5. RISKS TO SOIL INVERTEBRATES

This chapter addresses risks from chemicals to soil invertebrates, which are represented by earthworms. Radiological risks to earthworms are discussed in this report in Chapter 9.

Ten subbasins had contaminants that resulted in invertebrate hazard indices (HIs) greater than one including: HF-2, SWSA 5 Tributary 1, SWSA 5 WOC, Intermediate Pond, WOC, Seep A, Seep B West, SWSA 4 Main, HRE, and Lower WOC/White Oak Lake. The primary analytes contributing to these risks include chromium, copper, mercury, nickel, and zinc. Although many of the detected organics could not be evaluated due to a lack of appropriate toxicity values, those organic compounds that could be evaluated did not result in hazard quotients (HQ) above 1. The subsections that follow describe the risks to soil invertebrates in more detail. Table 5.1 provides a summary of the subbasins with HIs greater than one and the HQs for the primary risk contributors.

5.1 EXPOSURE ASSESSMENT FOR SOIL INVERTEBRATES

Earthworms absorb a variety of inorganic and organic soil contaminants through both feeding in soil and litter and burrowing in soil. It is assumed that these organisms represent highly exposed soil invertebrates. It is not possible or necessary to distinguish the exposure of earthworms to solid, liquid, and gaseous phases of the soil. Both in toxicity tests and the field, earthworms integrate exposure to all soil components by all uptake routes.

The bioavailability of the contaminants in soil and decomposing plant litter are controlled by soil, litter, and analyte characteristics; however, current knowledge is not sufficient to allow the prediction of bioavailability based on soil variables. An exception is the association of extremes in pH and metal availability (van Gestel 1992).

It is assumed that the earthworms spend their entire life span in soil with contaminant levels represented by the 0.5 m depth of soil sampled. The assumption is reasonable, though organisms feeding on well-decomposed organic material near the surface may be exposed to different quantities of organic chemicals than worms feeding on litter pulled down into burrows in the subsoil (Curl et al. 1987). Few earthworms are found in waterlogged soils so exposure to seeps is not considered. Because earthworms and other soil invertebrates may spend their entire lives at a single sampling location, the maximum detected contaminant concentrations were screened against toxicity benchmarks, as described in Section 5.2. These concentrations are used to assess potential negative impacts of contaminated soils on soil invertebrate populations.

5.2 EFFECTS ASSESSMENT FOR SOIL INVERTEBRATES

Toxicity tests and biological surveys were not performed at these sites. Earthworm sampling in the WOC Watershed was limited (2 samples in WAG 2 and 6 samples in WAG 5), and quantitative surveys were not performed. Thus the only line of evidence in the risk assessment is the comparison to benchmarks (Will and Suter 1995a), described in the following paragraphs. Where benchmarks were not available, risks could not be evaluated.

Contaminant concentrations in soils were compared to toxicological benchmarks (Will and Suter 1995a) for earthworms in order to screen out chemicals that do not constitute a hazard to soil

invertebrates and therefore do not require detailed risk characterization. Chemicals that were not screened out because the maximum detected concentrations were greater than benchmarks may potentially pose significant risks to soil invertebrates. References used for the derivation of benchmarks were reports of toxicity tests of individual chemicals in laboratory, greenhouse, or field settings. Tests conducted with natural soils in the laboratory were assumed to represent the exposures of worms in floodplain soils. However, chemicals freshly added to soils in toxicity tests may be more bioavailable than the chemical forms that occur in field soils. Only experiments in which earthworms were exposed to soil (natural or artificial mixture of components), soil/litter microcosms, or manure were considered. Twenty percent reduction in growth, reproduction, or activity was used as the threshold for significant effects to be consistent with other screening benchmarks for ecological risk assessment and because the FFA parties adopted this level of effects for ecological endpoints (Suter et al. 1995).

The method used for deriving soil benchmarks is described in Will and Suter (1995a). Benchmarks used to evaluate toxic effects of contaminants present in each of the subbasins are presented in Table 5.2. Toxicological profiles for analytes retained in the analysis are provided in the attachment of this appendix.

5.3 RISK CHARACTERIZATION FOR SOIL INVERTEBRATES

The evidence concerning risks to soil invertebrates consists of analyses of inorganic, organic, and radionuclide contaminants in soil. This single line of evidence is summarized in the following text. Toxicity tests and biological surveys were not available.

5.3.1 Single Chemical Soil Toxicity

Contaminants of potential ecological concern (COPECs) for soil invertebrates were identified by comparing maximum concentrations in soil at each location to the following: (1) background for soils (DOE 1995a); and (2) available benchmarks for toxicity to soil invertebrates (Will and Suter 1995a). Maximum detected concentrations in soil were used because earthworms and other soil invertebrates are relatively immobile and can therefore be exposed to the maximum concentration during the course of their lifetimes (Suter et al. 1995). If both background and benchmark criteria were exceeded, the contaminant was identified as a COPEC. The magnitude of exceedance of a benchmark is described by the hazard quotient, the maximum concentration in soil divided by the toxicity benchmark concentration. If background criteria were not available, exceedance of a benchmark was sufficient for the COPEC designation. A summary of sites with HIs above one and the analytes that contribute a HQ above 1 is provided in Table 5.1; supporting documentation including maximum detected concentrations and toxicity values is provided in Table 5.2. The major COPECs for soil invertebrates were chromium, copper, mercury, nickel, and zinc.

5.3.1.1 HF-2

The overall soil invertebrate HI for subbasin HF-2 soil was 423 (Table 5.1). Inorganics accounted for 100% of the HI. Of the 29 inorganics detected at HF-2, 16 were below background levels and eliminated from further consideration. Nine of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. HQs exceeding one were estimated for two (chromium and zinc) of the four inorganics evaluated for invertebrate effects, indicating a potential risk of adverse effects for these elements.

Chromium contributed 99% of the overall HI for the subbasin. Chromium was detected in both of the soil samples collected at HF-2, but at levels higher than background in only one, and then at a concentration only about twice as high (168 mg/kg for HF-2 versus 78 mg/kg background). The analytical data did not specify the valence state of the chromium. Chromium (VI) is more toxic and bioavailable than chromium (III) (Smith et al. 1989, cited in Will and Suter 1995b), but in most soils chromium (VI) is likely to be reduced to chromium (III) (Bartlett and James 1979, cited in Will and Suter 1995b). However, the toxicological benchmark used to estimate effects of chromium is based on chromium (VI) studies. The use of the benchmark for the more toxic and available chromium (VI) when exposures may be predominantly from chromium (III) may lead to overestimation of the risks of adverse effects.

Benchmarks were not available for either of the two organics detected at HF-2.

These results indicate a potential risk of adverse effects on soil invertebrates from HF-2 soil, primarily resulting from chromium.

5.3.1.2 HRE

The overall soil invertebrate HI for the HRE subbasin was 261.4 (Table 5.1). HQs exceeding one were estimated for two metals: chromium and zinc, indicating a potential risk of adverse effects for these elements. Chromium was the risk driver in the subbasin, resulting in an HQ of 260.

While chromium was the primary risk driver in this subbasin, it was detected at only 1.3 times background. The analytical data did not specify the valence state of the chromium. Chromium (VI) is more toxic and bioavailable than chromium (III) (Will and Suter 1995a), but in most soils chromium (VI) is likely to be reduced to chromium (III). The toxicological benchmarks used in this assessment were based on chromium (VI) studies. The use of benchmarks for the more toxic and available chromium (VI) when exposures may be predominantly from chromium (III) may lead to overestimation of risks.

5.3.1.3 SWSA 5 Tributary 1

The overall soil invertebrate HI for SWSA 5 Trib 1 soil was 43 (Table 5.1). Inorganics accounted for 100% of the HI. Of the 23 inorganics detected at SWSA 5 Trib 1, 14 were below background levels and eliminated from further consideration. Six of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. An HQ exceeding one was estimated for one (mercury) of the three inorganics evaluated for invertebrate effects, indicating a potential risk of adverse effects for this element. Mercury contributed over 99% of the overall HI for the subbasin.

Toxicological benchmarks were not available for any of the 45 organics detected at the site.

These results indicate a potential risk of adverse effects on soil invertebrates from SWSA 5 Trib 1 soil, primarily resulting from mercury,.

5.3.1.4 SWSA 5 WOC

The overall soil invertebrate HI for SWSA 5 WOC soil was 10 (Table 5.1). Inorganics accounted for over 99% of the HI. Organics contributed only 0.1%. Of the 23 inorganics detected at SWSA 5 WOC, 12 were below background levels and eliminated from further consideration.

Seven of the remaining inorganics (calcium, magnesium and sodium) could not be evaluated for invertebrate effects because toxicological benchmarks were not available. An HQ exceeding one was estimated for one (mercury) of the four inorganics evaluated for invertebrate effects, indicating a potential risk of adverse effects for this element. Mercury contributed 90% of the overall HI for the subbasin.

No toxicological benchmarks were available for 49 of the 50 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on soil invertebrates from SWSA 5 WOC soil, primarily resulting from mercury.

5.3.1.5 SWSA 5 N WOC

The overall soil invertebrate HI for SWSA 5 N WOC soil was 0.02. Inorganics accounted for 100% of the HI. Of the 19 inorganics detected at SWSA 5 N WOC, 17 were below background levels and eliminated from further consideration. One of the remaining inorganics, silver could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQ for the other remaining inorganic, selenium, was 0.02, indicating no risk of adverse effects.

Toxicological benchmarks were not available for any of the 14 organics detected at the site.

These results indicate no risk of adverse effects on soil invertebrates from SWSA 5 N WOC soil for the contaminants that could be evaluated.

5.3.1.6 Intermediate Pond

The overall soil invertebrate HI for the Intermediate Pond soil was 767 (Table 5.1). Inorganics accounted for over 99.9% of the HI. Organics contributed only 0.002%. Of the 30 inorganics detected at the Intermediate Pond, 15 were below background levels and eliminated from further consideration. Ten of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (mercury, nickel and zinc) of the five inorganics evaluated for invertebrate effects, indicating a potential risk of adverse effects for these elements. Mercury contributed over 99% of the overall HI for the subbasin.

No toxicological benchmarks were available for 24 of the 26 organics detected at the site. The HQs for the two remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on soil invertebrates from the Intermediate Pond soil, primarily resulting from mercury.

5.3.1.7 SWSA 4 Main

The overall soil invertebrate HI for the SWSA 4 Main subbasin was 39.9 (Table 5.1). An HQ exceeding one was estimated for only one analyte (nickel), indicating a potential risk of adverse effects from this element. Nickel was the primary risk driver, resulting in an HQ of 39.3. However, the results are driven by the high nickel concentration (7860 mg/kg) at one sample locations (WAG 4 Seep 6). The highest concentration at two other locations in the subbasin was 49.6 mg/kg, suggesting that risks from nickel are spatially limited within the subbasin.

5.3.1.8 WAG 7 WOC

No risks were identified for soil invertebrates exposed to contaminants in WAG 7 WOC. Concentrations of all detected analytes were below toxicological benchmarks (Table 5.2).

5.3.1.9 WOC

The overall soil invertebrate HI for the WOC subbasin soil was 56 (Table 5.1). Inorganics accounted for 100% of the HI. Of the 30 inorganics detected at the WOC subbasin, 16 were below background levels and eliminated from further consideration. Nine of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (copper, mercury and zinc) of the five inorganics evaluated for invertebrate effects, indicating a potential risk of adverse effects for these elements. Mercury contributed 86% of the overall HI for the subbasin.

Toxicological benchmarks were not available for any of the 16 organics detected at the site.

These results indicate a potential risk of adverse effects on soil invertebrates from WOC subbasin soil, primarily resulting from mercury.

5.3.1.10 NHF

The overall soil invertebrate HI for NHF soil was 0.008 (Table 5.1). Organics accounted for 100% of the HI. Of the 18 inorganics detected at NHF, 15 were below background levels and eliminated from further consideration. The three remaining inorganics, barium, sodium and silver, could not be evaluated for invertebrate effects because toxicological benchmarks were not available.

No toxicological benchmarks were available for 12 of the 13 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate adverse effects on soil invertebrates from NHF soil are unlikely for those contaminants that could be evaluated.

5.3.1.11 SWSA 5 Drainage D-2

The overall soil invertebrate HI was not estimated for SWSA 5 Drainage D-2 soil. Of the 18 inorganics detected at WAG 5 Mid-drain, 14 were below background levels and eliminated from further consideration. The four remaining inorganics (barium, calcium, magnesium and silver) could not be evaluated for invertebrate effects because toxicological benchmarks were not available.

Toxicological benchmarks were not available for any of the 16 organics detected at the site.

5.3.1.12 Seep A

The overall soil invertebrate HI for Seep A soil was 1.7 (Table 5.1). Inorganics accounted for 100% of the HI. Of the 23 inorganics detected at Seep A, 16 were below background levels and eliminated from further consideration. Four of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. HQs exceeding one were estimated for one (zinc) of the three inorganics evaluated for invertebrate effects. The HQ of 1.6 for zinc does not warrant concern.

Toxicological benchmarks were not available for any of the 45 organics detected at the site.

These results indicate no risk of adverse effects on soil invertebrates from Seep A soil for those contaminants that could be evaluated.

5.3.1.13 Seep B West

The overall soil invertebrate HI for Seep B soil was 20 (Table 5.1). Inorganics accounted for 100% of the HI. Of the 30 inorganics detected at Seep B, 21 were below background levels and eliminated from further consideration. Six of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. HQs exceeding one were estimated for one (mercury) of the three inorganics evaluated for invertebrate effects, indicating a potential risk of adverse effects for this element. Mercury contributed over 99% of the overall HI for the subbasin.

Toxicological benchmarks were not available for any of the 17 organics detected at the site.

These results indicate a potential risk of adverse effects on soil invertebrates from Seep B soil, primarily resulting from mercury.

5.3.1.14 Seep B East

The overall soil invertebrate HI for the Seep B East soil was 0.005. Inorganics accounted for 100% of the HI. Of the 21 inorganics detected at Seep B East, 17 were below background levels and eliminated from further consideration. Three of the four remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQ for the one other remaining inorganic, selenium, was well below one, indicating no risk of adverse effects.

Toxicological benchmarks were not available for any of the 38 organics detected at the site.

These results indicate no risk of adverse effects on soil invertebrates from Seep B East soil for the contaminants that could be evaluated.

5.3.1.15 Seep C

The overall soil invertebrate HI for Seep C soil was 0.07. Inorganics accounted for 100% of the HI. Of the 31 inorganics detected at Seep C, 15 were below background levels and eliminated from further consideration. Fourteen of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQs for the two other remaining inorganics, cadmium and selenium, were well below one, indicating no risk of adverse effects.

Toxicological benchmarks were not available for any of the 21 organics detected at the site.

These results indicate no risk of adverse effects on soil invertebrates from the Seep C soil for the contaminants that could be evaluated.

5.3.1.16 W6MS3

The overall soil invertebrate HI for W6MS3 soil was 0.5. Inorganics accounted for 93% of the HI. Organics contributed 7%. Of the 22 inorganics detected at W6MS3, 14 were below background levels and eliminated from further consideration. Six of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQs for the two other remaining inorganics, arsenic and cadmium, were below one, indicating no risk of adverse effects.

No toxicological benchmarks were available for 29 of the 34 organics detected at the site. The HQs for the five remaining organics were well below one, indicating no risk of adverse effects.

These results indicate no risk of adverse effects on soil invertebrates from W6MS3 soil for the contaminants that could be evaluated.

5.3.1.17 W6MS1

The overall soil invertebrate HI for W6MS1 soil was 0.8. Inorganics accounted for 100% of the HI. Of the 18 inorganics detected at W6MS1, 11 were below background levels and eliminated from further consideration. Four of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQs for the three other remaining inorganics, arsenic, cadmium and nickel, were below one, indicating no risk of adverse effects.

Toxicological benchmarks were not available for any of the 19 organics detected at the site.

These results indicate no risk of adverse effects on soil invertebrates from W6MS1 soil for the contaminants that could be evaluated.

5.3.1.18 West Seep

The overall soil invertebrate HI for West Seep soil was 0.6. Inorganics accounted for 99% of the HI. Organics contributed only 0.9%. Of the 24 inorganics detected at West Seep, 15 were below background levels and eliminated from further consideration. Seven of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQs for the two other remaining inorganics, cadmium and nickel, were below one, indicating no risk of adverse effects.

No toxicological benchmarks were available for 30 of the 32 organics detected at the site. The HQs for the two remaining organics were well below one, indicating no risk of adverse effects.

These results indicate no risk of adverse effects on soil invertebrates from West Seep soil for the contaminants that could be evaluated.

5.3.1.19 East Seep

No risks were identified for soil invertebrates exposed to contaminants in the East Seep subbasin. Concentrations of all detected analytes were below toxicological benchmarks (Table 5.2).

5.3.1.20 Lower WOC/White Oak Lake

The overall soil invertebrate HI for Lower WOC/White Oak Lake soil was 343 (Table 5.1). Inorganics accounted for over 99.9% of the HI. Organics contributed only 0.01%. Of the 30 inorganics detected at Lower WOC/White Oak Lake, 16 were below background levels and eliminated from further consideration. Nine of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (chromium, mercury, and zinc) of the five inorganics evaluated for invertebrate effects, indicating a potential risk of adverse effects for these elements.

Chromium and mercury contributed 99% of the overall HI for the subbasin. The analytical data did not specify the valence state of the chromium. Chromium (VI) is more toxic and bioavailable than chromium (III) (Smith et al. 1989, cited in Will and Suter 1995b), but in most soils chromium (VI) is likely to be reduced to chromium (III) (Bartlett and James 1979, cited in Will and Suter 1995b). However, the toxicological benchmark used to estimate effects of chromium is based on chromium (VI) studies. The use of the benchmark for the more toxic and available chromium (VI) when exposures may be predominantly from chromium (III) may lead to overestimation of the risks of adverse invertebrate effects.

No toxicological benchmarks were available for 22 of the 24 organics detected at the site. The HQs for the two remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on soil invertebrates from Lower WOC/White Oak Lake soil, primarily resulting from chromium and mercury.

5.3.1.21 Pit 4 South

The overall soil invertebrate HI for Pit 4 South soil was 0.04. Inorganics accounted for 92% of the HI. Organics contributed 8%. Of the 29 inorganics detected at Pit 4 South, 18 were below background levels and eliminated from further consideration. Nine of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQs for the two other remaining inorganics, cadmium and selenium, were below one, indicating no risk of adverse effects.

No toxicological benchmarks were available for 15 of the 16 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate no risk of adverse effects on soil invertebrates from Pit 4/South soil for the contaminants that could be evaluated.

5.3.1.22 SWSA 6 East

The overall soil invertebrate HI for SWSA 6 East soil was 1.2. Inorganics accounted for approximately 100% of the HI. Of the 18 inorganics detected at SWSA 6 East, 12 were below background levels and eliminated from further consideration. Three of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQs for the three other remaining inorganics, cadmium, nickel and zinc, were below one, indicating no risk of adverse effects.

No toxicological benchmarks were available for 10 of the 11 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate no risk of adverse effects on soil invertebrates from SWSA 6 East soil for the contaminants that could be evaluated.

5.3.1.23 SWSA 6 South

The overall soil invertebrate HI for SWSA 6 South soil was 0.5. Inorganics accounted for 100% of the HI. Of the 17 inorganics detected at SWSA 6 South, 12 were below background levels and eliminated from further consideration. Three of the remaining inorganics could not be evaluated for invertebrate effects because toxicological benchmarks were not available. The HQs for the two other remaining inorganics, arsenic and cadmium, were below one, indicating no risk of adverse effects.

Benchmarks were not available for any of the three organics detected at SWSA 6 South.

These results indicate no risk of adverse effects on soil invertebrates from SWSA 6 South soil for the contaminants that could be evaluated.

5.3.2 Summary of Risk Characterization for Soil Invertebrates

In this ecological risk assessment potential hazard is indicated by the exceedance of toxicological benchmarks. COPECs for soil invertebrates include chromium, copper, mercury, nickel, and zinc. The subbasins with no contaminants above a HQ of one include NHF, SWSA 5 Drainage D-2, Pit 4 South, Seep B East, Seep C, SWSA 5 N WOC, SWSA 6 East, W6MS1, West Seep, SWSA 6 South, and W6MS3. A summary of those subbasins with HIs greater than one (Intermediate Pond, HF-2, Lower WOC, HRE, WOC, SWSA 5 Trib 1, SWSA 4 Main. Seep A, Seep B West, and SWSA 5 WOC) along with their primary risk contributors above a HQ of 1 can be found in Table 5.1.

5.4 UNCERTAINTIES CONCERNING RISKS TO SOIL INVERTEBRATES

The following factors create uncertainty in assessing the risk posed by the potential contaminants of concern in soils:

- **Bioavailability of elements.** The extraction methods used during sample collection may remove from the soil quantities of elements and compounds greater than those that are extracted from soil as they pass through the gut of the earthworm or those that are absorbed dermally.

- **Variable response to contaminants.** Various earthworm and other soil invertebrate species and earthworm growth stages tolerate contaminants to different degrees. The literature from which benchmarks were derived is not necessarily based on experiments using earthworm species known to be representative of those occurring in the soils of the subbasins.

- **Multiple contaminant exposure.** Toxicity benchmark concentrations are derived form experiments in which earthworms are exposed to single contaminants. Soils of the subbasins

may expose earthworms to multiple contaminants which may not be adequately assessed on the basis of literature-derived benchmarks.

- **Lack of benchmarks for some metals and most organic compounds.** Little research has been conducted on the toxic effects of the organic compounds, other than pesticides. Thus, it is not possible to assess the risk to earthworm populations posed by many of the analytes found in the soils.

- **Chemical speciation.** Earthworm toxicity benchmarks for metals are often derived from studies with a single species of a contaminant. For example, the analytical data did not specify the valence state of the chromium. Chromium (VI) is more toxic and bioavailable than chromium (III) (Smith et al. 1989, cited in Will and Suter 1995b), but in most soils chromium (VI) is likely to be reduced to chromium (III) (Bartlett and James 1979, cited in Will and Suter 1995b). However, the toxicological benchmark used to estimate effects of chromium is based on chromium (VI) studies. The use of the benchmark for the more toxic and available form of a contaminant when exposures may be predominantly from a less available or less toxic form may lead to overestimation of the risks of adverse effects.

Table 5.1. Summary of Potential Risks to Invertebrates Exposed to Soils in the White Oak Creek Watershed

		Hazard quotients for risk driving analytes				
Subbasin	**Hazard Index**	**Cr**	**Cu**	**Hg**	**Ni**	**Zn**
IntermediatePond	767.0			764.0	1.6	1.7
HF-2	423.0	420.0				2.9
LowerWOC/WOL	343.0	290.0		51.0		2.1
HRE	261.4	260.0				1.2
WOC	55.9		3.3	48.0		4.5
SWSA5Trib-1	43.1			43.0		
SWSA 4 Main	39.9				39.3	
Seep B West	20.1			20.0		
SWSA5/WOC	10.3			9.6		
SeepA	1.7					1.6

Notes:
Cr = chromium, Cu = copper, Hg = mercury, Ni = nickel, Zn = zinc
risk driving analytes = any detected contaminant present above background concentrations that contributes a hazard quotient above 1.

Table 5.2. Risk results for soil invertebrates and terrestrial plants exposed to contaminants in the White Oak Creek watershed

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
East Seep	Aluminum	3/3	2.44E+04	3.03E+04	6.84E-01	5.00E+01		6.06E+02	
East Seep	Arsenic	3/3	4.63E+00	6.00E+00	4.81E-01	1.00E+01	6.00E+01	6.00E-01	1.00E-01
East Seep	Barium	3/3	1.85E+02	3.09E+02	1.46E+00	5.00E+02		6.18E-01	
East Seep	Beryllium	3/3	1.11E+00	1.30E+00	5.91E-01	1.00E+01		1.30E-01	
East Seep	Calcium	3/3	2.72E+04	7.37E+04	1.04E+01				
East Seep	Chromium	3/3	3.40E+01	3.71E+01	4.73E-01	1.00E+00	4.00E-01	3.71E+01	9.28E+01
East Seep	Cobalt	3/3	2.08E+01	3.09E+01	8.42E-01	2.00E+01		1.55E+00	
East Seep	Copper	3/3	2.95E+01	4.80E+01	3.84E-01	1.00E+02	5.00E+01	4.80E-01	9.60E-01
East Seep	Iron	3/3	3.47E+04	4.25E+04	2.47E-01				
East Seep	Lead	3/3	2.76E+01	3.74E+01	2.50E-01	5.00E+01	5.00E+02	7.48E-01	7.48E-02
East Seep	Magnesium	3/3	6.35E+03	7.78E+03	1.05E+00				
East Seep	Manganese	3/3	2.60E+03	5.96E+03	4.31E-01	5.00E+02		1.19E+01	
East Seep	Nickel	3/3	3.12E+01	3.96E+01	6.98E-01	3.00E+01	2.00E+02	1.32E+00	1.98E-01
East Seep	Potassium	3/3	3.60E+03	4.56E+03	8.46E-01				
East Seep	Selenium	1/3	8.00E-01	1.20E+00		1.00E+00	7.00E+01	1.20E+00	1.71E-02
East Seep	Sodium	3/3	7.06E+02	8.43E+02					
East Seep	Thallium	1/3	1.42E+00	2.50E+00	3.16E+00	1.00E+00		2.50E+00	
East Seep	Vanadium	3/3	2.88E+01	3.36E+01	2.09E-01	2.00E+00		1.68E+01	
East Seep	Zinc	3/3	7.58E+01	7.95E+01	7.36E-01	5.00E+01	2.00E+02	1.59E+00	3.98E-01
East Seep	PCB-1016	3/3	1.87E-02	2.10E-02					
East Seep	PCB-1221	3/3	1.87E-02	2.10E-02					
East Seep	PCB-1232	3/3	1.87E-02	2.10E-02					
East Seep	PCB-1242	3/3	1.87E-02	2.10E-02					
East Seep	PCB-1248	3/3	1.87E-02	2.10E-02					
East Seep	PCB-1254	3/3	1.87E-02	2.10E-02					
HF-2	Aluminum	2/2	1.55E+04	1.58E+04	3.57E-01	5.00E+01		3.16E+02	
HF-2	Antimony	2/2	8.60E-01	9.60E-01		5.00E+00		1.92E-01	
HF-2	Arsenic	2/2	6.50E+00	7.30E+00	5.85E-01	1.00E+01	6.00E+01	7.30E-01	1.22E-01
HF-2	Barium	2/2	6.13E+02	9.61E+02	4.53E+00	5.00E+02		1.92E+00	
HF-2	Beryllium	2/2	1.45E+00	1.50E+00	6.82E-01	1.00E+01		1.50E-01	
HF-2	Boron	2/2	4.10E+00	4.20E+00	1.11E-01	5.00E-01		8.40E+00	
HF-2	Cadmium	2/2	2.55E-01	2.60E-01		3.00E+00	2.00E+01	8.67E-02	1.30E-02
HF-2	Calcium	2/2	1.44E+04	1.50E+04	2.12E+00				
HF-2	Chromium	2/2	1.20E+02	1.68E+02		1.00E+00	4.00E-01	1.68E+02	4.20E+02
HF-2	Cobalt	2/2	3.47E+01	4.06E+01	1.11E+00	2.00E+01		2.03E+00	
HF-2	Copper	2/2	2.78E+01	3.28E+01	2.62E-01	1.00E+02	5.00E+01	3.28E-01	6.56E-01
HF-2	Iron	2/2	6.67E+04	8.16E+04	4.75E-01				
HF-2	Lead	2/2	1.39E+01	1.51E+01	1.01E-01	5.00E+01	5.00E+02	3.02E-01	3.02E-02
HF-2	Lithium	2/2	2.35E+01	2.49E+01	8.98E-02	2.00E+00		1.25E+01	
HF-2	Magnesium	2/2	6.26E+03	7.02E+03	9.45E-01				
HF-2	Manganese	2/2	5.60E+03	8.33E+03	6.02E-01	5.00E+02		1.67E+01	
HF-2	Mercury	2/2	1.10E-01	1.10E-01	2.06E-01	3.00E-01	1.00E-01	3.67E-01	1.10E+00
HF-2	Molybdenum	2/2	2.85E+00	2.90E+00		2.00E+00		1.45E+00	
HF-2	Nickel	2/2	3.91E+01	4.04E+01	7.13E-01	3.00E+01	2.00E+02	1.35E+00	2.02E-01
HF-2	Osmium	1/2	6.20E+00	8.50E+00					
HF-2	Potassium	2/2	2.00E+03	2.02E+03	3.75E-01				

