-DDD	-	113	100	90
o,p'-DDE	-	102	100	89
p,p'-DDE	-	83	110	89
o,p'-DDT	-	90	100	89
p,p'-DDT	-	96	100	90
Endosulphan (I), alpha-	90	-	105	99
Endosulphan (II), beta-	104	-	104	101
Endosulphan Sulphate	109	-	88	98
HCH, alpha-	-	59	83	75
HCH, beta-	-	125	150	89
HCH, gamma-	-	95	100	81
HCH, delta-	107	-	70	76
Heptachlor	-	74	63	114
Heptachlor Epoxide	86	-	102	144
Methoxychlor	107	-	155	91
Mirex	-	110	120	91
Nonachlor, cis-	-	98	98	92
Nonachlor, trans-	-	93	94	85
Surrogate Standards				
13C6-1,4-Dichlorobenzene	-	-	37	33
13C6-1,2,3-Trichlorobenzene	-	-	26	46
13C-1,2,3,4-Tetrachlorobenzene	-	20	26	50
13C6-Pentachlorobenzene	-	27	27	62
13C-Hexachlorobenzene	-	42	33	68
13C-HCH, beta-	-	-	-	79
13C-HCH, gamma-	-	66	64	94
13C-Heptachlor	-	-	-	68
13C-Aldrin	-	-	-	80
13C-Chlordane, trans-	-	-	-	93
13C-Nonachlor, trans-	-	-	-	94
13C-p,p'-DDE	-	110	90	92
13C-p,p'-DDT	-	120	100	100
d4-Endosulphan-alpha	110	-	110	102
d4-Endosulphan-beta	-	-	-	99
13C-PCB 15	-	-	-	80
13C-PCB 101	97	-	89	-

NQ = Not quantifiable.

Table 120: Recovery (%) of toxaphene and chlorobornane compounds and surrogate standard in each XAD-2 spiked matrix.

Toxaphene & Chlorobornane compounds	Spiked Matrix
	WQ-99-TOX
	% Recovery
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane	93
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane	125
P3-GC/MS:Octachloro-Derivative	56
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane	92
P5-GC/MS:Nonachloro-Derivative	90
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	86
P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	85
P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	78
P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	77
P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	72
Total Toxaphene	90
Surrogate Standard	
13C-PCB 180	97

6.1.6.4 Carbamates, Herbicides, Organophosphates, Organonitrogens and Triazines

Table 121: Recovery (%) of pesticide compounds and surrogate standards in each XAD-2 spiked matrix.

Pesticide compounds	Spiked Matrix	
	WQ-99-PEST	WQ-00-PEST
	% Recovery	% Recovery
2,4,5-T	106	78
2,4-D	60	58
Bromoxynil	39	78
Dicamba	23	63
2,4-DB	-	78
Dichloroprop	54	76
Dinoseb	69	48
MCPA	51	50
Mecoprop (MCP)	-	105
Picloram	44	72
Silvex (2,4,5-TP)	106	75
Azinphos methyl	21	50
Carbophenothion	-	70
Chlorpyrifos	12	71
Coumaphos	-	78
Demeton-O	0	42
Demeton-S	79	107
Diazinon	87	67
Dichlorvos/Naled	54	51
Dimethoate	63	107
Disulfoton	-	47
Ethion	71	91
Fenitrothion	70	120
Fensulfothion	83	108
Fenthion	85	58
Fonofos	139	61
Malathion	69	73
Methidathion	56	67
Mevinphos	103	60
Parathion	92	105
Parathion-methyl	48	117
Phorate	151	36
Phosalone	-	99
Phosmet	-	82
Sulfotep	159	64
Terbufos	161	49
Hexazinone	64	62
Metolachlor	76	72

Table 121 (cont'd): Recovery (%) of pesticide compounds and surrogate standards in each XAD-2 spiked matrix.

Pesticide compounds	Spiked Matrix	
	WQ-99-ASL % Recovery	WQ-00-ASL % Recovery
Propanil	73	80
Trifluralin	142	76
Vinclozolin	90	74
Aldicarb	-	24
Aldicarb Sulfone	-	75
Aldicarb Sulfoxide	-	84
Carbaryl	111	47
Carbofuran	99	62
3-Hydroxycarbofuran	-	71
Methiocarb	88	61
Methomyl	-	67
Oxamyl	111	67
Propoxur	-	59
Atrazine	53	57
Simazine	51	60
Surrogate Standards		
2,4-DPA (SS)	62	76
Triphenyl Phosphate (SS)	85	91

6.1.6.5 Nonylphenol

Table 122: Recovery (%) of nonylphenol and surrogate standard in each XAD-2 spiked matrix.

Compound	Spiked Matrix	
	WQ-00-NP % Recovery	WQ-01-NP % Recovery
4-Nonylphenol	95	99
Surrogate Standard		
13C6-p-Nonylphenol	75	100

6.1.6.6 Polycyclic Aromatic Hydrocarbons

Table 123: Recovery (%) of polycyclic aromatic hydrocarbons and surrogate standards in each XAD-2 spiked matrix.

Polycyclic aromatic hydrocarbons	Spiked Matrix	
	WQ-00-PAH % Recovery	WQ-01-PAH % Recovery
Naphthalene	110	105
Biphenyl	-	105
Acenaphthylene	83	108
Acenaphthene	100	104
Fluorene	91	95
Phenanthrene	120	105
Anthracene	110	104
Fluoranthene	110	105
Pyrene	110	106
Benz(a)anthracene	110	106
Chrysene	110	106
Benzo(b/j/k)fluoranthenes	130	108
Benzo(e)pyrene	76	115
Benzo(a)pyrene	81	110
Perylene	74	111
Dibenz(ah)anthracene	97	109
Indeno(1,2,3,cd)pyrene	110	109
Benzo(ghi)perylene	96	106
Dibenzothiophene	57	-
Retene	120	-

Table 123 (cont'd): Recovery (%) of polycyclic aromatic hydrocarbons and surrogate standards in each XAD-2 spiked matrix.

	Spiked Matrix	
	WQ-00-PAH	WQ-01-PAH
Polycyclic aromatic hydrocarbons	% Recovery	% Recovery
2-Methylnaphthalene	130	107
1-Methylnaphthalene	-	106
2,6-Dimethylnaphthalene	-	106
2,3,5-Trimethylnaphthalene	-	106
1-Methylphenanthrene	170	108
3,6-Dimethylphenanthrene	-	103
Surrogate Standards		
Naphthalene d-8	41	50
Acenaphthylene d-8	41	55
Phenanthrene d-10	51	66
Fluoranthene d-10	64	68
Benz[a]anthracene d-12	-	64
Chrysene d-12	64	65
Benzo[bk]fluoranthene d-12	60	68
Benzo[a]pyrene d-12	93	63
Perylene d-12	89	63
Dibenz[ah]anthracene d-14	76	64
Indeno[1,2,3-cd]pyrene d-12	-	66
Benzo[ghi]perylene d-12	78	69
2-Methylnaphthalene d-10	39	54
2,6-Dimethylnaphthalene d-12	-	55

6.1.6.7 Sterols

Table 124: Recovery (%) of sterols and surrogate standard in each XAD-2 spiked matrix.

	Spiked Matrix	
	WQ-00-STER	WQ-01-STER
Sterols	% Recovery	% Recovery
Desogestrel	79	71
Mestranol	77	110
Norethindrone	82	100
Estrone	86	96
Equilin	85	99
Norgestrel	76	100
Testosterone	77	99
Ethinylestradiol	71	99
17a-Estradiol	81	94
17b-Estradiol	83	92
a-Zearalanol	76	65
Coprostanol	83	92
Epicoprostanol	85	89
Cholesterol	96	100
Cholestanol	82	100
Desmosterol	85	100
Ergosterol	90	100
Stigmasterol	86	100
b-Estradiol 3-benzoate	81	130
b-Sitosterol	86	100
Surrogate Standard		
d37-n-Octadecanol	92	79

6.1.6.8 Polybrominated Diphenyl Ethers

Table 125: Recovery (%) of polybrominated diphenyl ethers and surrogate standards in each XAD-2 spiked matrix.

	Spiked Matrix WQ-01-PBDE
Polybrominated diphenyl ethers	% Recovery
3-MonoBDE (2)	93.9
2,4'/3,3'-DiBDE (8/11)	112
2,2',4'-TriBDE (17)	96.3
2,4,4'/2',3,4'-TriBDE (28/33)	96.4
2,2',4,4'-TetraBDE (47)	98.8
2,3',4,4'-TetraBDE (66)	93.9
2,4,4',6'-TetraBDE (75)	98.4
2,2',3,4,4'-PentaBDE (85)	101
2,2',4,4',5'-PentaBDE (99)	98.7
2,2',4,4',6'-PentaBDE (100)	101
2,2',3,4,4',5'/2,3,4,4',5,6'-HexaBDE (138/166)	103
2,2',4,4',5,5'-HexaBDE (153)	102
2,2',4,4',5,6'-HexaBDE (154)	102
2,2',3,4,4',5',6'-HeptaBDE (183)	104
2,3,3',4,4',5,6'-HeptaBDE (190)	103
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	97.3
Surrogate Standards	
13C-4-MonoBDE	78.9
13C-4,4'-DiBDE	96.7
13C-2,4,4'-TriBDE	103
13C-2,2',4,4'-TetraBDE	104
13C-3,3',4,4'-TetraBDE	109
13C-2,2',4,4',5'-PentaBDE	108
13C-2,2',4,4',6'-PentaBDE	105
13C-3,3',4,4',5'-PentaBDE	109
13C-2,2',4,4',5,5'-HexaBDE	106
13C-2,2',4,4',5,6'-HexaBDE	104
13C-2,2',3,4,4',5',6'-HeptaBDE	107
13C-2,2',3,3',4,4',5,5',6,6'-DecaBDE	74.9

6.1.7 Surrogate Standard Recoveries

6.1.7.1 PCB Aroclors

Table 126: Recovery (%) of PCB aroclor surrogate standards in each integrated water sample.

Surrogate Standards	Fall 1999			Spring 2000			
	Ref	mid Ag	d/s Ag	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 101	100	88	110	85	83	87	74
13C12-PCB 118	100	92	110	-	-	-	-
13C12-PCB 105	100	92	110	-	-	-	-
13C12-PCB 180	93	91	100	90	89	95	85
13C12-PCB 209	110	100	110	-	-	-	-

Surrogate Standards	Fall 2000				Fall 2001			
	Ref	mid Ag	d/s Ag	d/s Urban	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 3	-	-	-	-	68	68	73	73
13C12-PCB 15	-	-	-	-	81	80	88	88
13C12-PCB 37	-	-	-	-	96	94	97	95
13C12-PCB 54	-	-	-	-	80	82	81	73
13C12-PCB 101	87	86	90	89	-	-	-	-
13C12-PCB 118	-	-	-	-	94	93	94	90
13C12-PCB 167	-	-	-	-	93	92	97	89
13C12-PCB 180	91	92	90	95	94	92	95	87
13C12-PCB 202	-	-	-	-	98	96	95	87
13C12-PCB 206	-	-	-	-	96	91	97	90
13C12-PCB 209	-	-	-	-	93	87	96	86

6.1.7.2 PCB Congeners

Table 127: Recovery (%) of PCB congener surrogate standards in each integrated water sample.

Surrogate Standards	Fall 1999			Spring 2000			
	Ref	mid Ag	d/s Ag	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 101	100	88	110	85	83	87	74
13C12-PCB 118	100	92	110	82	86	86	76
13C12-PCB 105	100	92	110	88	92	85	79
13C12-PCB 180	93	91	100	90	89	95	85
13C12-PCB 209	110	100	110	91	89	94	75

Surrogate Standards	Fall 2000				Fall 2001			
	Ref	mid Ag	d/s Ag	d/s Urban	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 15	-	-	-	-	62	65	71	73
13C12-PCB 37	-	-	-	-	91	91	92	88
13C12-PCB 54	-	-	-	-	68	71	75	73
13C12-PCB 101	87	86	90	89	-	-	-	-
13C12-PCB 118	92	85	88	85	98	97	95	91
13C12-PCB 105	96	90	93	94	-	-	-	-
13C12-PCB 167	-	-	-	-	98	97	97	87
13C12-PCB 180	91	92	90	95	100	100	97	90
13C12-PCB 189	-	-	-	-	98	99	97	88
13C12-PCB 206	-	-	-	-	98	98	95	90
13C12-PCB 209	94	92	97	92	96	92	93	86

6.1.7.3 Organochlorines

Table 128: Recovery (%) of organochlorine surrogate standards in each integrated water sample.

Surrogate Standards	Fall 1999			Spring 2000			
	Ref	mid Ag	d/s Ag	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C6-1,4-Dichlorobenzene	-	-	-	44	21	29	19
13C6-1,2,3-Trichlorobenzene	-	-	-	35	15	20	17
13C-1,2,3,4-Tetrachlorobenzene	18	25	25	41	20	28	25
13C6-Pentachlorobenzene	27	30	38	48	28	36	34
13C-Hexachlorobenzene	48	44	60	58	42	49	47
13C-HCH, beta-	-	-	-	-	-	-	-
13C-HCH, gamma-	68	64	82	77	69	68	59
13C-Heptachlor	-	-	-	-	-	-	-
13C-Aldrin	-	-	-	-	-	-	-
13C-Chlordane, trans-	-	-	-	-	-	-	-
13C-Nonachlor, trans-	-	-	-	-	-	-	-
13C-p,p'-DDE	110	94	92	78	82	77	64
13C-p,p'-DDT	93	85	75	91	86	80	73
13C-PCB 15	-	-	-	-	-	-	-
13C-PCB 101	-	-	-	91	87	86	78
d4-Endosulphan, alpha-	87 (70)	81	100 (77)	119	108	99	111
d4-Endosulphan, beta-	-	-	-	-	-	-	-

Surrogate Standards	Fall 2000				Fall 2001			
	Ref	mid Ag	d/s Ag	d/s Urban	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C6-1,4-Dichlorobenzene	18	31	31	15	67	55	56	54
13C6-1,2,3-Trichlorobenzene	13	20	23	15	52	36	43	51
13C-1,2,3,4-Tetrachlorobenzene	17	26	33	25	50	43	45	52
13C6-Pentachlorobenzene	26	36	46	37	59	56	53	62
13C-Hexachlorobenzene	43	51	61	53	66	64	66	73
13C-HCH, beta-	-	-	-	-	82	75	62	65
13C-HCH, gamma-	73	71	85	72	102	94	90	83
13C-Heptachlor	-	-	-	-	82	77	57	63
13C-Aldrin	-	-	-	-	72	78	72	76
13C-Chlordane, trans-	-	-	-	-	98	99	94	81
13C-Nonachlor, trans-	-	-	-	-	101	98	89	82
13C-p,p'-DDE	85	80	85	85	101	96	97	90
13C-p,p'-DDT	82	77	81	81	90	85	83	80
13C-PCB 15	-	-	-	-	81	80	88	88
13C-PCB 101	96	91	96	96	-	-	-	-
d4-Endosulphan, alpha-	112	108	123	117	101	81	89	83
d4-Endosulphan, beta-	-	-	-	-	111	52	92	92

(% Recovery from re-injection data)

Table 129: Recovery (%) of toxaphene surrogate standard in each integrated water sample.

Surrogate Standard	Fall 1999		
	Ref	mid Ag	d/s Ag
	% Recovery	% Recovery	% Recovery
13C-PCB 180	100	86	97

6.1.7.4 Carbamates, Herbicides, Organophosphates, Organonitrogens and Triazines

Table 130: Recovery (%) of pesticide surrogate standards in each integrated water sample.