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
HF-2	Selenium	2/2	7.65E-01	7.80E-01		1.00E+00	7.00E+01	7.80E-01	1.11E-02
HF-2	Silicon	2/2	3.84E+02	4.43E+02	6.36E-01				
HF-2	Silver	2/2	2.55E-01	2.60E-01		2.00E+00		1.30E-01	
HF-2	Sodium	2/2	3.32E+02	3.64E+02					
HF-2	Thallium	2/2	7.65E-01	7.80E-01	9.87E-01	1.00E+00		7.80E-01	
HF-2	Tin	2/2	1.89E+01	2.25E+01		5.00E+01		4.50E-01	
HF-2	Vanadium	2/2	3.68E+01	3.86E+01	2.41E-01	2.00E+00		1.93E+01	
HF-2	Zinc	2/2	5.41E+02	5.80E+02	5.37E+00	5.00E+01	2.00E+02	1.16E+01	2.90E+00
HF-2	bis(2-Ethylhexyl)phthalate	2/2	9.20E-02	9.90E-02					
HF-2	Methoxychlor	1/2	1.38E-02	1.70E-02					
HRE	Aluminum	7/7	1.91E+04	2.30E+04	5.19E-01	5.00E+01		4.60E+02	
HRE	Arsenic	7/7	4.62E+00	5.80E+00	4.65E-01	1.00E+01	6.00E+01	5.80E-01	9.67E-02
HRE	Barium	7/7	2.08E+02	3.29E+02	1.55E+00	5.00E+02		6.58E-01	
HRE	Beryllium	7/7	8.43E-01	1.00E+00	4.55E-01	1.00E+01		1.00E-01	
HRE	Cadmium	3/7	1.31E+00	3.20E+00		3.00E+00	2.00E+01	1.07E+00	1.60E-01
HRE	Calcium	7/7	5.71E+03	1.42E+04	2.01E+00				
HRE	Chromium	7/7	4.69E+01	1.04E+02	1.33E+00	1.00E+00	4.00E-01	1.04E+02	2.60E+02
HRE	Cobalt	7/7	1.36E+01	1.70E+01	4.63E-01	2.00E+01		8.50E-01	
HRE	Copper	7/7	2.21E+01	2.76E+01	2.21E-01	1.00E+02	5.00E+01	2.76E-01	5.52E-01
HRE	Iron	7/7	2.68E+04	3.28E+04	1.91E-01				
HRE	Lead	7/7	2.28E+01	2.86E+01	1.91E-01	5.00E+01	5.00E+02	5.72E-01	5.72E-02
HRE	Magnesium	7/7	2.97E+03	5.37E+03	7.23E-01				
HRE	Manganese	7/7	1.06E+03	1.98E+03	1.43E-01	5.00E+02		3.96E+00	
HRE	Nickel	7/7	2.11E+01	2.92E+01	5.15E-01	3.00E+01	2.00E+02	9.73E-01	1.46E-01
HRE	Potassium	7/7	3.43E+03	4.43E+03	8.22E-01				
HRE	Sodium	7/7	6.69E+02	7.86E+02					
HRE	Vanadium	7/7	2.74E+01	3.44E+01	2.14E-01	2.00E+00		1.72E+01	
HRE	Zinc	7/7	1.18E+02	2.38E+02	2.20E+00	5.00E+01	2.00E+02	4.76E+00	1.19E+00
HRE	PCB-1016	7/7	2.03E-02	2.50E-02					
HRE	PCB-1221	7/7	2.03E-02	2.50E-02					
HRE	PCB-1232	7/7	2.03E-02	2.50E-02					
HRE	PCB-1242	7/7	2.03E-02	2.50E-02					
HRE	PCB-1248	7/7	2.03E-02	2.50E-02					
HRE	PCB-1254	7/7	2.03E-02	2.50E-02					
HRE	PCB-1260	7/7	6.29E-02	1.60E-01					
Intermediate Pond	Aluminum	15/15	1.66E+04	2.85E+04	6.43E-01	5.00E+01		5.70E+02	
Intermediate Pond	Antimony	4/15	4.95E+00	9.50E-01		5.00E+00		1.90E-01	
Intermediate Pond	Arsenic	15/15	5.47E+00	7.40E+00	5.93E-01	1.00E+01	6.00E+01	7.40E-01	1.23E-01
Intermediate Pond	Barium	15/15	1.51E+02	2.68E+02	1.26E+00	5.00E+02		5.36E-01	
Intermediate Pond	Beryllium	15/15	1.09E+00	1.70E+00	7.73E-01	1.00E+01		1.70E-01	
Intermediate Pond	Boron	15/15	5.74E+00	1.02E+01	2.71E-01	5.00E-01		2.04E+01	
Intermediate Pond	Cadmium	14/14	1.08E+00	1.50E+00		3.00E+00	2.00E+01	5.00E-01	7.50E-02
Intermediate Pond	Calcium	15/15	9.67E+03	2.65E+04	3.75E+00				
Intermediate Pond	Chromium	15/15	5.03E+01	7.16E+01		1.00E+00	4.00E-01	7.16E+01	1.79E+02
Intermediate Pond	Cobalt	15/15	1.20E+01	1.62E+01	4.41E-01	2.00E+01		8.10E-01	
Intermediate Pond	Copper	15/15	3.27E+01	6.49E+01	5.19E-01	1.00E+02	5.00E+01	6.49E-01	1.30E+00

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
Intermediate Pond	Iron	15/15	2.61E+04	3.40E+04	1.98E-01				
Intermediate Pond	Lead	15/15	5.37E+01	1.11E+02	7.41E-01	5.00E+01	5.00E+02	2.22E+00	2.22E-01
Intermediate Pond	Lithium	15/15	2.12E+01	4.14E+01	1.49E-01	2.00E+00		2.07E+01	
Intermediate Pond	Magnesium	15/15	2.55E+03	3.84E+03	5.17E-01				
Intermediate Pond	Manganese	15/15	1.05E+03	4.15E+03	3.00E-01	5.00E+02		8.30E+00	
Intermediate Pond	Mercury	14/14	1.21E+01	7.64E+01	1.43E+02	3.00E-01	1.00E-01	2.55E+02	7.64E+02
Intermediate Pond	Molybdenum	15/15	3.87E+00	5.20E+00		2.00E+00		2.60E+00	
Intermediate Pond	Nickel	15/15	3.69E+01	3.10E+02	5.47E+00	3.00E+01	2.00E+02	1.03E+01	1.55E+00
Intermediate Pond	Osmium	2/15	6.20E+00	1.01E+01					
Intermediate Pond	Potassium	15/15	2.02E+03	3.41E+03	6.33E-01				
Intermediate Pond	Selenium	12/14	6.13E-01	9.50E-01		1.00E+00	7.00E+01	9.50E-01	1.36E-02
Intermediate Pond	Silicon	15/15	4.73E+02	1.72E+03	2.47E+00				
Intermediate Pond	Silver	15/15	7.25E+00	1.73E+01		2.00E+00		8.65E+00	
Intermediate Pond	Sodium	15/15	4.71E+02	6.31E+02					
Intermediate Pond	Strontium	13/15	2.16E+01	4.65E+01	7.74E-02				
Intermediate Pond	Thallium	13/15	7.86E-01	9.80E-01	1.24E+00	1.00E+00		9.80E-01	
Intermediate Pond	Tin	15/15	1.04E+01	1.62E+01		5.00E+01		3.24E-01	
Intermediate Pond	Vanadium	15/15	2.49E+01	3.37E+01	2.10E-01	2.00E+00		1.69E+01	
Intermediate Pond	Zinc	15/15	1.42E+02	3.30E+02	3.06E+00	5.00E+01	2.00E+02	6.60E+00	1.65E+00
Intermediate Pond	2-Methylnaphthalene	3/10	3.08E-02	3.50E-02					
Intermediate Pond	4-Methylphenol	1/10	2.99E-01	2.20E-01					
Intermediate Pond	Acenaphthene	3/10	1.07E-01	1.30E-01		2.00E+01		6.50E-03	
Intermediate Pond	Anthracene	4/10	1.09E-01	2.20E-01					
Intermediate Pond	Benz(a)anthracene	8/10	1.89E-01	6.70E-01					
Intermediate Pond	Benzo(a)pyrene	8/10	2.01E-01	5.50E-01					
Intermediate Pond	Benzo(b)fluoranthene	10/10	2.09E-01	7.90E-01					
Intermediate Pond	Benzo(ghi)peryline	7/10	1.61E-01	3.80E-01					
Intermediate Pond	Benzo(k)fluoranthene	9/10	1.85E-01	6.30E-01					
Intermediate Pond	bis(2-Ethylhexyl)phthalate	5/10	2.91E-01	6.00E-01					
Intermediate Pond	Butylbenzylphthalate	1/10	3.13E-01	2.70E-02					
Intermediate Pond	Carbazole	3/10	1.34E-01	2.10E-01					
Intermediate Pond	Chrysene	10/10	2.39E-01	7.60E-01					
Intermediate Pond	Di-n-butylphthalate	8/10	1.85E-01	4.20E-01		2.00E+02		2.10E-03	
Intermediate Pond	Di-n-octylphthalate	1/10	3.07E-01	2.50E-02					
Intermediate Pond	Dibenz(a,h)anthracene	3/10	1.18E-01	2.40E-01					
Intermediate Pond	Dibenzofuran	2/10	7.07E-02	7.20E-02					
Intermediate Pond	Fluoranthene	10/10	4.66E-01	1.40E+00					
Intermediate Pond	Fluorene	3/10	1.20E-01	1.40E-01			3.00E+01		4.67E-03
Intermediate Pond	Indeno(1,2,3-cd)pyrene	8/10	1.45E-01	5.00E-01					
Intermediate Pond	Naphthalene	3/10	3.59E-02	4.10E-02					
Intermediate Pond	PCB-1254	5/10	2.16E-01	1.90E+00					
Intermediate Pond	PCB-1260	8/10	2.26E-01	6.10E-01					
Intermediate Pond	Pentachlorophenol	1/10	8.87E-01	2.90E-02		3.00E+00	4.00E+00	9.67E-03	7.25E-03
Intermediate Pond	Phenanthrene	9/10	2.45E-01	9.40E-01					
Intermediate Pond	Pyrene	10/10	3.63E-01	1.20E+00					
Little No-Name	Aluminum	2/2	9.91E+03	1.11E+04	2.51E-01	5.00E+01		2.22E+02	

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
Little No-Name	Arsenic	2/2	1.90E+00	2.20E+00	1.76E-01	1.00E+01	6.00E+01	2.20E-01	3.67E-02
Little No-Name	Barium	2/2	5.13E+01	5.37E+01	2.53E-01	5.00E+02		1.07E-01	
Little No-Name	Beryllium	2/2	7.05E-01	7.70E-01	3.50E-01	1.00E+01		7.70E-02	
Little No-Name	Cadmium	2/2	2.65E+00	2.80E+00		3.00E+00	2.00E+01	9.33E-01	1.40E-01
Little No-Name	Calcium	2/2	1.24E+03	1.24E+03	1.76E-01				
Little No-Name	Chromium	2/2	1.74E+01	1.80E+01	2.30E-01	1.00E+00	4.00E-01	1.80E+01	4.50E+01
Little No-Name	Cobalt	1/1	1.30E+01	1.30E+01	3.54E-01	2.00E+01		6.50E-01	
Little No-Name	Copper	2/2	1.25E+01	1.36E+01	1.09E-01	1.00E+02	5.00E+01	1.36E-01	2.72E-01
Little No-Name	Iron	2/2	2.42E+04	2.60E+04	1.51E-01				
Little No-Name	Lead	2/2	1.26E+01	1.31E+01	8.75E-02	5.00E+01	5.00E+02	2.62E-01	2.62E-02
Little No-Name	Magnesium	2/2	1.13E+03	1.19E+03	1.60E-01				
Little No-Name	Manganese	2/2	3.30E+02	3.39E+02	2.45E-02	5.00E+02		6.78E-01	
Little No-Name	Nickel	2/2	3.08E+01	3.33E+01	5.87E-01	3.00E+01	2.00E+02	1.11E+00	1.67E-01
Little No-Name	Potassium	2/2	6.95E+02	7.22E+02	1.34E-01				
Little No-Name	Sodium	2/2	7.63E+01	1.01E+02					
Little No-Name	Vanadium	2/2	1.64E+01	1.92E+01	1.20E-01	2.00E+00		9.60E+00	
Little No-Name	Zinc	2/2	3.22E+01	3.37E+01	3.12E-01	5.00E+01	2.00E+02	6.74E-01	1.69E-01
Little No-Name	4-Hydroxy-4-methyl-2-pentanone	2/2	2.75E+01	2.80E+01					
Little No-Name	Bis(2-ethylhexyl)phthalate	2/2	7.05E-02	9.00E-02					
Little No-Name	Ethylbenzene	1/1	2.70E-01	2.70E-01					
Little No-Name	Phenol	1/2	1.44E-01	9.20E-02		7.00E+01	3.00E+01	1.31E-03	3.07E-03
Little No-Name	Styrene	1/1	6.00E-01	6.00E-01		3.00E+02		2.00E-03	
Little No-Name	Totarol	2/2	4.70E-01	4.80E-01					
Lower WOC	Aluminum	12/12	1.38E+04	2.12E+04	4.79E-01	5.00E+01		4.24E+02	
Lower WOC	Antimony	7/12	8.00E-01	1.10E+00		5.00E+00		2.20E-01	
Lower WOC	Arsenic	8/12	3.65E+00	7.40E+00	5.93E-01	1.00E+01	6.00E+01	7.40E-01	1.23E-01
Lower WOC	Barium	12/12	1.56E+02	2.63E+02	1.24E+00	5.00E+02		5.26E-01	
Lower WOC	Beryllium	12/12	1.12E+00	1.50E+00	6.82E-01	1.00E+01		1.50E-01	
Lower WOC	Boron	12/12	5.99E+00	1.02E+01	2.71E-01	5.00E-01		2.04E+01	
Lower WOC	Cadmium	12/12	5.67E-01	1.00E+00		3.00E+00	2.00E+01	3.33E-01	5.00E-02
Lower WOC	Calcium	12/12	4.61E+03	1.46E+04	2.07E+00				
Lower WOC	Chromium	12/12	7.10E+01	1.16E+02		1.00E+00	4.00E-01	1.16E+02	2.90E+02
Lower WOC	Cobalt	12/12	2.00E+01	3.57E+01	9.73E-01	2.00E+01		1.79E+00	
Lower WOC	Copper	12/12	2.01E+01	3.52E+01	2.81E-01	1.00E+02	5.00E+01	3.52E-01	7.04E-01
Lower WOC	Iron	12/12	3.40E+04	5.96E+04	3.47E-01				
Lower WOC	Lead	12/12	2.37E+01	5.04E+01	3.37E-01	5.00E+01	5.00E+02	1.01E+00	1.01E-01
Lower WOC	Lithium	12/12	1.76E+01	2.73E+01	9.85E-02	2.00E+00		1.37E+01	
Lower WOC	Magnesium	12/12	3.47E+03	7.00E+03	9.42E-01				
Lower WOC	Manganese	12/12	1.33E+03	2.04E+03	1.47E-01	5.00E+02		4.08E+00	
Lower WOC	Mercury	12/12	1.23E+00	5.10E+00	9.54E+00	3.00E-01	1.00E-01	1.70E+01	5.10E+01
Lower WOC	Molybdenum	12/12	3.05E+00	3.90E+00		2.00E+00		1.95E+00	
Lower WOC	Nickel	12/12	2.74E+01	4.56E+01	8.04E-01	3.00E+01	2.00E+02	1.52E+00	2.28E-01
Lower WOC	Osmium	4/8	7.28E+00	1.24E+01					
Lower WOC	Potassium	12/12	1.57E+03	2.83E+03	5.25E-01				
Lower WOC	Selenium	9/12	7.88E-01	1.30E+00		1.00E+00	7.00E+01	1.30E+00	1.86E-02
Lower WOC	Silicon	12/12	3.26E+02	6.45E+02	9.25E-01				

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
Lower WOC	Silver	12/12	1.68E+00	6.80E+00		2.00E+00		3.40E+00	
Lower WOC	Sodium	12/12	3.65E+02	4.77E+02					
Lower WOC	Strontium	7/12	9.95E+00	2.04E+01	3.40E-02				
Lower WOC	Thallium	12/12	7.53E-01	1.00E+00	1.27E+00	1.00E+00		1.00E+00	
Lower WOC	Tin	12/12	8.77E+00	1.53E+01		5.00E+01		3.06E-01	
Lower WOC	Vanadium	12/12	2.33E+01	3.83E+01	2.39E-01	2.00E+00		1.92E+01	
Lower WOC	Zinc	12/12	1.89E+02	4.10E+02	3.80E+00	5.00E+01	2.00E+02	8.20E+00	2.05E+00
Lower WOC	2-Methylnaphthalene	1/12	6.04E-01	8.30E-02					
Lower WOC	4-Methylphenol	1/12	6.37E-01	4.20E-01					
Lower WOC	Acenaphthene	1/12	6.01E-01	9.20E-02		2.00E+01		4.60E-03	
Lower WOC	alpha-BHC	1/11	2.08E-03	1.90E-02					
Lower WOC	Anthracene	1/12	6.07E-01	7.80E-02					
Lower WOC	Benz(a)anthracene	2/12	9.68E-02	1.10E-01					
Lower WOC	Benzo(a)pyrene	4/12	1.07E-01	1.20E-01					
Lower WOC	Benzo(b)fluoranthene	2/12	1.12E-01	1.30E-01					
Lower WOC	Benzo(ghi)peryline	2/12	9.61E-02	1.10E-01					
Lower WOC	Benzo(k)fluoranthene	2/12	1.00E-01	1.10E-01					
Lower WOC	bis(2-Ethylhexyl)phthalate	8/12	1.39E-01	4.80E-01					
Lower WOC	Carbazole	2/12	9.04E-02	1.60E-01					
Lower WOC	Chrysene	3/12	2.23E-01	4.50E-01					
Lower WOC	Di-n-butylphthalate	3/12	1.16E-01	1.70E-01		2.00E+02		8.50E-04	
Lower WOC	Di-n-octylphthalate	1/12	6.19E-01	5.50E-02					
Lower WOC	Dibenz(a,h)anthracene	2/12	3.95E-02	4.60E-02					
Lower WOC	Dibenzofuran	1/12	6.05E-01	3.40E-01					
Lower WOC	Fluoranthene	5/12	1.54E-01	2.00E-01					
Lower WOC	Fluorene	1/12	6.17E-01	4.50E-01			3.00E+01		1.50E-02
Lower WOC	Indeno(1,2,3-cd)pyrene	2/12	7.93E-02	8.90E-02					
Lower WOC	N-Nitrosodiphenylamine	1/12	6.37E-01	4.20E-01			2.00E+01		2.10E-02
Lower WOC	PCB-1260	8/11	1.08E-01	4.50E-01					
Lower WOC	Phenanthrene	4/12	1.94E-01	7.70E-01					
Lower WOC	Pyrene	5/12	1.39E-01	2.30E-01					
NHF	Aluminum	3/3	1.71E+04	1.81E+04	4.09E-01	5.00E+01		3.62E+02	
NHF	Arsenic	3/3	2.97E+00	3.10E+00	2.48E-01	1.00E+01	6.00E+01	3.10E-01	5.17E-02
NHF	Barium	3/3	1.96E+02	2.23E+02	1.05E+00	5.00E+02		4.46E-01	
NHF	Beryllium	3/3	9.80E-01	1.00E+00	4.55E-01	1.00E+01		1.00E-01	
NHF	Calcium	3/3	4.35E+03	4.96E+03	7.02E-01				
NHF	Chromium	3/3	3.10E+01	3.51E+01	4.48E-01	1.00E+00	4.00E-01	3.51E+01	8.78E+01
NHF	Cobalt	3/3	1.93E+01	2.00E+01	5.45E-01	2.00E+01		1.00E+00	
NHF	Copper	3/3	2.29E+01	2.53E+01	2.02E-01	1.00E+02	5.00E+01	2.53E-01	5.06E-01
NHF	Iron	3/3	2.87E+04	3.01E+04	1.75E-01				
NHF	Lead	3/3	8.97E+00	1.07E+01	7.15E-02	5.00E+01	5.00E+02	2.14E-01	2.14E-02
NHF	Magnesium	3/3	4.64E+03	5.09E+03	6.85E-01				
NHF	Manganese	3/3	1.31E+03	1.81E+03	1.31E-01	5.00E+02		3.62E+00	
NHF	Nickel	3/3	2.87E+01	3.16E+01	5.57E-01	3.00E+01	2.00E+02	1.05E+00	1.58E-01
NHF	Potassium	3/3	1.92E+03	2.23E+03	4.14E-01				
NHF	Silver	3/3	1.17E+00	1.40E+00		2.00E+00		7.00E-01	

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
NHF	Sodium	3/3	5.47E+01	6.19E+01					
NHF	Vanadium	3/3	2.43E+01	2.63E+01	1.64E-01	2.00E+00		1.32E+01	
NHF	Zinc	3/3	5.66E+01	7.72E+01	7.15E-01	5.00E+01	2.00E+02	1.54E+00	3.86E-01
NHF	1,1-Dichloroethene	2/4	8.00E-03	1.00E-02					
NHF	4-Nitrophenol	1/3	3.34E-01	5.80E-02			7.00E+00		8.29E-03
NHF	Benzene	2/4	8.00E-03	1.00E-02					
NHF	Carbon tetrachloride	2/4	8.00E-03	1.00E-02					
NHF	Chloroform	2/4	8.00E-03	1.00E-02					
NHF	Di-n-butylphthalate	3/3	1.07E-01	1.50E-01		2.00E+02		7.50E-04	
NHF	Dimethylbenzene	2/4	8.00E-03	1.00E-02					
NHF	Ethylbenzene	2/4	8.00E-03	1.00E-02					
NHF	Methylene chloride	2/9	5.48E-03	1.00E-02					
NHF	Naphthalene	2/5	1.21E-01	1.00E-02					
NHF	Tetrachloroethene	2/4	8.00E-03	1.00E-02					
NHF	Toluene	3/5	6.60E-03	1.00E-02		2.00E+02		5.00E-05	
NHF	trans-1,2-Dichloroethene	2/2	1.00E-02	1.00E-02					
PIT 4 South	Aluminum	2/2	1.68E+04	1.77E+04	4.00E-01	5.00E+01		3.54E+02	
PIT 4 South	Antimony	2/2	1.20E+00	1.30E+00		5.00E+00		2.60E-01	
PIT 4 South	Arsenic	2/2	4.05E+00	4.80E+00	3.84E-01	1.00E+01	6.00E+01	4.80E-01	8.00E-02
PIT 4 South	Barium	2/2	2.24E+02	2.66E+02	1.25E+00	5.00E+02		5.32E-01	
PIT 4 South	Beryllium	2/2	1.05E+00	1.10E+00	5.00E-01	1.00E+01		1.10E-01	
PIT 4 South	Boron	2/2	5.60E+00	6.10E+00	1.62E-01	5.00E-01		1.22E+01	
PIT 4 South	Cadmium	2/2	3.50E-01	3.80E-01		3.00E+00	2.00E+01	1.27E-01	1.90E-02
PIT 4 South	Calcium	2/2	3.79E+04	4.25E+04	6.02E+00				
PIT 4 South	Chromium	2/2	3.39E+01	3.51E+01		1.00E+00	4.00E-01	3.51E+01	8.78E+01
PIT 4 South	Cobalt	2/2	1.67E+01	1.67E+01	4.55E-01	2.00E+01		8.35E-01	
PIT 4 South	Copper	2/2	4.10E+01	5.44E+01	4.35E-01	1.00E+02	5.00E+01	5.44E-01	1.09E+00
PIT 4 South	Iron	2/2	2.54E+04	2.80E+04	1.63E-01				
PIT 4 South	Lead	2/2	1.78E+01	1.92E+01	1.28E-01	5.00E+01	5.00E+02	3.84E-01	3.84E-02
PIT 4 South	Lithium	2/2	1.95E+01	2.00E+01	7.22E-02	2.00E+00		1.00E+01	
PIT 4 South	Magnesium	2/2	8.17E+03	8.84E+03	1.19E+00				
PIT 4 South	Manganese	2/2	2.03E+03	2.24E+03	1.62E-01	5.00E+02		4.48E+00	
PIT 4 South	Mercury	2/2	1.75E-01	1.80E-01	3.37E-01	3.00E-01	1.00E-01	6.00E-01	1.80E+00
PIT 4 South	Molybdenum	2/2	3.85E+00	4.20E+00		2.00E+00		2.10E+00	
PIT 4 South	Nickel	2/2	2.47E+01	2.69E+01	4.74E-01	3.00E+01	2.00E+02	8.97E-01	1.35E-01
PIT 4 South	Potassium	2/2	2.06E+03	2.10E+03	3.90E-01				
PIT 4 South	Selenium	2/2	1.08E+00	1.20E+00		1.00E+00	7.00E+01	1.20E+00	1.71E-02
PIT 4 South	Silicon	2/2	4.97E+02	6.05E+02	8.68E-01				
PIT 4 South	Silver	2/2	3.50E-01	3.80E-01		2.00E+00		1.90E-01	
PIT 4 South	Sodium	2/2	7.55E+02	7.60E+02					
PIT 4 South	Strontium	2/2	4.13E+01	4.58E+01	7.62E-02				
PIT 4 South	Thallium	2/2	1.08E+00	1.20E+00	1.52E+00	1.00E+00		1.20E+00	
PIT 4 South	Tin	2/2	1.02E+01	1.11E+01		5.00E+01		2.22E-01	
PIT 4 South	Vanadium	2/2	2.39E+01	2.53E+01	1.58E-01	2.00E+00		1.27E+01	
PIT 4 South	Zinc	2/2	7.67E+01	7.76E+01	7.19E-01	5.00E+01	2.00E+02	1.55E+00	3.88E-01
PIT 4 South	Acenaphthene	1/2	9.10E-02	2.20E-02		2.00E+01		1.10E-03	

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
PIT 4 South	Anthracene	1/2	1.00E-01	4.00E-02					
PIT 4 South	Benz(a)anthracene	1/2	9.60E-02	3.20E-02					
PIT 4 South	Benzo(a)pyrene	1/2	9.80E-02	3.60E-02					
PIT 4 South	Benzo(b)fluoranthene	2/2	3.50E-02	3.90E-02					
PIT 4 South	Benzo(k)fluoranthene	2/2	2.85E-02	3.60E-02					
PIT 4 South	bis(2-Ethylhexyl)phthalate	2/2	7.15E-02	9.30E-02					
PIT 4 South	Chrysene	1/2	9.75E-02	3.50E-02					
PIT 4 South	Di-n-butylphthalate	2/2	3.55E-01	4.70E-01		2.00E+02		2.35E-03	
PIT 4 South	Dibenzofuran	1/2	1.13E-01	6.60E-02					
PIT 4 South	Fluoranthene	2/2	7.35E-02	1.20E-01					
PIT 4 South	Fluorene	1/2	1.28E-01	9.60E-02			3.00E+01		3.20E-03
PIT 4 South	Naphthalene	1/2	9.55E-02	3.10E-02					
PIT 4 South	PCB-1254	1/2	3.68E-02	4.70E-02					
PIT 4 South	Phenanthrene	1/2	1.65E-01	1.70E-01					
PIT 4 South	Pyrene	2/2	5.45E-02	8.70E-02					
SWSA 5 Seep A	Aluminum	6/6	1.76E+04	2.24E+04	5.06E-01	5.00E+01		4.48E+02	
SWSA 5 Seep A	Antimony	2/2	3.45E+00	4.10E+00		5.00E+00		8.20E-01	
SWSA 5 Seep A	Arsenic	6/6	3.62E+00	5.50E+00	4.41E-01	1.00E+01	6.00E+01	5.50E-01	9.17E-02
SWSA 5 Seep A	Barium	6/6	1.49E+02	2.05E+02	9.67E-01	5.00E+02		4.10E-01	
SWSA 5 Seep A	Beryllium	5/5	8.64E-01	1.10E+00	5.00E-01	1.00E+01		1.10E-01	
SWSA 5 Seep A	Cadmium	2/5	3.87E-01	1.20E+00		3.00E+00	2.00E+01	4.00E-01	6.00E-02
SWSA 5 Seep A	Calcium	6/6	6.63E+03	1.70E+04	2.41E+00				
SWSA 5 Seep A	Chromium	6/6	2.97E+01	4.34E+01	5.54E-01	1.00E+00	4.00E-01	4.34E+01	1.09E+02
SWSA 5 Seep A	Cobalt	6/6	1.81E+01	2.46E+01	6.70E-01	2.00E+01		1.23E+00	
SWSA 5 Seep A	Copper	6/6	1.62E+01	1.98E+01	1.58E-01	1.00E+02	5.00E+01	1.98E-01	3.96E-01
SWSA 5 Seep A	Iron	6/6	3.05E+04	3.48E+04	2.03E-01				
SWSA 5 Seep A	Lead	6/6	2.43E+01	3.79E+01	2.53E-01	5.00E+01	5.00E+02	7.58E-01	7.58E-02
SWSA 5 Seep A	Magnesium	6/6	4.33E+03	6.14E+03	8.26E-01				
SWSA 5 Seep A	Manganese	6/6	2.22E+03	5.54E+03	4.00E-01	5.00E+02		1.11E+01	
SWSA 5 Seep A	Mercury	4/5	1.42E-01	4.10E-01	7.67E-01	3.00E-01	1.00E-01	1.37E+00	4.10E+00
SWSA 5 Seep A	Nickel	6/6	2.57E+01	3.74E+01	6.60E-01	3.00E+01	2.00E+02	1.25E+00	1.87E-01
SWSA 5 Seep A	Potassium	6/6	1.86E+03	2.34E+03	4.34E-01				
SWSA 5 Seep A	Selenium	5/5	2.02E+00	5.10E+00		1.00E+00	7.00E+01	5.10E+00	7.29E-02
SWSA 5 Seep A	Silver	6/6	1.55E+00	2.20E+00		2.00E+00		1.10E+00	
SWSA 5 Seep A	Sodium	3/6	7.16E+01	2.06E+02					
SWSA 5 Seep A	Thallium	2/6	3.73E-01	6.10E-01	7.72E-01	1.00E+00		6.10E-01	
SWSA 5 Seep A	Vanadium	6/6	2.66E+01	2.94E+01	1.83E-01	2.00E+00		1.47E+01	
SWSA 5 Seep A	Zinc	6/6	9.87E+01	3.21E+02	2.97E+00	5.00E+01	2.00E+02	6.42E+00	1.61E+00
SWSA 5 Seep A	1,1-Dichloroethene	4/9	7.92E-03	1.00E-02					
SWSA 5 Seep A	1,2-Dichloroethene	1/6	5.50E-03	2.00E-03					
SWSA 5 Seep A	2-Butanone	1/6	8.33E-03	1.90E-02					
SWSA 5 Seep A	4,4'-DDD	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	4,4'-DDE	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	4,4'-DDT	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	Acetone	2/9	9.03E-03	1.10E-01					
SWSA 5 Seep A	Aldrin	2/6	1.51E-03	2.50E-03					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 Seep A	alpha-BHC	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	alpha-Chlordane	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	Benzene	4/9	7.92E-03	1.00E-02					
SWSA 5 Seep A	Benzo(k)fluoranthene	1/4	1.65E-01	4.90E-02					
SWSA 5 Seep A	beta-BHC	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	Carbon tetrachloride	4/9	7.92E-03	1.00E-02					
SWSA 5 Seep A	Chloroform	5/9	7.33E-03	1.00E-02					
SWSA 5 Seep A	delta-BHC	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	Dieldrin	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	Dimethylbenzene	4/9	7.92E-03	1.00E-02					
SWSA 5 Seep A	Endosulfan I	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	Endosulfan II	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	Endosulfan sulfate	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	Endrin	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	Endrin aldehyde	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	Endrin ketone	2/6	2.90E-03	4.80E-03					
SWSA 5 Seep A	Ethylbenzene	1/6	6.83E-03	1.00E-02					
SWSA 5 Seep A	Fluoranthene	1/4	1.63E-01	4.30E-02					
SWSA 5 Seep A	gamma-Chlordane	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	Heptachlor	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	Heptachlor epoxide	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	Lindane	2/6	1.51E-03	2.50E-03					
SWSA 5 Seep A	Methoxychlor	2/6	1.51E-02	2.50E-02					
SWSA 5 Seep A	Methylene chloride	4/9	7.92E-03	1.00E-02					
SWSA 5 Seep A	Naphthalene	4/8	1.08E-01	1.00E-02					
SWSA 5 Seep A	PCB-1016	2/6	2.90E-02	4.80E-02					
SWSA 5 Seep A	PCB-1221	2/6	5.88E-02	9.80E-02					
SWSA 5 Seep A	PCB-1232	2/6	2.90E-02	4.80E-02					
SWSA 5 Seep A	PCB-1242	2/6	2.90E-02	4.80E-02					
SWSA 5 Seep A	PCB-1248	2/6	2.90E-02	4.80E-02					
SWSA 5 Seep A	PCB-1254	3/6	4.11E-02	9.30E-02					
SWSA 5 Seep A	PCB-1260	3/6	3.24E-02	7.80E-02					
SWSA 5 Seep A	Pyrene	1/4	1.66E-01	5.20E-02					
SWSA 5 Seep A	Tetrachloroethene	4/9	7.92E-03	1.00E-02					
SWSA 5 Seep A	Toluene	4/9	7.92E-03	1.00E-02		2.00E+02		5.00E-05	
SWSA 5 Seep A	Toxaphene	2/6	1.51E-01	2.50E-01					
SWSA 5 Seep A	trans-1,2-Dichloroethene	4/4	1.00E-02	1.00E-02					
SWSA 5 Seep B West	Aluminum	2/2	1.89E+04	2.45E+04	5.53E-01	5.00E+01		4.90E+02	
SWSA 5 Seep B West	Antimony	1/2	5.83E+00	6.20E+00		5.00E+00		1.24E+00	
SWSA 5 Seep B West	Arsenic	1/2	2.55E+00	4.00E+00	3.20E-01	1.00E+01	6.00E+01	4.00E-01	6.67E-02
SWSA 5 Seep B West	Barium	2/2	1.19E+02	1.19E+02	5.61E-01	5.00E+02		2.38E-01	
SWSA 5 Seep B West	Beryllium	2/2	7.55E-01	8.00E-01	3.64E-01	1.00E+01		8.00E-02	
SWSA 5 Seep B West	Boron	1/1	9.00E+00	9.00E+00	2.39E-01	5.00E-01		1.80E+01	
SWSA 5 Seep B West	Cadmium	1/2	9.30E-01	7.10E-01		3.00E+00	2.00E+01	2.37E-01	3.55E-02
SWSA 5 Seep B West	Calcium	2/2	7.68E+03	1.33E+04	1.88E+00				
SWSA 5 Seep B West	Chromium	1/1	3.19E+01	3.19E+01		1.00E+00	4.00E-01	3.19E+01	7.98E+01

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 Seep B West	Cobalt	2/2	2.05E+01	2.31E+01	6.29E-01	2.00E+01		1.16E+00	
SWSA 5 Seep B West	Copper	2/2	2.33E+01	3.14E+01	2.51E-01	1.00E+02	5.00E+01	3.14E-01	6.28E-01
SWSA 5 Seep B West	Cyanide	1/1	7.00E-02	7.00E-02	1.59E-01				
SWSA 5 Seep B West	Iron	2/2	2.79E+04	3.25E+04	1.89E-01				
SWSA 5 Seep B West	Lead	2/2	2.82E+01	3.85E+01	2.57E-01	5.00E+01	5.00E+02	7.70E-01	7.70E-02
SWSA 5 Seep B West	Lithium	1/1	1.50E+01	1.50E+01	5.41E-02	2.00E+00		7.50E+00	
SWSA 5 Seep B West	Magnesium	2/2	3.51E+03	4.54E+03	6.11E-01				
SWSA 5 Seep B West	Manganese	2/2	1.21E+03	1.28E+03	9.25E-02	5.00E+02		2.56E+00	
SWSA 5 Seep B West	Mercury	1/2	1.02E+00	2.00E+00	3.74E+00	3.00E-01	1.00E-01	6.67E+00	2.00E+01
SWSA 5 Seep B West	Molybdenum	1/1	3.30E+00	3.30E+00		2.00E+00		1.65E+00	
SWSA 5 Seep B West	Nickel	2/2	2.72E+01	3.18E+01	5.61E-01	3.00E+01	2.00E+02	1.06E+00	1.59E-01
SWSA 5 Seep B West	Potassium	2/2	2.50E+03	3.16E+03	5.86E-01				
SWSA 5 Seep B West	Selenium	2/2	8.30E-01	1.30E+00		1.00E+00	7.00E+01	1.30E+00	1.86E-02
SWSA 5 Seep B West	Silicon	1/1	2.46E+02	2.46E+02	3.53E-01				
SWSA 5 Seep B West	Silver	1/2	7.25E-01	9.50E-01		2.00E+00		4.75E-01	
SWSA 5 Seep B West	Sodium	2/2	2.45E+02	3.48E+02					
SWSA 5 Seep B West	Strontium	1/1	7.20E+00	7.20E+00	1.20E-02				
SWSA 5 Seep B West	Thallium	2/2	5.35E-01	7.10E-01	8.99E-01	1.00E+00		7.10E-01	
SWSA 5 Seep B West	Tin	1/1	6.40E+00	6.40E+00		5.00E+01		1.28E-01	
SWSA 5 Seep B West	Vanadium	2/2	2.63E+01	3.45E+01	2.15E-01	2.00E+00		1.73E+01	
SWSA 5 Seep B West	Zinc	2/2	5.61E+01	5.81E+01	5.38E-01	5.00E+01	2.00E+02	1.16E+00	2.91E-01
SWSA 5 Seep B West	1,1-Dichloroethene	1/2	7.50E-03	1.00E-02					
SWSA 5 Seep B West	4-Methylphenol	1/2	3.05E-01	4.00E-01					
SWSA 5 Seep B West	Benzene	1/2	7.50E-03	1.00E-02					
SWSA 5 Seep B West	Bis(2-ethylhexyl)phthalate	1/1	5.20E-02	5.20E-02					
SWSA 5 Seep B West	bis(2-Ethylhexyl)phthalate	1/1	4.60E-02	4.60E-02					
SWSA 5 Seep B West	Carbon tetrachloride	1/2	7.50E-03	1.00E-02					
SWSA 5 Seep B West	Chloroform	1/2	7.50E-03	1.00E-02					
SWSA 5 Seep B West	Di-n-butylphthalate	1/2	1.17E-01	2.30E-02		2.00E+02		1.15E-04	
SWSA 5 Seep B West	Dimethylbenzene	1/2	7.50E-03	1.00E-02					
SWSA 5 Seep B West	Ethylbenzene	1/2	7.50E-03	1.00E-02					
SWSA 5 Seep B West	Methylene chloride	1/2	7.50E-03	1.00E-02					
SWSA 5 Seep B West	Naphthalene	1/3	1.40E-01	1.00E-02					
SWSA 5 Seep B West	PCB-1248	1/2	2.35E-02	2.60E-02					
SWSA 5 Seep B West	PCB-1254	1/2	3.55E-02	5.00E-02					
SWSA 5 Seep B West	Tetrachloroethene	1/2	7.50E-03	1.00E-02					
SWSA 5 Seep B West	Toluene	1/2	7.50E-03	1.00E-02		2.00E+02		5.00E-05	
SWSA 5 Seep B West	trans-1,2-Dichloroethene	1/1	1.00E-02	1.00E-02					
SWSA 5 Seep B East	Aluminum	3/3	1.98E+04	2.20E+04	4.97E-01	5.00E+01		4.40E+02	
SWSA 5 Seep B East	Antimony	1/1	3.40E+00	3.40E+00		5.00E+00		6.80E-01	
SWSA 5 Seep B East	Arsenic	3/3	3.33E+00	4.50E+00	3.60E-01	1.00E+01	6.00E+01	4.50E-01	7.50E-02
SWSA 5 Seep B East	Barium	3/3	1.64E+02	1.91E+02	9.01E-01	5.00E+02		3.82E-01	
SWSA 5 Seep B East	Beryllium	3/3	1.12E+00	1.40E+00	6.36E-01	1.00E+01		1.40E-01	
SWSA 5 Seep B East	Calcium	3/3	3.39E+03	5.89E+03	8.34E-01				
SWSA 5 Seep B East	Chromium	3/3	3.37E+01	3.62E+01	4.62E-01	1.00E+00	4.00E-01	3.62E+01	9.05E+01
SWSA 5 Seep B East	Cobalt	3/3	1.92E+01	2.32E+01	6.32E-01	2.00E+01		1.16E+00	

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 Seep B East	Copper	3/3	3.82E+01	7.44E+01	5.95E-01	1.00E+02	5.00E+01	7.44E-01	1.49E+00
SWSA 5 Seep B East	Iron	3/3	3.05E+04	3.13E+04	1.82E-01				
SWSA 5 Seep B East	Lead	3/3	1.58E+01	2.60E+01	1.74E-01	5.00E+01	5.00E+02	5.20E-01	5.20E-02
SWSA 5 Seep B East	Magnesium	3/3	6.46E+03	6.72E+03	9.04E-01				
SWSA 5 Seep B East	Manganese	3/3	1.01E+03	1.17E+03	8.45E-02	5.00E+02		2.34E+00	
SWSA 5 Seep B East	Nickel	3/3	3.67E+01	3.92E+01	6.91E-01	3.00E+01	2.00E+02	1.31E+00	1.96E-01
SWSA 5 Seep B East	Potassium	3/3	2.19E+03	2.34E+03	4.34E-01				
SWSA 5 Seep B East	Selenium	1/3	3.48E-01	3.40E-01		1.00E+00	7.00E+01	3.40E-01	4.86E-03
SWSA 5 Seep B East	Silver	3/3	1.43E+00	1.60E+00		2.00E+00		8.00E-01	
SWSA 5 Seep B East	Sodium	2/3	5.44E+01	7.82E+01					
SWSA 5 Seep B East	Thallium	2/3	4.13E-01	7.00E-01	8.86E-01	1.00E+00		7.00E-01	
SWSA 5 Seep B East	Vanadium	3/3	2.54E+01	2.63E+01	1.64E-01	2.00E+00		1.32E+01	
SWSA 5 Seep B East	Zinc	3/3	6.90E+01	7.16E+01	6.63E-01	5.00E+01	2.00E+02	1.43E+00	3.58E-01
SWSA 5 Seep B East	1,1-Dichloroethene	2/4	7.88E-03	1.00E-02					
SWSA 5 Seep B East	4,4'-DDD	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	4,4'-DDE	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	4,4'-DDT	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	Aldrin	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	alpha-BHC	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	alpha-Chlordane	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	Benzene	2/4	7.88E-03	1.00E-02					
SWSA 5 Seep B East	beta-BHC	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	Carbon tetrachloride	2/4	7.88E-03	1.00E-02					
SWSA 5 Seep B East	Chloroform	2/4	7.88E-03	1.00E-02					
SWSA 5 Seep B East	delta-BHC	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	Dieldrin	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	Dimethylbenzene	2/4	7.88E-03	1.00E-02					
SWSA 5 Seep B East	Endosulfan I	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	Endosulfan II	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	Endosulfan sulfate	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	Endrin	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	Endrin aldehyde	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	Endrin ketone	1/3	2.58E-03	3.90E-03					
SWSA 5 Seep B East	gamma-Chlordane	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	Heptachlor	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	Heptachlor epoxide	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	Lindane	1/3	1.32E-03	2.00E-03					
SWSA 5 Seep B East	Methoxychlor	1/3	1.32E-02	2.00E-02					
SWSA 5 Seep B East	Methylene chloride	2/4	7.88E-03	1.00E-02					
SWSA 5 Seep B East	Naphthalene	2/4	1.00E-01	1.00E-02					
SWSA 5 Seep B East	PCB-1016	1/3	2.58E-02	3.90E-02					
SWSA 5 Seep B East	PCB-1221	1/3	5.22E-02	7.90E-02					
SWSA 5 Seep B East	PCB-1232	1/3	2.58E-02	3.90E-02					
SWSA 5 Seep B East	PCB-1242	1/3	2.58E-02	3.90E-02					
SWSA 5 Seep B East	PCB-1248	1/3	2.58E-02	3.90E-02					
SWSA 5 Seep B East	PCB-1254	1/3	2.58E-02	3.90E-02					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 Seep B East	PCB-1260	2/3	6.83E-02	1.40E-01					
SWSA 5 Seep B East	Tetrachloroethene	5/7	6.21E-03	1.00E-02					
SWSA 5 Seep B East	Toluene	3/5	6.50E-03	1.00E-02		2.00E+02		5.00E-05	
SWSA 5 Seep B East	Toxaphene	1/3	1.32E-01	2.00E-01					
SWSA 5 Seep B East	trans-1,2-Dichloroethene	2/2	1.00E-02	1.00E-02					
SWSA 5 Seep C	Aluminum	15/15	2.50E+04	3.68E+04	8.31E-01	5.00E+01		7.36E+02	
SWSA 5 Seep C	Antimony	3/6	6.61E+00	1.21E+01		5.00E+00		2.42E+00	
SWSA 5 Seep C	Arsenic	14/15	4.72E+00	1.12E+01	8.97E-01	1.00E+01	6.00E+01	1.12E+00	1.87E-01
SWSA 5 Seep C	Barium	15/15	2.18E+02	4.79E+02	2.26E+00	5.00E+02		9.58E-01	
SWSA 5 Seep C	Beryllium	14/15	1.28E+00	2.40E+00	1.09E+00	1.00E+01		2.40E-01	
SWSA 5 Seep C	Boron	4/4	5.70E+00	9.40E+00	2.49E-01	5.00E-01		1.88E+01	
SWSA 5 Seep C	Cadmium	4/15	2.54E-01	1.10E+00		3.00E+00	2.00E+01	3.67E-01	5.50E-02
SWSA 5 Seep C	Calcium	15/15	7.95E+03	4.90E+04	6.94E+00				
SWSA 5 Seep C	Chromium	11/11	3.81E+01	4.62E+01	5.89E-01	1.00E+00	4.00E-01	4.62E+01	1.16E+02
SWSA 5 Seep C	Cobalt	15/15	2.36E+01	5.27E+01	1.44E+00	2.00E+01		2.64E+00	
SWSA 5 Seep C	Copper	15/15	2.07E+01	3.06E+01	2.45E-01	1.00E+02	5.00E+01	3.06E-01	6.12E-01
SWSA 5 Seep C	Cyanide	1/8	3.37E-01	7.00E-01	1.59E+00				
SWSA 5 Seep C	Iron	15/15	3.31E+04	4.39E+04	2.56E-01				
SWSA 5 Seep C	Lead	15/15	1.49E+01	2.66E+01	1.78E-01	5.00E+01	5.00E+02	5.32E-01	5.32E-02
SWSA 5 Seep C	Lithium	4/4	2.13E+01	2.59E+01	9.35E-02	2.00E+00		1.30E+01	
SWSA 5 Seep C	Magnesium	15/15	6.62E+03	1.02E+04	1.37E+00				
SWSA 5 Seep C	Manganese	15/15	2.37E+03	9.40E+03	6.79E-01	5.00E+02		1.88E+01	
SWSA 5 Seep C	Mercury	5/14	8.15E-02	1.40E-01	2.62E-01	3.00E-01	1.00E-01	4.67E-01	1.40E+00
SWSA 5 Seep C	Molybdenum	4/4	6.13E+00	7.30E+00		2.00E+00		3.65E+00	
SWSA 5 Seep C	Nickel	15/15	3.57E+01	4.70E+01	8.29E-01	3.00E+01	2.00E+02	1.57E+00	2.35E-01
SWSA 5 Seep C	Osmium	3/3	8.50E+00	1.22E+01					
SWSA 5 Seep C	Potassium	15/15	3.01E+03	4.61E+03	8.55E-01				
SWSA 5 Seep C	Selenium	4/13	6.42E-01	8.40E-01		1.00E+00	7.00E+01	8.40E-01	1.20E-02
SWSA 5 Seep C	Silicon	4/4	7.02E+02	1.72E+03	2.47E+00				
SWSA 5 Seep C	Silver	8/14	1.47E+00	5.00E+00		2.00E+00		2.50E+00	
SWSA 5 Seep C	Sodium	10/15	2.11E+02	6.22E+02					
SWSA 5 Seep C	Strontium	4/4	1.25E+01	2.33E+01	3.88E-02				
SWSA 5 Seep C	Thallium	5/14	5.94E-01	1.40E+00	1.77E+00	1.00E+00		1.40E+00	
SWSA 5 Seep C	Tin	4/4	9.38E+00	1.13E+01		5.00E+01		2.26E-01	
SWSA 5 Seep C	Vanadium	15/15	3.28E+01	4.04E+01	2.52E-01	2.00E+00		2.02E+01	
SWSA 5 Seep C	Zinc	15/15	7.14E+01	9.17E+01	8.49E-01	5.00E+01	2.00E+02	1.83E+00	4.59E-01
SWSA 5 Seep C	1,1,1-Trichloroethane	2/11	5.32E-03	3.00E-03					
SWSA 5 Seep C	1,1-Dichloroethane	2/11	5.23E-03	2.00E-03					
SWSA 5 Seep C	1,1-Dichloroethene	10/19	8.15E-03	1.00E-02					
SWSA 5 Seep C	1,2-Dichloroethene	2/11	5.50E-03	4.00E-03					
SWSA 5 Seep C	4,4'-DDD	1/17	2.07E-03	8.20E-04					
SWSA 5 Seep C	Acetone	10/19	1.55E-02	8.10E-02					
SWSA 5 Seep C	Benzene	10/19	8.15E-03	1.00E-02					
SWSA 5 Seep C	bis(2-Ethylhexyl)phthalate	6/6	1.96E-01	2.80E-01					
SWSA 5 Seep C	Carbon tetrachloride	10/19	8.15E-03	1.00E-02					
SWSA 5 Seep C	Chloroform	10/19	8.15E-03	1.00E-02					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 Seep C	Di-n-butylphthalate	11/16	2.08E-01	4.40E-01		2.00E+02		2.20E-03	
SWSA 5 Seep C	Diethylphthalate	1/16	2.86E-01	6.10E-02		1.00E+02		6.10E-04	
SWSA 5 Seep C	Dimethylbenzene	11/20	7.88E-03	1.00E-02					
SWSA 5 Seep C	Endrin	1/17	2.05E-03	5.10E-04					
SWSA 5 Seep C	Ethylbenzene	9/18	8.05E-03	1.00E-02					
SWSA 5 Seep C	Methylene chloride	10/19	8.15E-03	1.00E-02					
SWSA 5 Seep C	Naphthalene	11/27	1.75E-01	1.00E-02					
SWSA 5 Seep C	Tetrachloroethene	11/20	7.83E-03	1.00E-02					
SWSA 5 Seep C	Toluene	12/21	7.45E-03	1.00E-02		2.00E+02		5.00E-05	
SWSA 5 Seep C	trans-1,2-Dichloroethene	10/10	1.00E-02	1.00E-02					
SWSA 5 Seep C	Trichloroethene	4/12	4.79E-03	4.00E-03					
SWSA 5 Trib 1	Aluminum	17/17	2.09E+04	2.72E+04	6.14E-01	5.00E+01		5.44E+02	
SWSA 5 Trib 1	Antimony	2/5	2.21E+00	3.60E+00		5.00E+00		7.20E-01	
SWSA 5 Trib 1	Arsenic	17/17	3.19E+00	1.16E+01	9.29E-01	1.00E+01	6.00E+01	1.16E+00	1.93E-01
SWSA 5 Trib 1	Barium	17/17	1.50E+02	2.58E+02	1.22E+00	5.00E+02		5.16E-01	
SWSA 5 Trib 1	Beryllium	17/17	1.14E+00	1.60E+00	7.27E-01	1.00E+01		1.60E-01	
SWSA 5 Trib 1	Cadmium	1/17	2.14E-01	5.40E-01		3.00E+00	2.00E+01	1.80E-01	2.70E-02
SWSA 5 Trib 1	Calcium	17/17	9.29E+03	6.85E+04	9.70E+00				
SWSA 5 Trib 1	Chromium	17/17	3.16E+01	3.80E+01	4.85E-01	1.00E+00	4.00E-01	3.80E+01	9.50E+01
SWSA 5 Trib 1	Cobalt	17/17	1.89E+01	3.38E+01	9.21E-01	2.00E+01		1.69E+00	
SWSA 5 Trib 1	Copper	16/17	1.82E+01	2.70E+01	2.16E-01	1.00E+02	5.00E+01	2.70E-01	5.40E-01
SWSA 5 Trib 1	Iron	17/17	3.12E+04	4.06E+04	2.36E-01				
SWSA 5 Trib 1	Lead	17/17	1.88E+01	1.31E+02	8.75E-01	5.00E+01	5.00E+02	2.62E+00	2.62E-01
SWSA 5 Trib 1	Magnesium	17/17	5.95E+03	1.19E+04	1.60E+00				
SWSA 5 Trib 1	Manganese	17/17	9.74E+02	2.84E+03	2.05E-01	5.00E+02		5.68E+00	
SWSA 5 Trib 1	Mercury	4/16	3.28E-02	4.30E+00	8.05E+00	3.00E-01	1.00E-01	1.43E+01	4.30E+01
SWSA 5 Trib 1	Nickel	17/17	3.12E+01	4.44E+01	7.83E-01	3.00E+01	2.00E+02	1.48E+00	2.22E-01
SWSA 5 Trib 1	Potassium	17/17	2.30E+03	2.96E+03	5.49E-01				
SWSA 5 Trib 1	Selenium	4/13	5.87E-01	3.30E+00		1.00E+00	7.00E+01	3.30E+00	4.71E-02
SWSA 5 Trib 1	Silver	11/17	1.56E+00	3.10E+00		2.00E+00		1.55E+00	
SWSA 5 Trib 1	Sodium	9/17	7.83E+01	1.87E+02					
SWSA 5 Trib 1	Thallium	3/17	3.15E-01	5.40E-01	6.84E-01	1.00E+00		5.40E-01	
SWSA 5 Trib 1	Vanadium	17/17	2.69E+01	3.11E+01	1.94E-01	2.00E+00		1.56E+01	
SWSA 5 Trib 1	Zinc	17/17	6.48E+01	7.61E+01	7.05E-01	5.00E+01	2.00E+02	1.52E+00	3.81E-01
SWSA 5 Trib 1	1,1-Dichloroethene	12/26	7.86E-03	1.00E-02					
SWSA 5 Trib 1	4,4'-DDD	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	4,4'-DDE	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	4,4'-DDT	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	Aldrin	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	alpha-BHC	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	alpha-Chlordane	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	Benzene	12/25	7.93E-03	1.00E-02					
SWSA 5 Trib 1	beta-BHC	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	Bis(2-ethylhexyl)phthalate	5/15	1.78E-01	3.90E-01					
SWSA 5 Trib 1	Butylbenzylphthalate	1/15	1.75E-01	4.30E-02					
SWSA 5 Trib 1	Carbon tetrachloride	12/25	7.93E-03	1.00E-02					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 Trib 1	Chloroform	14/27	7.44E-03	1.00E-02					
SWSA 5 Trib 1	delta-BHC	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	Di-n-butylphthalate	6/15	1.62E-01	1.50E-01		2.00E+02		7.50E-04	
SWSA 5 Trib 1	Dieldrin	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	Diethylphthalate	2/15	1.94E-01	3.00E-01		1.00E+02		3.00E-03	
SWSA 5 Trib 1	Dimethylbenzene	12/25	7.93E-03	1.00E-02					
SWSA 5 Trib 1	Endosulfan I	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	Endosulfan II	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	Endosulfan sulfate	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	Endrin	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	Endrin aldehyde	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	Endrin ketone	2/17	3.60E-03	4.30E-03					
SWSA 5 Trib 1	Ethylbenzene	2/15	6.53E-03	1.00E-02					
SWSA 5 Trib 1	gamma-Chlordane	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	Heptachlor	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	Heptachlor epoxide	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	Lindane	2/17	1.86E-03	2.20E-03					
SWSA 5 Trib 1	Methoxychlor	2/17	1.86E-02	2.20E-02					
SWSA 5 Trib 1	Methylene chloride	12/25	7.93E-03	1.00E-02					
SWSA 5 Trib 1	Naphthalene	12/27	1.13E-01	1.00E-02					
SWSA 5 Trib 1	PCB-1016	2/17	3.60E-02	4.30E-02					
SWSA 5 Trib 1	PCB-1221	2/17	7.28E-02	8.70E-02					
SWSA 5 Trib 1	PCB-1232	2/17	3.60E-02	4.30E-02					
SWSA 5 Trib 1	PCB-1242	2/17	3.60E-02	4.30E-02					
SWSA 5 Trib 1	PCB-1248	2/17	3.60E-02	4.30E-02					
SWSA 5 Trib 1	PCB-1254	2/17	1.50E-02	1.40E-01					
SWSA 5 Trib 1	PCB-1260	5/17	2.99E-02	2.80E-01					
SWSA 5 Trib 1	Pyrene	1/15	1.86E-01	4.10E-02					
SWSA 5 Trib 1	Styrene	1/14	5.71E-03	2.00E-03		3.00E+02		6.67E-06	
SWSA 5 Trib 1	Tetrachloroethene	12/25	7.93E-03	1.00E-02					
SWSA 5 Trib 1	Toluene	16/28	7.57E-03	1.00E-02		2.00E+02		5.00E-05	
SWSA 5 Trib 1	Toxaphene	2/17	1.86E-01	2.20E-01					
SWSA 5 Trib 1	trans-1,2-Dichloroethene	12/12	1.00E-02	1.00E-02					
SWSA 5 WOC	Aluminum	22/22	2.14E+04	3.31E+04	7.47E-01	5.00E+01		6.62E+02	
SWSA 5 WOC	Antimony	2/9	2.92E+00	3.70E+00		5.00E+00		7.40E-01	
SWSA 5 WOC	Arsenic	21/22	2.31E+00	5.10E+00	4.09E-01	1.00E+01	6.00E+01	5.10E-01	8.50E-02
SWSA 5 WOC	Barium	22/22	1.77E+02	2.74E+02	1.29E+00	5.00E+02		5.48E-01	
SWSA 5 WOC	Beryllium	19/22	1.37E+00	3.30E+00	1.50E+00	1.00E+01		3.30E-01	
SWSA 5 WOC	Cadmium	5/20	2.25E-01	2.00E+00		3.00E+00	2.00E+01	6.67E-01	1.00E-01
SWSA 5 WOC	Calcium	22/22	1.51E+04	2.46E+05	3.48E+01				
SWSA 5 WOC	Chromium	22/22	3.24E+01	4.98E+01	6.35E-01	1.00E+00	4.00E-01	4.98E+01	1.25E+02
SWSA 5 WOC	Cobalt	21/22	1.78E+01	2.24E+01	6.10E-01	2.00E+01		1.12E+00	
SWSA 5 WOC	Copper	20/22	2.43E+01	8.67E+01	6.93E-01	1.00E+02	5.00E+01	8.67E-01	1.73E+00
SWSA 5 WOC	Iron	22/22	2.98E+04	3.74E+04	2.18E-01				
SWSA 5 WOC	Lead	22/22	2.34E+01	5.57E+01	3.72E-01	5.00E+01	5.00E+02	1.11E+00	1.11E-01
SWSA 5 WOC	Magnesium	22/22	7.80E+03	2.26E+04	3.04E+00				