Surrogate Standards	Fall 1999			Spring 2000			
	Ref	mid Ag	d/s Ag	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
2,4-DPA (SS)	22.5	46	37.7	48	36	55	63
Triphenyl Phosphate (SS)	47	100	29	95	96	96	123

Table 130 (cont'd): Recovery (%) of pesticide surrogate standards in each integrated water sample.

Surrogate Standards	Fall 2000			
	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery
2,4-DPA (SS)	49	76	65	68
Triphenyl Phosphate (SS)	97	88	107	132

6.1.7.5 Nonylphenol

Table 131: Recovery (%) of nonylphenol surrogate standard in each integrated water sample.

Surrogate Standard	Spring 2000				Fall 2000			
	Ref	mid Ag	d/s Ag	d/s Urban	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C6-p-Nonylphenol	92	93	100	98	94	96	100	86

Surrogate Standard	Fall 2001			
	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery
13C6-p-Nonylphenol	76	82	119	74

6.1.7.6 Polycyclic Aromatic Hydrocarbons

Table 132: Recovery (%) of polycyclic aromatic hydrocarbon surrogate standards in each integrated water sample.

Surrogate Standards	Spring 2000				Fall 2000			
	Ref	mid Ag	d/s Ag	d/s Urban	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene d-8	50	53	44	33	39	55	40	43
Acenaphthylene d-8	52	54	50	38	42	60	42	49
Phenanthrene d-10	52	50	54	42	49	53	43	47
Fluoranthene d-10	62	57	65	51	61	62	50	51
Chrysene d-12	60	59	61	48	63	63	47	47
Benzo[bk]fluoranthene d-12	58	58	58	47	60	64	47	44
Benzo[a]pyrene d-12	86	86	89	69	92	92	70	67
Perylene d-12	85	86	86	68	89	92	68	65
Dibenz[ah]anthracene d-14	60	69	63	55	64	72	54	53
Benzo[ghi]perylene d-12	71	74	72	59	78	80	59	57
2-Methylnaphthalene d-10	48	51	44	33	38	54	39	44

Surrogate Standards	Fall 2001			
	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene d-8	49	45	32	37
Acenaphthylene d-8	51	44	37	44
Phenanthrene d-10	57	53	56	59
Fluoranthene d-10	63	59	63	59
Benz[a]anthracene d-12	59	51	58	53
Chrysene d-12	61	57	59	55
Benzo[bk]fluoranthene d-12	61	55	61	53
Benzo[a]pyrene d-12	60	20	60	53
Perylene d-12	59	12	59	50
Dibenz[ah]anthracene d-14	54	48	54	47
Indeno[1,2,3-cd]pyrene d-12	55	50	54	48
Benzo[ghi]perylene d-12	60	54	61	50
2-Methylnaphthalene d-10	53	48	34	42
2,6-Dimethylnaphthalene d-12	53	48	37	46

6.1.7.7 Sterols

Table 133: Recovery (%) of sterol surrogate standard in each integrated water sample.

Surrogate Standard	Spring 2000				Fall 2000			
	Ref	mid Ag	d/s Ag	d/s Urban	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
d37-n-Octadecanol	96	95	100	110	95	93	97	99

Surrogate Standard	Fall 2001			
	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery
d37-n-Octadecanol	74	120	92	100

6.1.7.8 Polybrominated Diphenyl Ethers

Table 134: Recovery (%) of polybrominated diphenyl ether surrogate standards in each integrated water sample.

Surrogate Standards	Fall 2001			
	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery
13C-4-MonoBDE (3)	73.4	75.5	79.0	79.7
13C-4,4'-DiBDE (15)	103	99.4	100	99.8
13C-2,4,4'-TriBDE (28)	100	102	100	98.9
13C-2,2',4,4'-TetraBDE (47)	98.8	109	105	102
13C-3,3',4,4'-TetraBDE (77)	106	113	111	108
13C-2,2',4,4',5-PentaBDE (99)	107	113	109	106
13C-2,2',4,4',6-PentaBDE (100)	100	107	105	100
13C-3,3',4,4',5-PentaBDE (126)	104	112	110	110
13C-2,2',4,4',5,5'-HexaBDE (153)	98.5	108	108	98.1
13C-2,2',4,4',5,6'-HexaBDE (154)	102	111	106	101
13C-2,2',3,4,4',5,6'-HeptaBDE (183)	103	114	106	98.0
13C-2,2',3,3',4,4',5,5',6,6'-DecaBDE (20)	51.8	53.4	52.1	44.5

6.2 Tissue QA

6.2.1 Trace Metals

Cutthroat Trout

Table 135: Metal concentrations (mg/kg) in replicate cutthroat trout muscle tissue samples.

Exposure Period	Site	Sample/ Statistic	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Gallium (Ga)	Lanthanum (La)	Lead (Pb)	Lithium (Li)	Manganese (Mn)
Fall 1999	Ref	sample	ND	1.07	0.038	0.005	0.14	0.179	0.94	0.010	0.001	0.033	ND	0.249
		replicate	ND	1.00	0.032	0.001	0.16	0.190	1.16	0.010	0.001	0.036	ND	0.267
	mid Ag	sample	ND	1.04	0.017	ND	0.14	0.154	0.70	0.009	ND	0.008	ND	0.218
		replicate	0.001	1.06	0.019	ND	0.24	0.172	0.67	0.009	ND	0.011	ND	0.238
	d/s Ag	sample	ND	1.14	0.016	ND	0.12	0.252	0.99	0.009	ND	0.012	ND	0.243
		replicate	ND	1.18	0.029	ND	0.23	0.272	1.51	0.010	ND	0.042	ND	0.298

Exposure Period	Site	Sample/ Statistic	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Rubidium (Rb)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)
Fall 1999	Ref	sample	0.058	ND	0.06	0.402	0.26	0.001	0.941	0.006	ND	0.015	8.56
		replicate	0.063	0.004	0.15	0.382	0.27	0.001	1.200	0.006	ND	0.016	8.95
	mid Ag	sample	0.061	0.005	0.38	0.380	0.28	0.001	0.769	0.006	ND	0.016	8.21
		replicate	0.070	0.006	0.15	0.404	0.28	ND	0.857	0.006	ND	0.017	8.53
	d/s Ag	sample	0.063	ND	0.06	0.411	0.27	0.001	0.881	0.005	ND	0.013	8.30
		replicate	0.073	ND	0.05	0.427	0.30	0.001	1.190	0.005	ND	0.018	9.10

ND = Not detected.

Exposure Period	Site	Sample/ Statistic	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Gallium (Ga)	Lanthanum (La)	Lead (Pb)	Lithium (Li)	Manganese (Mn)
Spring 2000	Ref	sample	0.001	0.83	0.010	0.001	ND	0.008	0.94	0.023	0.001	0.004	ND	0.226
		replicate	0.001	0.78	0.012	0.001	ND	0.006	0.92	0.021	0.001	0.003	ND	0.183
	mid Ag	sample	0.001	0.92	0.023	ND	ND	0.011	0.73	0.021	0.001	0.018	ND	0.202
		replicate	0.001	0.92	0.064	0.002	ND	0.013	0.75	0.022	ND	0.017	ND	0.171

Exposure Period	Site	Sample/ Statistic	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Rubidium (Rb)	Selenium (Se)	Silver (Ag)	Strontium (Sr)	Thallium (Tl)	Uranium (U)	Vanadium (V)	Zinc (Zn)
Spring 2000	Ref	sample	0.074	0.006	0.05	2.510	0.36	0.001	0.854	0.005	ND	0.002	6.63
		replicate	0.075	0.005	0.05	2.360	0.43	ND	0.775	0.005	ND	ND	6.43
	mid Ag	sample	0.071	ND	0.05	2.360	0.35	ND	1.080	0.005	ND	ND	7.11
		replicate	0.074	0.005	0.04	2.390	0.39	ND	0.675	0.005	ND	ND	6.69

ND = Not detected.

6.2.2 Histology

Cutthroat Trout

Table 136: Histological assessments of replicate cutthroat trout tissue samples.

			Hingut	Pyloric Caeca	Spleen		Gill				Liver					
			Normal	Normal	Normal	Hemosiderin	Normal	Hyperpasia	Epithelial Lifting	Anuerysm	Normal	Inflammatory Focus	Regenerative tissue	Vacuolated	Melanin	
Spring 2000	Ref	sample 7	yes	yes	yes	no	no	yes	no	no	no	yes	no	yes	not examined	
		replicate	yes	yes	yes	no	no	yes	no	no	no	yes	no	yes		
	sample 16	replicate	yes	yes	yes	no	no	yes	no	no	no	yes	no	no		
		replicate	yes	yes	yes	no	no	yes	no	no	no	yes	no	no		
	sample 23	replicate	yes	yes	yes	no	no	yes	no	no	no	yes	no	yes		
		replicate	yes	yes	yes	no	no	yes	no	no	no	yes	yes	yes		
	d/s Ag	sample 7	yes	yes	no	yes	no	yes	no	no	no	yes	no	yes		
		replicate	yes	yes	no	yes	no	yes	no	no	no	yes	no	yes		
	d/s Urban	sample 7	yes	yes	yes	no	no	yes	yes	no	yes	no	no	no		
		replicate	yes	yes	yes	no	yes	no	no	no	yes	no	no	no		
sample 23	replicate	yes	yes	yes	no	yes	no	no	no	no	yes	no	yes			
	replicate	yes	yes	yes	no	yes	no	no	no	no	yes	no	yes			
Fall 2000	Ref	sample 12	yes	yes	yes	no	yes	no	no	no	yes	no	no	no	no	
		replicate	yes	yes	yes	no	yes	no	no	no	no	yes (1)	no	no	no	
		sample 17	replicate	yes	yes	no	yes	yes	no	no	no	no	yes (2)	no	no	no
			replicate	yes	yes	no	yes	yes	no	no	no	no	yes (1)	no	no	no
		sample 22	replicate	yes	yes	no	yes	yes	no	no	no	no	yes (1)	no	no	no
			replicate	yes	yes	no	yes	yes	no	no	no	no	yes (1)	no	no	no
		sample 23	replicate	yes	yes	no	yes	yes	no	no	no	no	yes (1)	no	no	yes
			replicate	yes	yes	no	yes	yes	no	no	no	no	yes (1)	no	no	yes
	mid Ag	sample 17	replicate	yes	yes	no	yes	no	yes	no	no	no	yes ++	no	no	no
			replicate	yes	yes	no	yes	no	yes	no	no	no	yes ++	no	no	no
		sample 20	replicate	yes	yes	no	yes	no	no	yes	no	no	yes ++	no	no	no
			replicate	yes	yes	no	yes	yes	no	no	no	no	yes ++	no	no	no
		sample 22	replicate	yes	yes	no	yes	no	yes	no	no	no	yes ++	no	no	no
			replicate	yes	yes	no	yes	no	yes	no	no	no	yes ++	no	no	no
		sample 25	replicate	yes	yes	no	yes	no	yes	no	yes	no	yes ++	no	no	no
			replicate	yes	yes	no	yes	no	yes	no	no	no	yes ++	no	no	no
	sample 26	replicate	yes	yes	no	yes	no	no	yes	no	no	yes ++	no	no	no	
		replicate	yes	yes	no	yes	no	no	yes	no	no	yes ++	no	no	no	
	d/s Ag	sample 17	replicate	yes	yes	yes	no	no	yes	no	no	no	yes	no	no	no
			replicate	yes	yes	yes	no	no	yes	no	no	no	yes	no	no	no
		sample 18	replicate	yes	yes	yes	no	no	yes	no	no	no	yes	no	no	no
			replicate	yes	yes	yes	no	no	yes	no	no	no	yes	no	no	no
		sample 21	replicate	yes	yes	no	yes	no	yes	no	no	no	yes ++	no	no	no
			replicate	yes	yes	no	yes	no	yes	no	no	no	yes ++	no	no	no
		sample 22	replicate	yes	yes	no	yes	no	yes	no	no	no	yes	no	no	no
			replicate	yes	yes	no	yes	yes	no	no	no	no	yes	no	no	no
sample 26	replicate	yes	yes	yes	no	no	yes	no	no	no	yes ++	no	no	no		
	replicate	yes	yes	yes	no	no	yes	no	no	no	yes ++	no	no	no		
d/s Urban	sample 22	replicate	yes	yes	yes	no	yes	no	no	no	no	no	no	no	yes	
		replicate	yes	yes	yes	no	no	yes	no	no	no	no	no	no	yes	

++ = Severe inflammatory focus.

(1) = Only one focus area.

(2) = Two areas of focus.

Crayfish

Table 137: Histological assessments of replicate crayfish tissue samples.

			Seminiferous Tubules			Oogenesis		Hepatopancreas				Hepatopancreas (R-cell vacuolation)		
			Spermatids present	Arrested spermatogenesis	Synchronous spermatogenesis	Early	Mature	B-cell no. > F-cell no.	B-cell no. < F-cell no.	Granulocytes	Necrosis	No vacuoles	Moderately vacuolated	Extremely vacuolated
Spring 2000	Ref	sample 7	-	-	-	yes	no	no	yes	yes	not examined	no	no	yes
		replicate	-	-	-	yes	no	no	yes	yes		no	no	yes
	mid Ag	sample 9	-	-	-	yes	no	yes	no	yes		no	no	yes
		replicate	-	-	-	yes	no	yes	no	yes		no	no	yes

6.2.3 Mixed Function Oxidase

Cutthroat Trout

Table 138: Mixed function oxidase (MFO) activity in replicate cutthroat trout liver samples.

Exposure Period	Site	Statistic	GST (nmol/min/mg)	P450 (nmol/mg)	EROD (pmol/min/mg)
Spring 2000	Ref	sample 3	217.9	0.25	10.50
		replicate	228.4	0.27	9.40
		sample 7	248.5	0.08	13.10
		replicate	254.1	0.13	15.70
		sample 16	269.9	0.15	19.40
		replicate	265.8	0.11	19.20
	mid Ag	sample 23	225.2	0.26	6.80
		replicate	220.2	0.27	10.10
	d/s Ag	sample 19	231.4	0.21	32.90
		replicate	242.8	0.21	37.20
	d/s Urban	sample 7	228.4	0.33	24.80
		replicate	226.6	0.28	25.60
		sample 7	172.3	0.29	41.80
		replicate	155.4	0.25	37.40
Fall 2000	Ref	sample 23	276.4	0.33	17.30
		replicate	267.3	0.29	13.20
		sample 12	240.4	0.05	7.18
		replicate	200.9	ND	7.15
		sample 17	154.6	0.08	6.87
		replicate	162.4	0.12	6.52
	mid Ag	sample 22	277.9	0.04	6.59
		replicate	287.7	0.08	6.84
		sample 23	220.2	0.15	5.21
		replicate	225.3	0.19	5.12
mid Ag	sample 17	342.6	ND	10.02	
	replicate	366.4	0.14	13.08	
	sample 20	269.5	0.27	29.32	
	replicate	251.7	0.25	25.97	
	sample 22	302.3	0.26	42.18	
	replicate	288.5	0.19	46.61	
mid Ag	sample 25	222.3	0.25	17.87	
	replicate	217.7	0.22	14.32	
	sample 26	200.5	0.15	25.97	
	replicate	189.6	0.19	21.55	

GST = Glutathione-S-transferase.

EROD = 7-ethoxyresorufin-O-deethylase.

P450 = Cytochrome system.

Table 138 (cont'd): Mixed function oxidase (MFO) activity in replicate cutthroat trout liver samples.