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 WOC	Manganese	22/22	1.38E+03	3.71E+03	2.68E-01	5.00E+02		7.42E+00	
SWSA 5 WOC	Mercury	7/21	6.49E-02	9.60E-01	1.80E+00	3.00E-01	1.00E-01	3.20E+00	9.60E+00
SWSA 5 WOC	Nickel	19/22	3.14E+01	4.42E+01	7.80E-01	3.00E+01	2.00E+02	1.47E+00	2.21E-01
SWSA 5 WOC	Potassium	22/22	2.23E+03	3.35E+03	6.22E-01				
SWSA 5 WOC	Selenium	3/19	4.19E-01	1.70E+00		1.00E+00	7.00E+01	1.70E+00	2.43E-02
SWSA 5 WOC	Silver	10/22	1.08E+00	2.20E+00		2.00E+00		1.10E+00	
SWSA 5 WOC	Sodium	8/22	7.87E+01	1.76E+02					
SWSA 5 WOC	Thallium	1/21	2.79E-01	5.70E-01	7.22E-01	1.00E+00		5.70E-01	
SWSA 5 WOC	Vanadium	20/22	2.71E+01	3.55E+01	2.21E-01	2.00E+00		1.78E+01	
SWSA 5 WOC	Zinc	22/22	7.26E+01	1.18E+02	1.09E+00	5.00E+01	2.00E+02	2.36E+00	5.90E-01
SWSA 5 WOC	1,1,1-Trichloroethane	1/22	6.00E-03	2.00E-03					
SWSA 5 WOC	1,1-Dichloroethene	24/45	8.23E-03	1.00E-02					
SWSA 5 WOC	1,2-Dichloroethene	1/22	6.00E-03	2.00E-03					
SWSA 5 WOC	4,4'-DDD	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	4,4'-DDE	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	4,4'-DDT	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	4-Nitrophenol	1/19	4.60E-01	8.20E-02			7.00E+00		1.17E-02
SWSA 5 WOC	Acetone	5/36	3.63E-03	6.50E-01					
SWSA 5 WOC	Aldrin	1/19	1.10E-03	2.20E-03					
SWSA 5 WOC	alpha-BHC	1/19	1.10E-03	2.20E-03					
SWSA 5 WOC	alpha-Chlordane	1/19	1.10E-03	2.20E-03					
SWSA 5 WOC	Benzene	24/45	8.23E-03	1.00E-02					
SWSA 5 WOC	beta-BHC	1/19	1.10E-03	2.20E-03					
SWSA 5 WOC	Bis(2-ethylhexyl)phthalate	3/19	1.83E-01	1.10E-01					
SWSA 5 WOC	Butylbenzylphthalate	2/19	1.84E-01	5.20E-02					
SWSA 5 WOC	Carbon tetrachloride	28/49	7.73E-03	1.00E-02					
SWSA 5 WOC	Chloroform	30/51	7.39E-03	1.00E-02					
SWSA 5 WOC	Chloromethane	2/23	5.83E-03	2.00E-03					
SWSA 5 WOC	delta-BHC	1/19	1.10E-03	2.20E-03					
SWSA 5 WOC	Di-n-butylphthalate	4/19	1.40E-01	3.80E+00		2.00E+02		1.90E-02	
SWSA 5 WOC	Dieldrin	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	Diethylphthalate	1/19	1.94E-01	6.70E-02		1.00E+02		6.70E-04	
SWSA 5 WOC	Dimethylbenzene	32/53	7.38E-03	1.00E-02					
SWSA 5 WOC	Endosulfan I	1/19	1.10E-03	2.20E-03					
SWSA 5 WOC	Endosulfan II	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	Endosulfan sulfate	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	Endrin	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	Endrin aldehyde	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	Endrin ketone	1/19	2.11E-03	4.30E-03					
SWSA 5 WOC	Ethylbenzene	24/44	8.16E-03	1.80E-02					
SWSA 5 WOC	gamma-Chlordane	2/19	1.62E-03	2.20E-03					
SWSA 5 WOC	Heptachlor	1/19	1.10E-03	2.20E-03					
SWSA 5 WOC	Heptachlor epoxide	2/19	1.02E-03	2.20E-03					
SWSA 5 WOC	Lindane	1/19	1.10E-03	2.20E-03					
SWSA 5 WOC	Methoxychlor	1/19	1.10E-02	2.20E-02					
SWSA 5 WOC	Methylene chloride	24/48	7.94E-03	1.00E-02					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 WOC	Naphthalene	24/43	9.38E-02	1.00E-02					
SWSA 5 WOC	PCB-1016	1/19	2.11E-02	4.30E-02					
SWSA 5 WOC	PCB-1221	1/19	4.29E-02	8.70E-02					
SWSA 5 WOC	PCB-1232	1/19	2.11E-02	4.30E-02					
SWSA 5 WOC	PCB-1242	1/19	2.11E-02	4.30E-02					
SWSA 5 WOC	PCB-1248	1/19	2.11E-02	4.30E-02					
SWSA 5 WOC	PCB-1254	4/19	1.98E-02	4.60E-01					
SWSA 5 WOC	PCB-1260	6/19	2.38E-02	4.20E-01					
SWSA 5 WOC	Styrene	1/21	6.05E-03	3.00E-03		3.00E+02		1.00E-05	
SWSA 5 WOC	Tetrachloroethene	29/50	7.60E-03	1.00E-02					
SWSA 5 WOC	Toluene	28/48	7.69E-03	1.00E-02		2.00E+02		5.00E-05	
SWSA 5 WOC	Toxaphene	1/19	1.10E-01	2.20E-01					
SWSA 5 WOC	trans-1,2-Dichloroethene	24/24	1.00E-02	1.00E-02					
SWSA 5 WOC	Trichloroethene	4/25	5.92E-03	9.00E-03					
SWSA 4 Main	Aluminum	3/3	2.64E+04	3.92E+04	8.85E-01	5.00E+01		7.84E+02	
SWSA 4 Main	Arsenic	3/3	6.87E+00	1.00E+01	8.01E-01	1.00E+01	6.00E+01	1.00E+00	1.67E-01
SWSA 4 Main	Barium	3/3	2.91E+02	4.58E+02	2.16E+00	5.00E+02		9.16E-01	
SWSA 4 Main	Beryllium	3/3	1.73E+00	2.70E+00	1.23E+00	1.00E+01		2.70E-01	
SWSA 4 Main	Calcium	3/3	1.21E+04	2.26E+04	3.20E+00				
SWSA 4 Main	Chromium	3/3	3.77E+01	5.06E+01	6.46E-01	1.00E+00	4.00E-01	5.06E+01	1.27E+02
SWSA 4 Main	Cobalt	3/3	2.27E+01	2.88E+01	7.85E-01	2.00E+01		1.44E+00	
SWSA 4 Main	Copper	3/3	2.30E+01	2.99E+01	2.39E-01	1.00E+02	5.00E+01	2.99E-01	5.98E-01
SWSA 4 Main	Iron	3/3	4.03E+04	5.25E+04	3.06E-01				
SWSA 4 Main	Lead	3/3	3.49E+01	6.42E+01	4.29E-01	5.00E+01	5.00E+02	1.28E+00	1.28E-01
SWSA 4 Main	Magnesium	3/3	5.59E+03	5.96E+03	8.02E-01				
SWSA 4 Main	Manganese	3/3	1.86E+03	3.83E+03	2.77E-01	5.00E+02		7.66E+00	
SWSA 4 Main	Nickel	3/3	2.64E+03	7.86E+03	1.39E+02	3.00E+01	2.00E+02	2.62E+02	3.93E+01
SWSA 4 Main	Potassium	3/3	4.39E+03	7.18E+03	1.33E+00				
SWSA 4 Main	Selenium	1/3	1.03E+00	2.00E+00		1.00E+00	7.00E+01	2.00E+00	2.86E-02
SWSA 4 Main	Sodium	3/3	6.35E+02	8.86E+02					
SWSA 4 Main	Vanadium	3/3	3.18E+01	4.45E+01	2.77E-01	2.00E+00		2.23E+01	
SWSA 4 Main	Zinc	3/3	9.88E+01	1.22E+02	1.13E+00	5.00E+01	2.00E+02	2.44E+00	6.10E-01
SWSA 4 Main	PCB-1254	6/6	2.52E-02	3.90E-02					
SWSA 4 Main	PCB-1260	4/6	4.18E-02	8.40E-02					
SWSA 5 N WOC	Aluminum	4/4	2.46E+04	2.73E+04	6.16E-01	5.00E+01		5.46E+02	
SWSA 5 N WOC	Arsenic	4/4	2.68E+00	3.40E+00	2.72E-01	1.00E+01	6.00E+01	3.40E-01	5.67E-02
SWSA 5 N WOC	Barium	4/4	8.98E+01	1.00E+02	4.72E-01	5.00E+02		2.00E-01	
SWSA 5 N WOC	Beryllium	3/3	1.07E+00	1.10E+00	5.00E-01	1.00E+01		1.10E-01	
SWSA 5 N WOC	Calcium	4/4	8.16E+02	1.17E+03	1.66E-01				
SWSA 5 N WOC	Chromium	4/4	3.48E+01	3.79E+01	4.84E-01	1.00E+00	4.00E-01	3.79E+01	9.48E+01
SWSA 5 N WOC	Cobalt	4/4	1.35E+01	1.63E+01	4.44E-01	2.00E+01		8.15E-01	
SWSA 5 N WOC	Copper	4/4	2.75E+01	3.22E+01	2.57E-01	1.00E+02	5.00E+01	3.22E-01	6.44E-01
SWSA 5 N WOC	Iron	4/4	3.56E+04	3.82E+04	2.22E-01				
SWSA 5 N WOC	Lead	4/4	1.09E+01	1.64E+01	1.10E-01	5.00E+01	5.00E+02	3.28E-01	3.28E-02
SWSA 5 N WOC	Magnesium	4/4	3.78E+03	4.18E+03	5.63E-01				
SWSA 5 N WOC	Manganese	4/4	4.29E+02	5.53E+02	4.00E-02	5.00E+02		1.11E+00	

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 N WOC	Mercury	3/4	7.00E-02	9.00E-02	1.68E-01	3.00E-01	1.00E-01	3.00E-01	9.00E-01
SWSA 5 N WOC	Nickel	4/4	2.62E+01	3.00E+01	5.29E-01	3.00E+01	2.00E+02	1.00E+00	1.50E-01
SWSA 5 N WOC	Potassium	4/4	2.23E+03	2.39E+03	4.43E-01				
SWSA 5 N WOC	Selenium	2/4	1.07E+00	1.40E+00		1.00E+00	7.00E+01	1.40E+00	2.00E-02
SWSA 5 N WOC	Silver	4/4	1.90E+00	2.20E+00		2.00E+00		1.10E+00	
SWSA 5 N WOC	Vanadium	4/4	2.98E+01	3.47E+01	2.16E-01	2.00E+00		1.74E+01	
SWSA 5 N WOC	Zinc	4/4	4.95E+01	5.33E+01	4.94E-01	5.00E+01	2.00E+02	1.07E+00	2.67E-01
SWSA 5 N WOC	1,1-Dichloroethene	4/7	8.41E-03	1.00E-02					
SWSA 5 N WOC	2-Butanone	1/4	5.38E-03	3.00E-03					
SWSA 5 N WOC	Benzene	4/7	8.41E-03	1.00E-02					
SWSA 5 N WOC	Bis(2-ethylhexyl)phthalate	1/4	1.73E-01	9.20E-02					
SWSA 5 N WOC	Carbon tetrachloride	4/7	8.41E-03	1.00E-02					
SWSA 5 N WOC	Chloroform	4/7	8.41E-03	1.00E-02					
SWSA 5 N WOC	Di-n-butylphthalate	2/4	1.24E-01	5.00E-02		2.00E+02		2.50E-04	
SWSA 5 N WOC	Diethylphthalate	1/3	1.52E-01	6.10E-02		1.00E+02		6.10E-04	
SWSA 5 N WOC	Dimethylbenzene	4/7	8.41E-03	1.00E-02					
SWSA 5 N WOC	Methylene chloride	6/8	9.02E-03	1.00E-02					
SWSA 5 N WOC	Naphthalene	4/7	9.14E-02	1.00E-02					
SWSA 5 N WOC	Tetrachloroethene	4/7	8.41E-03	1.00E-02					
SWSA 5 N WOC	Toluene	4/7	8.41E-03	1.00E-02		2.00E+02		5.00E-05	
SWSA 5 N WOC	trans-1,2-Dichloroethene	4/4	1.00E-02	1.00E-02					
SWSA 6 East	Aluminum	4/4	2.22E+04	2.71E+04	6.12E-01	5.00E+01		5.42E+02	
SWSA 6 East	Arsenic	3/3	1.83E+00	2.40E+00	1.92E-01	1.00E+01	6.00E+01	2.40E-01	4.00E-02
SWSA 6 East	Barium	4/4	1.34E+02	2.47E+02	1.17E+00	5.00E+02		4.94E-01	
SWSA 6 East	Beryllium	4/4	1.60E+00	2.00E+00	9.09E-01	1.00E+01		2.00E-01	
SWSA 6 East	Cadmium	4/4	4.35E+00	5.50E+00		3.00E+00	2.00E+01	1.83E+00	2.75E-01
SWSA 6 East	Calcium	2/2	3.85E+03	6.64E+03	9.40E-01				
SWSA 6 East	Chromium	4/4	3.28E+01	4.30E+01	5.49E-01	1.00E+00	4.00E-01	4.30E+01	1.08E+02
SWSA 6 East	Cobalt	4/4	2.55E+01	2.81E+01	7.66E-01	2.00E+01		1.41E+00	
SWSA 6 East	Copper	3/4	1.89E+01	2.52E+01	2.01E-01	1.00E+02	5.00E+01	2.52E-01	5.04E-01
SWSA 6 East	Iron	4/4	3.46E+04	3.99E+04	2.32E-01				
SWSA 6 East	Lead	4/4	1.21E+01	1.89E+01	1.26E-01	5.00E+01	5.00E+02	3.78E-01	3.78E-02
SWSA 6 East	Magnesium	4/4	6.23E+03	8.13E+03	1.09E+00				
SWSA 6 East	Manganese	4/4	9.56E+02	1.61E+03	1.16E-01	5.00E+02		3.22E+00	
SWSA 6 East	Nickel	4/4	5.24E+01	6.00E+01	1.06E+00	3.00E+01	2.00E+02	2.00E+00	3.00E-01
SWSA 6 East	Potassium	4/4	2.14E+03	2.26E+03	4.19E-01				
SWSA 6 East	Sodium	4/4	8.13E+01	1.53E+02					
SWSA 6 East	Vanadium	4/4	2.01E+01	2.25E+01	1.40E-01	2.00E+00		1.13E+01	
SWSA 6 East	Zinc	4/4	9.09E+01	1.31E+02	1.21E+00	5.00E+01	2.00E+02	2.62E+00	6.55E-01
SWSA 6 East	1,2-Dichloropropane	1/4	2.75E-03	1.00E-03			7.00E+02		1.43E-06
SWSA 6 East	2-Butanone	2/4	4.70E-02	1.10E-01					
SWSA 6 East	3-Methylpentane	2/2	1.48E-02	2.00E-02					
SWSA 6 East	4-Hydroxy-4-methyl-2-pentanone	4/4	1.90E+01	2.60E+01					
SWSA 6 East	Acetone	1/5	7.80E-03	1.70E-02					
SWSA 6 East	Bis(2-ethylhexyl)phthalate	2/4	2.44E-01	3.20E-01					
SWSA 6 East	Chloroform	1/4	9.50E-03	2.40E-02					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 6 East	Dioctyl hexanedioate	1/1	4.50E+00	4.50E+00					
SWSA 6 East	Methylcyclopentane	1/1	5.00E-03	5.00E-03					
SWSA 6 East	Methylene chloride	1/5	1.44E-02	1.50E-02					
SWSA 6 East	Toluene	2/4	2.88E-03	3.00E-03		2.00E+02		1.50E-05	
SWSA 6 South	Arsenic	1/1	2.16E+01	2.16E+01	1.73E+00	1.00E+01	6.00E+01	2.16E+00	3.60E-01
SWSA 6 South	Barium	1/1	6.86E+01	6.86E+01	3.24E-01	5.00E+02		1.37E-01	
SWSA 6 South	Beryllium	1/1	1.00E+00	1.00E+00	4.55E-01	1.00E+01		1.00E-01	
SWSA 6 South	Cadmium	1/1	3.20E+00	3.20E+00		3.00E+00	2.00E+01	1.07E+00	1.60E-01
SWSA 6 South	Calcium	1/1	3.17E+04	3.17E+04	4.49E+00				
SWSA 6 South	Chromium	1/1	3.48E+01	3.48E+01	4.44E-01	1.00E+00	4.00E-01	3.48E+01	8.70E+01
SWSA 6 South	Cobalt	1/1	1.73E+01	1.73E+01	4.71E-01	2.00E+01		8.65E-01	
SWSA 6 South	Copper	1/1	1.86E+01	1.86E+01	1.49E-01	1.00E+02	5.00E+01	1.86E-01	3.72E-01
SWSA 6 South	Lead	1/1	1.25E+01	1.25E+01	8.35E-02	5.00E+01	5.00E+02	2.50E-01	2.50E-02
SWSA 6 South	Magnesium	1/1	3.14E+03	3.14E+03	4.23E-01				
SWSA 6 South	Manganese	1/1	4.55E+02	4.55E+02	3.29E-02	5.00E+02		9.10E-01	
SWSA 6 South	Nickel	1/1	3.66E+01	3.66E+01	6.46E-01	3.00E+01	2.00E+02	1.22E+00	1.83E-01
SWSA 6 South	Potassium	1/1	2.64E+03	2.64E+03	4.90E-01				
SWSA 6 South	Sodium	1/1	1.09E+02	1.09E+02					
SWSA 6 South	Thallium	1/1	1.00E+00	1.00E+00	1.27E+00	1.00E+00		1.00E+00	
SWSA 6 South	Vanadium	1/1	1.81E+01	1.81E+01	1.13E-01	2.00E+00		9.05E+00	
SWSA 6 South	Zinc	1/1	3.89E+01	3.89E+01	3.60E-01	5.00E+01	2.00E+02	7.78E-01	1.95E-01
SWSA 6 South	Benzo(k)fluoranthene	1/1	4.00E-02	4.00E-02					
SWSA 6 South	Mono(2-ethylhexyl) phthalate	1/1	6.90E-01	6.90E-01					
SWSA 6 South	Totarol	1/1	1.60E-01	1.60E-01					
W6MS3	Aluminum	11/11	1.44E+04	2.65E+04	5.98E-01	5.00E+01		5.30E+02	
W6MS3	Antimony	1/2	3.38E+00	9.00E-01		5.00E+00		1.80E-01	
W6MS3	Arsenic	10/11	3.13E+00	1.51E+01	1.21E+00	1.00E+01	6.00E+01	1.51E+00	2.52E-01
W6MS3	Barium	11/11	1.11E+02	1.64E+02	7.74E-01	5.00E+02		3.28E-01	
W6MS3	Beryllium	4/11	1.46E+00	2.00E+00	9.09E-01	1.00E+01		2.00E-01	
W6MS3	Cadmium	10/11	2.36E+00	4.20E+00		3.00E+00	2.00E+01	1.40E+00	2.10E-01
W6MS3	Calcium	11/11	3.35E+03	1.19E+04	1.68E+00				
W6MS3	Chromium	11/11	2.44E+01	3.60E+01	4.59E-01	1.00E+00	4.00E-01	3.60E+01	9.00E+01
W6MS3	Cobalt	11/11	1.87E+01	2.61E+01	7.11E-01	2.00E+01		1.31E+00	
W6MS3	Copper	11/11	1.56E+01	3.00E+01	2.40E-01	1.00E+02	5.00E+01	3.00E-01	6.00E-01
W6MS3	Iron	11/11	2.56E+04	3.80E+04	2.21E-01				
W6MS3	Lead	10/11	1.05E+01	1.80E+01	1.20E-01	5.00E+01	5.00E+02	3.60E-01	3.60E-02
W6MS3	Magnesium	11/11	2.95E+03	5.94E+03	7.99E-01				
W6MS3	Manganese	11/11	7.73E+02	1.55E+03	1.12E-01	5.00E+02		3.10E+00	
W6MS3	Nickel	11/11	3.55E+01	5.36E+01	9.45E-01	3.00E+01	2.00E+02	1.79E+00	2.68E-01
W6MS3	Osmium	1/1	3.77E+02	3.77E+02					
W6MS3	Potassium	11/11	1.60E+03	3.80E+03	7.05E-01				
W6MS3	Silver	1/11	1.34E+00	3.60E+00		2.00E+00		1.80E+00	
W6MS3	Sodium	10/11	7.05E+01	9.33E+01					
W6MS3	Tin	1/1	2.57E+01	2.57E+01		5.00E+01		5.14E-01	
W6MS3	Vanadium	11/11	1.55E+01	2.80E+01	1.75E-01	2.00E+00		1.40E+01	
W6MS3	Zinc	11/11	4.61E+01	6.70E+01	6.20E-01	5.00E+01	2.00E+02	1.34E+00	3.35E-01

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
W6MS3	1,2-Dichloroethene	1/10	4.45E-03	1.50E-02					
W6MS3	1,2-Dichloropropane	1/10	3.35E-03	3.00E-03			7.00E+02		4.29E-06
W6MS3	2,4-Dimethyl-2-pentanol	1/1	1.70E+01	1.70E+01					
W6MS3	2,4-Dimethyl-3-heptanone	1/1	5.60E+00	5.60E+00					
W6MS3	2,6-Dinitrotoluene	2/11	2.05E-01	1.40E-01					
W6MS3	2-Butanone	6/10	9.48E-02	2.70E-01					
W6MS3	2-Chlorophenol	1/11	2.13E-01	5.60E-02					
W6MS3	2-Cyclohexen-1-one	1/1	1.90E-01	1.90E-01					
W6MS3	2-Heptanol acetate	1/1	5.20E-01	5.20E-01					
W6MS3	3-Methylpentane	6/6	1.78E-02	3.80E-02					
W6MS3	4-Chloro-3-methylphenol	1/11	2.16E-01	8.50E-02					
W6MS3	4-Hydroxy-4-methyl-2-pentanone	3/3	1.85E+01	3.30E+01					
W6MS3	4-Nitrophenol	1/11	1.01E+00	7.30E-02			7.00E+00		1.04E-02
W6MS3	5-Methyl-5-hexen-2-one	1/1	1.10E+00	1.10E+00					
W6MS3	Acetone	1/10	8.55E-03	1.80E-02					
W6MS3	Bis(2-ethylhexyl)phthalate	10/11	5.00E-01	1.70E+00					
W6MS3	Bromomethane	1/10	7.05E-03	1.00E-02					
W6MS3	Chloroform	7/10	1.65E-02	6.40E-02					
W6MS3	cis-1,3-Dichloropropene	1/10	3.15E-03	1.00E-03					
W6MS3	Dimethylbenzene	1/10	3.25E-03	2.00E-03					
W6MS3	Hexadecanoic acid	1/1	1.60E+00	1.60E+00					
W6MS3	Isobutanol	1/1	4.50E-02	4.50E-02					
W6MS3	Methylene chloride	4/10	2.44E-02	2.00E-01					
W6MS3	N-Nitrosodiphenylamine	1/11	2.09E-01	5.90E-02			2.00E+01		2.95E-03
W6MS3	Pentachlorophenol	1/11	1.01E+00	7.80E-02		3.00E+00	4.00E+00	2.60E-02	1.95E-02
W6MS3	Phenol	2/11	1.99E-01	1.00E-01		7.00E+01	3.00E+01	1.43E-03	3.33E-03
W6MS3	Propanoic acid, 2-methyl-, 1-(1	1/1	3.80E-01	3.80E-01					
W6MS3	Pyrene	1/11	2.13E-01	5.20E-02					
W6MS3	Styrene	1/10	3.89E-03	8.00E-03		3.00E+02		2.67E-05	
W6MS3	Tetrachloroethene	1/10	3.40E-03	3.00E-03					
W6MS3	Toluene	6/10	3.13E-03	5.00E-03		2.00E+02		2.50E-05	
W6MS3	Totarol	5/5	5.84E-01	1.30E+00					
W6MS3	Trichloroethene	9/10	5.01E-03	1.70E-02					
W6MS3	Trimethylsilanol	5/5	9.36E-03	1.30E-02					
W6MS1	Aluminum	5/5	1.89E+04	2.35E+04	5.30E-01	5.00E+01		4.70E+02	
W6MS1	Arsenic	6/6	7.35E+00	1.34E+01	1.07E+00	1.00E+01	6.00E+01	1.34E+00	2.23E-01
W6MS1	Barium	6/6	1.73E+02	1.97E+02	9.29E-01	5.00E+02		3.94E-01	
W6MS1	Beryllium	6/6	1.57E+00	2.40E+00	1.09E+00	1.00E+01		2.40E-01	
W6MS1	Cadmium	6/6	3.83E+00	4.90E+00		3.00E+00	2.00E+01	1.63E+00	2.45E-01
W6MS1	Calcium	6/6	7.05E+03	1.69E+04	2.39E+00				
W6MS1	Chromium	6/6	3.18E+01	3.87E+01	4.94E-01	1.00E+00	4.00E-01	3.87E+01	9.68E+01
W6MS1	Cobalt	6/6	2.69E+01	3.57E+01	9.73E-01	2.00E+01		1.79E+00	
W6MS1	Copper	4/6	1.68E+01	2.74E+01	2.19E-01	1.00E+02	5.00E+01	2.74E-01	5.48E-01
W6MS1	Iron	5/5	3.04E+04	3.64E+04	2.12E-01				
W6MS1	Lead	6/6	1.46E+01	2.22E+01	1.48E-01	5.00E+01	5.00E+02	4.44E-01	4.44E-02
W6MS1	Magnesium	6/6	6.01E+03	8.50E+03	1.14E+00				

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
W6MS1	Manganese	6/6	1.69E+03	3.45E+03	2.49E-01	5.00E+02		6.90E+00	
W6MS1	Nickel	6/6	5.05E+01	6.53E+01	1.15E+00	3.00E+01	2.00E+02	2.18E+00	3.27E-01
W6MS1	Potassium	6/6	1.96E+03	2.47E+03	4.58E-01				
W6MS1	Sodium	6/6	8.61E+01	1.39E+02					
W6MS1	Vanadium	6/6	1.62E+01	1.83E+01	1.14E-01	2.00E+00		9.15E+00	
W6MS1	Zinc	6/6	6.68E+01	8.08E+01	7.48E-01	5.00E+01	2.00E+02	1.62E+00	4.04E-01
W6MS1	2-Butanone	2/5	4.23E-02	1.00E-01					
W6MS1	3-Methylpentane	1/1	7.10E-03	7.10E-03					
W6MS1	4-Hydroxy-4-methyl-2-pentanone	3/3	1.23E+01	1.40E+01					
W6MS1	5-Methyl-5-hexen-2-one	1/1	2.20E-01	2.20E-01					
W6MS1	Acetone	1/5	1.29E-02	2.40E-02					
W6MS1	Benz(a)anthracene	1/6	1.89E-01	5.10E-02					
W6MS1	Benzenemethanol	1/6	2.42E-01	3.50E-01					
W6MS1	Bis(2-ethylhexyl)phthalate	3/6	2.63E-01	3.30E-01					
W6MS1	Butylbenzylphthalate	1/6	1.64E-01	6.80E-02					
W6MS1	Chloroform	1/5	4.60E-03	7.00E-03					
W6MS1	Chrysene	1/6	2.04E-01	1.40E-01					
W6MS1	Dimethylbenzene	2/5	2.50E-03	2.00E-03					
W6MS1	Docosane	1/1	3.60E-01	3.60E-01					
W6MS1	Methylene chloride	1/5	1.67E-02	3.90E-02					
W6MS1	Tetrachloroethene	1/5	3.00E-03	2.00E-03					
W6MS1	Toluene	2/5	2.60E-03	2.00E-03		2.00E+02		1.00E-05	
W6MS1	Totarol	2/2	2.80E-01	3.50E-01					
W6MS1	Trichloroethene	3/5	4.00E-03	1.00E-02					
W6MS1	Trimethylsilanol	1/1	1.20E-02	1.20E-02					
WAG 7 WOC	Aluminum	1/1	3.08E+04	3.08E+04	6.95E-01	5.00E+01		6.16E+02	
WAG 7 WOC	Arsenic	1/1	3.50E+00	3.50E+00	2.80E-01	1.00E+01	6.00E+01	3.50E-01	5.83E-02
WAG 7 WOC	Barium	1/1	9.22E+01	9.22E+01	4.35E-01	5.00E+02		1.84E-01	
WAG 7 WOC	Beryllium	1/1	1.20E+00	1.20E+00	5.45E-01	1.00E+01		1.20E-01	
WAG 7 WOC	Calcium	1/1	1.93E+03	1.93E+03	2.73E-01				
WAG 7 WOC	Chromium	1/1	3.06E+01	3.06E+01	3.90E-01	1.00E+00	4.00E-01	3.06E+01	7.65E+01
WAG 7 WOC	Cobalt	1/1	1.22E+01	1.22E+01	3.32E-01	2.00E+01		6.10E-01	
WAG 7 WOC	Copper	1/1	2.02E+01	2.02E+01	1.61E-01	1.00E+02	5.00E+01	2.02E-01	4.04E-01
WAG 7 WOC	Iron	1/1	3.45E+04	3.45E+04	2.01E-01				
WAG 7 WOC	Lead	1/1	1.45E+01	1.45E+01	9.68E-02	5.00E+01	5.00E+02	2.90E-01	2.90E-02
WAG 7 WOC	Magnesium	1/1	6.44E+03	6.44E+03	8.67E-01				
WAG 7 WOC	Manganese	1/1	5.57E+02	5.57E+02	4.02E-02	5.00E+02		1.11E+00	
WAG 7 WOC	Nickel	1/1	2.54E+01	2.54E+01	4.48E-01	3.00E+01	2.00E+02	8.47E-01	1.27E-01
WAG 7 WOC	Potassium	1/1	3.99E+03	3.99E+03	7.40E-01				
WAG 7 WOC	Sodium	1/1	4.74E+02	4.74E+02					
WAG 7 WOC	Vanadium	1/1	3.26E+01	3.26E+01	2.03E-01	2.00E+00		1.63E+01	
WAG 7 WOC	Zinc	1/1	7.12E+01	7.12E+01	6.59E-01	5.00E+01	2.00E+02	1.42E+00	3.56E-01
WAG 7 WOC	PCB-1016	1/1	1.70E-02	1.70E-02					
WAG 7 WOC	PCB-1221	1/1	1.70E-02	1.70E-02					
WAG 7 WOC	PCB-1232	1/1	1.70E-02	1.70E-02					
WAG 7 WOC	PCB-1242	1/1	1.70E-02	1.70E-02					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
WAG 7 WOC	PCB-1248	1/1	1.70E-02	1.70E-02					
WAG 7 WOC	PCB-1254	1/1	1.70E-02	1.70E-02					
West Seep	Aluminum	32/32	2.06E+04	3.84E+04	8.67E-01	5.00E+01		7.68E+02	
West Seep	Arsenic	26/31	2.49E+00	7.00E+00	5.61E-01	1.00E+01	6.00E+01	7.00E-01	1.17E-01
West Seep	Barium	32/32	1.39E+02	2.35E+02	1.11E+00	5.00E+02		4.70E-01	
West Seep	Beryllium	30/32	1.38E+00	1.80E+00	8.18E-01	1.00E+01		1.80E-01	
West Seep	Cadmium	19/32	2.07E+00	5.00E+00		3.00E+00	2.00E+01	1.67E+00	2.50E-01
West Seep	Calcium	32/32	2.30E+03	5.87E+03	8.31E-01				
West Seep	Chromium	32/32	2.93E+01	4.89E+01	6.24E-01	1.00E+00	4.00E-01	4.89E+01	1.22E+02
West Seep	Cobalt	32/32	2.28E+01	3.98E+01	1.08E+00	2.00E+01		1.99E+00	
West Seep	Copper	30/32	1.99E+01	3.10E+01	2.48E-01	1.00E+02	5.00E+01	3.10E-01	6.20E-01
West Seep	Cyanide	1/24	5.72E+00	1.87E+00	4.25E+00				
West Seep	Iron	32/32	3.31E+04	4.53E+04	2.64E-01				
West Seep	Lead	31/31	2.29E+01	1.25E+02	8.35E-01	5.00E+01	5.00E+02	2.50E+00	2.50E-01
West Seep	Magnesium	32/32	4.79E+03	7.26E+03	9.77E-01				
West Seep	Manganese	32/32	1.03E+03	3.53E+03	2.55E-01	5.00E+02		7.06E+00	
West Seep	Mercury	5/20	4.80E-02	6.00E-02	1.12E-01	3.00E-01	1.00E-01	2.00E-01	6.00E-01
West Seep	Nickel	32/32	4.01E+01	6.88E+01	1.21E+00	3.00E+01	2.00E+02	2.29E+00	3.44E-01
West Seep	Osmium	3/3	3.85E+02	4.21E+02					
West Seep	Potassium	32/32	2.43E+03	5.05E+03	9.37E-01				
West Seep	Silver	5/28	1.11E+00	2.90E+00		2.00E+00		1.45E+00	
West Seep	Sodium	31/32	1.69E+02	1.47E+03					
West Seep	Thallium	1/29	3.75E-01	5.00E-01	6.33E-01	1.00E+00		5.00E-01	
West Seep	Tin	3/3	6.48E+01	8.71E+01		5.00E+01		1.74E+00	
West Seep	Vanadium	32/32	2.24E+01	3.61E+01	2.25E-01	2.00E+00		1.81E+01	
West Seep	Zinc	32/32	6.78E+01	1.03E+02	9.54E-01	5.00E+01	2.00E+02	2.06E+00	5.15E-01
West Seep	2,4-Dimethyl-3-heptanone	9/9	4.79E-01	1.40E+00					
West Seep	2,5-Hexanedione	1/1	2.10E-01	2.10E-01					
West Seep	2,6-Dinitrotoluene	1/23	2.06E-01	7.20E-02					
West Seep	2-Butanone	10/21	3.66E-02	3.40E-01					
West Seep	2-Heptanol acetate	1/1	3.10E-01	3.10E-01					
West Seep	3-Methylpentane	5/5	9.40E-03	1.30E-02					
West Seep	4-Chlorophenylphenylether	1/23	2.04E-01	7.00E-02					
West Seep	4-Hydroxy-4-methyl-2-pentanone	23/23	2.18E+01	5.90E+01					
West Seep	5-Methyl-2-hexanone	1/1	1.50E+00	1.50E+00					
West Seep	5-Methyl-5-hexen-2-one	9/9	8.88E-01	1.90E+00					
West Seep	6-(Acetyloxy)-2-hexanone	5/5	2.42E-01	3.10E-01					
West Seep	Acetone	8/27	9.82E-03	6.90E-02					
West Seep	Benzoic Acid	4/24	8.51E-01	6.70E-02					
West Seep	Bis(2-ethylhexyl)phthalate	7/24	1.53E-01	5.60E-01					
West Seep	Bromodichloromethane	1/25	3.08E-03	4.00E-03					
West Seep	Butyl 2-methylpropyl phthalate	1/1	2.40E-01	2.40E-01					
West Seep	Butylbenzylphthalate	1/23	2.03E-01	5.80E-02					
West Seep	Chloroform	8/27	6.10E-03	6.10E-02					
West Seep	Di-n-octylphthalate	1/23	2.04E-01	8.00E-02					
West Seep	Dioctyl hexanedioate	12/12	1.01E+01	3.40E+01					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
West Seep	Hexadecanoic acid	8/8	3.72E-01	6.90E-01					
West Seep	Methylene chloride	8/27	1.12E-02	6.20E-02					
West Seep	N-Nitrosodiphenylamine	2/23	1.90E-01	4.60E-02			2.00E+01		2.30E-03
West Seep	Octamethylcyclotetrasiloxane	2/2	9.00E-03	1.30E-02					
West Seep	PCB-1016	8/32	4.21E-02	2.10E-02					
West Seep	PCB-1221	8/32	4.21E-02	2.10E-02					
West Seep	PCB-1232	8/32	4.21E-02	2.10E-02					
West Seep	PCB-1242	8/32	4.21E-02	2.10E-02					
West Seep	PCB-1248	8/32	4.21E-02	2.10E-02					
West Seep	PCB-1254	8/32	8.03E-02	2.10E-02					
West Seep	Phenol	2/23	1.99E-01	8.90E-02		7.00E+01	3.00E+01	1.27E-03	2.97E-03
West Seep	Prometon	1/1	3.30E-01	3.30E-01					
West Seep	Tetrachloroethene	1/25	3.04E-03	3.00E-03					
West Seep	Toluene	9/26	2.54E-03	4.00E-03		2.00E+02		2.00E-05	
West Seep	trans-4-Chlorocyclohexanol	4/4	2.48E-01	2.80E-01					
West Seep	Trichloroethene	2/26	2.88E-03	2.00E-03					
West Seep	Trichlorofluoromethane	4/4	5.33E-02	7.20E-02					
West Seep	Trimethylsilanol	4/4	7.23E-03	8.00E-03					
SWSA 5 Drainage D-2	Aluminum	5/5	2.07E+04	2.47E+04	5.58E-01	5.00E+01		4.94E+02	
SWSA 5 Drainage D-2	Arsenic	5/5	2.88E+00	3.70E+00	2.96E-01	1.00E+01	6.00E+01	3.70E-01	6.17E-02
SWSA 5 Drainage D-2	Barium	5/5	1.61E+02	2.38E+02	1.12E+00	5.00E+02		4.76E-01	
SWSA 5 Drainage D-2	Beryllium	5/5	1.18E+00	1.40E+00	6.36E-01	1.00E+01		1.40E-01	
SWSA 5 Drainage D-2	Calcium	5/5	6.27E+03	1.03E+04	1.46E+00				
SWSA 5 Drainage D-2	Chromium	5/5	3.00E+01	3.84E+01	4.90E-01	1.00E+00	4.00E-01	3.84E+01	9.60E+01
SWSA 5 Drainage D-2	Cobalt	5/5	1.84E+01	2.09E+01	5.69E-01	2.00E+01		1.05E+00	
SWSA 5 Drainage D-2	Copper	5/5	2.11E+01	2.51E+01	2.01E-01	1.00E+02	5.00E+01	2.51E-01	5.02E-01
SWSA 5 Drainage D-2	Iron	5/5	3.23E+04	3.55E+04	2.07E-01				
SWSA 5 Drainage D-2	Lead	5/5	2.07E+01	2.50E+01	1.67E-01	5.00E+01	5.00E+02	5.00E-01	5.00E-02
SWSA 5 Drainage D-2	Magnesium	5/5	5.89E+03	7.89E+03	1.06E+00				
SWSA 5 Drainage D-2	Manganese	5/5	1.11E+03	1.27E+03	9.18E-02	5.00E+02		2.54E+00	
SWSA 5 Drainage D-2	Mercury	1/4	4.00E-02	7.00E-02	1.31E-01	3.00E-01	1.00E-01	2.33E-01	7.00E-01
SWSA 5 Drainage D-2	Nickel	5/5	3.23E+01	3.85E+01	6.79E-01	3.00E+01	2.00E+02	1.28E+00	1.93E-01
SWSA 5 Drainage D-2	Potassium	5/5	2.24E+03	2.79E+03	5.18E-01				
SWSA 5 Drainage D-2	Silver	2/5	1.13E+00	2.20E+00		2.00E+00		1.10E+00	
SWSA 5 Drainage D-2	Vanadium	5/5	2.83E+01	3.05E+01	1.90E-01	2.00E+00		1.53E+01	
SWSA 5 Drainage D-2	Zinc	5/5	7.29E+01	8.76E+01	8.11E-01	5.00E+01	2.00E+02	1.75E+00	4.38E-01
SWSA 5 Drainage D-2	1,1-Dichloroethene	4/8	8.16E-03	1.00E-02					
SWSA 5 Drainage D-2	1,2-Dichloroethene	1/5	5.60E-03	3.00E-03					
SWSA 5 Drainage D-2	2-Butanone	2/6	1.05E-02	2.10E-02					
SWSA 5 Drainage D-2	Acetone	2/6	5.25E-02	1.80E-01					
SWSA 5 Drainage D-2	Benzene	4/8	8.16E-03	1.00E-02					
SWSA 5 Drainage D-2	Bis(2-ethylhexyl)phthalate	1/5	1.72E-01	5.30E-02					
SWSA 5 Drainage D-2	Carbon tetrachloride	4/8	8.16E-03	1.00E-02					
SWSA 5 Drainage D-2	Chloroform	5/9	7.33E-03	1.00E-02					
SWSA 5 Drainage D-2	Dimethylbenzene	4/8	8.16E-03	1.00E-02					
SWSA 5 Drainage D-2	Ethylbenzene	1/5	6.40E-03	7.00E-03					

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
SWSA 5 Drainage D-2	Methylene chloride	4/8	8.16E-03	1.00E-02					
SWSA 5 Drainage D-2	Naphthalene	4/9	1.16E-01	1.00E-02					
SWSA 5 Drainage D-2	PCB-1260	2/5	7.12E-01	2.30E+00					
SWSA 5 Drainage D-2	Tetrachloroethene	5/8	7.69E-03	1.00E-02					
SWSA 5 Drainage D-2	Toluene	6/10	1.16E-02	2.00E-02		2.00E+02		1.00E-04	
SWSA 5 Drainage D-2	trans-1,2-Dichloroethene	4/4	1.00E-02	1.00E-02					
WOC	Aluminum	6/6	8.75E+03	1.19E+04	2.69E-01	5.00E+01		2.38E+02	
WOC	Antimony	3/6	2.39E+00	5.50E-01		5.00E+00		1.10E-01	
WOC	Arsenic	4/6	3.30E+00	4.80E+00	3.84E-01	1.00E+01	6.00E+01	4.80E-01	8.00E-02
WOC	Barium	6/6	1.18E+02	1.38E+02	6.51E-01	5.00E+02		2.76E-01	
WOC	Beryllium	6/6	8.18E-01	9.90E-01	4.50E-01	1.00E+01		9.90E-02	
WOC	Boron	6/6	6.00E+00	1.09E+01	2.89E-01	5.00E-01		2.18E+01	
WOC	Cadmium	6/6	9.18E-01	1.60E+00		3.00E+00	2.00E+01	5.33E-01	8.00E-02
WOC	Calcium	6/6	2.36E+04	6.68E+04	9.46E+00				
WOC	Chromium	6/6	3.46E+01	4.68E+01		1.00E+00	4.00E-01	4.68E+01	1.17E+02
WOC	Cobalt	6/6	1.23E+01	1.48E+01	4.03E-01	2.00E+01		7.40E-01	
WOC	Copper	6/6	5.95E+01	1.63E+02	1.30E+00	1.00E+02	5.00E+01	1.63E+00	3.26E+00
WOC	Iron	6/6	1.96E+04	2.48E+04	1.44E-01				
WOC	Lead	6/6	3.94E+01	7.97E+01	5.32E-01	5.00E+01	5.00E+02	1.59E+00	1.59E-01
WOC	Lithium	6/6	1.01E+01	1.30E+01	4.69E-02	2.00E+00		6.50E+00	
WOC	Magnesium	6/6	4.36E+03	1.12E+04	1.51E+00				
WOC	Manganese	6/6	7.07E+02	9.09E+02	6.57E-02	5.00E+02		1.82E+00	
WOC	Mercury	6/6	1.95E+00	4.80E+00	8.98E+00	3.00E-01	1.00E-01	1.60E+01	4.80E+01
WOC	Molybdenum	6/6	3.00E+00	4.00E+00		2.00E+00		2.00E+00	
WOC	Nickel	6/6	1.85E+01	2.47E+01	4.36E-01	3.00E+01	2.00E+02	8.23E-01	1.24E-01
WOC	Osmium	4/4	7.33E+00	8.50E+00					
WOC	Potassium	6/6	7.30E+02	1.10E+03	2.04E-01				
WOC	Selenium	2/6	6.46E-01	1.60E+00		1.00E+00	7.00E+01	1.60E+00	2.29E-02
WOC	Silicon	6/6	2.48E+02	2.88E+02	4.13E-01				
WOC	Silver	6/6	8.43E+00	2.52E+01		2.00E+00		1.26E+01	
WOC	Sodium	6/6	3.65E+02	4.24E+02					
WOC	Strontium	6/6	2.82E+01	6.67E+01	1.11E-01				
WOC	Thallium	6/6	7.47E-01	8.60E-01	1.09E+00	1.00E+00		8.60E-01	
WOC	Tin	6/6	7.58E+00	1.07E+01		5.00E+01		2.14E-01	
WOC	Vanadium	6/6	1.31E+01	1.81E+01	1.13E-01	2.00E+00		9.05E+00	
WOC	Zinc	6/6	3.47E+02	9.08E+02	8.41E+00	5.00E+01	2.00E+02	1.82E+01	4.54E+00
WOC	Anthracene	2/6	2.61E-01	1.20E-01					
WOC	Benz(a)anthracene	2/6	3.10E-01	3.70E-01					
WOC	Benzo(a)pyrene	3/6	2.56E-01	4.00E-01					
WOC	Benzo(b)fluoranthene	3/6	2.63E-01	3.90E-01					
WOC	Benzo(ghi)peryline	3/6	2.23E-01	3.20E-01					
WOC	Benzo(k)fluoranthene	3/6	2.59E-01	4.50E-01					
WOC	bis(2-Ethylhexyl)phthalate	5/6	3.25E-01	9.40E-01					
WOC	Carbazole	1/6	3.56E-01	6.20E-02					
WOC	Chrysene	3/6	2.80E-01	4.50E-01					
WOC	Di-n-butylphthalate	5/6	2.18E-01	4.70E-01		2.00E+02		2.35E-03	

Table 5.2 (continued)

Subbasin	Chemical	Freq. of detect.	Mean conc. (mg/kg)	Max. detected conc. (mg/kg)	Background quotient	Plant tox. (mg/kg)	Invert. tox. (mg/kg)	Plant HQ	Invert. HQ
WOC	Dibenz(a,h)anthracene	2/6	2.63E-01	1.30E-01					
WOC	Fluoranthene	6/6	4.57E-01	1.30E+00					
WOC	Indeno(1,2,3-cd)pyrene	4/6	2.68E-01	4.00E-01					
WOC	PCB-1260	6/6	1.90E-01	6.10E-01					
WOC	Phenanthrene	4/6	3.13E-01	6.50E-01					
WOC	Pyrene	6/6	3.62E-01	9.50E-01					

Notes:
Background quotient = maximum detected concentration divided by background concentration. Values < 1.0 indicate concentrations below background.
Plant toxicity values are from Will and Suter (1995b). Soil invertebrate toxicity values are from Will and Suter (1995a).
Hazard quotients (HQ) = maximum detected concentrations divided by the plant or invertebrate toxicity values.

6. RISKS TO PLANTS

6.1 EXPOSURE ASSESSMENT FOR PLANTS

Vegetation growing in the WOC watershed is exposed to contaminants in soil and potentially in shallow groundwater seeps and intermittent tributaries.

6.1.1 Soil Exposures

Concentrations of analytes in the soil derived from double acid-extractions (nitric and hydrochloric) generally represent the total potential reservoir of contaminants, not the concentrations to which plants are exposed at any one time. Some metals are more readily available for uptake by plants than others, depending on the solubility and species of the compound, interactions with soil constituents (organic matter and clay) and with other contaminants, and mechanisms for bioaccumulation in particular plant species. Organic contaminants may interact strongly with soil organic matter and therefore be only be partially available for plant uptake.

Contaminants have vertical distributions in soil that reflect interactions between the soil and the contaminant, controlled by the chemical and physical characteristics of the soil and the quantity and chemical characteristics of the contaminant. The exposure of plant roots to a contaminant in the soil depends on these abiotic factors and the growth characteristics of individual plants, such as rooting depth and density. Deep-rooted trees and shallow-rooted grasses may be exposed to different concentrations of contaminants, depending on the location of the source. In the absence of data on root distribution, it is assumed that the plants are rooted within the zone from which the soil was sampled for analysis.

Two other routes of exposure cannot be addressed because of a lack of data. These are exposure to volatile organic compounds in the air above and in the soil, and contaminants in dust particles deposited on above-ground plant parts. These routes are assumed to contribute negligibly to plant exposure in the WOC watershed.

6.1.2 Soil Solution Exposures

Plants growing in seep areas are exposed to contaminants in the aqueous phase. Numerous seeps, springs, or intermittent tributaries in the WOC watershed were sampled for contaminants. It is assumed that the roots of plants near the springs may be exposed to water containing contaminants at similar concentrations. Although the discharge in many of these seeps is seasonal and heightened during rainfall events, we make the conservative assumption that plants growing at these locations are exposed to contaminants in the water throughout the year. We also assume that the entire root systems of plants growing in seep areas are exposed to contaminants, and that this type of exposure is the only significant source for the plants.

Filtered water samples from seeps are better representations than unfiltered samples of concentrations to which plants are exposed because contaminants bound to particles in surface water are generally not bioavailable for absorption by plants. Samples for this assessment were not filtered; thus the data are conservative estimates of exposure.

6.2 EFFECTS ASSESSMENT FOR THE PLANT COMMUNITY

Contaminant concentrations in soils and springs were compared to toxicological benchmarks (Will and Suter 1995b) in order to screen out chemicals that do not constitute a hazard to plants and therefore do not require detailed risk characterization. Tests conducted in natural soils in the laboratory were assumed to be representative of the exposure of plants to contaminants measured in floodplain soils, with the possibility that chemicals freshly added to soils in literature toxicity tests may be more bioavailable than contaminants in WOC soils. Tests conducted in nutrient and mineral solutions are the best available representation of exposures of plants to contaminants in the vicinity of seeps and springs. Toxicological profiles for analytes retained after screening against benchmarks are provided in the attachment to this appendix.

Benchmarks were not available for numerous organic contaminants, including polycyclic aromatic hydrocarbons.

6.3 RISK CHARACTERIZATION FOR THE PLANT COMMUNITY

The evidence concerning risks to the plant community consists of analyses of inorganic, organic and radionuclide contaminants in soil. This single line of evidence is summarized in the following text. Toxicity tests and biological surveys were not available.

6.3.1 Single chemical soil and solution toxicity

Contaminants of potential ecological concern.(COPECs) for terrestrial plants in the WOC watershed were identified by comparing maximum detected site concentrations of soil to 1) twice the mean background for soils from Waste Area Grouping 5 (DOE 1995a) and 2) available benchmarks for toxicity to terrestrial plants (Will and Suter 1995b). The screening of maximum concentrations against benchmarks is intended to protect plants which spend their entire lives in a single, highly contaminated location. If both background and benchmark criteria were exceeded, the contaminant was identified as a COPEC. The magnitude of exceedence of a benchmark is described by the hazard quotient, the maximum concentration in soil divided by the toxicity benchmark concentration. If background criteria were not available, exceedence of a benchmark was sufficient for the COPEC designation. Benchmarks for plants growing in soils, maximum concentrations of analytes at each subbasin exceeding background and for which benchmarks are available, and hazard quotients for the contaminants are given in Table 5.2. COPECs for plants potentially exposed to water from seeps and springs were identified by a similar comparison of contaminant concentrations with background and toxicity benchmarks (Table 6.1).

6.3.1.1 Terrestrial plants

The screening of contaminant concentrations in soil against phytotoxicity benchmarks is provided in Table 5.2. The strength of the literature toxicity line of evidence is in its ability to relate the concentration of a single contaminant in soil to observed effects. The screening is most useful if the chemical species and bioavailability of contaminants in WOC soils are comparable to those of the chemicals in laboratory toxicity tests in other soils. For example, the fractions of mercuric chloride, methyl mercury, mercuric sulfide, etc. were not determined for WOC soils. Thus, the hazard quotients for mercury may be conservative.

HF-2

The overall plant HI for subbasin HF-2 soil was 187. Inorganics accounted for 100% of the HI. Of the 29 inorganics detected at HF-2, 16 were below background levels and eliminated from further consideration. Three of the remaining inorganics (calcium, osmium, and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for five (chromium, zinc, cobalt, barium and molybdenum) of the ten inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects from these elements.

Chromium accounted for 90% of the overall HI for the subbasin. Chromium was detected in both of the soil samples collected at HF-2, but at levels higher than background in only one, and then at a concentration only about twice as high (168 mg/kg for HF-2 versus 78 mg/kg background). The analytical data did not specify the valence state of the chromium. Chromium (VI) is more toxic and available to plants than chromium (III) (Smith et al. 1989, cited in Will and Suter 1995b), but in most soils chromium (VI) is likely to be reduced to chromium (III) (Bartlett and James 1979, cited in Will and Suter 1995b). However, the toxicological benchmark used to estimate effects of chromium is based on chromium (VI) studies. The use of the benchmark for the more toxic and available chromium (VI) when exposures may be predominantly from chromium (III) may lead to overestimation of the risks of adverse phytotoxic effects.

Benchmarks were not available for either of the two organics detected at HF-2.

These results indicate a potential risk of adverse effects on plants from HF-2 soil, primarily resulting from chromium.

HRE

The overall terrestrial plant HI for the HRE subbbasin was 110.5 (Table 6.2). HQs exceeding one were estimated for three metals: cadmium, chromium, and zinc, indicating a potential risk of adverse effects for these elements. Chromium was the primary risk driver in the subbasin, resulting in a HQ of 104.

While chromium was the primary risk driver in this subbasin, it was detected at only 1.3 times background. The analytical data did not specify the valence state of the chromium. Chromium (VI) is more toxic and bioavailable than chromium (III) (Will and Suter 1995a), but in most soils chromium (VI) is likely to be reduced to chromium (III). The toxicological benchmarks used in this assessment were based on chromium (VI) studies. The use of benchmarks for the more toxic and available chromium (VI) when exposures may be predominantly from chromium (III) may lead to overestimation of risks.

SWSA 5 Tributary 1

The overall plant HI for SWSA 5 Tributary 1 soil was 21. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.02%. Of the 23 inorganics detected at SWSA 5 Tributary 1, 14 were below background levels and eliminated from further consideration. Three of the remaining inorganics (calcium, magnesium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (mercury, selenium and silver) of the six inorganics evaluated for phytotoxic effects,

indicating a potential risk of adverse effects for these elements. Mercury, selenium and silver accounted for over 90% of the overall HI for the subbasin.

No toxicological benchmarks were available for 41 of the 45 organics detected at the site. The HQs for the four remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from SWSA 5 Tributary 1 soil, primarily resulting from mercury, selenium and silver.

SWSA 5 WOC

The overall plant HI for SWSA 5 WOC soil was 11. Inorganics accounted for over 99% of the HI. Organics accounted for only 0.2%. Of the 23 inorganics detected at SWSA 5 WOC, 12 were below background levels and eliminated from further consideration. Three of the remaining inorganics (calcium, magnesium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for four (mercury, selenium, silver and zinc) of the eight inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Mercury, selenium, silver and zinc accounted for 78% of the overall HI for the subbasin.

No toxicological benchmarks were available for 46 of the 50 organics detected at the site. The HQs for the four remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from SWSA 5 WOC soil, primarily resulting from mercury, selenium, silver and zinc.

SWSA 5 N WOC

The overall plant HI for SWSA 5 N WOC soil was 2.5. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.04%. Of the 19 inorganics detected at SWSA 5 N WOC, 17 were below background levels and eliminated from further consideration. HQs exceeding one were estimated for the two (selenium and silver) inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Selenium and silver accounted for 99% of the overall HI for the subbasin.

No toxicological benchmarks were available for 11 of the 14 organics detected at the site. The HQs for the three remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a minor risk of adverse effects on plants from SWSA 5 N WOC soil, primarily resulting from selenium and silver.

Intermediate Pond

The overall plant HI for the Intermediate Pond soil was 287. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.01%. Of the 30 inorganics detected at the Intermediate Pond, 15 were below background levels and eliminated from further consideration. [The analytical data reported chromium as chromium (VI) for this site, but we assumed this to be total chromium. This assumption resulted in elimination of chromium based on the background comparison. Inclusion of chromium would have resulted in exceedence of the benchmark and a higher HI for the subbasin.] Four of the remaining inorganics (calcium, osmium, silicon and sodium)

could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for five (mercury, molybdenum, nickel, silver and zinc) of the 11 inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Mercury accounted for 89% of the overall HI for the subbasin.

No toxicological benchmarks were available for 23 of the 26 organics detected at the site. The HQs for the three remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from the Intermediate Pond soil, primarily resulting from mercury.

SWSA 4 Main

The overall terrestrial plant HI for the SWSA 4 Main subbbasin was 267.6 (Table 6.2). HQs exceeding one were estimated for three analytes (nickel, selenium, and zinc), indicating a potential risk of adverse effects from these elements. Nickel was the primary risk driver, resulting in a HQ of 262. However, the results are driven by the high nickel concentration (7860 mg/kg) at one sample location (WAG4Seep6). The highest concentration at two other locations in the subbasin was 49.6 mg/kg, suggesting that risks from nickel are spatially limited within the subbasin.

WAG 7 WOC

No risks were identified for terrestrial plants exposed to contaminants in WAG 7 WOC. Concentrations of all detected analytes were below toxicological benchmarks (Table 5.2).

WOC

The overall plant HI for the WOC subbasin soil was 54. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.004%. Of the 30 inorganics detected at the WOC subbasin, 16 were below background levels and eliminated from further consideration. [The analytical data reported chromium as chromium (VI) for this site, but we assumed this to be total chromium. This assumption resulted in elimination of chromium based on the background comparison. Inclusion of chromium would have resulted in exceedence of the benchmark and a higher HI for the subbasin.] Four of the remaining inorganics (calcium, magnesium, osmium, and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for six (copper, mercury, molybdenum, selenium, silver and zinc) of the 10 inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Mercury, silver and zinc accounted for 87% of the overall HI for the subbasin.

No toxicological benchmarks were available for 15 of the 16 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from the WOC subbasin soil, primarily resulting from mercury, silver and zinc.

NHF

The overall plant HI for NHF soil was 1.15. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.1%. Of the 18 inorganics detected at NHF, 15 were below background levels and eliminated from further consideration. One of the remaining inorganics,

sodium, could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. The HQs for the two other remaining inorganics, barium and silver, were 0.4 and 0.7, respectively, indicating no risk of adverse effects.

No toxicological benchmarks were available for 11 of the 13 organics detected at the site. The HQs for the two remaining organics were well below one, indicating no risk of adverse effects.

These results indicate no risk of adverse effects on plants from NHF soil.

SWSA 5 Drainage D-2

The overall plant HI for SWSA 5 Drainage D-2 soil was 1.6. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.01%. Of the 18 inorganics detected at SWSA 5 Drainage D-2, 14 were below background levels and eliminated from further consideration. Two of the remaining inorganics (calcium and magnesium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. An HQ exceeding one was estimated for one (silver) of the two inorganics evaluated for phytotoxic effects. Silver was detected in only two of five soil samples, and the HQ of 1.1 does not warrant concern.

No toxicological benchmarks were available for 15 of the 16 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate no risk of adverse effects on plants from SWSA 5 Drainage D-2 soil.

Seep A

The overall plant HI for Seep A soil was 14. Inorganics accounted for approximately 100% of the HI. Of the 23 inorganics detected at Seep A, 16 were below background levels and eliminated from further consideration. Two of the remaining inorganics (calcium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (selenium, silver and zinc) of the five inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Selenium, silver and zinc accounted for over 90% of the overall HI for the subbasin.

No toxicological benchmarks were available for 44 of the 45 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from Seep A soil, primarily resulting from selenium, silver and zinc.

Seep B West

The overall plant HI for Seep B soil was 12. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.001%. Of the 30 inorganics detected at Seep B, 21 were below background levels and eliminated from further consideration. [The analytical data reported chromium as chromium (VI) for this site, but we assumed this to be total chromium. This assumption resulted in elimination of chromium based on the background comparison. Inclusion of chromium would have resulted in exceedence of the benchmark and a higher HI for the subbasin.] Two of the remaining inorganics (calcium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for four

(antimony, mercury, molybdenum and selenium) of the seven inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Antimony, mercury, molybdenum and selenium accounted for over 90% of the overall HI for the subbasin.

No toxicological benchmarks were available for 15 of the 17 organics detected at the site. The HQs for two remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from Seep B soil, primarily resulting from antimony, mercury, molybdenum and selenium.

Seep B East

The overall plant HI for the Seep B/A soil was 1.8. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.003%. Of the 21 inorganics detected at Seep B/A, 17 were below background levels and eliminated from further consideration. One of the four remaining inorganics, sodium, could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. The HQs for the three other remaining inorganics, antimony, selenium and silver, were 0.7, 0.3 and 0.8, respectively, indicating no risk of adverse effects.

No toxicological benchmarks were available for 37 of the 38 six organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate no risk of adverse effects on plants from Seep B/A soil.

Seep C

The overall plant HI for Seep C soil was 15. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.02%. Of the 31 inorganics detected at Seep C, 15 were below background levels and eliminated from further consideration. [The analytical data reported chromium as chromium (VI) for this site, but we assumed this to be total chromium. This assumption resulted in elimination of chromium based on the background comparison. Inclusion of chromium would have resulted in exceedence of the benchmark and a higher HI for the subbasin.] Six of the remaining inorganics (calcium, cyanide, magnesium, osmium, silicon and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for five (antimony, cobalt, molybdenum, silver and thallium) of the 10 inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Antimony, cobalt, molybdenum, silver and thallium accounted for 82% of the overall HI for the subbasin.

No toxicological benchmarks were available for 18 of the 21 organics detected at the site. The HQs for the three remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from the Seep C soil, primarily resulting from antimony, cobalt, molybdenum, silver and thallium.

W6MS3

The overall plant HI for WAG 6MS3 soil was 5. Inorganics accounted for over 99% of the HI. Organics accounted for only 0.5%. Of the 22 inorganics detected at WAG 6MS3, 14 were below background levels and eliminated from further consideration. Three of the remaining inorganics

(calcium, osmium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (arsenic, cadmium and silver) of the five inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Arsenic, cadmium and silver accounted for 87% of the overall HI for the subbasin.

No toxicological benchmarks were available for 30 of the 34 organics detected at the site. The HQs for the four remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a minor risk of adverse effects on plants from WAG 6MS3 soil, primarily resulting from arsenic, cadmium and silver.

W6MS1

The overall plant HI for W6MS1 soil was 5. Inorganics accounted for approximately 100% of the HI. Of the 18 inorganics detected at W6MS1, 11 were below background levels and eliminated from further consideration. Three of the remaining inorganics (calcium, magnesium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (arsenic, cadmium and nickel) of the four inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Arsenic, cadmium and nickel accounted for 95% of the overall HI for the subbasin.

No toxicological benchmarks were available for 18 of the 19 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate a minor risk of adverse effects on plants from W6MS1 soil, primarily resulting from arsenic, cadmium and nickel.

West Seep

The overall plant HI for West Seep soil was 9.6. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.5%. Of the 24 inorganics detected at West Seep, 15 were below background levels and eliminated from further consideration. Three of the remaining inorganics (cyanide, osmium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for five (cadmium, cobalt, nickel, silver and tin) of the six inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Cadmium, cobalt, nickel, silver and tin accounted for 95% of the overall HI for the subbasin.

No toxicological benchmarks were available for 30 of the 32 organics detected at the site. The HQs for the two remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from West Seep soil, primarily resulting from cadmium, cobalt, nickel, silver and tin.

East Seep

The overall terrestrial plant HI for the East Seep subbbasin was 4.3 (Table 6.2). HQs exceeding one were estimated for two analytes (selenium and thallium), indicating a potential risk of adverse

effects from these elements. Soil concentrations of these analytes marginally exceeded phytotoxicity benchmarks (maximum HQ of 2.5).

Lower WOC

The overall plant HI for Lower WOC/White Oak Lake soil was 150. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.004%. Of the 30 inorganics detected at Lower WOC/White Oak Lake, 16 were below background levels and eliminated from further consideration. Three of the remaining inorganics (calcium, osmium, and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for six (chromium, mercury, molybdenum, selenium, silver and zinc) of the 11 inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements.

Chromium and mercury accounted for 89% of the overall HI for the subbasin. The analytical data did not specify the valence state of the chromium. Chromium (VI) is more toxic and available to plants than chromium (III) (Smith et al. 1989, cited in Will and Suter 1995b), but in most soils chromium (VI) is likely to be reduced to chromium (III) (Bartlett and James 1979, cited in Will and Suter 1995b). However, the toxicological benchmark used to estimate effects of chromium is based on chromium (VI) studies. The use of the benchmark for the more toxic and available chromium (VI) when exposures may be predominantly from chromium (III) may lead to overestimation of the risks of adverse phytotoxic effects.

No toxicological benchmarks were available for 22 of the 24 organics detected at the site. The HQs for the two remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a potential risk of adverse effects on plants from Lower WOC/White Oak Lake soil, primarily resulting from chromium and mercury.