Exposure Period	Site	Statistic	GST (nmol/min/mg)	P450 (nmol/mg)	EROD (pmol/min/mg)
Fall 2000	d/s Ag	sample 17	158.6	0.21	43.33
		replicate	162.9	0.07	48.65
		sample 18	256.8	0.08	10.84
		replicate	266.7	ND	9.76
		sample 21	231.6	ND	34.23
	replicate	210.5	ND	30.66	
	d/s Urban	sample 22	205.8	0.16	35.83
		replicate	191.4	0.21	38.76
		sample 26	217.8	0.26	48.33
		replicate	229.5	0.24	51.25
sample 22		289.5	0.19	41.12	
	replicate	274.2	0.11	43.84	
Fall 2001	mid Ag	sample 20	361.4	0.24	27.60
		replicate	194.7	0.11	9.40
	d/s Urban	sample 13	182.5	0.15	38.10
		replicate	233.8	0.19	24.70
		sample 24	256.9	0.09	16.00
		replicate	197.3	0.14	21.20

GST = Glutathione-S-transferase.

EROD = 7-ethoxyresorufin-O-deethylase.

P450 = Cytochrome system.

Crayfish

Table 139: Mixed function oxidase (MFO) activity in replicate crayfish hepatopancreas samples.

Exposure Period	Site	Statistic	GST (nmol/min/mg)	P450 (nmol/mg)	EROD (pmol/min/mg)
Fall 1999	Ref	sample 21	131.58	0.15	1.97
		replicate	74.69	0.26	1.52
Spring 2000	Ref	sample 7	55.97	0.09	0.79
		replicate	160.89	ND	ND
	mid Ag	sample 9	98.28	0.26	2.22
		replicate	94.91	0.25	1.91

GST = Glutathione-S-transferase.

EROD = 7-ethoxyresorufin-O-deethylase.

P450 = Cytochrome system.

6.2.4 Procedural Blanks

6.2.4.1 PCB Aroclors

Table 140: Concentration (ng/g) of PCB aroclors and recovery (%) of surrogate standards in each tissue lab blank.

	Lab Blank															
	TC-99-ARO-1		TC-99-ARO-2		TC-00-ARO-1		TC-00-ARO-2		TC-00-ARO-3		TC-00-ARO-4		TC-01-ARO-1		TC-01-ARO-2	
PCB Aroclors	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Aroclor 1242	ND	0.57	ND	1.1	ND	0.033	ND	0.078	ND	0.079	ND	0.0059	ND	0.0984	ND	0.0847
Aroclor 1254	ND	0.86	ND	3.2	ND	0.075	ND	0.12	ND	0.18	ND	0.009	ND	0.158	ND	0.114
Aroclor 1260	ND	0.66	ND	1.5	ND	0.087	ND	0.11	ND	0.18	ND	0.0057	ND	0.116	ND	0.0717
Surrogate Standards	% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery	
13C12-PCB 3	-	-	-	-	-	-	-	-	-	-	-	-	35	70	-	-
13C12-PCB 15	-	-	-	-	-	-	-	-	-	-	-	-	54	76	-	-
13C12-PCB 37	-	-	-	-	-	-	-	-	-	-	-	-	74	100	-	-
13C12-PCB 54	-	-	-	-	-	-	-	-	-	-	-	-	56	84	-	-
13C12-PCB 101	68	-	87	-	88	-	86	-	88	-	55	-	-	-	-	-
13C12-PCB 118	-	-	-	-	-	-	-	-	-	-	-	-	91	107	-	-
13C12-PCB 167	-	-	-	-	-	-	-	-	-	-	-	-	95	117	-	-
13C12-PCB 180	83	-	93	-	96	-	88	-	100	-	69	-	96	114	-	-
13C12-PCB 202	-	-	-	-	-	-	-	-	-	-	-	-	96	114	-	-
13C12-PCB 206	-	-	-	-	-	-	-	-	-	-	-	-	98	116	-	-
13C12-PCB 209	89	-	92	-	-	-	-	-	-	-	-	-	101	118	-	-

ND = Not detected.

6.2.4.2 PCB Congeners

Table 141: Concentration (ng/g) of PCB congeners and recovery (%) of surrogate standards in each tissue lab blank.

	Lab Blank															
	TC-99-PCB-1		TC-99-PCB-2		TC-00-PCB-1		TC-00-PCB-2		TC-00-PCB-3		TC-00-PCB-4		TC-01-PCB-1		TC-01-PCB-2	
PCB Congeners	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
8/5	ND	0.012	ND	0.036	ND	0.012	ND	0.13	ND	0.026	ND	0.097	ND	0.0178	ND	0.0223
15	ND	0.01	ND	0.032	ND	0.012	ND	0.13	ND	0.026	ND	0.097	ND	0.0107	ND	0.0132
19	ND	0.04	ND	0.076	ND	0.0021	ND	0.0049	ND	0.005	ND	0.0002	ND	0.0259	ND	0.0176
18	ND	0.04	ND	0.076	ND	0.0021	ND	0.0049	ND	0.005	ND	0.0002	ND	0.0259	ND	0.0176
17	ND	0.04	ND	0.076	ND	0.0021	ND	0.0049	ND	0.005	ND	0.0002	ND	0.0259	ND	0.0176
24/27	ND	0.04	ND	0.076	ND	0.0021	ND	0.0049	ND	0.005	ND	0.0002	ND	0.0259	ND	0.0176
16/32	ND	0.04	ND	0.076	ND	0.0014	ND	0.0029	ND	0.0034	ND	0.0003	ND	0.0259	ND	0.0176
26	ND	0.023	ND	0.046	ND	0.0014	ND	0.0029	ND	0.0034	ND	0.0003	ND	0.0259	ND	0.0176
25	ND	0.023	ND	0.046	ND	0.0014	ND	0.0029	ND	0.0034	ND	0.0003	ND	0.0259	ND	0.0176
31/28	ND	0.023	ND	0.046	ND	0.0014	ND	0.0029	ND	0.0034	ND	0.0003	ND	0.0163	ND	0.0108
33/20/21	ND	0.023	ND	0.046	ND	0.0014	ND	0.0029	ND	0.0034	ND	0.0003	ND	0.0163	ND	0.0108
22	ND	0.023	ND	0.046	ND	0.0014	ND	0.0029	ND	0.0034	ND	0.0003	ND	0.0163	ND	0.0108
45	ND	0.045	ND	0.097	ND	0.0019	ND	0.0032	ND	0.0056	ND	0.0003	ND	0.0216	ND	0.0072
46	ND	0.045	ND	0.097	ND	0.0019	ND	0.0032	ND	0.0056	ND	0.0003	ND	0.0216	ND	0.0072
52/73	ND	0.045	ND	0.097	ND	0.0019	ND	0.0032	ND	0.0056	0.005*	0.0003	ND	0.0216	ND	0.0072
49/43	ND	0.048	ND	0.1	ND	0.0019	ND	0.0034	ND	0.0056	ND	0.0004	ND	0.0216	ND	0.0072
47/48 /75	ND	0.045	ND	0.097	ND	0.0019	ND	0.0032	ND	0.0056	0.003*	0.0003	ND	0.0216	ND	0.0072

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

Table 141 (cont'd): Concentration (ng/g) of PCB congeners and recovery (%) of surrogate standards in each tissue lab blank.

PCB Congeners	Lab Blank															
	TC-99-PCB-1		TC-99-PCB-2		TC-00-PCB-1		TC-00-PCB-2		TC-00-PCB-3		TC-00-PCB-4		TC-01-PCB-1		TC-01-PCB-2	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
44	ND	0.046	ND	0.098	ND	0.0019	ND	0.0034	ND	0.0057	ND	0.0004	ND	0.0216	ND	0.0072
42/59	ND	0.046	ND	0.098	ND	0.0019	ND	0.0034	ND	0.0057	ND	0.0004	ND	0.0216	ND	0.0072
41/71/64/68	ND	0.046	ND	0.098	ND	0.0014	ND	0.0025	ND	0.0042	ND	0.0003	ND	0.0216	ND	0.0072
40	ND	0.039	ND	0.086	ND	0.0014	ND	0.0025	ND	0.0042	ND	0.0003	ND	0.0216	ND	0.0072
74/61	ND	0.039	ND	0.086	ND	0.0014	ND	0.0025	ND	0.0042	ND	0.0003	0.0379*	0.0216	ND	0.0072
70/76	ND	0.039	ND	0.086	ND	0.0014	ND	0.0025	ND	0.0042	0.002*	0.0003	ND	0.0216	ND	0.0072
66/80	ND	0.037	ND	0.088	ND	0.0014	ND	0.0025	ND	0.0042	ND	0.0003	ND	0.0216	ND	0.0072
56/60	ND	0.037	ND	0.088	ND	0.0014	ND	0.002	ND	0.0033	0.001*	0.0002	ND	0.0216	ND	0.0072
95/93	ND	0.039	ND	0.13	ND	0.0019	ND	0.0029	ND	0.0054	0.003*	0.0003	ND	0.0103	ND	0.0076
91	ND	0.039	ND	0.13	ND	0.0019	ND	0.0029	ND	0.0054	ND	0.0003	ND	0.0103	ND	0.0076
92	ND	0.039	ND	0.13	ND	0.0022	ND	0.0034	ND	0.0054	ND	0.0002	ND	0.0103	ND	0.0076
84	ND	0.039	ND	0.13	ND	0.0022	ND	0.0034	ND	0.0054	ND	0.0002	ND	0.0103	ND	0.0076
89/90/101	ND	0.039	ND	0.13	ND	0.0022	ND	0.0034	ND	0.0054	ND	0.0002	ND	0.0103	ND	0.0076
99	ND	0.039	ND	0.13	ND	0.0022	ND	0.0034	ND	0.0054	ND	0.0002	ND	0.0103	ND	0.0076
83/108	ND	0.022	ND	0.081	ND	0.0019	ND	0.003	ND	0.0047	ND	0.0002	ND	0.0105	ND	0.0075
97/86	ND	0.022	ND	0.081	ND	0.0019	ND	0.003	ND	0.0047	ND	0.0002	ND	0.0105	ND	0.0075
87/115/116	ND	0.022	ND	0.081	ND	0.0019	ND	0.003	ND	0.0047	ND	0.0002	ND	0.0105	ND	0.0075
85/120	ND	0.022	ND	0.081	ND	0.0019	ND	0.003	ND	0.0047	ND	0.0002	ND	0.0105	ND	0.0075
110	ND	0.022	ND	0.081	ND	0.0019	ND	0.003	ND	0.0047	ND	0.0002	ND	0.0105	ND	0.0075
107/109	ND	0.022	ND	0.081	ND	0.0018	ND	0.0032	ND	0.0041	ND	0.0006	ND	0.0105	ND	0.0075
106/118	ND	0.022	ND	0.088	ND	0.0019	ND	0.0023	ND	0.0048	ND	0.0005	ND	0.0105	ND	0.0075
114	ND	0.022	ND	0.081	ND	0.0018	ND	0.0032	ND	0.0041	ND	0.0006	ND	0.0106	ND	0.0076
105/127	ND	0.021	ND	0.091	ND	0.0019	ND	0.0024	ND	0.0048	0.022*	0.0006	ND	0.0110	ND	0.0078
136	ND	0.032	ND	0.079	ND	0.0021	ND	0.0025	ND	0.0051	ND	0.0004	ND	0.0070	ND	0.0048
151	ND	0.032	ND	0.079	ND	0.002	ND	0.0031	ND	0.005	ND	0.0004	not analyzed		ND	0.0048
144/135	ND	0.032	ND	0.079	ND	0.002	ND	0.0031	ND	0.005	ND	0.0004	ND	0.0070	ND	0.0048
149/139	ND	0.032	ND	0.079	ND	0.002	ND	0.0031	ND	0.005	0.00097*	0.0004	ND	0.0070	ND	0.0048
134/143	ND	0.032	ND	0.079	ND	0.002	ND	0.0031	ND	0.005	ND	0.0004	ND	0.0070	ND	0.0048
131/142	ND	0.032	ND	0.079	ND	0.002	ND	0.0031	ND	0.005	ND	0.0004	ND	0.0070	ND	0.0048
146	ND	0.032	ND	0.082	ND	0.0023	ND	0.0035	ND	0.0051	ND	0.0004	ND	0.0070	ND	0.0048
153	ND	0.029	ND	0.09	ND	0.0023	0.006	0.0035	ND	0.0051	ND	0.0004	ND	0.0087	ND	0.0055
141	ND	0.036	ND	0.12	ND	0.0029	ND	0.0046	ND	0.0064	ND	0.0006	ND	0.0087	ND	0.0055
130	ND	0.033	ND	0.1	ND	0.0028	ND	0.0047	ND	0.0064	ND	0.0005	ND	0.0087	ND	0.0055
137	ND	0.033	ND	0.1	ND	0.0028	ND	0.0047	ND	0.0064	ND	0.0005	ND	0.0087	ND	0.0055
138/163/164	ND	0.033	ND	0.1	ND	0.0028	ND	0.0047	ND	0.0064	ND	0.0005	ND	0.0087	ND	0.0055
158/160	ND	0.033	ND	0.1	ND	0.0028	ND	0.0047	ND	0.0064	ND	0.0005	ND	0.0087	ND	0.0055
129	ND	0.033	ND	0.1	ND	0.0028	ND	0.0047	ND	0.0064	ND	0.0005	ND	0.0087	ND	0.0055
128	ND	0.033	ND	0.1	ND	0.0028	ND	0.0047	ND	0.0064	ND	0.0005	ND	0.0087	ND	0.0055
156	ND	0.033	ND	0.1	ND	0.0028	ND	0.0047	ND	0.0064	ND	0.0005	ND	0.0087	ND	0.0055
157	ND	0.033	ND	0.1	ND	0.0028	ND	0.0047	ND	0.0064	ND	0.0005	ND	0.0088	ND	0.0056
179	ND	0.039	ND	0.09	ND	0.0041	ND	0.0055	ND	0.0081	ND	0.0003	ND	0.0106	ND	0.0064
176	ND	0.039	ND	0.09	ND	0.0041	ND	0.0055	ND	0.0081	ND	0.0003	ND	0.0106	ND	0.0064
178	ND	0.039	ND	0.09	ND	0.0041	ND	0.0055	ND	0.0081	ND	0.0003	ND	0.0141	ND	0.0084
175	ND	0.039	ND	0.09	ND	0.0041	ND	0.0055	ND	0.0081	ND	0.0003	ND	0.0141	ND	0.0084
187/182	ND	0.039	ND	0.09	ND	0.0041	ND	0.0055	ND	0.0081	ND	0.0003	ND	0.0141	ND	0.0084
183	ND	0.043	ND	0.1	ND	0.0043	ND	0.0057	ND	0.0084	ND	0.0003	ND	0.0141	ND	0.0084

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

Table 141 (cont'd): Concentration (ng/g) of PCB congeners and recovery (%) of surrogate standards in each tissue lab blank.