Pit 4 South

The overall plant HI for Pit 4/South soil was 6. Inorganics accounted for over 99.9% of the HI. Organics accounted for only 0.1%. Of the 29 inorganics detected at Pit 4/South, 18 were below background levels and eliminated from further consideration. [The analytical data reported chromium as chromium (VI) for this site, but we assumed this to be total chromium. This assumption resulted in elimination of chromium based on the background comparison. Inclusion of chromium would have resulted in exceedence of the benchmark and a higher HI for the subbasin.] Three of the remaining inorganics (calcium, magnesium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (molybdenum, selenium and thallium) of the eight inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Molybdenum, selenium and thallium accounted for 78% of the overall HI for the subbasin.

No toxicological benchmarks were available for 14 of the 16 organics detected at the site. The HQs for the two remaining organics were well below one, indicating no risk of adverse effects.

These results indicate a minor risk of adverse effects on plants from Pit 4/South soil, primarily resulting from molybdenum, selenium and thallium.

SWSA 6 East

The overall plant HI for SWSA 6 East soil was 7. Inorganics accounted for approximately 100% of the HI. Of the 18 inorganics detected at SWSA 6 East, 12 were below background levels and eliminated from further consideration. Two of the remaining inorganics (magnesium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for three (cadmium, nickel and zinc) of the four inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Cadmium, nickel and zinc accounted for 93% of the overall HI for the subbasin.

No toxicological benchmarks were available for 10 of the 11 organics detected at the site. The HQ for the one remaining organic was well below one, indicating no risk of adverse effects.

These results indicate a minor risk of adverse effects on plants from SWSA 6 East soil, primarily resulting from cadmium, nickel and zinc.

SWSA 6 South

The overall plant HI for SWSA 6 South soil was 4. Inorganics accounted for 100% of the HI. Of the 17 inorganics detected at SWSA 6 South, 12 were below background levels and eliminated from further consideration. Two of the remaining inorganics (calcium and sodium) could not be evaluated for phytotoxic effects because toxicological benchmarks were not available. HQs exceeding one were estimated for two (arsenic and cadmium) of the three inorganics evaluated for phytotoxic effects, indicating a potential risk of adverse effects for these elements. Arsenic and cadmium accounted for 76% of the overall HI for the subbasin.

Benchmarks were not available for any of the three organics detected at SWSA 6 South.

These results indicate a minor risk of adverse effects on plants from SWSA 6 South soil, primarily resulting from arsenic and cadmium.

6.3.1.2 Plants exposed to seeps and springs

The screening of contaminant concentrations in soil solution against phytotoxicity benchmarks is provided in Table 6.1. Unfiltered surface water samples were using resulting in conservative estimates of risk. Because individual seeps, not entire subbasins, potentially constitute risks to terrestrial plants rooted in these areas, the following text summarizes screening results by sampling station. Results are presented only for those stations where at least one contaminant exceeded a benchmark.

East Seep

SW7-3. The overall plant HI for SW7-3 surface water was 11.7. Inorganics accounted for 100% of the HI. Of the 14 inorganics detected at SW7-3 and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=3.88), arsenic (HQ=4.20), and chromium (HQ=1.83). Aluminum and arsenic accounted for most significantly to the overall HI for this station with 33% and 36%, respectively. Chromium accounted for 16% to the HI. Aluminum exceeded background by a factor of 1.3. Background data were not available for arsenic or chromium. No organic contaminants exceeded a hazard quotient of 1 for SW7-3. These results indicate a potential

risk of adverse effects on plants from SW7-3 surface water, primarily resulting from aluminum, arsenic, and chromium.

SW7-4. The overall plant HI for SW7-4 surface water was 16.7. Inorganics accounted for 100% of the HI. Of the 7 inorganics detected at SW7-4 and that exceeded background levels if background data were available, 2 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were manganese (HQ=1.85) and thallium (HQ=14.5). Thallium accounted for 86% to the overall HI for this station. No background data were available for thallium, but manganese exceeded background by a factor of 36. No organic contaminants exceeded a hazard quotient of 1 for SW7-4. These results indicate a potential risk of adverse effects on plants from SW7-4 surface water, primarily resulting primarily from thallium.

SW7-7. The overall plant HI for SW7-7 surface water was 8.6. Inorganics accounted for 100% of the HI. Of the 7 inorganics detected at SW7-7 and that exceeded background levels if background data were available, only thallium (HQ=8.0)exceeded toxicological benchmarks for terrestrial plants associated with surface water. Thallium accounted for 94% to the overall HI for this station. No background data were available for thallium, but manganese exceeded background by a factor of 36. No organic contaminants exceeded a hazard quotient of 1 for SW7-7. These results indicate a potential risk of adverse effects on plants from SW7-7 surface water, primarily resulting primarily from thallium.

SW7-8. The overall plant HI for SW7-8 surface water was 2.1. Inorganics accounted for 100% of the HI. Of the 3 inorganics detected at SW7-8 and that exceeded background levels if background data were available, only aluminum (HQ=2.1) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Aluminum accounted for 97% to the overall HI for this station and exceeded background by a factor of 1.2. No organic contaminants exceeded a hazard quotient of 1 for SW7-8. These results indicate a potential risk of adverse effects on plants from SW7-8 surface water, primarily resulting from aluminum.

HF-2

05.SW005. The overall plant HI for 05.SW005 surface water was 224. Inorganics accounted for >99% of the HI. Of the 14 inorganics detected at 05.SW005 and that exceeded background levels if background data were available, 8 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=202), arsenic (HQ=3.10), chromium (HQ=2.86), copper (HQ=2.40), iron (HQ=5.39), manganese (HQ=1.80), nickel (HQ=1.25), and lead (HQ=3.30). Aluminum accounted for 90.4% to the overall HI for this station. Aluminum exceeded background by a factor of 18. Background data were also available for iron, manganese, and lead which exceeded background by factors of 5.2, 3.5, and 1.4, respectively. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SW005 surface water, primarily resulting from aluminum.

HRE

05.SW004. The overall plant HI for 05.SW004 surface water was 98.2. Inorganics accounted for 100% of the HI. Of the 11 inorganics detected at this station, and that exceeded background levels if background data were available, 5 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=88.5), arsenic (HQ=3.60), chromium (HQ=1.16), iron (HQ=2.85), and manganese (HQ=1.38). Aluminum accounted for 90.1% of the

overall HI for this station. Aluminum exceeded background by a factor of 4.1. Background data were also available for iron and manganese which exceeded background by factors of 2.2 and 4, respectively. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SW004 surface water, primarily resulting from aluminum.

SW9-1. The overall plant HI for SW9-1 surface water was 1.33. Inorganics accounted for 100% of the HI. Of the 3 inorganics detected at SW9-1 and that exceeded background levels if background data were available, only fluoride (HQ=1.1) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Fluoride accounted for 84% to the overall HI for this station. No background data were available for this contaminant. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW9-1 surface water, primarily resulting from fluoride.

SW9-2. The overall plant HI for SW9-2 surface water was 9.23. Inorganics accounted for 100% of the HI. Of the 6 inorganics detected at SW9-2 and that exceeded background levels if background data were available, only aluminum (HQ=7.3) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Aluminum accounted for 79% to the overall HI for this station and exceeded background by a factor of 4.3. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW9-2 surface water, primarily resulting from aluminum.

Intermediate Pond

WAG4 T2. The overall plant HI for WAG4 T2 surface water was 6.75. Inorganics accounted for >99% of the HI. Of the 11 inorganics detected at WAG4 T2, and that exceeded background levels if background data were available, only aluminum (HQ=5.0) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Aluminum accounted for 74.1% to the overall HI for this station. Aluminum exceeded background by a factor of 1.9. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WAG4 T2 surface water, primarily resulting from aluminum.

WCTRIB-4. The overall plant HI for WCTRIB-4 surface water was 14.0. Inorganics accounted for 100% of the HI. Of the 6 inorganics detected at WCTRIB-4, and that exceeded background levels if background data were available, only thallium (HQ=13.6) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Thallium accounted for 96% to the overall HI for this station. No background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WCTRIB-4 surface water, primarily resulting primarily from thallium.

Lower WOC

05.SW006. The overall plant HI for 05.SW006 surface water was 18.5. Inorganics accounted for >99% of the HI. Of the 9 inorganics detected at 05.SW006, and that exceeded background levels if background data were available, only aluminum (HQ=17.5) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Aluminum accounted for 94% to the overall HI for this station. Aluminum exceeded background by a factor of 1.5. No organic contaminants

exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SW006 surface water, primarily resulting primarily from aluminum.

MBTRIB-3. The overall plant HI for MBTRIB-3 surface water was 16.8. Inorganics accounted for 100% of the HI. Of the 3 inorganics detected at MBTRIB-3, and that exceeded background levels if background data were available, only thallium (HQ=16.6) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Thallium accounted for 99% to the overall HI for this station. No background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from MBTRIB-3 surface water, primarily resulting primarily from thallium.

SW2-5. The overall plant HI for SW2-5 surface water was 27.1. Inorganics accounted for 100% of the HI. Of the 10 inorganics detected at SW2-5, and that exceeded background levels if background data were available, only thallium (HQ=25.6) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Thallium accounted for 95% to the overall HI for this station. No background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW2-5 surface water, primarily resulting primarily from thallium.

SW2-7. The overall plant HI for SW2-7 surface water was 3.9. Inorganics accounted for 100% of the HI. Of the 8 inorganics detected at SW2-7, and that exceeded background levels if background data were available, 2 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were arsenic (HQ=1.40) and iron (HQ=1.70). Arsenic accounted for 36% to the overall HI and iron accounted for 44% of the overall HI for this station. Iron exceeded background by a factor of 19. Background data were not available for arsenic. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW2-7 surface water, primarily resulting from arsenic and iron.

SW6-1. The overall plant HI for SW6-1 surface water was 24.8. Inorganics accounted for 100% of the HI. Of the 6 inorganics detected at SW6-1, and that exceeded background levels if background data were available, 2 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were iron (HQ=1.47) and thallium (HQ=22.5). Thallium accounted for 90.1% to the overall HI for this station. Iron exceeded background by a factor of 18, and no background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW6-1 surface water, primarily resulting from thallium.

SW7-5. The overall plant HI for SW7-5 surface water was 25.5. Inorganics accounted for 100% of the HI. Of the 18 inorganics detected at SW7-5 and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=19.0), copper (HQ=1.04), and thallium (HQ=3.00). Aluminum accounted for 75% to the overall HI for this station. Aluminum exceeded background by a factor of 6. No background data were available for arsenic and thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW7-5 surface water, primarily resulting from aluminum.

WCTRIB-1. The overall plant HI for WCTRIB-1 surface water was 18.6. Inorganics accounted for 100% of the HI. Of the 5 inorganics detected at WCTRIB-1, and that exceeded background levels if background data were available, 2 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=4.79) and thallium (HQ=13.4). Thallium accounted for 72% to the overall HI for this station. Aluminum exceeded background by a factor of 1.5, and no background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WCTRIB-1 surface water, primarily resulting from thallium.

WSTRIB-1. The overall plant HI for WSTRIB-1 surface water was 17.5. Inorganics accounted for 100% of the HI. Of the 5 inorganics detected at WSTRIB-1, and that exceeded background levels if background data were available, only thallium (HQ=17.3) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Thallium accounted for 99% to the overall HI for this station. No background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WSTRIB-1 surface water, primarily resulting primarily from thallium.

MV Drive

5NNT. The overall plant HI for 5NNT surface water was 17.2. Inorganics accounted for 100% of the HI. Of the 18 inorganics detected at 5NNT and that exceeded background levels if background data were available, 2 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=12.0) and thallium (HQ=3.27). Aluminum accounted for 70% to the overall HI for this station. Aluminum exceeded background by a factor of 6. No background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 5NNT surface water, primarily resulting from aluminum.

Pit 4 South

East Seep. The overall plant HI for East Seep surface water was 197. Inorganics accounted for 100% of the HI. Of the 19 inorganics detected at East Seep and that exceeded background levels if background data were available, 6 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=150), arsenic (HQ=28.2), boron (HQ=1.99), fluoride (HQ=2.10), iron (HQ=3.64), and thallium (HQ=7.75). Aluminum accounted for 76% to the overall HI for this station. Aluminum exceeded background by a factor of 20. Background data were also available for iron which exceeded background by a factor of nine. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from East Seep surface water, primarily resulting from aluminum.

Seep A

05.SP009. The overall plant HI for 05.SP009 surface water was 9.63. Inorganics accounted for >99% of the HI. Of the 4 inorganics detected at 05.SP009 and that exceeded background levels if background data were available, 2 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=6.75) and manganese (HQ=2.19). Aluminum accounted for 71% to the overall HI and manganese accounted for 22% of the overall HI for this station. Aluminum exceeded background by a factor of 4 and manganese exceeded by a

factor of 43. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP009 surface water, primarily resulting from aluminum and manganese.

05.SP016. The overall plant HI for 05.SP016 surface water was 63.9. Inorganics accounted for >99% of the HI. Of the 9 inorganics detected at 05.S016 and that exceeded background levels if background data were available, 2 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=61.5) and iron (HQ=1.38). Aluminum accounted for 96% to the overall HI for this station. Aluminum exceeded background by a factor of 36, and iron exceeded background by a factor of 17. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP016 surface water, primarily resulting from aluminum.

05.SP017. The overall plant HI for 05.SP017 surface water was 9.88. Inorganics accounted for >99% of the HI. Of the inorganics detected at 05.SP017 and that exceeded background levels if background data were available, 4 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=1.90), arsenic (HQ=3.60), iron (HQ=1.72), and manganese (HQ=2.55). Aluminum accounted for 19% to the overall HI, arsenic accounted for 36%, iron accounted for 17%, and manganese accounted for 26% for this station. Aluminum exceeded background by a factor of 1.12, iron by a factor of 21, and manganese by a factor of 50. Background data were not available for arsenic. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP017 surface water resulting from aluminum, arsenic, iron, and manganese.

05.SW003. The overall plant HI for 05.SW003 surface water was 46.3. Inorganics accounted for >99% of the HI. Of the 11 inorganics detected at 05.SW003 and that exceeded background levels if background data were available, only aluminum (HQ=44.5) exceeded its toxicological benchmark for terrestrial plants associated with surface water contributing 96% to the overall HI for this station. Aluminum exceeded background by a factor of 5. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SW003 surface water, primarily resulting from aluminum.

SW5-6. The overall plant HI for SW5-6 surface water was 35.4. Inorganics accounted for >99% of the HI. Of the 8 inorganics detected at SW5-6 and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=6.75), manganese (HQ=2.03), and thallium (HQ=25.3). Thallium accounted for 71% to the overall HI for this station. Aluminum exceeded background by a factor of 3 and manganese exceeded by factor of 40. Background data were not available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW5-6 surface water, primarily resulting from thallium.

SW5-7. The overall plant HI for SW5-7 surface water was 6.72. Inorganics accounted for 100% of the HI. Of the 7 inorganics detected at SW5-7 and that exceeded background levels if background data were available, arsenic (HQ=3.00) and manganese (HQ=2.21) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Arsenic accounted for 45% to the overall HI and manganese accounted for 33% to the overall HI for this station. Background data were available only for manganese which exceeded background by a factor of 43. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a

potential risk of adverse effects on plants from SW5-7 surface water, resulting from arsenic and manganese.

SW5-8. The overall plant HI for SW5-8 surface water was 24.5. Inorganics accounted for >99% of the HI. Of the 7 inorganics detected at SW5-8 and that exceeded background levels if background data were available, manganese (HQ=1.23) and thallium (HQ=22.0) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Thallium accounted for 90% to the overall HI for this station. No background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW5-8 surface water, primarily resulting from thallium.

SW5-9. The overall plant HI for SW5-9 surface water was 31.9. Inorganics accounted for >99% of the HI. Of the 11 inorganics detected at SW5-9 and that exceeded background levels if background data were available, 4 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=3.55), arsenic (HQ=3.00), manganese (HQ=1.26), and thallium (HQ=21.9). Thallium accounted for 69% to the overall HI for this station. No background data were available for thallium. Background data were available for aluminum and manganese which exceeded background by factors of 1.6 and 21, respectively. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW5-9 surface water, primarily resulting from thallium.

Seep C

05.SP005. The overall plant HI for 05.SP005 surface water was 11.8. Inorganics accounted for >99% of the HI. Of the 4 inorganics detected at 05.SP005 and that exceeded background levels if background data were available, only aluminum (HQ=11.5) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum accounted for 97% to the overall HI for this station and exceeded background by a factor of 7. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP005 surface water, primarily resulting from aluminum.

SW5-3. The overall plant HI for SW5-3 surface water was 15.2. Inorganics accounted for 100% of the HI. Of the 7 inorganics detected at SW5-3 and that exceeded background levels if background data were available, 2 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=11.5) and fluoride (HQ=3.20). Aluminum accounted for 76% to the overall HI for this station. Aluminum exceeded background by a factor of 7. Background data were not available for fluoride. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW5-3 surface water, primarily resulting from aluminum.

SW5-4. The overall plant HI for SW5-4 surface water was 6.30. Inorganics accounted for >99% of the HI. Of the 11 inorganics detected at SW5-4 and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were arsenic (HQ=3.00), fluoride (HQ=1.03), and manganese (HQ=1.44). Arsenic, fluoride, and manganese accounted for 48%, 16%, and 23% to the overall HI for this station, respectively. Background data were available only for manganese which exceeded background by a factor of 13. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW5-4 surface water, primarily resulting from arsenic, fluoride, and manganese.

SWSA 5 Trib 1

05.SP003. The overall plant HI for 05.SP003 surface water was 23.3. Inorganics accounted for >99% of the HI. Of the 7 inorganics detected at 05.SP003 and that exceeded background levels if background data were available, only aluminum (HQ=18.1) and arsenic (HQ=3.50) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum accounted for 78% to the overall HI for this station and exceeded background by a factor of 11. Background data were not available for arsenic. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP003 surface water, primarily resulting from aluminum.

05.SP015. The overall plant HI for 05.SP015 surface water was 8.32. Inorganics accounted for >99% of the HI. Of the 8 inorganics detected at 05.SP015 and that exceeded background levels if background data were available, only cobalt (HQ=4.88) and manganese (HQ=1.98) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Cobalt and manganese accounted for 59% and 24% to the overall HI for this station, respectively. Manganese exceeded background by a factor of 38, but no background data were available for cobalt. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP015 surface water, primarily resulting from cobalt and manganese.

05.SW001. The overall plant HI for 05.SW001 surface water was 24.3. Inorganics accounted for >99% of the HI. Of the 8 inorganics detected at 05.SW001 and that exceeded background levels if background data were available, only aluminum (HQ=20.2) and arsenic (HQ=3.70) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum accounted for 83% to the overall HI for this station. Aluminum exceeded background by a factor of 3, but no background data were available for arsenic. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SW001 surface water, primarily resulting from aluminum.

SW5-1. The overall plant HI for SW5-1 surface water was 45.1. Inorganics accounted for 100% of the HI. Of the 10 inorganics detected at SW5-1 and that exceeded background levels if background data were available, 4 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=18.1), arsenic (HQ=3.50), manganese (HQ=1.35), and thallium (HQ=21.1). Aluminum and thallium accounted for 40% and 47% to the overall HI for this station, respectively. Aluminum exceeded background by a factor of 9, and no background data were available thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW5-1 surface water, primarily resulting from aluminum and thallium.

SWSA 5 WOC

05.SP004. The overall plant HI for 05.SP004 surface water was 8.62. Inorganics accounted for >99% of the HI. Of the 5 inorganics detected at 05.SP004 and that exceeded background levels if background data were available, only aluminum (HQ=6.00) and arsenic (HQ=2.30) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum and arsenic accounted for 70% and 27% to the overall HI for this station, respectively. Aluminum exceeded background by a factor of 3.5, and no background data were available for arsenic. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP004 surface water, primarily resulting from aluminum.

SW5-2. The overall plant HI for SW5-2 surface water was 6.66. Inorganics accounted for 100% of the HI. Of the 7 inorganics detected at SW5-2 and that exceeded background levels if background data were available, only aluminum (HQ=6.00) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Aluminum accounted for 90% to the overall HI for this station. Aluminum exceeded background by a factor of 3.5. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW5-2 surface water, primarily resulting from aluminum.

SWSA 4 Main

SCS1B. The overall plant HI for SCS1B surface water was 53.9. Inorganics accounted for 100% of the HI. Of the 18 inorganics detected at SCS1B and that exceeded background levels if background data were available, only arsenic(HQ=50.0) and lead (HQ=2.50) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Arsenic accounted for 93% to the overall HI for this station. No background data were available for arsenic, and lead exceeded background by a factor of 4. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SCS1B surface water, primarily resulting from arsenic.

SW4-1. The overall plant HI for SW4-1 surface water was 30.2. Inorganics accounted for >99% of the HI. Of the 9 inorganics detected at SW4-1 and that exceeded background levels if background data were available, 4 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were arsenic (HQ=6.2), fluoride (HQ=3.1), iron (HQ=2.9), and thallium (HQ=16.6). Thallium accounted for 55% to the overall HI for this station. Iron exceeded background by a factor of 32 and background data were not available for arsenic, fluoride, and thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW4-1 surface water, primarily resulting from thallium.

SW4-2. The overall plant HI for SW4-2 surface water was 21.5. Inorganics accounted for >99% of the HI. Of the 13 inorganics detected at SW4-2 and that exceeded background levels if background data were available, only nickel (HQ=18.9) exceeded toxicological its benchmark for terrestrial plants associated with surface water. Nickel accounted for 88% to the overall HI for this station. No background data were available for nickel. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW4-2 surface water, primarily resulting from nickel.

W4TRIB-5. The overall plant HI for W4TRIB-5 surface water was 12.6. Inorganics accounted for 100% of the HI. Of the 6 inorganics detected at W4TRIB-5 and that exceeded background levels if background data were available, aluminum (HQ=10.6) and fluoride (HQ=1.51) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum accounted for 84% to the overall HI for this station and exceeded background by a factor of 5.5. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from W4TRIB-5 surface water, primarily resulting from aluminum.

W4TRIB-7. The overall plant HI for W4TRIB-7 surface water was 2.11. Inorganics accounted for 100% of the HI. Of the 5 inorganics detected at W4TRIB-7 and that exceeded background levels if background data were available, only manganese (HQ=1.43) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Manganese accounted

for 68% to the overall HI for this station and exceeded background by a factor of 18. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from W4TRIB-7 surface water, primarily resulting from manganese.

WAG 4 MS1. The overall plant HI for WAG 4 MS1 surface water was 19.6. Inorganics accounted for 100% of the HI. Of the 13 inorganics detected at WAG 4 MS1, and that exceeded background levels if background data were available, only manganese (HQ=1.62) and thallium (HQ=16.7) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Thallium accounted for 85% to the overall HI for this station. No background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WAG 4 MS1 surface water, primarily resulting from thallium.

SWSA 5 North/WOC

05.SP002. The overall plant HI for 05.SP002 surface water was 2.23. Inorganics accounted for >99% of the HI. The only inorganic detected above background was aluminum (HQ=2.23) constituting 99.9% of the overall HI for this site. Aluminum exceeded background by a factor of 1.32. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP002 surface water, primarily resulting from aluminum.

5NW-1. The overall plant HI for 5NW-1 surface water was 2.62. Inorganics accounted for 100% of the HI. Of the 5 inorganics detected at 5NW-1, and that exceeded background levels if background data were available, only aluminum (HQ=2.23) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Manganese accounted for 85% to the overall HI for this station and exceeded background by a factor of 1.32. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 5NW-1 surface water, primarily resulting from aluminum.

5NW-2. The overall plant HI for 5NW-2 surface water was 6.67. Inorganics accounted for >99% of the HI. Of the inorganics detected at 5NW-2, and that exceeded background levels if background data were available, only aluminum (HQ=4.90) and manganese (HQ=1.33) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum and manganese accounted for 73% and 20% to the overall HI for this station, respectively. Aluminum and manganese exceeded background by factors 3 and 20, respectively. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 5NW-2 surface water, primarily resulting from aluminum and manganese.

W6MS3

ETF-14. The overall plant HI for ETF-14 surface water was 8.64. Inorganics accounted for 100% of the HI. Of the 2 inorganics detected at ETF-14, and that exceeded background levels if background data were available, only copper (HQ=8.58) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Copper accounted for 99% to the overall HI for this station. No background data were available for copper. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from ETF-14 surface water, primarily resulting from copper.

WAG 6 MS3A. The overall plant HI for WAG 6 MS3A surface water was 20.5. Inorganics accounted for 100% of the HI. Of the 8 inorganics detected at WAG 6 MS3A, and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were arsenic (HQ=3.00), manganese (HQ=1.49), and thallium (HQ=15.6). Thallium accounted for 76% to the overall HI for this station. Manganese exceeded background by a factor of 29 and no background were available for arsenic and thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WAG 6 MS3A surface water, primarily resulting from thallium.

WAG 6 MS3A-1. The overall plant HI for WAG 6 MS3A-1 surface water was 13.2. Inorganics accounted for 100% of the HI. Of the 4 inorganics detected at WAG 6 MS3A-1, and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were arsenic (HQ=2.80), manganese (HQ=1.49), and thallium (HQ=8.70). Thallium accounted for 67% to the overall HI for this station. Manganese exceeded background by a factor of 29 and no background were available for arsenic and thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WAG 6 MS3A-1 surface water, primarily resulting from thallium.

WAG 6 MS3B. The overall plant HI for WAG 6 MS3B surface water was 22.8. Inorganics accounted for >99% of the HI. Of the 11 inorganics detected at WAG 6 MS3B, and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were arsenic (HQ=5.00), chromium (HQ=1.02), and thallium (HQ=15.5). Thallium accounted for 68% to the overall HI for this station. No background were available for arsenic, chromium, or thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WAG 6 MS3B surface water, primarily resulting from thallium.

WAG 6 MS1

French Dr South. The overall plant HI for French Dr South surface water was 10.8. Inorganics accounted for >99% of the HI. Thallium (HQ=10.8) was the only inorganic detected above background. No background data were available for thallium which constituted 99% of the overall HI for this station. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from French Dr South surface water, primarily resulting from thallium.

WAG 6 MS1. The overall plant HI for WAG 6 MS1 surface water was 20.5. Inorganics accounted for 100% of the HI. Of the 6 inorganics detected at WAG 6 MS1, and that exceeded background levels if background data were available, only thallium (HQ=19.2) exceeded its toxicological benchmark for terrestrial plants associated with surface water. No background data were available for thallium which accounted for 94% to the overall HI for this station. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WAG 6 MS1 surface water, primarily resulting from thallium.

WAG 6 MS1-1. The overall plant HI for WAG 6 MS1-1 surface water was 22.7. Inorganics accounted for 100% of the HI. Of the 6 inorganics detected at WAG 6 MS1-1, and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were arsenic (HQ=4.00), manganese

(HQ=3.05), and thallium (HQ=15.3). Thallium accounted for 68% to the overall HI for this station. Manganese exceeded background by a factor of 59 and no background were available for arsenic and thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WAG 6 MS1-1 surface water, primarily resulting from thallium.

W6MS2. The overall plant HI for W6MS2 surface water was 8.35. Inorganics accounted for 100% of the HI. Of the 4 inorganics detected at W6MS2, and that exceeded background levels if background data were available, only thallium (HQ=8.10) exceeded its toxicological benchmark for terrestrial plants associated with surface water. No background data were available for thallium which accounted for 97% to the overall HI for this station. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from W6MS2 surface water, primarily resulting from thallium.

WCTRIB-1

SW7-6. The overall plant HI for SW7-6 surface water was 3.87. Inorganics accounted for 100% of the HI. Of the 3 inorganics detected at SW7-6, and that exceeded background levels if background data were available, only aluminum (HQ=3.81) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Aluminum which accounted for 98% to the overall HI for this station and exceeded background by a factor of 2. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW7-6 surface water, primarily resulting from aluminum.

West Seep

RS-1. The overall plant HI for RS-1 surface water was 29.1. Inorganics accounted for 100% of the HI. Of the 8 inorganics detected at RS-1, and that exceeded background levels if background data were available, 3 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were arsenic (HQ=14.0), manganese (HQ=1.83), and thallium (HQ=12.9). Arsenic and thallium accounted for 48% and 44% to the overall HI for this station, respectively. Manganese exceeded background by a factor of 31 and no background were available for arsenic and thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from RS-1 surface water, primarily resulting from arsenic and thallium.

RS-3. The overall plant HI for RS-3 surface water was 34.5. Inorganics accounted for 100% of the HI. Of the 12 inorganics detected at RS-3, and that exceeded background levels if background data were available, 4 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=7.85), arsenic (HQ=22.0), chromium (HQ=1.28), and fluoride (HQ=2.20). Arsenic accounted for 64% to the overall HI for this station. Aluminum exceeded background by a factor of 5 and no background were available for arsenic, chromium, or fluoride. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from RS-3 surface water, primarily resulting from arsenic.

RS-3A. The overall plant HI for RS-3A surface water was 120. Inorganics accounted for 100% of the HI. Of the 18 inorganics detected at RS-3A, and that exceeded background levels if background data were available, 5 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=88.5), arsenic (HQ=23.6), chromium

(HQ=1.93), and fluoride (HQ=2.42). Aluminum accounted for 74% to the overall HI for this station and exceeded background by a factor of 5. No background were available for arsenic, chromium, or fluoride. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from RS-3A surface water, primarily resulting from aluminum.

RS-3B. The overall plant HI for RS-3B surface water was 7.35. Inorganics accounted for 100% of the HI. Of the 4 inorganics detected at RS-3B, and that exceeded background levels if background data were available, only aluminum (HQ=7.10) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Aluminum accounted for 97% to the overall HI for this station and exceeded background by a factor of 4. These results indicate a potential risk of adverse effects on plants from RS-3B surface water, primarily resulting from aluminum.

SW6-2. The overall plant HI for SW6-2 surface water was 18.3. Inorganics accounted for 100% of the HI. Of the 5 inorganics detected at SW6-2, and that exceeded background levels if background data were available, arsenic (HQ=2.00) and thallium (HQ=15.6) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Thallium accounted for 85% to the overall HI for this station. No background data were available for arsenic or thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW6-2 surface water, primarily resulting from thallium.

SW7-1. The overall plant HI for SW7-1 surface water was 2.37. Inorganics accounted for 100% of the HI. Of the 5 inorganics detected at SW7-1, and that exceeded background levels if background data were available, only manganese (HQ=1.60) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Manganese accounted for 68% to the overall HI for this station and exceeded background by a factor of 31. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW7-1 surface water, primarily resulting from manganese.

SW7-2. The overall plant HI for SW7-2 surface water was 6.64. Inorganics accounted for 100% of the HI. Of the 8 inorganics detected at SW7-2, and that exceeded background levels if background data were available, aluminum (HQ=3.26) and cobalt (HQ=2.37) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum accounted for 49% to the overall HI for this station and exceeded background by a factor of 3. No background data were available for cobalt which accounted for 36% to the overall HI. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW7-2 surface water, primarily resulting from aluminum and cobalt.

WSS-025. The overall plant HI for WSS-025 surface water was 522. Inorganics accounted for 100% of the HI. Of the 21 inorganics detected at WSS-025, and that exceeded background levels if background data were available, 7 exceeded toxicological benchmarks for terrestrial plants associated with surface water. These were aluminum (HQ=485), arsenic (HQ=10.0), chromium (HQ=2.60), copper (HQ=1.06), iron (HQ=9.8), lead (HQ=1.6), and titanium (HQ=9.00). Aluminum accounted for 93% to the overall HI for this station and exceeded background by more than 2 orders of magnitude. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from WSS-025 surface water, primarily resulting from aluminum.

SWSA 5 Drainage D-2

05.SP007. The overall plant HI for 05.SP007 surface water was 32.1. Inorganics accounted for >99% of the HI. Of the 7 inorganics detected at 05.SP007, and that exceeded background levels if background data were available, aluminum (HQ=29.0) iron (HQ=1.68), and manganese (HQ=1.12) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum accounted for 90% to the overall HI for this station and exceeded background by a factor of 17. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP007 surface water, primarily resulting from aluminum.

05.SP014. The overall plant HI for 05.SP014 surface water was 12.7. Inorganics accounted for >99% of the HI. Of the 7 inorganics detected at 05.SP014, and that exceeded background levels if background data were available, only aluminum (HQ=11.5) exceeded toxicological its benchmark for terrestrial plants associated with surface water. Aluminum accounted for 90% to the overall HI for this station and exceeded background by a factor of 7. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SP014 surface water, primarily resulting from aluminum.

05.SW002. The overall plant HI for 05.SW002 surface water was 11.9. Inorganics accounted for >99% of the HI. Of the 10 inorganics detected at 05.SW002, and that exceeded background levels if background data were available, aluminum (HQ=6.1), arsenic (HQ=2.2), iron (HQ=2.2), and manganese (HQ=1.0) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum accounted for 51% to the overall HI for this station and exceeded background by a factor of 1.5. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 05.SW002 surface water, primarily resulting from aluminum.

SW5-5. The overall plant HI for SW5-5 surface water was 32.3. Inorganics accounted for 100% of the HI. Of the 9 inorganics detected at SW5-5, and that exceeded background levels if background data were available, aluminum (HQ=29.0), iron (HQ=1.7), and manganese (HQ=1.1) exceeded toxicological benchmarks for terrestrial plants associated with surface water. Aluminum accounted for 90% to the overall HI for this station and exceeded background by a factor of 17. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW5-5 surface water, primarily resulting from aluminum.

WOC

5NST. The overall plant HI for 5NST surface water was 13.8. Inorganics accounted for 100% of the HI. Of the 4 inorganics detected at 5NST, and that exceeded background levels if background data were available, only thallium (HQ=13.6) exceeded its toxicological benchmark for terrestrial plants associated with surface water. Thallium accounted for 99% to the overall HI for this station. No background data were available for thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from 5NST surface water, primarily resulting from thallium.

SW2-4. The overall plant HI for SW2-4 surface water was 26.8. Inorganics accounted for 100% of the HI. Of the 8 inorganics detected at SW2-4, and that exceeded background levels if background data were available, arsenic (HQ=3.00) manganese (HQ=2.65), and thallium (HQ=20.9)

exceeded toxicological benchmarks for terrestrial plants associated with surface water. Thallium accounted for 78% to the overall HI for this station. No background data were available for arsenic or thallium. No organic contaminants exceeded a hazard quotient of 1 for this station. These results indicate a potential risk of adverse effects on plants from SW6-2 surface water, primarily resulting from thallium.

6.4 SUMMARY OF POTENTIAL RISKS TO PLANTS

Potential nonradionuclide risks to terrestrial plants were identified by comparing a representative soil concentration for each subbasin to conservative ecotoxicological benchmarks for plants. In addition, potential risks to plants exposed to surface water from seeps within the WOC watershed were evaluated by comparing a representative surface water concentration for each sampling location within each subbasin to conservative ecotoxicological benchmarks for plants grown in soil solution. Results of these screening procedures are summarized in Tables 6.2 for soils and 6.3 for surface water for those subbasins and sampling stations where at least one benchmark was exceeded.

For soil, potential risks were identified within 19 subbasins. Hazard quotients were generally low (<3.8) with the exception of mercury, nickel, silver, and zinc at the Intermediate Pond; chromium and zinc at HF-2; chromium, mercury, and zinc at Lower WOC; mercury, silver, and zinc at WOC; mercury at SWSA 5 Trib-1 and Seep B; nickel at SWSA 4 Main; chromium at HRE; and zinc and selenium at Seep A. Subbasins in which no risks to plants were identified were Seep B East, SWSA 5 Drainage D-2, SWSA 5 North WOC, and WAG 7 WOC.

For seeps, potential risks were identified at 71 sampling stations within 19 subbasins. Hazard quotients were generally low (<10) with the exception of thallium at East Seep, HF-2, Intermediate Pond, Lower WOC, Seep A, SWSA 5 Trib-1, SWSA 4 Main, W6MS3, WAG 6 MS-1, West Seep, and WOC; aluminum at HF-2, HRE, Lower WOC, MV Drive, Pit 4 South, Seep A, Seep C, SWSA Trib-1, SWSA 4 Main, West Seep, and SWSA 5 Drainage D-2; arsenic at Pit 4 South, SWSA 4 Main, and West Seep; and nickel at SWSA 4 Main.

6.5 UNCERTAINTIES CONCERNING RISKS TO PLANTS

The following factors create uncertainty in assessing the risk posed to plants by contaminants of potential concern in WOC watershed soils and seeps.

- **Bioavailability of elements in soil.** The extraction methods used may to evaluate soil samples remove from the soil quantities of chemicals greater than are available to plants. The double-acid extraction method removes the exchangeable fraction of metals thereby giving a concentration that reflects the total potential pool of contaminants, not that to which the plant is exposed at any one time. Estimates of exposure are confounded by the concentration- and species-dependent synergistic and antagonistic interactions between metals during uptake by roots and inside plants.

- **Bioavailability of elements in surface water and seeps.** Concentrations of contaminants such as aluminum in whole, unfiltered surface water are probably higher then the concentrations bioavailable to plants. In unfiltered water samples (i.e., containing suspended

particles), acidification will bring into solution metals strongly bounded to this particulate matter which would otherwise not be bioavailable to plants.

- **Variable response to toxicants.** Various plant species and plant growth stages tolerate contaminants to different extents. The literature from which benchmarks were derived is not based on experiments using plants found in ecosystems representative of the WOC watershed. It is difficult to extrapolate from largely agricultural species in early growth stages used in most of the published literature to trees and varied growth natural vegetation.

- **Multiple contaminant exposure.** Because of the lack of understanding of complex interactions between contaminants, benchmark levels are necessarily derived from experiments in which plants are exposed to single contaminants. Typical soils in the WOC watershed expose plants to multiple contaminants, the effects of which may not be adequately accounted for by literature derived, single-contaminant benchmarks.

- **Lack of benchmarks for some metals and most organic compounds.** For a variety of organic and inorganic contaminants, appropriate benchmark values are not available since little research has focused on phytotoxic effects from these compounds. Thus, it is not possible to assess the risk to plant growth posed by some of the analytes found in WOC soils and surface water.

- **Chemical speciation.** The analytical techniques did not generally differentiate among species of chemicals present in soils and surface water which have variable toxicity to plants. Toxicity benchmarks for metals are often derived from studies with a single species of a contaminant. For example, the analytical data did not specify the valence state of the chromium. Chromium (VI) is more toxic and bioavailable than chromium (III) (Smith et al. 1989, cited in Will and Suter 1995b), but in most soils chromium (VI) is likely to be reduced to chromium (III) (Bartlett and James 1979, cited in Will and Suter 1995b). However, the toxicological benchmark used to estimate effects of chromium is based on chromium (VI) studies. The use of the benchmark for the more toxic and available form of a contaminant when exposures may be predominantly from a less available or less toxic form may lead to overestimation of the risks of adverse effects.