PCB Congeners	Lab Blank															
	TC-99-PCB-1		TC-99-PCB-2		TC-00-PCB-1		TC-00-PCB-2		TC-00-PCB-3		TC-00-PCB-4		TC-01-PCB-1		TC-01-PCB-2	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
185	ND	0.043	ND	0.1	ND	0.0043	ND	0.0057	ND	0.0084	ND	0.0003	ND	0.0141	ND	0.0084
174/181	ND	0.043	ND	0.1	ND	0.0043	ND	0.0057	ND	0.0084	ND	0.0003	ND	0.0141	ND	0.0084
177	ND	0.043	ND	0.1	ND	0.0043	ND	0.0057	ND	0.0084	ND	0.0003	ND	0.0146	ND	0.0088
171	ND	0.034	ND	0.077	ND	0.0039	ND	0.0049	ND	0.0078	ND	0.0002	ND	0.0146	ND	0.0088
172/192	ND	0.034	ND	0.077	ND	0.0039	ND	0.0049	ND	0.0078	ND	0.0002	ND	0.0146	ND	0.0088
180	ND	0.034	ND	0.077	ND	0.0039	ND	0.0049	ND	0.0078	ND	0.0002	ND	0.0146	ND	0.0088
193	ND	0.034	ND	0.077	ND	0.0039	ND	0.0049	ND	0.0078	ND	0.0002	ND	0.0146	ND	0.0088
191	ND	0.034	ND	0.077	ND	0.0039	ND	0.0049	ND	0.0078	ND	0.0002	ND	0.0146	ND	0.0088
170/190	ND	0.04	ND	0.091	ND	0.0047	ND	0.006	ND	0.0097	ND	0.0003	ND	0.0164	ND	0.0101
189	ND	0.04	ND	0.091	ND	0.0047	ND	0.006	ND	0.0097	ND	0.0003	ND	0.0115	ND	0.0075
201	ND	0.054	ND	0.13	ND	0.0055	ND	0.0051	ND	0.012	ND	0.0005	ND	0.0123	ND	0.0167
197	ND	0.054	ND	0.13	ND	0.0055	ND	0.0051	ND	0.012	ND	0.0005	ND	0.0123	ND	0.0167
198	ND	0.054	ND	0.13	ND	0.0055	ND	0.0051	ND	0.012	ND	0.0005	ND	0.0123	ND	0.0167
199	ND	0.054	ND	0.13	ND	0.0055	ND	0.0051	ND	0.012	ND	0.0005	ND	0.0123	ND	0.0167
196/203	ND	0.054	ND	0.13	ND	0.0055	ND	0.0051	ND	0.012	ND	0.0005	ND	0.0123	ND	0.0167
195	ND	0.054	ND	0.13	ND	0.0063	0.007*	0.0064	ND	0.014	ND	0.0007	ND	0.0123	ND	0.0167
194	ND	0.054	ND	0.13	ND	0.0063	ND	0.0064	ND	0.014	ND	0.0007	ND	0.0123	ND	0.0167
205	ND	0.054	ND	0.13	ND	0.0063	ND	0.0064	ND	0.014	ND	0.0007	ND	0.0125	ND	0.0175
208	ND	0.029	ND	0.085	ND	0.0067	ND	0.0044	ND	0.014	ND	0.0007	ND	0.0243	ND	0.0171
207	ND	0.029	ND	0.085	ND	0.0067	ND	0.0044	ND	0.014	ND	0.0007	ND	0.0243	ND	0.0171
206	ND	0.029	ND	0.085	ND	0.0067	ND	0.0044	ND	0.014	ND	0.0007	ND	0.0288	ND	0.0206
209	ND	0.065	ND	0.1	ND	0.0055	ND	0.0041	ND	0.015	0.0039*	0.0003	ND	0.0115	ND	0.0045
Surrogate Standards	% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery	
13C12-PCB 3	-	-	-	-	-	-	-	-	-	-	-	-	-	35	-	70
13C12-PCB 15	-	-	-	-	-	-	-	-	-	-	-	-	-	54	-	76
13C12-PCB 37	-	-	-	-	-	-	-	-	-	-	-	-	-	74	-	100
13C12-PCB 54	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	84
13C12-PCB 101	68	-	87	-	88	-	86	-	88	-	55	-	-	-	-	-
13C12-PCB 118	83	-	93	-	91	-	79	-	88	-	61	-	91	-	-	107
13C12-PCB 105	89	-	92	-	91	-	80	-	90	-	65	-	-	-	-	-
13C12-PCB 167	-	-	-	-	-	-	-	-	-	-	-	-	95	-	-	117
13C12-PCB 180	86	-	93	-	96	-	88	-	100	-	69	-	96	-	-	114
13C12-PCB 202	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-	114
13C12-PCB 206	-	-	-	-	-	-	-	-	-	-	-	-	98	-	-	116
13C12-PCB 209	54	-	81	-	110	-	89	-	120	-	71	-	101	-	-	118

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

6.2.4.3 Organochlorines

Table 142: Concentration (ng/g) of organochlorines and recovery (%) of surrogate standards in each tissue lab blank.

Organochlorine compounds	Lab Blank															
	TC-99-OC-1		TC-99-OC-2		TC-00-OC-1		TC-00-OC-2		TC-00-OC-3		TC-00-OC-4		TC-01-OC-1		TC-01-OC-2	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
1,2-Dichlorobenzene	NQ	-	NQ	-	0.033	0.0017	0.08*	0.0036	0.11	0.0051	0.096	0.0009	0.120	0.0637	0.0193	0.0092
1,3/1,4-Dichlorobenzene	NQ	-	NQ	-	0.18	0.0017	0.34	0.0032	0.24	0.0044	0.51	0.0017	0.203	0.0712	0.0909*	0.0111
1,2,3-Trichlorobenzene	ND	0.026	ND	0.13	0.004*	0.0025	0.007	0.0039	ND	0.0049	0.011	0.0015	ND	0.0695	ND	0.0109
1,2,4-Trichlorobenzene	0.14	0.027	ND	0.14	0.056	0.0023	0.097	0.0035	0.11	0.0047	0.15	0.0014	0.147	0.0700	0.113	0.0108
1,3,5-Trichlorobenzene	ND	0.027	ND	0.12	ND	0.0025	ND	0.0037	ND	0.0048	ND	0.0015	ND	0.0698	0.0184*	0.0107
1,2,3,4-Tetrachlorobenzene	ND	0.02	ND	0.087	0.003	0.0021	0.004*	0.0029	0.009*	0.0045	0.005	0.0026	ND	0.0345	ND	0.0099
1,2,3,5/1,2,4,5-Tetrachlorobenzene	0.025	0.02	ND	0.085	ND	0.002	ND	0.0026	ND	0.0041	ND	0.0024	ND	0.0335	ND	0.0097
Pentachlorobenzene	0.036*	0.033	ND	0.12	ND	0.0039	ND	0.0052	0.009*	0.0074	ND	0.004	ND	0.0483	ND	0.0170
Hexachlorobenzene	ND	0.044	ND	0.1	0.042	0.0057	0.058*	0.0048	0.076	0.011	0.095	0.0057	ND	0.0381	0.0289*	0.0094
Hexachlorobutadiene	ND	0.02	ND	0.087	ND	0.0017	ND	0.0021	ND	0.0033	0.001*	0.0003	not analyzed		ND	0.0099
Aldrin	ND	0.089	ND	0.17	ND	0.012	ND	0.012	ND	0.033	ND	0.016	ND	0.0827	ND	0.0382
Dieldrin	ND	0.0069	ND	0.046	ND	0.035	ND	0.023	ND	0.046	ND	0.018	ND	0.0294	ND	0.0160
Endrin	ND	0.035	ND	0.17	ND	0.058	ND	0.046	ND	0.069	ND	0.0046	ND	0.0538	ND	0.0170
Chlordane, alpha (cis)	ND	0.056	ND	0.098	ND	0.029	ND	0.024	ND	0.045	ND	0.012	ND	0.0158	ND	0.0228
Chlordane, gamma (trans)	ND	0.06	ND	0.1	ND	0.027	ND	0.022	ND	0.043	ND	0.011	ND	0.0129	ND	0.0187
Chlordane, oxy-	ND	0.23	ND	0.77	ND	0.046	ND	0.043	ND	0.09	ND	0.052	ND	0.0909	ND	0.0631
op'-DDD	ND	0.021	ND	0.052	ND	0.061	ND	0.07	ND	0.1	ND	0.05	ND	0.0172	ND	0.0119
pp'-DDD	ND	0.021	ND	0.053	ND	0.073	ND	0.083	ND	0.1	ND	0.046	ND	0.0189	ND	0.0126
op'-DDE	ND	0.06	ND	0.095	ND	0.081	ND	0.098	ND	0.1	ND	0.17	ND	0.0129	ND	0.0121
pp'-DDE	ND	0.053	ND	0.087	ND	0.11	ND	0.12	ND	0.1	ND	0.2	ND	0.0172	ND	0.0161
op'-DDT	ND	0.054	ND	0.062	ND	0.082	ND	0.1	ND	0.1	ND	0.046	ND	0.0194	ND	0.0130
pp'-DDT	ND	0.074	ND	0.074	ND	0.11	ND	0.14	ND	0.1	ND	0.054	ND	0.0248	ND	0.0154
Endosulphan (I), alpha-	ND	0.03	ND	0.05	ND	0.040	ND	0.030	ND	0.040	ND	0.0067	ND	0.0255	ND	0.0140
Endosulphan (II), beta-	ND	0.04	ND	0.07	ND	0.050	ND	0.050	ND	0.060	ND	0.13	ND	0.0454	ND	0.0200
Endosulphan Sulphate	ND	0.05	ND	0.058	ND	0.060	ND	0.060	ND	0.070	ND	0.011	ND	0.0636	ND	0.0200
HCH, alpha-	ND	0.12	ND	0.21	ND	0.017	ND	0.017	ND	0.04	ND	0.021	ND	0.0520	ND	0.0532
HCH, beta-	0.18*	0.16	ND	0.27	ND	0.029	ND	0.028	ND	0.048	ND	0.032	ND	0.0708	ND	0.0943
HCH, gamma-	ND	0.23	ND	0.38	ND	0.02	ND	0.019	ND	0.069	ND	0.025	ND	0.0617	ND	0.0636
HCH, delta-	ND	0.01	ND	0.069	ND	0.046	ND	0.035	ND	0.058	ND	0.0043	ND	0.135	ND	0.0420
Heptachlor	ND	0.49	ND	0.66	ND	0.021	ND	0.016	0.054*	0.041	ND	0.014	ND	0.108	ND	0.0830
Heptachlor Epoxide	ND	0.0069	ND	0.046	ND	0.035	ND	0.023	0.058	0.041	ND	0.041	ND	0.0242	ND	0.0173
Methoxychlor	ND	0.035	ND	0.092	ND	0.080	ND	0.10	ND	0.15	ND	0.027	ND	0.146	ND	0.110
Mirex	ND	0.041	ND	0.084	ND	0.0061	ND	0.0044	ND	0.019	ND	0.0037	ND	0.0363	ND	0.0244
Nonachlor, cis-	ND	0.032	ND	0.057	ND	0.033	ND	0.028	ND	0.086	ND	0.02	ND	0.0183	ND	0.0089
Nonachlor, trans-	ND	0.043	ND	0.078	ND	0.028	ND	0.024	ND	0.041	0.013*	0.011	ND	0.0162	ND	0.0078
Surrogate Standards	% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery		% Recovery	
13C6-1,4-Dichlorobenzene	-		-		84		53		105		92		44		40	
13C6-1,2,3-Trichlorobenzene	83		31		93		50		101		60		22		50	
13C6-1,2,3,4-Tetrachlorobenzene	69		46		75		50		92		52		23		50	
13C6-Pentachlorobenzene	62		54		83		53		88		50		26		52	
13C6-Hexachlorobenzene	66		69		82		66		95		49		38		63	
13C6-HCH, beta-	-		-		-		-		-		-		57		84	
13C6-HCH, gamma-	71		92		99		70		104		65		66		86	
13C10-Heptachlor	-		-		-		-		-		-		50		70	
13C12-Aldrin	-		-		-		-		-		-		56		81	
13C10-Chlordane, trans-	-		-		-		-		-		-		79		92	
13C10-Nonachlor, trans-	-		-		-		-		-		-		74		94	
13C12-pp'-DDE	48		91		92		83		89		59		82		98	
13C12-pp'-DDT	60		86		88		88		101		71		80		100	
13C12-PCB 101	68		87		97		97		104		66		-		-	
13C12-PCB 118	-		-		-		-		-		-		91		107	
d4-Endosulphan, alpha-	29		110		108		95		112		61		86		109	
d4-Endosulphan, beta-	-		-		-		-		-		-		84		103	

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

NQ = Not quantifiable.

Table 143: Concentration (ng/g) of toxaphene and chlorobornane compounds and recovery (%) of surrogate standard in each tissue lab blank.

	Lab Blank			
	TC-99-TOX-1		TC-99-TOX-2	
Toxaphene & Chlorobornanes	Conc.	DL	Conc.	DL
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane	ND	0.073	ND	0.45
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane	ND	0.039	ND	0.45
P3-GC/MS:Octachloro-Derivative	ND	0.028	ND	0.2
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane	ND	0.093	ND	0.7
P5-GC/MS:Nonachloro-Derivative	ND	0.032	ND	0.3
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.045	ND	0.55
P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	ND	0.01	ND	0.22
P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.079	ND	0.9
P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	ND	0.091	ND	1.1
P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	ND	0.14	ND	0.96
Total Toxaphene	ND	0.22	ND	2.3
Surrogate Standard	% Recovery		% Recovery	
13C-PCB 180	82		82	

ND = Not detected.

6.2.4.4 Carbamates, Herbicides, Organophosphates and Organonitrogens

Table 144: Concentration (mg/kg or µg/g) of pesticide compounds and recovery (%) of surrogate standards in each tissue lab blank.

	Lab Blank			
	TC-99-PEST (mg/kg)		TC-00-PEST (µg/g)	
Pesticide compounds	Conc.	DL	Conc.	DL (range)
All compounds (refer to Table 29)	ND	0.001	ND	(0.01 - 0.5)
Surrogate Standards	% Recovery		% Recovery	
2,4-DPA (SS)	-		86	
Triphenyl Phosphate (SS)	-		60	

ND = Not detected.

6.2.4.5 Polycyclic Aromatic Hydrocarbons

Table 145: Concentration (ng/g) of polycyclic aromatic hydrocarbons and recovery (%) of surrogate standards in each tissue lab blank.

Polycyclic aromatic hydrocarbons	Lab Blank							
	TC-00-PAH-1		TC-00-PAH-2		TC-00-PAH-3		TC-01-PAH	
	Conc.	DL	Conc.	DL	Conc.	DL	Conc.	DL
Naphthalene	0.44	0.0094	0.46	0.0033	0.29	0.0038	0.155	0.0277
Acenaphthylene	0.027*	0.0051	0.04	0.0081	0.018	0.0054	ND	0.0471
Acenaphthene	ND	0.03	0.013	0.0015	0.0087	0.0044	ND	0.0292
Fluorene	0.038	0.0084	0.019	0.012	0.012	0.0091	0.0793	0.0361
Phenanthrene	0.15	0.017	0.12	0.0022	0.09	0.0031	0.0803	0.0216
Anthracene	0.023	0.023	0.0073	0.0012	0.011	0.0046	ND	0.0234
Fluoranthene	0.057	0.0082	0.052	0.0034	0.036	0.0059	0.0252	0.0160
Pyrene	0.075	0.011	0.05	0.003	0.048	0.0051	0.0257	0.0155
Benz(a)anthracene	0.01*	0.0073	ND	0.0061	ND	0.0053	ND	0.0111
Chrysene	0.02	0.0047	0.012	0.0033	0.012	0.008	ND	0.0172
Benzo(a)fluoranthene	ND	0.0073	ND	0.01	ND	0.013	ND	0.0444
Benzo(a)pyrene	ND	0.0069	ND	0.011	ND	0.016	ND	0.0449
Benzo(e)pyrene	ND	0.0059	ND	0.0061	ND	0.012	ND	0.0490
Perylene	ND	0.03	ND	0.01	ND	0.016	ND	0.0424
Dibenz(ah)anthracene	ND	0.033	ND	0.019	ND	0.073	ND	0.0320
Benzo(ghi)perylene	ND	0.013	ND	0.0073	ND	0.014	ND	0.0325
Indeno(1,2,3-cd)pyrene	ND	0.019	ND	0.0086	ND	0.015	ND	0.0343
C1-Naphthalene	0.48	0.0056	0.33	0.01	0.22	0.012	ND	0.111
C2-Naphthalene	0.46	0.0045	0.11	0.015	0.19	0.019	0.121	0.0839
C3-Naphthalene	0.25	0.013	0.085	0.0099	0.087	0.01	ND	0.0611
C4-Naphthalene	ND	0.03	ND	0.0078	0.062	0.0059	ND	0.0754
C1-Phenanthrene/Anthracene	0.5	0.0078	0.086	0.0091	0.075	0.01	0.0652	0.0474
C2-Phenanthrene/Anthracene	0.35	0.0079	0.11	0.0066	0.12	0.0057	ND	0.0543
C3-Phenanthrene/Anthracene	0.27	0.0093	0.043	0.0036	0.027	0.0084	ND	0.0261
C4-Phenanthrene/Anthracene	0.14	0.0086	0.017	0.0081	0.031	0.0061	ND	0.0414
Retene	0.41	0.011	0.034	0.022	0.03	0.015	ND	0.0414
Dibenzothiophene	0.016	0.0061	ND	0.0047	ND	0.016	ND	0.0315
C1-Dibenzothiophenes	ND	0.026	0.044	0.011	ND	0.0087	ND	0.0265
C2-Dibenzothiophenes	ND	0.023	ND	0.0094	0.05	0.012	ND	0.0303
Surrogate Standards	% Recovery		% Recovery		% Recovery		% Recovery	
Naphthalene d-8	59		72		81		45	
Acenaphthylene d-8	62		76		84		44	
Phenanthrene d-10	65		80		94		66	
Fluoranthene d-10	82		97		97		81	
Benz[a]anthracene d-12	-		-		-		82	
Chrysene d-12	76		98		93		90	
Benzo[bk]fluoranthene d-12	70		90		77		80	
Benzo[a]pyrene d-12	100		130		110		52	
Perylene d-12	98		120		100		61	
Dibenz[ah]anthracene d-14	98		97		100		67	
Indeno[1,2,3-cd]pyrene d-12	-		-		-		65	
Benzo[ghi]perylene d-12	72		110		76		74	
2-Methylnaphthalene d-10	58		70		82		44	
2,6-Dimethylnaphthalene d-12	-		-		-		47	

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

6.2.4.6 Polybrominated Diphenyl Ethers

Table 146: Concentration (pg/g) of polybrominated diphenyl ethers and recovery (%) of surrogate standards in each tissue lab blank.

Polybrominated diphenyl ethers	Lab Blank TC-01-PBDE	
	Conc.	DL
2-MonoBDE (1)	ND	400
3-MonoBDE (2)	ND	400
4-MonoBDE (3)	ND	400
2,4-DiBDE (7)	ND	15.0
2,4'/3,3'-DiBDE (8/11)	ND	15.0
2,6-DiBDE (10)	ND	15.0
3,4-DiBDE (12)	ND	15.0
3,4'-DiBDE (13)	ND	15.0
4,4'-DiBDE (15)	ND	15.0
2,2',4-TriBDE (17)	ND	40.2
2,3',4-TriBDE (25)	ND	38.1
2,4,4'/2',3,4-TriBDE (28/33)	ND	36.3
2,4,6-TriBDE (30)	ND	38.1
2,4',6-TriBDE (32)	ND	38.1
3,3',4-TriBDE (35)	ND	38.1
3,4,4'-TriBDE (37)	ND	38.1
2,2',4,4'-TetraBDE (47)	18.3*	14.6
2,2',4,5'-TetraBDE (49)	ND	18.3
2,3',4,4'-TetraBDE (66)	ND	24.9
2,3',4',6-TetraBDE (71)	ND	18.3
2,4,4',6-TetraBDE (75)	ND	18.0
3,3',4,4'-TetraBDE (77)	ND	18.3
2,2',3,4,4'-PentaBDE (85)	ND	25.0
2,2',4,4',5-PentaBDE (99)	34.7	16.9
2,2',4,4',6-PentaBDE (100)	ND	10.7
2,3,3',4,4'-PentaBDE (105)	ND	16.0
2,3,4,5,6-PentaBDE (116)	ND	16.0
2,3',4,4',6-PentaBDE (119)	ND	16.0
3,3',4,4',5-PentaBDE (126)	ND	16.0
2,2',3,4,4',5'/2,3,4,4',5,6-HexaBDE (138/166)	ND	30.1
2,2',3,4,4',6'-HexaBDE (140)	ND	24.4
2,2',4,4',5,5'-HexaBDE (153)	ND	31.9
2,2',4,4',5,6'-HexaBDE (154)	ND	17.1
2,2',4,4',6,6'-HexaBDE (155)	ND	24.4
2,2',3,4,4',5,6-HeptaBDE (181)	ND	53.7
2,2',3,4,4',5',6-HeptaBDE (183)	ND	40.7
2,3,3',4,4',5,6-HeptaBDE (190)	ND	79.2
2,2',3,3',4,4',5,5',6-NonaBDE (206)	ND	51.5
2,2',3,3',4,4',5,6,6'-NonaBDE (207)	ND	51.5
2,2',3,3',4,5,5',6,6'-NonaBDE (208)	ND	51.5
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	637*	480
Surrogate Standards	% Recovery	
13C-2,4,4'-TriBDE	74.1	
13C-2,2',4,4'-TetraBDE	69.8	
13C-3,3',4,4'-TetraBDE	81.6	
13C-2,2',4,4',5-PentaBDE	84.2	
13C-2,2',4,4',6-PentaBDE	73.7	
13C-3,3',4,4',5-PentaBDE	77.2	
13C-2,2',3,4,4',6-HexaBDE	88.9	
13C-2,2',4,4',5,5'-HexaBDE	75.5	
13C-2,2',4,4',5,6'-HexaBDE	84.8	
13C-2,2',3,4,4',5,6-HeptaBDE	66.4	
13C-2,2',3,3',4,4',5,5',6,6'-DecaBDE	28.1	

* = Peak detected, but did not meet quantification criteria.

ND = Not detected.

6.2.5 Spiked Matrix

6.2.5.1 PCB Aroclors

Table 147: Recovery (%) of PCB aroclors and surrogate standards in each tissue spiked matrix.

	Spiked Matrix							
	TC-99-ARO-1	TC-99-ARO-2	TC-00-ARO-1	TC-00-ARO-2	TC-00-ARO-3	TC-00-ARO-4	TC-01-ARO-1	TC-01-ARO-2
PCB Aroclors	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Aroclor 1242	86	100	90	84	100	82		
Aroclor 1254	94	104	92	98	92	83	no Aroclor spike	
Aroclor 1260	100	96	110	110	110	88		
Surrogate Standards								
13C12-PCB 101	97	82	94	93	100	93	-	-
13C12-PCB 180	100	85	99	89	110	91	-	-
13C12-PCB 209	99	110	-	-	-	-	-	-

6.2.5.2 PCB Congeners

Table 148: Recovery (%) of PCB congeners and surrogate standards in each tissue spiked matrix.

	Spiked Matrix							
	TC-99-PCB-1	TC-99-PCB-2	TC-00-PCB-1	TC-00-PCB-2	TC-00-PCB-3	TC-00-PCB-4	TC-01-PCB-1	TC-01-PCB-2
PCB Congeners	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
1	-	-	-	-	-	-	84	81
3	-	-	-	-	-	-	106	87
4/10	-	-	-	-	-	-	49	88
15	-	-	-	-	-	-	108	96
18	74	86	98	120	110	75	-	-
19	-	-	-	-	-	-	44	74
31/28	77	92	89	100	100	90	-	-
52/73	93	103	97	100	100	84	-	-
54	-	-	-	-	-	-	105	88
95/93	100	103	94	72	70	68	-	-
104	-	-	-	-	-	-	80	82
105/127	-	-	-	-	-	-	112	88
106/118	106	108	100	110	100	90	108	88
114	-	-	-	-	-	-	106	84
123	-	-	-	-	-	-	108	89
138/163/164	116	103	100	120	100	96	-	-
155	-	-	-	-	-	-	93	79
156	-	-	-	-	-	-	112	84
157	-	-	-	-	-	-	110	83
167	-	-	-	-	-	-	106	84
169	-	-	-	-	-	-	110	82
170/190	-	-	-	-	-	-	106	87
180	83	77	100	110	100	91	106	87
182/187	-	-	-	-	-	-	104	85
188	-	-	-	-	-	-	100	83

Table 148 (cont'd): Recovery (%) of PCB congeners and surrogate standards in each tissue spiked matrix.

PCB Congeners	Spiked Matrix							
	TC-99-PCB-1 % Recovery	TC-99-PCB-2 % Recovery	TC-00-PCB-1 % Recovery	TC-00-PCB-2 % Recovery	TC-00-PCB-3 % Recovery	TC-00-PCB-4 % Recovery	TC-01-PCB-1 % Recovery	TC-01-PCB-2 % Recovery
189	-	-	-	-	-	-	104	83
196/203	66	70	100	110	110	87	-	-
202	-	-	-	-	-	-	107	86
205	-	-	-	-	-	-	111	90
206	-	-	-	-	-	-	105	85
208	-	-	-	-	-	-	103	83
209	-	-	-	-	-	-	108	82
Surrogate Standards								
13C12-PCB 3	-	-	-	-	-	-	24	73
13C12-PCB 15	-	-	-	-	-	-	56	76
13C12-PCB 37	-	-	-	-	-	-	89	94
13C12-PCB 54	-	-	-	-	-	-	54	83
13C12-PCB 101	97	82	94	93	110	93	-	-
13C12-PCB 118	100	85	91	86	110	89	101	98
13C12-PCB 105	100	84	91	89	110	93	-	-
13C12-PCB 167	-	-	-	-	-	-	102	101
13C12-PCB 180	100	100	99	89	120	91	104	98
13C12-PCB 202	-	-	-	-	-	-	102	95
13C12-PCB 206	-	-	-	-	-	-	103	97
13C12-PCB 209	99	110	110	94	130	92	99	97

6.2.5.3 Organochlorines

Table 149: Recovery (%) of organochlorine compounds and surrogate standards in each tissue spiked matrix.

Organochlorine compounds	Spiked Matrix							
	TC-99-OC-1 % Recovery	TC-99-OC-2 % Recovery	TC-00-OC-1 % Recovery	TC-00-OC-2 % Recovery	TC-00-OC-3 % Recovery	TC-00-OC-4 % Recovery	TC-01-OC-1 % Recovery	TC-01-OC-2 % Recovery
1,2-Dichlorobenzene	NQ	NQ	76	64	89	62	116	88
1,3/1,4-Dichlorobenzene	NQ	NQ	75	58	80	110	129	101
1,2,3-Trichlorobenzene	102	98	NQ	NQ	NQ	410	132	98
1,2,4-Trichlorobenzene	104	100	NQ	NQ	NQ	1000	150	119
1,3,5-Trichlorobenzene	102	96	94	89	89	87	82	81
1,2,3,4-Tetrachlorobenzene	105	102	110	100	120	120	107	96
1,2,3,5/1,2,4,5-Tetrachlorobenzene	103	101	94	89	94	90	102	85
Pentachlorobenzene	105	107	110	110	110	93	109	94
Hexachlorobenzene	100	100	110	110	98	97	102	92
Aldrin	78	112	98	100	100	83	102	87
Dieldrin	106	108	112	81	124	110	103	107
Endrin	155	209	111	71	118	86	123	91
Chlordane, alpha (cis)	96	109	110	120	98	100	105	93
Chlordane, gamma (trans)	94	108	86	96	94	84	105	90
Chlordane, oxy-	70	123	88	94	96	86	90	71

NQ = Not quantifiable.

Table 149 (cont'd): Recovery (%) of organochlorine compounds and surrogate standards in each tissue spiked matrix.

Organochlorine compounds	Spiked Matrix							
	TC-99-OC-1	TC-99-OC-2	TC-00-OC-1	TC-00-OC-2	TC-00-OC-3	TC-00-OC-4	TC-01-OC-1	TC-01-OC-2
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
op'-DDD	96	126	79	100	91	91	96	95
pp'-DDD	112	137	74	100	89	91	102	77
op'-DDE	86	109	110	110	110	93	107	89
pp'-DDE	95	116	100	100	100	97	104	89
op'-DDT	88	108	110	100	100	86	97	79
pp'-DDT	106	113	99	110	98	95	104	88
Endosulphan (I), alpha-	100	89	100	95	89	87	117	88
Endosulphan (II), beta-	-	-	113	120	109	89	103	85
Endosulphan Sulphate	-	-	112	116	114	83	75	62
HCH, alpha-	95	103	100	100	100	93	68	83
HCH, beta-	92	97	140	110	130	110	102	89
HCH, gamma-	95	98	110	97	100	87	88	83
HCH, delta-	-	-	106	102	106	82	93	62
Heptachlor	-	-	79	91	88	74	110	98
Heptachlor Epoxide	83	93	105	82	110	97	78	82
Methoxychlor	60	90	100	97	100	140	93	59
Mirex	96	120	100	100	100	110	105	85
Nonachlor, cis-	117	121	87	85	87	85	114	96
Nonachlor, trans-	85	113	89	94	87	85	106	88
Surrogate Standards								
13C6-1,4-Dichlorobenzene	-	-	74	103	100	87	24	33
13C6-1,2,3-Trichlorobenzene	80	37	83	72	93	58	16	41
13C6-1,2,3,4-Tetrachlorobenzene	64	53	75	66	90	51	16	45
13C6-Pentachlorobenzene	61	62	77	65	83	53	19	55
13C6-Hexachlorobenzene	68	71	80	74	96	56	33	67
13C6-HCH, beta-	-	-	-	-	-	-	76	84
13C6-HCH, gamma-	85	86	95	73	113	75	65	88
13C10-Heptachlor	-	-	-	-	-	-	57	65
13C12-Aldrin	-	-	-	-	-	-	63	76
13C10-Chlordane, trans-	-	-	-	-	-	-	95	86
13C10-Nonachlor, trans-	-	-	-	-	-	-	95	83
13C12-PCB 101	97	82	119	103	118	89	-	-
13C12-PCB 118	-	-	-	-	-	-	101	97
13C12-pp'-DDE	100	86	108	99	101	89	98	88
13C12-pp'-DDT	130	100	88	103	110	97	115	89
d4-Endosulphan, alpha-	64	110	107	102	117	110	81	87
d4-Endosulphan, beta-	-	-	-	-	-	-	92	105

Table 150: Recovery (%) of toxaphene and chlorobornane compounds and surrogate standard in each tissue spiked matrix.

	Spiked Matrix	
	TC-99-TOX-1	TC-99-TOX-2
Toxaphene & Chlorobornanes	% Recovery	% Recovery
P1-2-exo,3-endo,5-exo,6-endo,8,8,10,10-Octachlorobornane	69	125
P2-2,2,5-endo,6-exo,8,9,10-Heptachlorobornane	94	115
P3-GC/MS:Octachloro-Derivative	117	111
P4-2-exo,3-endo,5-exo,6-endo,8,8,9,10,10,-Nonachlorobornane	89	115
P5-GC/MS:Nonachloro-Derivative	77	97
P6-2,2,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	64	73
P8-2-exo,3-exo,5-endo,6-exo,8,8,9,10,10-Nonachlorobornane	77	80
P9-2,2,3-exo,5-endo,6-exo,8,8,9,10,10-Decachlorobornane	48	80
P10-2,2,5,5,6-exo,8,8,9,10,10-Decachlorobornane	62	79
P11-2,2,3-exo,5,5,8,8,9,10,10-Decachlorobornane	52	83
Total Toxaphene	81	100
Surrogate Standard		
13C-PCB 180	91	78

6.2.5.4 Carbamates, Herbicides, Organophosphates and Organonitrogens

Table 151: Recovery (%) of pesticide compounds and surrogate standards in each tissue spiked matrix.

	Spiked matrix	
	TC-99-PEST	TC-00-PEST
Pesticide compounds	% Recovery	% Recovery
2,4,5-T	-	94
2,4-D	-	99
Bromoxynil	-	94
Dicamba	-	98
2,4-DB	-	97
Dichloroprop	-	92
Dinoseb	-	55
MCPA	-	102
Mecoprop (MCP)	-	110
Picloram	-	64
Silvex (2,4,5-TP)	-	92
Azinphos methyl	21	-
Carbophenothion	12	86
Chlorpyrifos	-	93
Coumaphos	-	105
Demeton-O	-	28
Demeton-S	-	113
Diazinon	34	55
Dichlorvos/Naled	-	65
Dimethoate	16	103
Disulfoton	-	87
Ethion	-	91

Table 151 (cont'd): Recovery (%) of pesticide compounds and surrogate standards in each tissue spiked matrix.

Pesticide compounds	Spiked matrix	
	TC-99-ASL	TC-00-ASL
	% Recovery	% Recovery
Fenitrothion	16	42
Fensulfothion	13	132
Fenthion	15	88
Fonofos	14	106
Malathion	8	90
Methodathion	-	28
Mevinphos	20	94
Parathion	15	82
Parathion-methyl	18	66
Phorate	-	94
Phosalone	-	89
Phosmet	16	156
Sulfotep	-	57
Terbufos	-	77
Hexazinone	-	-
Metolachlor	-	78
Propanil	-	-
Trifluralin	-	70
Vinclozolin	-	77
Aldicarb	-	70
Aldicarb Sulfone	-	79
Aldicarb Sulfoxide	-	67
Carbaryl	-	14
Carbofuran	-	44
3-Hydroxycarbofuran	-	90
Methiocarb	-	-
Methomyl	-	64
Oxamyl	-	58
Propoxur	-	46
Atrazine	-	-
Simazine	-	-
Surrogate Standards		
2,4-DPA (SS)	-	100
Triphenyl Phosphate (SS)	-	64

6.2.5.5 Polycyclic Aromatic Hydrocarbons

Table 152: Recovery (%) of polycyclic aromatic hydrocarbons and surrogate standards in each tissue spiked matrix.

Polycyclic aromatic hydrocarbons	Spiked Matrix			
	TC-00-PAH-1	TC-00-PAH-2	TC-00-PAH-3	TC-01-PAH
	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene	100	100	100	117
Biphenyl	-	-	-	113
Acenaphthylene	92	87	93	114
Acenaphthene	99	95	100	142
Fluorene	87	88	87	87.2
Phenanthrene	110	100	100	112
Anthracene	110	110	100	93.4
Fluoranthene	98	95	96	107
Pyrene	100	97	100	108
Benz(a)anthracene	110	100	110	103
Chrysene	110	97	110	114
Benzo(b/j/k)fluoranthenes	120	120	120	106
Benzo(e)pyrene	74	72	74	104
Benzo(a)pyrene	92	86	90	102
Perylene	110	86	100	107
Dibenz(ah)anthracene	92	88	89	111
Indeno(1,2,3,cd)pyrene	98	95	92	103
Benzo(ghi)perylene	94	88	92	104
Dibenzothiophene	93	95	95	-
Retene	100	99	96	-
2-Methylnaphthalene	130	120	120	117
1-Methylnaphthalene	-	-	-	110
2,6-Dimethylnaphthalene	-	-	-	108
2,3,5-Trimethylnaphthalene	-	-	-	139
1-Methylphenanthrene	160	150	130	120
3,6-Dimethylphenanthrene	-	-	-	103
Surrogate Standards				
Naphthalene d-8	63	80	55	22
Acenaphthylene d-8	70	87	85	32
Phenanthrene d-10	79	86	98	50
Fluoranthene d-10	92	100	93	60
Benzo[a]anthracene d-12	-	-	-	58
Chrysene d-12	82	97	86	56
Benzo[bk]fluoranthene d-12	75	92	69	55
Benzo[a]pyrene d-12	120	140	110	56
Perylene d-12	100	130	100	53
Dibenz[ah]anthracene d-14	86	120	73	52
Indeno[1,2,3-cd]pyrene d-12	-	-	-	51
Benzo[ghi]perylene d-12	98	130	89	58
2-Methylnaphthalene d-10	64	79	70	27
2,6-Dimethylnaphthalene d-12	-	-	-	32

6.2.5.6 Polybrominated Diphenyl Ethers

Table 153: Recovery (%) of polybrominated diphenyl ethers and surrogate standards in each tissue spiked matrix.

Polybrominated diphenyl ethers	Spiked matrix TC-01-PBDE % Recovery
3-MonoBDE (2)	25.8
2,4'/3,3'-DiBDE (8/11)	71.2
2,2',4'-TriBDE (17)	84.2
2,4,4'/2',3,4'-TriBDE (28/33)	96.8
2,2',4,4'-TetraBDE (47)	100
2,3',4,4'-TetraBDE (66)	84.7
2,4,4',6'-TetraBDE (75)	92.1
2,2',3,4,4'-PentaBDE (85)	87.7
2,2',4,4',5'-PentaBDE (99)	96.1
2,2',4,4',6'-PentaBDE (100)	93.2
2,2',3,4,4',5'/2,3,4,4',5,6'-HexaBDE (138/166)	80.2
2,2',4,4',5,5'-HexaBDE (153)	99.0
2,2',4,4',5,6'-HexaBDE (154)	91.1
2,2',3,4,4',5',6'-HeptaBDE (183)	95.6
2,3,3',4,4',5,6'-HeptaBDE (190)	85.7
2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	91.1
Surrogate Standards	
13C-2,4,4'-TriBDE	94.9
13C-2,2',4,4'-TetraBDE	91.9
13C-3,3',4,4'-TetraBDE	89.7
13C-2,2',4,4',5'-PentaBDE	82.6
13C-2,2',4,4',6'-PentaBDE	77.6
13C-3,3',4,4',5'-PentaBDE	83.9
13C-2,2',3,4,4',6'-HexaBDE	78.8
13C-2,2',4,4',5,5'-HexaBDE	66.0
13C-2,2',4,4',5,6'-HexaBDE	73.9
13C-2,2',3,4,4',5',6'-HeptaBDE	62.6
13C-2,2',3,3',4,4',5,5',6,6'-DecaBDE	33.7

6.2.6 Surrogate Standard Recoveries

6.2.6.1 PCB Aroclors

Cutthroat Trout

Table 154: Recovery (%) of PCB aroclor surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standards	Fall 1999							
	Food % Recovery	Control % Recovery	Ref % Recovery	Ref (replicate) % Recovery	Ref (lab split) % Recovery	mid Ag % Recovery	d/s Ag % Recovery	d/s Ag (replicate) % Recovery
13C-PCB 101	94	69	76	80	81	65	84	82
13C-PCB 180	100	82	88	89	91	78	94	95
13C-PCB 209	100	88	90	92	94	82	95	97

Surrogate Standards	Spring 2000										
	Food % Recovery	Control % Recovery	Control (replicate) % Recovery	Ref % Recovery	Ref (lab split) % Recovery	mid Ag % Recovery	mid Ag (lab split) % Recovery	d/s Ag % Recovery	d/s Ag (lab split) % Recovery	d/s Urban % Recovery	
13C-PCB 101	92	94	96	89	96	96	82	97	95	96	
13C-PCB 180	87	93	92	100	98	93	87	99	110	93	

Surrogate Standards	Fall 2000						
	Food % Recovery	Control % Recovery	Control (replicate) % Recovery	Ref % Recovery	mid Ag % Recovery	d/s Ag % Recovery	d/s Urban % Recovery
13C-PCB 101	95	88	83	96	95	93	99
13C-PCB 180	99	92	91	96	91	95	93

Surrogate Standards	Fall 2001						
	Food % Recovery	Control % Recovery	Ref % Recovery	mid Ag % Recovery	d/s Ag % Recovery	d/s Ag (lab split) % Recovery	d/s Urban % Recovery
13C12-PCB 3	97	49	41	55	53	53	50
13C12-PCB 15	89	72	67	78	73	78	74
13C12-PCB 37	104	89	89	93	94	97	99
13C12-PCB 54	92	75	69	80	73	81	72
13C12-PCB 118	101	96	95	106	103	103	106
13C12-PCB 167	107	98	95	105	104	103	107
13C12-PCB 180	107	99	95	107	105	106	107
13C12-PCB 202	102	101	97	109	107	107	106
13C12-PCB 206	104	98	97	111	106	108	102
13C12-PCB 209	112	100	96	110	106	109	101

Crayfish

Table 155: Recovery (%) of PCB aroclor surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Fall 1999				Spring 2000				
	Control % Recovery	Ref % Recovery	mid Ag % Recovery	d/s Ag % Recovery	Control % Recovery	Ref % Recovery	mid Ag % Recovery	d/s Ag % Recovery	d/s Urban % Recovery
13C-PCB 101	89	92	74	79	100	90	92	75	98
13C-PCB 180	92	95	90	85	100	93	91	87	100
13C-PCB 209	92	95	92	93	-	-	-	-	-

Table 155 (cont'd): Recovery (%) of PCB aroclor surrogate standards in each composited crayfish muscle tissue sample.

Surrogate Standards	Fall 2000					Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 3	-	-	-	-	-	50	47	33	65	43
13C12-PCB 15	-	-	-	-	-	72	71	55	86	64
13C12-PCB 37	-	-	-	-	-	98	93	79	103	90
13C12-PCB 54	-	-	-	-	-	70	68	54	82	63
13C-PCB 101	95	94	97	100	97	-	-	-	-	-
13C12-PCB 118	-	-	-	-	-	106	95	97	109	98
13C12-PCB 167	-	-	-	-	-	107	97	99	107	99
13C12-PCB 180	100	97	100	110	100	109	98	100	110	99
13C12-PCB 202	-	-	-	-	-	107	96	99	109	97
13C12-PCB 206	-	-	-	-	-	107	98	99	106	97
13C12-PCB 209	-	-	-	-	-	106	98	97	105	97

Crayfish Hepatopancreas

Table 156: Recovery (%) of PCB aroclor surrogate standards in each composite crayfish hepatopancreas sample.

Surrogate Standards	Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 3	51	76	61	68	64
13C12-PCB 15	67	94	89	83	86
13C12-PCB 37	82	110	106	97	102
13C12-PCB 54	64	90	85	80	81
13C12-PCB 118	89	114	108	104	108
13C12-PCB 167	89	114	108	104	111
13C12-PCB 180	90	114	118	107	113
13C12-PCB 202	89	112	108	105	110
13C12-PCB 206	87	113	110	104	112
13C12-PCB 209	84	110	105	100	109

6.2.6.2 PCB Congeners

Cutthroat Trout

Table 157: Recovery (%) of PCB congener surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standards	Fall 1999							
	Food	Control	Ref	Ref (replicate)	Ref (lab split)	mid Ag	d/s Ag	d/s Ag (replicate)
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C-PCB 101	94	69	76	80	81	65	84	82
13C-PCB 118	100	82	88	89	91	78	94	95
13C-PCB 105	100	88	90	92	94	82	95	97
13C-PCB 180	99	86	95	100	98	79	97	98
13C-PCB 209	88	74	94	90	85	52	85	67

Table 157 (cont'd): Recovery (%) of PCB congener surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standards	Spring 2000									
	Food	Control	Control (replicate)	Ref	Ref (lab split)	mid Ag	mid Ag (lab split)	d/s Ag	d/s Ag (lab split)	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C-PCB 101	92	94	96	89	96	96	82	97	95	96
13C-PCB 118	85	89	88	89	91	83	80	91	93	90
13C-PCB 105	81	87	92	89	89	88	84	91	96	88
13C-PCB 180	87	93	92	100	98	93	87	99	110	93
13C-PCB 209	100	120	99	120	120	97	92	120	130	120

Surrogate Standards	Fall 2000						
	Food	Control	Control (replicate)	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C-PCB 101	95	88	83	96	95	93	99
13C-PCB 118	92	85	78	90	91	91	82
13C-PCB 105	90	90	86	87	90	88	91
13C-PCB 180	99	92	91	96	91	95	93
13C-PCB 209	110	100	90	120	110	110	99

Surrogate Standards	Fall 2001						
	Food	Control	Ref	mid Ag	d/s Ag	d/s Ag (lab split)	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 3	97	49	41	55	53	53	50
13C12-PCB 15	89	72	67	78	73	78	74
13C12-PCB 37	104	89	89	93	94	97	99
13C12-PCB 54	92	75	69	80	73	81	72
13C12-PCB 118	101	96	95	106	103	103	106
13C12-PCB 167	107	98	95	105	104	103	107
13C12-PCB 180	107	99	95	107	105	106	107
13C12-PCB 202	102	101	97	109	107	107	106
13C12-PCB 206	104	98	97	111	106	108	102
13C12-PCB 209	112	100	96	110	106	109	101

Crayfish

Table 158: Recovery (%) of PCB congener surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Fall 1999				Spring 2000				
	Control	Ref	mid Ag	d/s Ag	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C-PCB 101	89	92	74	79	100	90	92	75	98
13C-PCB 118	92	95	90	85	95	87	84	71	94
13C-PCB 105	92	95	92	93	95	85	87	76	95
13C-PCB 180	92	97	110	100	100	93	91	87	100
13C-PCB 209	83	86	110	97	130	94	94	78	120

Table 158 (cont'd): Recovery (%) of PCB congener surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Fall 2000					Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 3	-	-	-	-	-	50	47	33	65	43
13C12-PCB 15	-	-	-	-	-	72	71	55	86	64
13C12-PCB 37	-	-	-	-	-	98	93	79	103	90
13C12-PCB 54	-	-	-	-	-	70	68	54	82	63
13C-PCB 101	95	94	97	100	97	-	-	-	-	-
13C12-PCB 118	90	91	94	94	93	106	95	97	109	98
13C-PCB 105	92	91	93	94	95	-	-	-	-	-
13C12-PCB 167	-	-	-	-	-	107	97	99	107	99
13C12-PCB 180	100	97	100	110	100	109	98	100	110	99
13C12-PCB 202	-	-	-	-	-	107	96	99	109	97
13C12-PCB 206	-	-	-	-	-	107	98	99	106	97
13C12-PCB 209	110	120	120	120	120	106	98	97	105	97

Crayfish Hepatopancreas

Table 159: Recovery (%) of PCB congener surrogate standards in each composite crayfish hepatopancreas sample.

Surrogate Standards	Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C12-PCB 3	51	76	61	68	64
13C12-PCB 15	67	94	89	83	86
13C12-PCB 37	82	110	106	97	102
13C12-PCB 54	64	90	85	80	81
13C12-PCB 118	89	114	108	104	108
13C12-PCB 167	89	114	108	104	111
13C12-PCB 180	90	114	118	107	113
13C12-PCB 202	89	112	108	105	110
13C12-PCB 206	87	113	110	104	112
13C12-PCB 209	84	110	105	100	109

6.2.6.3 Organochlorines

Cutthroat Trout

Table 160: Recovery (%) of organochlorine surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standards	Fall 1999							
	Food	Control	Ref	Ref (replicate)	Ref (lab split)	mid Ag	d/s Ag	d/s Ag (replicate)
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C6-1,2,3-Trichlorobenzene	87	84	55	83	91	85	92	74
13C6-1,2,3,4-Tetrachlorobenzene	66	64	49	66	69	67	71	63
13C6-Pentachlorobenzene	61	57	49	60	63	60	64	59
13C6-Hexachlorobenzene	72	62	56	65	64	65	68	64
13C6-HCH, gamma-	87	63	65	78	71	61	77	78
13C12-pp'-DDE	96	57	69	74	70	50	80	65
13C12-pp'-DDT	100	70	86	85	80	55	91	76
13C12-PCB 101	94	69	76	80	81	65	84	82
d4-Endosulphan, alpha-	41 (54)	41	56	51	55	34	57	43

(% Recovery from re-injection data)

Surrogate Standards	Spring 2000									
	Food	Control	Control (replicate)	Ref	Ref (lab split)	mid Ag	mid Ag (lab split)	d/s Ag	d/s Ag (lab split)	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C6-1,4-Dichlorobenzene	40	70	96	58	73	82	53	134	105	61
13C6-1,2,3-Trichlorobenzene	44	75	84	66	83	59	64	121	99	83
13C6-1,2,3,4-Tetrachlorobenzene	39	61	75	62	60	51	56	107	96	78
13C6-Pentachlorobenzene	47	71	79	67	74	68	58	103	92	84
13C6-Hexachlorobenzene	55	69	89	74	77	79	60	109	105	91
13C6-HCH, gamma-	63	92	86	92	106	73	58	110	113	104
13C12-pp'-DDE	109	91	94	95	68	80	58	98	98	102
13C12-pp'-DDT	85	66	90	96	74	80	81	98	102	66
13C12-PCB 101	97	107	104	102	90	98	84	116	113	118
d4-Endosulphan, alpha-	131	127	105	121	119	104	106	108	110	115

Surrogate Standards	Fall 2000						
	Food	Control	Control (replicate)	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C6-1,4-Dichlorobenzene	60	102	89	67	59	70	36
13C6-1,2,3-Trichlorobenzene	71	80	72	78	83	70	32
13C6-1,2,3,4-Tetrachlorobenzene	66	74	66	55	46	60	27
13C6-Pentachlorobenzene	71	76	71	80	79	63	44
13C6-Hexachlorobenzene	87	76	67	86	85	74	60
13C6-HCH, gamma-	92	83	73	104	107	67	62
13C12-pp'-DDE	106	101	86	106	109	86	79
13C12-pp'-DDT	88	95	87	96	104	78	82
13C12-PCB 101	104	111	91	104	114	88	89
d4-Endosulphan, alpha-	109	102	99	104	109	109	111

Table 160 (cont'd): Recovery (%) of organochlorine surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standards	Fall 2001						
	Food % Recovery	Control % Recovery	Ref % Recovery	mid Ag % Recovery	d/s Ag % Recovery	d/s Ag (lab split) % Recovery	d/s Urban % Recovery
13C6-1,4-Dichlorobenzene	46.9	43.4	55.0	50.1	66.5	61.0	33.5
13C6-1,2,3-Trichlorobenzene	65.6	25.9	28.9	27.8	42.9	33.7	27.9
13C6-1,2,3,4-Tetrachlorobenzene	71.5	30.7	29.9	32.8	42.0	36.8	34.7
13C6-Pentachlorobenzene	76.9	41.2	34.3	42.2	47.5	45.5	41.7
13C6-Hexachlorobenzene	83.8	59.5	53.1	59.2	62.4	65.2	59.0
13C6-HCH, beta-	83.7	67.4	61.8	61.3	32.5	75.4	67.0
13C6-HCH, gamma-	NQ	79.1	73.6	83.2	67.5	83.0	77.3
13C10-Heptachlor	NQ	65.8	61.4	63.9	67.2	71.8	67.3
13C12-Aldrin	NQ	81.0	73.1	82.2	90.1	85.1	76.5
13C10-Chlordane, trans-	87.3	93.3	87.6	97.1	90.9	99.0	95.5
13C10-Nonachlor, trans-	93.5	87.0	84.0	91.4	89.9	92.2	92.7
13C12-pp'-DDE	96.6	94.6	90.6	97.1	98.8	99.4	102
13C12-pp'-DDT	116	80.0	86.1	87.6	90.7	89.9	99.7
13C12-PCB 118	101	96.5	94.9	106	103	103	106
d4-Endosulphan, alpha-	103	87.8	73.9	88.4	98.6	83.0	88.8
d4-Endosulphan, beta-	102	99.5	77.2	88.6	92.9	89.4	106

Table 161: Recovery (%) of toxaphene surrogate standard in each composite cutthroat trout muscle tissue sample.

Surrogate Standard	Fall 1999							
	Food % Recovery	Control % Recovery	Ref % Recovery	Ref (replicate) % Recovery	Ref (lab split) % Recovery	mid Ag % Recovery	d/s Ag % Recovery	d/s Ag (replicate) % Recovery
13C-PCB 180	82	74	88	73	88	73	84	75

Crayfish

Table 162: Recovery (%) of organochlorine surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Fall 1999				Spring 2000				
	Control % Recovery	Ref % Recovery	mid Ag % Recovery	d/s Ag % Recovery	Control % Recovery	Ref % Recovery	mid Ag % Recovery	d/s Ag % Recovery	d/s Urban % Recovery
13C6-1,4-Dichlorobenzene	-	-	-	-	131	101	132	104	104
13C6-1,2,3-Trichlorobenzene	46	35	25	28	125	89	103	63	93
13C6-1,2,3,4-Tetrachlorobenzene	71	51	40	41	118	76	92	56	91
13C6-Pentachlorobenzene	77	58	47	48	104	82	91	53	86
13C6-Hexachlorobenzene	82	68	56	58	106	89	89	53	90
13C6-HCH, gamma-	99	86	77	72	119	80	91	73	109
13C12-pp'-DDE	91	94	87	81	105	95	85	65	99
13C12-pp'-DDT	86	90	91	86	103	88	76	72	103
13C12-PCB 101	89	92	74	79	130	106	98	94	122
d4-Endosulphan, alpha-	110	110	110	100 (120)	117	103	106	49	118

(% Recovery from re-injection data)

Table 162 (cont'd): Recovery (%) of organochlorine surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Fall 2000					Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C6-1,4-Dichlorobenzene	112	77	116	129	118	28	29	26	55	45
13C6-1,2,3-Trichlorobenzene	115	82	108	123	107	24	23	17	44	34
13C6-1,2,3,4-Tetrachlorobenzene	106	76	101	116	110	32	30	20	49	35
13C6-Pentachlorobenzene	95	71	92	105	101	39	38	26	56	38
13C6-Hexachlorobenzene	96	75	98	110	111	56	54	41	72	50
13C6-HCH, beta-	-	-	-	-	-	69	61	50	77	65
13C6-HCH, gamma-	118	105	118	121	120	81	80	66	94	76
13C10-Heptachlor	-	-	-	-	-	67	67	53	81	63
13C12-Aldrin	-	-	-	-	-	73	72	57	87	69
13C10-Chlordane, trans-	-	-	-	-	-	96	90	84	102	90
13C10-Nonachlor, trans-	-	-	-	-	-	93	85	81	96	87
13C12-pp'-DDE	90	82	105	116	96	101	92	90	103	93
13C12-pp'-DDT	93	95	99	105	99	105	97	96	105	94
13C12-PCB 101	105	105	119	128	124	-	-	-	-	-
13C12-PCB 118	-	-	-	-	-	106	95	97	109	98
d4-Endosulphan, alpha-	113	118	96	110	115	97	81	76	90	87
d4-Endosulphan, beta-	-	-	-	-	-	91	89	79	110	101

Table 163: Recovery (%) of toxaphene surrogate standard in each composite crayfish muscle tissue sample.

Surrogate Standard	Fall 1999			
	Control	Ref	mid Ag	d/s Ag
	% Recovery	% Recovery	% Recovery	% Recovery
13C-PCB 180	96	95	86	74

Crayfish Hepatopancreas

Table 164: Recovery (%) of organochlorine surrogate standards in each composite crayfish hepatopancreas sample.

Surrogate Standards	Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C6-1,4-Dichlorobenzene	75	83	52	71	61
13C6-1,2,3-Trichlorobenzene	44	58	35	49	40
13C6-1,2,3,4-Tetrachlorobenzene	43	63	41	54	45
13C6-Pentachlorobenzene	44	67	49	59	53
13C6-Hexachlorobenzene	53	79	70	71	70
13C6-HCH, beta-	66	78	89	69	68
13C6-HCH, gamma-	77	100	100	91	91
13C10-Heptachlor	63	91	89	83	82
13C12-Aldrin	68	95	92	86	87
13C10-Chlordane, trans-	83	106	101	96	100
13C10-Nonachlor, trans-	81	104	99	94	98
13C12-pp'-DDE	85	110	105	100	105
13C12-pp'-DDT	88	117	116	110	116
13C12-PCB 118	89	114	108	104	108
d4-Endosulphan, alpha-	87	110	112	110	98
d4-Endosulphan, beta-	99	115	126	115	100

6.2.6.4 Carbamates, Herbicides, Organophosphates and Organonitrogens

Cutthroat Trout

Table 165: Recovery (%) of pesticide surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standard	Fall 1999						
	Food	Control	Ref	Ref (replicate)	mid Ag	d/s Ag	d/s Ag (replicate)
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Triphenyl Phosphate (SS)	50.8	12	14.2	6.64	1.16	2.39	69

Surrogate Standards	Spring 2000								
	Food	Control	Control (replicate)	Control (lab split)	Ref	mid Ag	d/s Ag	d/s Ag (lab split)	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
2,4-DPA (SS)	61	156	100	139	60	57	40	26	57
Triphenyl Phosphate (SS)	137	77	78	23	63	118	40	-	139

Surrogate Standards	Fall 2000							
	Food	Control	Control (replicate)	Ref	mid Ag	d/s Ag	d/s Urban	d/s Urban (lab split)
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
2,4-DPA (SS)	48	72	107	95	91	98	77	100
Triphenyl Phosphate (SS)	96	68	64	114	84	92	73	66

Crayfish

Table 166: Recovery (%) of pesticide surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Fall 1999				Spring 2000				
	Control	Ref	mid Ag	d/s Ag	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
2,4-DPA (SS)	-	-	-	-	80	106	107	85	91
Triphenyl Phosphate (SS)	60.5	81.7	51.5	82.3	89	81	84	92	29

Surrogate Standards	Fall 2000				
	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
2,4-DPA (SS)	26	74	57	24	29
Triphenyl Phosphate (SS)	91	81	109	92	190

6.2.6.5 Polycyclic Aromatic Hydrocarbons

Cutthroat Trout

Table 167: Recovery (%) of polycyclic aromatic hydrocarbon surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standards	Spring 2000									
	Food	Control	Control (replicate)	Ref	Ref (lab split)	mid Ag	mid Ag (lab split)	d/s Ag	d/s Ag (lab split)	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene d-8	47	35	78	42	55	78	69	69	61	39
Acenaphthylene d-8	55	44	93	54	64	99	84	87	88	50
Phenanthrene d-10	67	62	91	74	74	90	83	91	90	60
Fluoranthene d-10	71	65	96	87	83	100	92	91	96	64
Chrysene d-12	64	59	84	82	66	94	79	81	92	52
Benzo[bk]fluoranthene d-12	58	51	86	69	64	95	81	78	84	52
Benzo[a]pyrene d-12	95	73	130	110	93	140	120	120	120	76
Perylene d-12	91	67	120	97	86	130	120	110	120	73
Dibenz[ah]anthracene d-14	75	50	100	82	69	120	93	83	93	61
Benzo[ghi]perylene d-12	90	58	110	92	80	130	100	95	100	69
2-Methylnaphthalene d-10	49	37	81	44	57	87	72	75	74	41

Surrogate Standards	Fall 2000						
	Food	Control	Control (replicate)	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene d-8	69	76	77	49	42	70	58
Acenaphthylene d-8	79	91	88	51	44	69	75
Phenanthrene d-10	72	86	97	64	58	65	80
Fluoranthene d-10	78	99	99	74	68	70	81
Chrysene d-12	71	88	86	56	57	59	72
Benzo[bk]fluoranthene d-12	66	87	86	58	56	52	68
Benzo[a]pyrene d-12	150	130	130	81	80	76	100
Perylene d-12	100	120	130	69	68	75	97
Dibenz[ah]anthracene d-14	99	110	97	64	55	45	68
Benzo[ghi]perylene d-12	110	120	110	72	64	56	82
2-Methylnaphthalene d-10	71	81	78	48	42	68	64

Table 167 (cont'd): Recovery (%) of polycyclic aromatic hydrocarbon surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standards	Fall 2001						
	Food	Control	Control (lab split)	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene d-8	28	22	58	66	41	27	27
Acenaphthylene d-8	60	27	62	67	54	34	29
Phenanthrene d-10	74	45	78	84	72	50	39
Fluoranthene d-10	78	53	73	80	70	58	43
Benz[a]anthracene d-12	55	49	60	71	61	54	38
Chrysene d-12	57	48	63	75	59	53	NQ
Benzo[bk]fluoranthene d-12	65	49	64	71	58	52	37
Benzo[a]pyrene d-12	61	49	61	69	60	51	38
Perylene d-12	NQ	47	NQ	73	57	48	38
Dibenz[ah]anthracene d-14	49	45	64	76	55	42	32
Indeno[1,2,3-cd]pyrene d-12	47	48	66	73	60	45	30
Benzo[ghi]perylene d-12	54	52	63	72	61	50	36
2-Methylnaphthalene d-10	52	25	68	73	48	33	31
2,6-Dimethylnaphthalene d-12	58	27	70	77	54	34	32

NQ = Not quantifiable.

Crayfish

Table 168: Recovery (%) of polycyclic aromatic hydrocarbon surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Spring 2000					Fall 2000				
	Control	Ref	mid Ag	d/s Ag	d/s Urban	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene d-8	83	67	54	48	76	82	90	70	87	61
Acenaphthylene d-8	90	82	78	56	85	87	99	80	92	71
Phenanthrene d-10	88	85	83	73	87	92	98	86	89	75
Fluoranthene d-10	96	98	99	91	97	94	100	89	95	78
Chrysene d-12	92	99	95	87	91	83	99	84	89	67
Benzo[bk]fluoranthene d-12	84	95	92	80	88	73	89	68	79	54
Benzo[a]pyrene d-12	120	140	130	120	130	100	130	100	120	83
Perylene d-12	120	140	130	120	130	100	120	96	110	78
Dibenz[ah]anthracene d-14	94	110	120	100	110	84	120	68	82	62
Benzo[ghi]perylene d-12	110	120	130	110	120	100	130	90	110	75
2-Methylnaphthalene d-10	83	72	60	48	76	80	92	74	87	63

Table 168 (cont'd): Recovery (%) of polycyclic aromatic hydrocarbon surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene d-8	35	33	37	53	41
Acenaphthylene d-8	39	33	41	57	48
Phenanthrene d-10	55	43	44	62	51
Fluoranthene d-10	58	51	52	68	56
Benz[a]anthracene d-12	54	48	53	62	54
Chrysene d-12	52	48	53	60	54
Benzo[bk]fluoranthene d-12	50	42	52	59	54
Benzo[a]pyrene d-12	52	44	50	61	52
Perylene d-12	48	40	46	52	47
Dibenz[ah]anthracene d-14	54	38	45	51	43
Indeno[1,2,3-cd]pyrene d-12	54	40	45	58	47
Benzo[ghi]perylene d-12	55	44	52	61	53
2-Methylnaphthalene d-10	39	35	40	57	44
2,6-Dimethylnaphthalene d-12	43	36	39	55	44

Crayfish Hepatopancreas

Table 169: Recovery (%) of polycyclic aromatic hydrocarbon surrogate standards in each composite crayfish hepatopancreas sample.

Surrogate Standards	Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Naphthalene d-8	34	32	28	22	30
Acenaphthylene d-8	33	37	36	22	36
Phenanthrene d-10	33	51	55	29	50
Fluoranthene d-10	33	58	62	31	54
Benz[a]anthracene d-12	29	51	53	25	47
Chrysene d-12	31	50	53	25	46
Benzo[bk]fluoranthene d-12	30	51	49	25	44
Benzo[a]pyrene d-12	31	51	51	24	45
Perylene d-12	NQ	NQ	NQ	NQ	NQ
Dibenz[ah]anthracene d-14	33	42	41	21	34
Indeno[1,2,3-cd]pyrene d-12	33	48	45	21	36
Benzo[ghi]perylene d-12	30	49	48	25	39
2-Methylnaphthalene d-10	35	34	31	23	32
2,6-Dimethylnaphthalene d-12	34	34	35	23	35

NQ = Not quantifiable.

6.2.6.6 Polybrominated Diphenyl Ethers

Cutthroat Trout

Table 170: Recovery (%) of polybrominated diphenyl ether surrogate standards in each composite cutthroat trout muscle tissue sample.

Surrogate Standards	Fall 2001						
	Food	Control	Ref	mid Ag	d/s Ag	d/s Ag (lab split)	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C-2,4,4'-TriBDE (28)	68.3	102	87.7	92.5	101	91.1	88.1
13C-2,2',4,4'-TetraBDE (47)	55.8	89.1	78.9	81.7	81.5	84.4	76.1
13C-3,3',4,4'-TetraBDE (77)	60.7	94.4	81.4	93.3	89.8	85.5	80.1
13C-2,2',4,4',5-PentaBDE (99)	61.1	85.3	77.2	78.5	80.1	71.8	76.2
13C-2,2',4,4',6-PentaBDE (100)	62.0	74.6	72.0	76.1	75.7	74.4	75.0
13C-3,3',4,4',5-PentaBDE (126)	61.5	82.5	71.9	74.8	77.1	72.2	75.0
13C-2,2',3,4,4',6-HexaBDE (139)	49.6	76.0	68.6	60.6	75.6	68.4	76.2
13C-2,2',4,4',5,5'-HexaBDE (153)	51.7	68.2	62.1	55.6	70.1	57.1	65.1
13C-2,2',4,4',5,6'-HexaBDE (154)	49.9	73.9	63.8	59.3	72.9	64.6	70.9
13C-2,2',3,4,4',5',6-HeptaBDE (183)	44.8	55.9	56.2	55.4	66.3	57.5	61.5
13C-2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	29.5	10.5	27.4	23.3	26.4	24.3	21.7

Crayfish

Table 171: Recovery (%) of polybrominated diphenyl ether surrogate standards in each composite crayfish muscle tissue sample.

Surrogate Standards	Fall 2001				
	Control	Ref	mid Ag	d/s Ag	d/s Urban
	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
13C-2,4,4'-TriBDE (28)	81.8	79.9	73.3	91.3	73.2
13C-2,2',4,4'-TetraBDE (47)	74.7	69.7	62.3	74.9	55.8
13C-3,3',4,4'-TetraBDE (77)	79.0	80.0	68.5	83.1	59.7
13C-2,2',4,4',5-PentaBDE (99)	74.6	74.3	70.9	67.9	64.1
13C-2,2',4,4',6-PentaBDE (100)	71.2	66.9	68.9	71.9	65.7
13C-3,3',4,4',5-PentaBDE (126)	75.3	77.6	66.2	79.8	65.0
13C-2,2',3,4,4',6-HexaBDE (139)	72.0	76.1	53.9	61.0	58.7
13C-2,2',4,4',5,5'-HexaBDE (153)	67.9	69.7	54.0	62.8	58.7
13C-2,2',4,4',5,6'-HexaBDE (154)	70.4	69.0	55.7	61.7	59.7
13C-2,2',3,4,4',5',6-HeptaBDE (183)	64.9	68.1	44.4	58.7	51.3
13C-2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	29.6	30.1	24.6	21.7	20.6

Crayfish Hepatopancreas

Table 172: Recovery (%) of polybrominated diphenyl ether surrogate standards in each composite crayfish hepatopancreas sample.

Surrogate Standards	Control % Recovery	Ref % Recovery	Fall 2001		
			mid Ag % Recovery	d/s Ag % Recovery	d/s Urban % Recovery
13C-2,4,4'-TriBDE (28)	79.7	105	95.3	88.5	89.1
13C-2,2',4,4'-TetraBDE (47)	68.3	87.6	85.4	76.5	73.1
13C-3,3',4,4'-TetraBDE (77)	74.8	93.8	94.4	79.3	80.5
13C-2,2',4,4',5-PentaBDE (99)	67.7	97.1	83.5	71.2	82.2
13C-2,2',4,4',6-PentaBDE (100)	71.8	88.3	83.7	74.2	74.0
13C-3,3',4,4',5-PentaBDE (126)	65.3	85.7	91.5	69.1	75.3
13C-2,2',3,4,4',6-HexaBDE (139)	53.6	72.3	71.3	57.4	72.0
13C-2,2',4,4',5,5'-HexaBDE (153)	59.6	73.3	73.4	60.7	71.0
13C-2,2',4,4',5,6'-HexaBDE (154)	61.6	80.2	71.4	60.9	65.8
13C-2,2',3,4,4',5',6-HeptaBDE (183)	42.0	72.8	65.2	50.3	56.9
13C-2,2',3,3',4,4',5,5',6,6'-DecaBDE (209)	21.9	29.7	25.0	23.2	25.6

Appendix A: Canadian Water Quality Guidelines and British Columbia Working Criteria for Water Uses and the Protection of Freshwater Biota

Parameter	Fresh Water Aquatic Life		Recreation		Irrigation (all soils)		Comments
	CWQG	BC Working Criteria	CWQG	BC Working Criteria	CWQG	BC Working Criteria	
Water Chemistry (mg/L)							
Dissolved Oxygen	6.5	8	-	-	-	-	For no production impairment of other life stages (aquatic life-BC criteria).
Major Ions (units mg/L unless otherwise stated)							
Alkalinity	-	<10 (high) 10-20 (moderate) >20 (low)	-	-	-	-	(sensitivity to acid inputs (aquatic life-BC criteria))
Conductivity (uS/cm)	-	-	-	-	-	700 - 5000	Depending on crop and soil (irrigation-BC criteria).
pH (relative units)	6.5 - 9.0	-	5.0 - 9.0	-	-	-	-
Calcium	-	<4 (high) 4-8 (moderate) >8 (low)	-	-	-	-	(sensitivity to acid inputs (aquatic life-BC criteria))
Nutrients (mg/L)							
Ammonia	2.2 (pH 6.5-7.5; temp 10°C) 2.1 (pH 7.75; temp 10°C) 1.37 (pH 8.0; temp 10°C)	1.84 (pH 6.5-7.7; temp 10°C) 1.59 (pH 7.8; temp 10°C) 1.13 (pH 8.0; temp 10°C)	-	-	-	-	As temperature decreases, guideline values increase (aquatic life-CWQG).
Nitrite	0.06	0.06	-	1	-	-	-
Nitrate	-	200	-	10	-	-	40 mg/L for 30-day average (aquatic life-BC criteria).
Bacteria (MPN/100mL)							
<i>E.coli</i>	-	-	200	77	-	1000	Geometric mean of 30-day period.
Fecal coliforms	-	-	200	200	100	1000	Geometric mean of 30-day period.
Total coliforms	-	-	-	-	1000	-	Geometric mean of 30-day period.
Trace Metals (Units mg/L unless otherwise stated)							
Aluminum (Al)	0.1	0.1	-	-	5.0	-	0.05 mg/L for 30-day average (aquatic life-BC criteria).
Arsenic (As)	0.05	0.05	-	0.05	0.1	0.1 - 2.0	Depending on crop sensitivity and soil type (irrigation-BC criteria).
Barium (Ba)	-	5.0	-	-	-	-	1.0 mg/L for 30-day average (aquatic life-BC criteria).
Beryllium (Be)	-	0.0053	-	-	0.1	0.1	Chronic criteria (aquatic life-BC).
Cadmium (Cd)	0.0002 (H: 0-60) 0.0008 (H: 60-120) 0.0013 (H: 120-180)	0.0002 (H: 0-60) 0.0008 (H: 60-120) 0.0013 (H: 120-180)	-	0.01	0.01	0.01	-
Chromium (Cr)	0.02 (protect fish) 0.002 (protect aquatic life)	0.02 (protect fish) 0.002 (protect aquatic life)	-	0.1	0.1	0.1	-
Cobalt (Co)	-	0.05	-	-	0.05	0.05	-
Copper (Cu)	0.002 (H: 0-120) 0.003 (H: 120-180)	-	-	1.0	0.2 (sensitive crops) 1.0 (tolerant crops)	0.2	-
Iron (Fe)	0.3	0.3	-	-	5.0	5.0	-
Lead (Pb)	0.001 (H: 0-60) 0.002 (H: 60-120) 0.004 (H: 120-180)	-	-	0.05	0.2	0.2	30-day average (recreation and irrigation-BC criteria).
Lithium (Li)	-	-	-	-	2.5	2.5	-
Manganese (Mn)	-	0.1 - 1.0	-	-	0.2	0.2	Under review (aquatic life-BC criteria).
Mercury (Hg)	0.1 (ug/L)	0.1 (ug/L)	-	1.0 (ug/L)	-	1.0 (ug/L)	0.02 ug/L for 30-day average (aquatic life-BC criteria).
Molybdenum (Mo)	-	2.0	-	-	0.01	-	1.0 mg/L for 30-day average (aquatic life-BC criteria).
Nickel (Ni)	0.025 (H: 0-60) 0.065 (H: 60-120) 0.110 (H: 120-180)	0.025 (H: 0-60) 0.065 (H: 60-120) 0.110 (H: 120-180)	-	0.2	0.2	0.2	-
Selenium (Se)	0.001	0.001	-	-	0.02	0.02 (continuous use) 0.05 (intermittent use)	-
Silver (Ag)	0.0001	0.0001	-	-	-	-	-
Vanadium (V)	-	-	-	-	0.1	0.1	-
Zinc (Zn)	0.03	0.03	-	5.0	1.0 (soil pH < 6.5) 5.0 (soil pH >6.5)	1.0 (soil pH < 6.5) 5.0 (soil pH >6.5)	-

H = Hardness (Ca + Mg) in mg/L

Appendix A: Canadian Water Quality Guidelines and British Columbia Working Criteria for Water Uses and the Protection of Freshwater Biota

Parameter	Fresh Water Aquatic Life		Recreation		Irrigation (all soils)		Comments
	CWQG	BC Working Criteria	CWQG	BC Working Criteria	CWQG	BC Working Criteria	
Organic Contaminants (Units ug/L unless otherwise stated)							
Acenaphthene	-	6.0	-	-	-	-	
Aldrin/Dieldrin	4.0 (ng/L)- Dieldrin	-	-	-	-	-	
Aldricarb	-	1.0	-	-	-	-	Interim maximum (aquatic life-BC criteria).
Anthracene	-	4.0	-	-	-	-	
Atrazine	-	2.0	-	-	-	10.0	Interim maximum (irrigation-BC criteria).
Benz[a]anthracene	-	0.1	-	-	-	-	
Benzo[a]pyrene	-	0.01	-	-	-	-	
Carbofuran	-	1.75	-	-	-	-	
Chlordane	6.0 (ng/L)	-	-	-	-	-	
Dichlorobenzene 1,2- and 1,3-	2.5	-	-	-	-	-	
Dichlorobenzene 1,4-	4.0	-	-	-	-	-	
Trichlorobenzene 1,2,3-	0.9	-	-	-	-	-	
Trichlorobenzene 1,2,4-	0.5	-	-	-	-	-	
Trichlorobenzene 1,3,5-	0.65	-	-	-	-	-	
Tetrachlorobenzene 1,2,3,4-	0.10	-	-	-	-	-	
Tetrachlorobenzene 1,2,3,5-	0.10	-	-	-	-	-	
Tetrachlorobenzene 1,2,4,5-	0.15	-	-	-	-	-	
Pentachlorobenzene	0.030	-	-	-	-	-	
Hexachlorobenzene	0.0065	-	-	-	-	-	
DDT	1.0 (ng/L)	-	-	-	-	-	
Diazinon	-	0.1	-	-	-	-	0.003 ug/L for 30-day average (aquatic life-BC criteria).
Dimethoate	-	6.2	-	-	-	-	Interim maximum (aquatic life-BC criteria).
Dinoseb	-	0.05	-	-	-	16.0 (protect all crops)	
Endosulphan	0.02	-	-	-	-	-	
Endrin	2.3 (ng/L)	-	-	-	-	-	
Fluoranthene	-	4.0	-	-	-	-	
Fluorene	-	12.0	-	-	-	-	
Hepatochlor + Hepatochlor epoxide	0.01	-	-	-	-	-	
Hexachlorobutadiene	0.1	0.1	-	-	-	-	
Hexachlorocyclohexane isomers	0.01	-	-	-	-	-	
Metolachlor	-	8.0	-	-	-	28.0	Interim maximum (aquatic life and irrigation-BC criteria).
Naphthalene	-	1.0	-	-	-	-	Chronic criteria (aquatic life-BC).
Phenanthrene	-	0.3	-	-	-	-	
Phenoxy herbicides (2,4-D)	4.0	-	-	-	-	-	
Picloram	-	29.0	-	-	-	0.5 (protect seedlings)	Interim maximum (aquatic life-BC criteria).
PCBs (total)	1.0 (ng/L)	0.1 (ng/L)	-	-	-	0.5	
2,3,3',4,4'-PCB	-	0.09 (ng/L)	-	-	-	-	
3,3',4,4',5,5'-PCB	-	0.06 (ng/L)	-	-	-	-	
3,3',4,4'-PCB	-	0.04 (ng/L)	-	-	-	-	
3,3',4,4',5-PCB	-	0.00025 (ng/L)	-	-	-	-	
Simazine	-	10.0	-	-	-	0.5	Interim maximum (aquatic life and irrigation-BC criteria).
Toxaphene	8.0 (ng/L)	-	-	-	-	-	
Trifluralin	-	0.1	-	-	-	-	
Organic Contaminants - Tissue Residue* (Units ug/kg diet ww unless otherwise stated)							
DDT (total)	14.0	-	-	-	-	-	
PCBs (total)	units ng TEQ/kg diet ww	0.1 ug/g ww (wildlife)	-	-	-	-	
	0.79 (mammalian)						
	2.4 (avian)						
Toxaphene	6.3	-	-	-	-	-	

* For the protection of wildlife consumers of aquatic biota.

CWQG (*Canadian Water Quality Guidelines* - prepared by the Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines Task Group, 1999)

BC Working Criteria (*British Columbia Approved and Working Criteria for Water Quality* - prepared by Water Quality Branch, Environmental Protection Department, Ministry of Environment, Lands and Parks, 1994)