Table 6.1. Results of single contaminant screening for plants exposed to surface water seeps in the White Oak Creek watershed. (Concentrations in mg/l)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
EAST SEEP	SW7-3	AL	8/12	4.33E-01	7.75E-01	1.28	2.00E-01	3.88E+00		33.03%
EAST SEEP	SW7-3	AS	4/10	4.02E-03	4.20E-03		1.00E-03	4.20E+00		35.75%
EAST SEEP	SW7-3	B	4/10	1.10E-01	1.78E-01		1.00E+00	1.78E-01		1.52%
EAST SEEP	SW7-3	BE	2/10	6.36E-04	5.00E-04		5.00E-01	1.00E-03		0.01%
EAST SEEP	SW7-3	CD	1/8	1.92E-03	6.00E-05		1.00E-01	6.00E-04		0.01%
EAST SEEP	SW7-3	CO	7/12	1.37E-02	2.16E-02		6.00E-02	3.60E-01		3.06%
EAST SEEP	SW7-3	CR	11/11	6.55E-02	9.13E-02		5.00E-02	1.83E+00		15.58%
EAST SEEP	SW7-3	CU	7/11	6.59E-03	8.30E-03		5.00E-02	1.66E-01		1.41%
EAST SEEP	SW7-3	FL	13/14	3.28E+00	4.01E+00		5.00E+00	8.02E-01		6.83%
EAST SEEP	SW7-3	HG	2/10	2.23E-04	4.30E-04		5.00E-03	8.60E-02		0.73%
EAST SEEP	SW7-3	MO	4/10	1.47E-02	1.67E-02		5.00E-01	3.34E-02		0.28%
EAST SEEP	SW7-3	NI	7/11	2.42E-02	3.28E-02		5.00E-01	6.56E-02		0.56%
EAST SEEP	SW7-3	SE	3/10	3.68E-03	4.00E-03		7.00E-01	5.71E-03		0.05%
EAST SEEP	SW7-3	V	3/10	1.04E-02	2.78E-02		2.00E-01	1.39E-01	1.17E+01	1.18%
EAST SEEP	SW7-4	B	1/2	3.65E-01	1.07E-01		1.00E+00	1.07E-01		0.64%
EAST SEEP	SW7-4	BE	1/2	2.33E-03	5.00E-04		5.00E-01	1.00E-03		0.01%
EAST SEEP	SW7-4	FL	1/3	7.18E-01	1.60E-01		5.00E+00	3.20E-02		0.19%
EAST SEEP	SW7-4	MN	2/2	2.68E+01	7.40E+00	36.00	4.00E+00	1.85E+00		11.08%
EAST SEEP	SW7-4	NI	1/3	5.48E-02	4.30E-02		5.00E-01	8.60E-02		0.51%
EAST SEEP	SW7-4	TL	1/3	3.73E-01	2.90E-01		2.00E-02	1.45E+01		86.83%
EAST SEEP	SW7-4	V	1/2	7.74E-02	2.48E-02		2.00E-01	1.24E-01	1.67E+01	0.74%
EAST SEEP	SW7-7	B	1/2	4.67E-01	1.35E-01		1.00E+00	1.35E-01		1.57%
EAST SEEP	SW7-7	BE	1/4	1.15E-03	2.00E-04		5.00E-01	4.00E-04		0.00%
EAST SEEP	SW7-7	FL	1/3	6.92E-01	2.00E-01		5.00E+00	4.00E-02		0.47%
EAST SEEP	SW7-7	MN	3/3	9.42E-01	7.57E-01	3.68	4.00E+00	1.89E-01		2.20%
EAST SEEP	SW7-7	NI	3/3	5.68E-02	4.60E-02		5.00E-01	9.20E-02		1.07%
EAST SEEP	SW7-7	TL	3/5	1.51E-01	1.61E-01		2.00E-02	8.05E+00		93.86%
EAST SEEP	SW7-7	V	2/4	1.49E-02	1.41E-02		2.00E-01	7.05E-02	8.58E+00	0.82%
EAST SEEP	SW7-8	AL	1/3	5.34E-01	4.12E-01	1.22	2.00E-01	2.06E+00		96.70%
EAST SEEP	SW7-8	BE	1/3	6.18E-04	2.00E-04		5.00E-01	4.00E-04		0.02%
EAST SEEP	SW7-8	V	1/2	4.19E-02	1.40E-02		2.00E-01	7.00E-02	2.13E+00	3.29%
HF-2	05.SW005	AL	10/17	6.10E+00	4.04E+01	18.00	2.00E-01	2.02E+02		90.37%
HF-2	05.SW005	AS	1/9	2.57E-03	3.10E-03		1.00E-03	3.10E+00		1.39%
HF-2	05.SW005	BE	1/10	7.56E-04	2.40E-03		5.00E-01	4.80E-03		0.00%
HF-2	05.SW005	CD	2/8	1.68E-03	1.80E-03		1.00E-01	1.80E-02		0.01%
HF-2	05.SW005	CO	4/10	1.86E-02	4.11E-02		6.00E-02	6.85E-01		0.31%
HF-2	05.SW005	CR	6/12	4.30E-02	1.43E-01		5.00E-02	2.86E+00		1.28%
HF-2	05.SW005	CU	3/17	1.73E-02	1.20E-01		5.00E-02	2.40E+00		1.07%
HF-2	05.SW005	FE	10/16	4.18E+00	5.39E+01	5.19	1.00E+01	5.39E+00		2.41%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
HF-2	05.SW005	FL	12/12	9.56E-01	1.80E+00		5.00E+00	3.60E-01		0.16%
HF-2	05.SW005	LI	4/4	2.00E-01	2.00E-01		3.00E+00	6.67E-02		0.03%
HF-2	05.SW005	MN	14/16	7.23E-01	7.20E+00	3.52	4.00E+00	1.80E+00		0.81%
HF-2	05.SW005	NAPHTHALENE	5/7	1.04E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
HF-2	05.SW005	NI	12/16	7.78E-02	6.23E-01		5.00E-01	1.25E+00		0.56%
HF-2	05.SW005	PB	8/12	1.92E-02	6.60E-02	1.37	2.00E-02	3.30E+00		1.48%
HF-2	05.SW005	TETRACHLOROETHENE	5/11	8.70E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
HF-2	05.SW005	TOLUENE	5/11	8.70E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
HF-2	05.SW005	V	5/10	2.72E-02	5.64E-02		2.00E-01	2.82E-01		0.13%
HF-2	05.SW005	XYLENE (TOTAL)	5/11	8.70E-03	1.00E-02		1.00E+02	1.00E-04	2.24E+02	0.00%
HRE	05.SW004	AL	6/14	1.40E+00	1.77E+01	4.13	2.00E-01	8.85E+01		90.14%
HRE	05.SW004	AS	1/6	2.43E-03	3.60E-03		1.00E-03	3.60E+00		3.67%
HRE	05.SW004	CO	2/6	1.03E-02	1.86E-02		6.00E-02	3.10E-01		0.32%
HRE	05.SW004	CR	3/7	2.48E-02	5.78E-02		5.00E-02	1.16E+00		1.18%
HRE	05.SW004	FE	6/14	1.78E+00	2.85E+01	2.21	1.00E+01	2.85E+00		2.90%
HRE	05.SW004	FL	8/8	5.12E-01	6.20E-01		5.00E+00	1.24E-01		0.13%
HRE	05.SW004	LI	3/3	2.00E-01	2.00E-01		3.00E+00	6.67E-02		0.07%
HRE	05.SW004	MN	12/12	8.34E-01	5.52E+00	4.05	4.00E+00	1.38E+00		1.41%
HRE	05.SW004	NAPHTHALENE	3/5	1.06E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
HRE	05.SW004	NI	3/7	1.42E-02	2.54E-02		5.00E-01	5.08E-02		0.05%
HRE	05.SW004	SE	1/5	2.31E-03	2.70E-03		7.00E-01	3.86E-03		0.00%
HRE	05.SW004	TETRACHLOROETHENE	3/9	8.22E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
HRE	05.SW004	TOLUENE	3/9	8.22E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
HRE	05.SW004	V	1/5	1.72E-02	2.62E-02		2.00E-01	1.31E-01		0.13%
HRE	05.SW004	XYLENE (TOTAL)	3/9	8.22E-03	1.00E-02		1.00E+02	1.00E-04	9.82E+01	0.00%
HRE	SW9-1	CU	1/4	5.93E-03	6.70E-03		5.00E-02	1.34E-01		10.06%
HRE	SW9-1	FL	2/3	7.22E+00	5.58E+00		5.00E+00	1.12E+00		84.10%
HRE	SW9-1	MN	3/5	2.85E-01	3.11E-01	1.39	4.00E+00	7.78E-02	1.33E+00	5.84%
HRE	SW9-2	AL	2/3	1.87E+00	1.46E+00	4.31	2.00E-01	7.30E+00		79.07%
HRE	SW9-2	CU	2/3	1.40E-02	9.20E-03		5.00E-02	1.84E-01		1.99%
HRE	SW9-2	FE	3/3	4.14E+00	3.37E+00	4.18	1.00E+01	3.37E-01		3.65%
HRE	SW9-2	FL	2/3	1.19E+00	7.30E-01		5.00E+00	1.46E-01		1.58%
HRE	SW9-2	MN	3/3	2.71E+00	2.18E+00	10.60	4.00E+00	5.45E-01		5.90%
HRE	SW9-2	ZN	3/3	3.68E-01	2.88E-01	1.34	4.00E-01	7.20E-01	9.23E+00	7.80%
Intermediate Po	SW2-2	B	1/2	6.67E-02	2.50E-02		1.00E+00	2.50E-02		4.05%
Intermediate Po	SW2-2	BE	1/2	8.66E-04	6.00E-04		5.00E-01	1.20E-03		0.19%
Intermediate Po	SW2-2	CO	1/2	1.94E-02	8.20E-03		6.00E-02	1.37E-01		22.20%
Intermediate Po	SW2-2	FL	1/1		2.80E-01		5.00E+00	5.60E-02		9.07%
Intermediate Po	SW2-2	MN	2/2	1.49E+00	9.86E-01	4.79	4.00E+00	2.47E-01		40.02%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
Intermediate Po	SW2-2	V	1/2	1.01E-01	3.02E-02		2.00E-01	1.51E-01	6.17E-01	24.47%
Intermediate Po	WAG4 T2A	AL	7/8	6.43E-01	1.00E+00	1.90	2.00E-01	5.00E+00		74.06%
Intermediate Po	WAG4 T2A	B	7/9	1.72E-01	2.06E-01		1.00E+00	2.06E-01		3.05%
Intermediate Po	WAG4 T2A	BE	2/7	5.07E-04	5.00E-04		5.00E-01	1.00E-03		0.01%
Intermediate Po	WAG4 T2A	CD	1/6	1.88E-03	9.00E-05		1.00E-01	9.00E-04		0.01%
Intermediate Po	WAG4 T2A	CR	1/7	1.31E-02	3.46E-02		5.00E-02	6.92E-01		10.25%
Intermediate Po	WAG4 T2A	CU	2/7	4.66E-03	5.50E-03		5.00E-02	1.10E-01		1.63%
Intermediate Po	WAG4 T2A	FE	7/8	1.02E+00	1.43E+00	1.26	1.00E+01	1.43E-01		2.12%
Intermediate Po	WAG4 T2A	FL	8/8	1.25E+00	1.47E+00		5.00E+00	2.94E-01		4.35%
Intermediate Po	WAG4 T2A	MN	8/9	2.10E-01	4.10E-01	1.02	4.00E+00	1.03E-01		1.53%
Intermediate Po	WAG4 T2A	NI	5/7	3.59E-02	3.71E-02		5.00E-01	7.42E-02		1.10%
Intermediate Po	WAG4 T2A	TETRACHLOROETHENE	3/3	3.00E-04	3.00E-04		1.00E+01	3.00E-05		0.00%
Intermediate Po	WAG4 T2A	V	2/8	2.61E-02	2.54E-02		2.00E-01	1.27E-01	6.75E+00	1.88%
Intermediate Po	WCTRIB-3	B	2/2	2.04E-01	1.99E-01		1.00E+00	1.99E-01		24.86%
Intermediate Po	WCTRIB-3	BE	1/2	8.66E-04	6.00E-04		5.00E-01	1.20E-03		0.15%
Intermediate Po	WCTRIB-3	FL	2/2	1.55E+00	1.10E+00		5.00E+00	2.20E-01		27.49%
Intermediate Po	WCTRIB-3	MN	2/2	1.63E+00	8.72E-01	4.24	4.00E+00	2.18E-01		27.24%
Intermediate Po	WCTRIB-3	NI	1/2	2.72E-02	1.11E-02		5.00E-01	2.22E-02		2.77%
Intermediate Po	WCTRIB-3	V	1/2	9.27E-02	2.79E-02		2.00E-01	1.40E-01	8.00E-01	17.49%
Intermediate Po	WCTRIB-4	B	1/2	2.48E-01	7.50E-02		1.00E+00	7.50E-02		0.53%
Intermediate Po	WCTRIB-4	BE	1/3	1.32E-03	5.00E-04		5.00E-01	1.00E-03		0.01%
Intermediate Po	WCTRIB-4	FL	1/3	6.41E-01	2.80E-01		5.00E+00	5.60E-02		0.40%
Intermediate Po	WCTRIB-4	MN	2/2	2.40E+00	6.79E-01	3.30	4.00E+00	1.70E-01		1.21%
Intermediate Po	WCTRIB-4	TL	2/3	4.33E-01	2.72E-01		2.00E-02	1.36E+01		96.83%
Intermediate Po	WCTRIB-4	V	1/3	3.58E-02	2.86E-02		2.00E-01	1.43E-01	1.40E+01	1.02%
Lower WOC	05.SP00D	FL	1/1		2.00E-01		5.00E+00	4.00E-02		36.43%
Lower WOC	05.SP00D	LI	1/1		2.00E-01		3.00E+00	6.67E-02		60.75%
Lower WOC	05.SP00D	NAPHTHALENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
Lower WOC	05.SP00D	TETRACHLOROETHENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
Lower WOC	05.SP00D	TOLUENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
Lower WOC	05.SP00D	XYLENE (TOTAL)	1/1		1.00E-02		1.00E+02	1.00E-04	1.10E-01	0.09%
Lower WOC	05.SW006	AL	5/17	5.02E-01	3.50E+00	1.48	2.00E-01	1.75E+01		94.44%
Lower WOC	05.SW006	BE	1/14	2.66E-04	7.30E-04		5.00E-01	1.46E-03		0.01%
Lower WOC	05.SW006	CO	2/8	3.03E-03	3.10E-03		6.00E-02	5.17E-02		0.28%
Lower WOC	05.SW006	CR	4/10	8.59E-03	1.21E-02		5.00E-02	2.42E-01		1.31%
Lower WOC	05.SW006	CU	1/14	3.98E-03	8.20E-03		5.00E-02	1.64E-01		0.89%
Lower WOC	05.SW006	FL	8/8	1.10E+00	1.35E+00		5.00E+00	2.70E-01		1.46%
Lower WOC	05.SW006	LI	3/3	2.00E-01	2.00E-01		3.00E+00	6.67E-02		0.36%
Lower WOC	05.SW006	MN	8/16	2.26E-01	8.79E-01	1.10	4.00E+00	2.20E-01		1.19%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
Lower WOC	05.SW006	NAPHTHALENE	4/6	1.05E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
Lower WOC	05.SW006	NI	3/9	3.87E-03	5.40E-03		5.00E-01	1.08E-02		0.06%
Lower WOC	05.SW006	TETRACHLOROETHENE	4/10	8.50E-03	1.00E-02		1.00E+01	1.00E-03		0.01%
Lower WOC	05.SW006	TOLUENE	4/10	8.50E-03	1.00E-02		1.00E+01	1.00E-03		0.01%
Lower WOC	05.SW006	XYLENE (TOTAL)	4/10	8.50E-03	1.00E-02		1.00E+02	1.00E-04	1.85E+01	0.00%
Lower WOC	MBTRIB-3	B	2/4	7.06E-02	6.14E-02		1.00E+00	6.14E-02		0.37%
Lower WOC	MBTRIB-3	MN	3/3	5.56E-01	5.05E-01	2.46	4.00E+00	1.26E-01		0.75%
Lower WOC	MBTRIB-3	TL	1/3	4.33E-01	3.32E-01		2.00E-02	1.66E+01	1.68E+01	98.88%
Lower WOC	SW2-1	B	2/2	5.70E-02	2.96E-02		1.00E+00	2.96E-02		2.30%
Lower WOC	SW2-1	BE	1/2	7.66E-04	4.00E-04		5.00E-01	8.00E-04		0.06%
Lower WOC	SW2-1	FE	2/2	1.49E+01	5.75E+00	7.13	1.00E+01	5.75E-01		44.68%
Lower WOC	SW2-1	FL	1/1		2.00E-01		5.00E+00	4.00E-02		3.11%
Lower WOC	SW2-1	HG	1/3	3.37E-04	2.70E-04		5.00E-03	5.40E-02		4.20%
Lower WOC	SW2-1	MN	2/2	4.71E+00	2.01E+00	9.77	4.00E+00	5.03E-01		39.09%
Lower WOC	SW2-1	V	1/2	5.25E-02	1.69E-02		2.00E-01	8.45E-02	1.29E+00	6.57%
Lower WOC	SW2-5	B	6/11	2.68E-01	3.36E-01		1.00E+00	3.36E-01		1.24%
Lower WOC	SW2-5	BE	2/11	6.76E-04	1.70E-04		5.00E-01	3.40E-04		0.00%
Lower WOC	SW2-5	CD	1/8	3.02E-03	5.00E-05		1.00E-01	5.00E-04		0.00%
Lower WOC	SW2-5	CO	6/11	6.18E-03	8.60E-03		6.00E-02	1.43E-01		0.53%
Lower WOC	SW2-5	CR	2/11	4.87E-03	6.30E-03		5.00E-02	1.26E-01		0.46%
Lower WOC	SW2-5	CU	4/11	4.14E-03	4.10E-03		5.00E-02	8.20E-02		0.30%
Lower WOC	SW2-5	MN	11/11	1.24E+00	3.06E+00	6.05	4.00E+00	7.65E-01		2.82%
Lower WOC	SW2-5	NI	6/12	1.47E-02	1.70E-02		5.00E-01	3.40E-02		0.13%
Lower WOC	SW2-5	TL	1/8	3.10E-01	5.12E-01		2.00E-02	2.56E+01		94.47%
Lower WOC	SW2-5	V	1/11	4.15E-03	2.60E-03		2.00E-01	1.30E-02	2.71E+01	0.05%
Lower WOC	SW2-6	AS	1/2	2.83E-03	1.00E-03		1.00E-03	1.00E+00		38.38%
Lower WOC	SW2-6	B	2/3	1.39E-01	1.18E-01		1.00E+00	1.18E-01		4.53%
Lower WOC	SW2-6	BE	1/3	7.11E-04	1.70E-04		5.00E-01	3.40E-04		0.01%
Lower WOC	SW2-6	CO	1/3	6.50E-03	4.60E-03		6.00E-02	7.67E-02		2.94%
Lower WOC	SW2-6	CR	1/3	1.00E-02	8.20E-03		5.00E-02	1.64E-01		6.29%
Lower WOC	SW2-6	CU	1/3	2.79E-03	1.60E-03		5.00E-02	3.20E-02		1.23%
Lower WOC	SW2-6	FE	3/3	1.11E+01	8.52E+00	10.60	1.00E+01	8.52E-01		32.70%
Lower WOC	SW2-6	MN	3/3	1.56E+00	1.36E+00	6.61	4.00E+00	3.40E-01		13.05%
Lower WOC	SW2-6	NI	2/3	1.29E-02	1.14E-02		5.00E-01	2.28E-02	2.61E+00	0.87%
Lower WOC	SW2-7	AS	1/3	1.56E-03	1.40E-03		1.00E-03	1.40E+00		35.93%
Lower WOC	SW2-7	B	2/4	1.54E-01	1.41E-01		1.00E+00	1.41E-01		3.62%
Lower WOC	SW2-7	BE	1/4	5.71E-04	2.90E-04		5.00E-01	5.80E-04		0.01%
Lower WOC	SW2-7	CR	1/4	5.32E-03	5.90E-03		5.00E-02	1.18E-01		3.03%
Lower WOC	SW2-7	CU	1/4	2.49E-03	2.30E-03		5.00E-02	4.60E-02		1.18%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
Lower WOC	SW2-7	FE	4/4	1.51E+01	1.70E+01	18.80	1.00E+01	1.70E+00		43.63%
Lower WOC	SW2-7	MN	4/4	1.97E+00	1.90E+00	9.24	4.00E+00	4.75E-01		12.19%
Lower WOC	SW2-7	NI	1/4	7.53E-03	7.70E-03		5.00E-01	1.54E-02	3.90E+00	0.40%
Lower WOC	SW6-1	BE	1/3	1.26E-03	2.00E-04		5.00E-01	4.00E-04		0.00%
Lower WOC	SW6-1	FE	2/2	4.47E+01	1.47E+01	18.20	1.00E+01	1.47E+00		5.92%
Lower WOC	SW6-1	FL	1/3	6.92E-01	2.00E-01		5.00E+00	4.00E-02		0.16%
Lower WOC	SW6-1	MN	2/2	4.17E+00	3.00E+00	14.60	4.00E+00	7.50E-01		3.02%
Lower WOC	SW6-1	TL	1/3	5.82E-01	4.50E-01		2.00E-02	2.25E+01		90.67%
Lower WOC	SW6-1	V	1/2	2.66E-02	1.09E-02		2.00E-01	5.45E-02	2.48E+01	0.22%
Lower WOC	SW7-5	AG	1/12	3.12E-03	3.00E-03		1.00E-01	3.00E-02		0.12%
Lower WOC	SW7-5	AL	11/13	2.06E+00	3.79E+00	6.07	2.00E-01	1.90E+01		74.63%
Lower WOC	SW7-5	AS	1/10	6.92E-02	1.00E-03		1.00E-03	1.00E+00		3.93%
Lower WOC	SW7-5	B	5/12	6.20E-02	7.72E-02		1.00E+00	7.72E-02		0.30%
Lower WOC	SW7-5	BE	4/12	9.49E-04	1.10E-03		5.00E-01	2.20E-03		0.01%
Lower WOC	SW7-5	CD	2/10	1.87E-03	1.00E-03		1.00E-01	1.00E-02		0.04%
Lower WOC	SW7-5	CO	6/12	1.37E-02	2.46E-02		6.00E-02	4.10E-01		1.61%
Lower WOC	SW7-5	CR	3/12	6.10E-03	8.40E-03		5.00E-02	1.68E-01		0.66%
Lower WOC	SW7-5	CU	6/13	1.04E-02	5.20E-02		5.00E-02	1.04E+00		4.09%
Lower WOC	SW7-5	FE	11/13	2.17E+00	3.81E+00	2.69	1.00E+01	3.81E-01		1.50%
Lower WOC	SW7-5	FL	2/10	3.11E-01	4.11E-01		5.00E+00	8.22E-02		0.32%
Lower WOC	SW7-5	LI	1/2	4.40E-02	4.10E-03		3.00E+00	1.37E-03		0.01%
Lower WOC	SW7-5	MO	1/11	8.13E-03	3.00E-03		5.00E-01	6.00E-03		0.02%
Lower WOC	SW7-5	NI	6/13	2.47E-02	5.52E-02		5.00E-01	1.10E-01		0.43%
Lower WOC	SW7-5	SE	1/10	7.27E-02	1.00E-03		7.00E-01	1.43E-03		0.01%
Lower WOC	SW7-5	SN	1/3	7.40E-02	6.00E-02		1.00E+02	6.00E-04		0.00%
Lower WOC	SW7-5	TL	1/11	1.58E+00	6.00E-02		2.00E-02	3.00E+00		11.78%
Lower WOC	SW7-5	V	4/12	1.13E-02	2.75E-02		2.00E-01	1.38E-01	2.55E+01	0.54%
Lower WOC	WCTRIB-1	AL	1/6	4.97E-01	9.57E-01	1.47	2.00E-01	4.79E+00		25.72%
Lower WOC	WCTRIB-1	BE	1/5	9.61E-04	5.00E-04		5.00E-01	1.00E-03		0.01%
Lower WOC	WCTRIB-1	MN	4/4	1.11E+00	1.26E+00	5.37	4.00E+00	3.15E-01		1.69%
Lower WOC	WCTRIB-1	TL	2/6	2.06E-01	2.68E-01		2.00E-02	1.34E+01		71.95%
Lower WOC	WCTRIB-1	V	1/5	1.64E-02	2.37E-02		2.00E-01	1.19E-01	1.86E+01	0.64%
Lower WOC	WSTRIB-1	B	1/2	1.93E-01	6.00E-02		1.00E+00	6.00E-02		0.34%
Lower WOC	WSTRIB-1	BE	1/2	2.86E-03	3.00E-04		5.00E-01	6.00E-04		0.00%
Lower WOC	WSTRIB-1	MN	2/2	1.31E+00	4.43E-01	2.15	4.00E+00	1.11E-01		0.63%
Lower WOC	WSTRIB-1	TL	1/3	4.45E-01	3.45E-01		2.00E-02	1.73E+01		98.67%
Lower WOC	WSTRIB-1	V	1/2	3.17E-02	1.23E-02		2.00E-01	6.15E-02	1.75E+01	0.35%
MB-15	MBTRIB-2A	CU	1/1		1.57E-02		5.00E-02	3.14E-01		47.87%
MB-15	MBTRIB-2A	FL	1/1		1.71E+00		5.00E+00	3.42E-01	6.56E-01	52.13%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
MVDrive	5NNT	AL	1/4	2.01E+00	2.39E+00	5.92	2.00E-01	1.20E+01		69.81%
MVDrive	5NNT	AS	1/4	4.35E-03	1.00E-03		1.00E-03	1.00E+00		5.82%
MVDrive	5NNT	BE	2/4	1.20E-03	1.00E-03		5.00E-01	2.00E-03		0.01%
MVDrive	5NNT	CD	1/3	3.22E-03	1.00E-03		1.00E-01	1.00E-02		0.06%
MVDrive	5NNT	CO	1/4	5.34E-03	3.00E-03		6.00E-02	5.00E-02		0.29%
MVDrive	5NNT	CR	1/4	7.48E-03	7.60E-03		5.00E-02	1.52E-01		0.88%
MVDrive	5NNT	CU	1/4	6.40E-03	5.10E-03		5.00E-02	1.02E-01		0.59%
MVDrive	5NNT	FE	1/4	2.49E+00	2.97E+00	3.09	1.00E+01	2.97E-01		1.73%
MVDrive	5NNT	FL	2/4	5.24E-01	4.00E-01		5.00E+00	8.00E-02		0.47%
MVDrive	5NNT	HG	1/3	1.32E-04	1.00E-04		5.00E-03	2.00E-02		0.12%
MVDrive	5NNT	LI	1/1		3.40E-03		3.00E+00	1.13E-03		0.01%
MVDrive	5NNT	MN	3/3	3.37E-01	2.55E-01	1.24	4.00E+00	6.38E-02		0.37%
MVDrive	5NNT	MO	1/4	1.12E-02	3.00E-03		5.00E-01	6.00E-03		0.03%
MVDrive	5NNT	NI	1/4	1.10E-02	6.60E-03		5.00E-01	1.32E-02		0.08%
MVDrive	5NNT	SE	1/4	2.26E-03	1.00E-03		7.00E-01	1.43E-03		0.01%
MVDrive	5NNT	SN	1/1		7.00E-03		1.00E+02	7.00E-05		0.00%
MVDrive	5NNT	TL	1/4	8.98E-02	6.54E-02		2.00E-02	3.27E+00		19.02%
MVDrive	5NNT	V	1/4	2.10E-02	2.42E-02		2.00E-01	1.21E-01	1.72E+01	0.70%
PIT4/south	EAST SEEP	AG	1/14	3.22E-03	3.00E-03		1.00E-01	3.00E-02		0.02%
PIT4/south	EAST SEEP	AL	32/36	6.79E+00	2.99E+01	20.00	2.00E-01	1.50E+02		76.32%
PIT4/south	EAST SEEP	AS	5/17	1.94E-02	2.82E-02		1.00E-03	2.82E+01		14.35%
PIT4/south	EAST SEEP	B	6/33	3.16E-02	1.99E+00		1.00E+00	1.99E+00		1.01%
PIT4/south	EAST SEEP	BE	3/26	5.01E-04	1.00E-03		5.00E-01	2.00E-03		0.00%
PIT4/south	EAST SEEP	CD	3/18	1.43E-03	2.70E-03		1.00E-01	2.70E-02		0.01%
PIT4/south	EAST SEEP	CO	24/34	1.10E-02	2.70E-02		6.00E-02	4.50E-01		0.23%
PIT4/south	EAST SEEP	CR	21/30	2.05E-02	4.82E-02		5.00E-02	9.64E-01		0.49%
PIT4/south	EAST SEEP	CU	25/35	1.30E-02	3.07E-02		5.00E-02	6.14E-01		0.31%
PIT4/south	EAST SEEP	FE	31/36	7.33E+00	3.64E+01	9.09	1.00E+01	3.64E+00		1.85%
PIT4/south	EAST SEEP	FL	34/35	1.22E+00	1.05E+01		5.00E+00	2.10E+00		1.07%
PIT4/south	EAST SEEP	LI	1/1		3.50E-03		3.00E+00	1.17E-03		0.00%
PIT4/south	EAST SEEP	MN	34/35	6.05E-01	1.66E+00	2.94	4.00E+00	4.15E-01		0.21%
PIT4/south	EAST SEEP	MO	4/20	6.55E-03	1.48E-02		5.00E-01	2.96E-02		0.02%
PIT4/south	EAST SEEP	NI	19/30	2.89E-02	5.38E-02		5.00E-01	1.08E-01		0.05%
PIT4/south	EAST SEEP	SE	3/16	2.89E-02	6.36E-02		7.00E-01	9.09E-02		0.05%
PIT4/south	EAST SEEP	SN	1/2	1.82E-01	6.00E-02		1.00E+02	6.00E-04		0.00%
PIT4/south	EAST SEEP	TL	2/12	7.64E-02	1.55E-01		2.00E-02	7.75E+00		3.94%
PIT4/south	EAST SEEP	V	2/25	1.24E-02	2.62E-02		2.00E-01	1.31E-01	1.97E+02	0.07%
SWSA 5 Seep A	05.SP009	AL	2/2	4.09E+00	1.35E+00	3.98	2.00E-01	6.75E+00		70.09%
SWSA 5 Seep A	05.SP009	FE	2/2	1.15E+01	6.58E+00	8.16	1.00E+01	6.58E-01		6.83%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA 5 Seep A	05.SP009	FL	1/1		1.50E-01		5.00E+00	3.00E-02		0.31%
SWSA 5 Seep A	05.SP009	MN	2/2	1.04E+01	8.75E+00	42.50	4.00E+00	2.19E+00		22.74%
SWSA 5 Seep A	05.SP009	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep A	05.SP009	TETRACHLOROETHENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep A	05.SP009	TOLUENE	2/2	1.00E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep A	05.SP009	XYLENE (TOTAL)	2/3	1.32E-02	1.00E-02		1.00E+02	1.00E-04	9.63E+00	0.00%
SWSA 5 Seep A	05.SP010	NAPHTHALENE	1/1		1.00E-02		1.00E+01	1.00E-03		32.26%
SWSA 5 Seep A	05.SP010	TETRACHLOROETHENE	1/1		1.00E-02		1.00E+01	1.00E-03		32.26%
SWSA 5 Seep A	05.SP010	TOLUENE	1/1		1.00E-02		1.00E+01	1.00E-03		32.26%
SWSA 5 Seep A	05.SP010	XYLENE (TOTAL)	1/1		1.00E-02		1.00E+02	1.00E-04	3.10E-03	3.23%
SWSA 5 Seep A	05.SP016	AL	1/2	4.48E+01	1.23E+01	36.30	2.00E-01	6.15E+01		96.25%
SWSA 5 Seep A	05.SP016	CO	1/2	3.15E-02	1.00E-02		6.00E-02	1.67E-01		0.26%
SWSA 5 Seep A	05.SP016	CR	1/2	5.52E-02	1.72E-02		5.00E-02	3.44E-01		0.54%
SWSA 5 Seep A	05.SP016	CU	1/2	1.31E-02	5.10E-03		5.00E-02	1.02E-01		0.16%
SWSA 5 Seep A	05.SP016	FE	2/2	4.99E+01	1.38E+01	17.10	1.00E+01	1.38E+00		2.16%
SWSA 5 Seep A	05.SP016	FL	2/2	7.46E-02	6.40E-02		5.00E+00	1.28E-02		0.02%
SWSA 5 Seep A	05.SP016	MN	2/2	2.76E+00	1.02E+00	4.96	4.00E+00	2.55E-01		0.40%
SWSA 5 Seep A	05.SP016	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	05.SP016	NI	1/2	6.21E-02	1.92E-02		5.00E-01	3.84E-02		0.06%
SWSA 5 Seep A	05.SP016	TETRACHLOROETHENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	05.SP016	TOLUENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	05.SP016	V	1/2	6.58E-02	1.92E-02		2.00E-01	9.60E-02		0.15%
SWSA 5 Seep A	05.SP016	XYLENE (TOTAL)	2/4	1.09E-02	1.00E-02		1.00E+02	1.00E-04	6.39E+01	0.00%
SWSA 5 Seep A	05.SP017	AL	1/2	1.34E+00	3.79E-01	1.12	2.00E-01	1.90E+00		19.23%
SWSA 5 Seep A	05.SP017	AS	2/2	6.52E-03	3.60E-03		1.00E-03	3.60E+00		36.44%
SWSA 5 Seep A	05.SP017	FE	2/2	3.29E+01	1.72E+01	21.30	1.00E+01	1.72E+00		17.41%
SWSA 5 Seep A	05.SP017	FL	2/2	1.43E-01	1.30E-01		5.00E+00	2.60E-02		0.26%
SWSA 5 Seep A	05.SP017	HG	3/3	2.41E-04	1.90E-04		5.00E-03	3.80E-02		0.38%
SWSA 5 Seep A	05.SP017	MN	2/2	1.09E+01	1.02E+01	49.60	4.00E+00	2.55E+00		25.81%
SWSA 5 Seep A	05.SP017	NAPHTHALENE	1/2	2.33E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep A	05.SP017	NI	2/2	2.52E-02	1.24E-02		5.00E-01	2.48E-02		0.25%
SWSA 5 Seep A	05.SP017	TETRACHLOROETHENE	1/3	1.15E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep A	05.SP017	TOLUENE	1/3	1.15E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep A	05.SP017	V	1/2	8.05E-03	3.40E-03		2.00E-01	1.70E-02		0.17%
SWSA 5 Seep A	05.SP017	XYLENE (TOTAL)	3/3	1.21E-02	1.00E-02		1.00E+02	1.00E-04	9.88E+00	0.00%
SWSA 5 Seep A	05.SW003	AL	9/15	1.73E+00	8.90E+00	5.10	2.00E-01	4.45E+01		96.13%
SWSA 5 Seep A	05.SW003	BE	1/12	2.84E-04	7.30E-04		5.00E-01	1.46E-03		0.00%
SWSA 5 Seep A	05.SW003	CO	1/8	2.83E-03	6.20E-03		6.00E-02	1.03E-01		0.22%
SWSA 5 Seep A	05.SW003	CR	3/10	5.57E-03	1.06E-02		5.00E-02	2.12E-01		0.46%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA 5 Seep A	05.SW003	FE	6/15	8.33E-01	9.64E+00	1.03	1.00E+01	9.64E-01		2.08%
SWSA 5 Seep A	05.SW003	FL	5/8	3.19E-01	2.00E-01		5.00E+00	4.00E-02		0.09%
SWSA 5 Seep A	05.SW003	LI	5/5	2.00E-01	2.00E-01		3.00E+00	6.67E-02		0.14%
SWSA 5 Seep A	05.SW003	MN	14/14	5.12E-01	1.25E+00	2.49	4.00E+00	3.13E-01		0.68%
SWSA 5 Seep A	05.SW003	NAPHTHALENE	7/10	9.90E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	05.SW003	NI	1/8	4.83E-03	1.14E-02		5.00E-01	2.28E-02		0.05%
SWSA 5 Seep A	05.SW003	SE	1/8	1.91E-03	2.70E-03		7.00E-01	3.86E-03		0.01%
SWSA 5 Seep A	05.SW003	TETRACHLOROETHENE	7/15	8.51E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	05.SW003	TOLUENE	7/15	8.51E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	05.SW003	V	1/8	5.17E-03	1.19E-02		2.00E-01	5.95E-02		0.13%
SWSA 5 Seep A	05.SW003	XYLENE (TOTAL)	7/15	8.51E-03	1.00E-02		1.00E+02	1.00E-04	4.63E+01	0.00%
SWSA 5 Seep A	SW5-6	AL	1/4	1.13E+00	1.35E+00	3.35	2.00E-01	6.75E+00		19.05%
SWSA 5 Seep A	SW5-6	B	2/2	5.43E-01	5.22E-01		1.00E+00	5.22E-01		1.47%
SWSA 5 Seep A	SW5-6	BE	1/4	1.24E-03	3.00E-04		5.00E-01	6.00E-04		0.00%
SWSA 5 Seep A	SW5-6	FE	3/3	8.56E+00	6.58E+00	8.16	1.00E+01	6.58E-01		1.86%
SWSA 5 Seep A	SW5-6	FL	1/4	4.38E-01	1.45E-01		5.00E+00	2.90E-02		0.08%
SWSA 5 Seep A	SW5-6	MN	3/3	1.02E+01	8.13E+00	39.50	4.00E+00	2.03E+00		5.73%
SWSA 5 Seep A	SW5-6	NI	3/4	3.66E-02	3.22E-02		5.00E-01	6.44E-02		0.18%
SWSA 5 Seep A	SW5-6	TL	1/2	1.79E+00	5.05E-01		2.00E-02	2.53E+01		71.42%
SWSA 5 Seep A	SW5-6	TOLUENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	SW5-6	V	1/4	1.24E-02	1.38E-02		2.00E-01	6.90E-02	3.54E+01	0.19%
SWSA 5 Seep A	SW5-7	AS	2/3	5.91E-03	3.00E-03		1.00E-03	3.00E+00		44.64%
SWSA 5 Seep A	SW5-7	B	3/3	6.32E-01	5.49E-01		1.00E+00	5.49E-01		8.17%
SWSA 5 Seep A	SW5-7	BE	1/2	2.86E-03	3.00E-04		5.00E-01	6.00E-04		0.01%
SWSA 5 Seep A	SW5-7	CO	1/2	2.04E-02	9.20E-03		6.00E-02	1.53E-01		2.28%
SWSA 5 Seep A	SW5-7	FE	3/3	8.08E+00	7.15E+00	8.87	1.00E+01	7.15E-01		10.64%
SWSA 5 Seep A	SW5-7	MN	3/3	1.04E+01	8.83E+00	42.90	4.00E+00	2.21E+00		32.88%
SWSA 5 Seep A	SW5-7	V	1/2	5.51E-02	1.87E-02		2.00E-01	9.35E-02	6.72E+00	1.39%
SWSA 5 Seep A	SW5-8	B	5/5	6.50E-01	6.99E-01		1.00E+00	6.99E-01		2.85%
SWSA 5 Seep A	SW5-8	FE	5/5	4.44E+00	4.36E+00	5.41	1.00E+01	4.36E-01		1.78%
SWSA 5 Seep A	SW5-8	FL	2/6	3.94E-01	7.00E-02		5.00E+00	1.40E-02		0.06%
SWSA 5 Seep A	SW5-8	MN	5/5	4.54E+00	4.91E+00	22.10	4.00E+00	1.23E+00		5.02%
SWSA 5 Seep A	SW5-8	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	SW5-8	NI	3/5	2.42E-02	2.40E-02		5.00E-01	4.80E-02		0.20%
SWSA 5 Seep A	SW5-8	TETRACHLOROETHENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	SW5-8	TL	1/4	4.11E-01	4.39E-01		2.00E-02	2.20E+01		89.81%
SWSA 5 Seep A	SW5-8	TOLUENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	SW5-8	V	1/5	1.01E-02	1.32E-02		2.00E-01	6.60E-02		0.27%
SWSA 5 Seep A	SW5-8	XYLENE (TOTAL)	2/4	1.83E-02	2.00E-02		1.00E+02	2.00E-04	2.45E+01	0.00%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA 5 Seep A	SW5-9	AL	2/6	5.50E-01	7.09E-01	1.62	2.00E-01	3.55E+00		11.14%
SWSA 5 Seep A	SW5-9	AS	2/5	4.15E-03	3.00E-03		1.00E-03	3.00E+00		9.41%
SWSA 5 Seep A	SW5-9	B	2/2	1.36E+00	9.38E-01		1.00E+00	9.38E-01		2.94%
SWSA 5 Seep A	SW5-9	BE	1/5	1.14E-03	4.00E-04		5.00E-01	8.00E-04		0.00%
SWSA 5 Seep A	SW5-9	CO	1/5	7.07E-03	8.30E-03		6.00E-02	1.38E-01		0.43%
SWSA 5 Seep A	SW5-9	FE	5/5	6.40E+00	9.03E+00	7.94	1.00E+01	9.03E-01		2.83%
SWSA 5 Seep A	SW5-9	FL	2/6	3.96E-01	9.00E-02		5.00E+00	1.80E-02		0.06%
SWSA 5 Seep A	SW5-9	MN	5/5	4.30E+00	5.02E+00	20.90	4.00E+00	1.26E+00		3.95%
SWSA 5 Seep A	SW5-9	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	SW5-9	NI	4/6	4.04E-02	3.80E-02		5.00E-01	7.60E-02		0.24%
SWSA 5 Seep A	SW5-9	TETRACHLOROETHENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	SW5-9	TL	1/3	5.69E-01	4.38E-01		2.00E-02	2.19E+01		68.73%
SWSA 5 Seep A	SW5-9	TOLUENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Seep A	SW5-9	V	1/5	1.18E-02	1.58E-02		2.00E-01	7.90E-02		0.25%
SWSA 5 Seep A	SW5-9	XYLENE (TOTAL)	2/4	9.19E-03	1.00E-02		1.00E+02	1.00E-04	3.19E+01	0.00%
SWSA 5 Seep B West	SW5-11	AG	1/2	2.47E-02	1.04E-02		1.00E-01	1.04E-01		25.57%
SWSA 5 Seep B West	SW5-11	B	1/1		7.43E-02		1.00E+00	7.43E-02		18.27%
SWSA 5 Seep B West	SW5-11	BE	1/3	1.38E-03	4.00E-04		5.00E-01	8.00E-04		0.20%
SWSA 5 Seep B West	SW5-11	FL	2/4	1.54E-01	1.40E-01		5.00E+00	2.80E-02		6.88%
SWSA 5 Seep B West	SW5-11	MN	4/4	5.26E-01	4.66E-01	2.27	4.00E+00	1.17E-01		28.77%
SWSA 5 Seep B West	SW5-11	NAPHTHALENE	1/2	2.33E-02	1.00E-02		1.00E+01	1.00E-03		0.25%
SWSA 5 Seep B West	SW5-11	TETRACHLOROETHENE	1/3	1.15E-02	1.00E-02		1.00E+01	1.00E-03		0.25%
SWSA 5 Seep B West	SW5-11	TOLUENE	1/3	1.15E-02	1.00E-02		1.00E+01	1.00E-03		0.25%
SWSA 5 Seep B West	SW5-11	V	1/3	1.92E-02	1.59E-02		2.00E-01	7.95E-02		19.55%
SWSA 5 Seep B West	SW5-11	XYLENE (TOTAL)	1/3	1.15E-02	1.00E-02		1.00E+02	1.00E-04	4.07E-01	0.02%
SWSA 5 Seep C	05.SP005	AL	1/2	8.32E+00	2.30E+00	6.78	2.00E-01	1.15E+01		97.18%
SWSA 5 Seep C	05.SP005	FE	2/2	8.83E+00	2.58E+00	3.20	1.00E+01	2.58E-01		2.18%
SWSA 5 Seep C	05.SP005	FL	1/1		7.00E-02		5.00E+00	1.40E-02		0.12%
SWSA 5 Seep C	05.SP005	MN	2/2	2.41E-01	2.33E-01	1.13	4.00E+00	5.83E-02		0.49%
SWSA 5 Seep C	05.SP005	NAPHTHALENE	1/2	2.33E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep C	05.SP005	TETRACHLOROETHENE	1/2	2.33E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep C	05.SP005	TOLUENE	1/2	2.33E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Seep C	05.SP005	XYLENE (TOTAL)	1/2	2.33E-02	1.00E-02		1.00E+02	1.00E-04	1.18E+01	0.00%
SWSA 5 Seep C	05.SP018	FL	1/1		2.00E-01		5.00E+00	4.00E-02		36.43%
SWSA 5 Seep C	05.SP018	LI	1/1		2.00E-01		3.00E+00	6.67E-02		60.75%
SWSA 5 Seep C	05.SP018	NAPHTHALENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
SWSA 5 Seep C	05.SP018	TETRACHLOROETHENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
SWSA 5 Seep C	05.SP018	TOLUENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
SWSA 5 Seep C	05.SP018	XYLENE (TOTAL)	1/1		1.00E-02		1.00E+02	1.00E-04	1.10E-01	0.09%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA 5 Seep C	SW5-3	AL	1/2	8.37E+00	2.30E+00	6.78	2.00E-01	1.15E+01		75.62%
SWSA 5 Seep C	SW5-3	B	1/1		8.06E-02		1.00E+00	8.06E-02		0.53%
SWSA 5 Seep C	SW5-3	BE	1/2	1.06E-03	4.00E-04		5.00E-01	8.00E-04		0.01%
SWSA 5 Seep C	SW5-3	FE	2/2	4.15E+00	2.58E+00	3.20	1.00E+01	2.58E-01		1.70%
SWSA 5 Seep C	SW5-3	FL	2/4	1.34E+01	1.60E+01		5.00E+00	3.20E+00		21.04%
SWSA 5 Seep C	SW5-3	MN	2/2	4.53E-01	2.91E-01	1.41	4.00E+00	7.28E-02		0.48%
SWSA 5 Seep C	SW5-3	V	1/2	6.42E-02	1.89E-02		2.00E-01	9.45E-02	1.52E+01	0.62%
SWSA 5 Seep C	SW5-4	AS	1/7	1.21E-02	3.00E-03		1.00E-03	3.00E+00		47.63%
SWSA 5 Seep C	SW5-4	B	5/9	1.52E-01	2.34E-01		1.00E+00	2.34E-01		3.71%
SWSA 5 Seep C	SW5-4	BE	1/9	6.21E-04	4.00E-04		5.00E-01	8.00E-04		0.01%
SWSA 5 Seep C	SW5-4	CD	1/8	2.06E-03	2.40E-03		1.00E-01	2.40E-02		0.38%
SWSA 5 Seep C	SW5-4	FE	11/12	1.66E+00	3.58E+00	2.06	1.00E+01	3.58E-01		5.68%
SWSA 5 Seep C	SW5-4	FL	6/23	2.13E-01	5.17E+00		5.00E+00	1.03E+00		16.35%
SWSA 5 Seep C	SW5-4	HG	2/7	1.08E-04	1.10E-04		5.00E-03	2.20E-02		0.35%
SWSA 5 Seep C	SW5-4	LI	2/3	3.18E-01	2.00E-01		3.00E+00	6.67E-02		1.06%
SWSA 5 Seep C	SW5-4	MN	11/12	2.76E+00	5.76E+00	13.40	4.00E+00	1.44E+00		22.86%
SWSA 5 Seep C	SW5-4	NAPHTHALENE	4/5	1.11E-02	1.00E-02		1.00E+01	1.00E-03		0.02%
SWSA 5 Seep C	SW5-4	NI	2/10	1.35E-02	1.54E-02		5.00E-01	3.08E-02		0.49%
SWSA 5 Seep C	SW5-4	TETRACHLOROETHENE	4/6	1.05E-02	1.00E-02		1.00E+01	1.00E-03		0.02%
SWSA 5 Seep C	SW5-4	TOLUENE	4/6	1.05E-02	1.00E-02		1.00E+01	1.00E-03		0.02%
SWSA 5 Seep C	SW5-4	V	1/10	6.91E-03	1.79E-02		2.00E-01	8.95E-02		1.42%
SWSA 5 Seep C	SW5-4	XYLENE (TOTAL)	4/6	9.85E-03	1.00E-02		1.00E+02	1.00E-04	6.30E+00	0.00%
SWSA 5 Trib 1	05.SP003	AL	1/2	1.32E+01	3.62E+00	10.70	2.00E-01	1.81E+01		77.71%
SWSA 5 Trib 1	05.SP003	AS	1/2	9.74E-03	3.50E-03		1.00E-03	3.50E+00		15.03%
SWSA 5 Trib 1	05.SP003	CO	1/2	2.06E-02	7.00E-03		6.00E-02	1.17E-01		0.50%
SWSA 5 Trib 1	05.SP003	FE	2/2	2.67E+01	7.46E+00	9.26	1.00E+01	7.46E-01		3.20%
SWSA 5 Trib 1	05.SP003	FL	1/1		1.60E-01		5.00E+00	3.20E-02		0.14%
SWSA 5 Trib 1	05.SP003	MN	2/2	8.62E+00	3.01E+00	14.60	4.00E+00	7.53E-01		3.23%
SWSA 5 Trib 1	05.SP003	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Trib 1	05.SP003	TETRACHLOROETHENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Trib 1	05.SP003	TOLUENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Trib 1	05.SP003	V	1/2	2.45E-02	7.90E-03		2.00E-01	3.95E-02		0.17%
SWSA 5 Trib 1	05.SP003	XYLENE (TOTAL)	2/3	1.32E-02	1.00E-02		1.00E+02	1.00E-04	2.33E+01	0.00%
SWSA 5 Trib 1	05.SP015	CO	2/2	4.42E-01	2.93E-01		6.00E-02	4.88E+00		58.68%
SWSA 5 Trib 1	05.SP015	CR	1/3	5.24E-03	4.40E-03		5.00E-02	8.80E-02		1.06%
SWSA 5 Trib 1	05.SP015	FE	2/2	1.11E+01	4.88E+00	6.05	1.00E+01	4.88E-01		5.87%
SWSA 5 Trib 1	05.SP015	FL	1/1		6.20E-01		5.00E+00	1.24E-01		1.49%
SWSA 5 Trib 1	05.SP015	HG	1/3	1.41E-04	1.20E-04		5.00E-03	2.40E-02		0.29%
SWSA 5 Trib 1	05.SP015	MN	2/2	1.35E+01	7.90E+00	38.40	4.00E+00	1.98E+00		23.81%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA 5 Trib 1	05.SP015	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Trib 1	05.SP015	NI	2/2	3.76E-01	3.28E-01		5.00E-01	6.56E-01		7.89%
SWSA 5 Trib 1	05.SP015	SE	3/3	5.55E-02	5.08E-02		7.00E-01	7.26E-02		0.87%
SWSA 5 Trib 1	05.SP015	TETRACHLOROETHENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Trib 1	05.SP015	TOLUENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Trib 1	05.SP015	XYLENE (TOTAL)	2/4	1.09E-02	1.00E-02		1.00E+02	1.00E-04	8.32E+00	0.00%
SWSA 5 Trib 1	05.SW001	AL	9/18	1.17E+00	4.03E+00	3.45	2.00E-01	2.02E+01		83.20%
SWSA 5 Trib 1	05.SW001	AS	1/10	1.70E-03	3.70E-03		1.00E-03	3.70E+00		15.24%
SWSA 5 Trib 1	05.SW001	CR	5/11	5.68E-03	7.80E-03		5.00E-02	1.56E-01		0.64%
SWSA 5 Trib 1	05.SW001	CU	1/17	6.89E-03	4.60E-03		5.00E-02	9.20E-02		0.38%
SWSA 5 Trib 1	05.SW001	FL	7/7	2.08E-01	2.00E-01		5.00E+00	4.00E-02		0.16%
SWSA 5 Trib 1	05.SW001	LI	5/5	2.00E-01	2.00E-01		3.00E+00	6.67E-02		0.27%
SWSA 5 Trib 1	05.SW001	NAPHTHALENE	7/10	1.18E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Trib 1	05.SW001	NI	4/10	7.59E-03	9.10E-03		5.00E-01	1.82E-02		0.07%
SWSA 5 Trib 1	05.SW001	SE	2/9	2.22E-03	3.00E-03		7.00E-01	4.29E-03		0.02%
SWSA 5 Trib 1	05.SW001	TETRACHLOROETHENE	6/14	8.36E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Trib 1	05.SW001	TOLUENE	6/14	8.36E-03	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Trib 1	05.SW001	XYLENE (TOTAL)	6/14	8.36E-03	1.00E-02		1.00E+02	1.00E-04	2.43E+01	0.00%
SWSA 5 Trib 1	SW5-1	AL	1/4	3.04E+00	3.62E+00	8.96	2.00E-01	1.81E+01		40.13%
SWSA 5 Trib 1	SW5-1	AS	1/4	4.95E-03	3.50E-03		1.00E-03	3.50E+00		7.76%
SWSA 5 Trib 1	SW5-1	B	3/3	8.01E-02	7.56E-02		1.00E+00	7.56E-02		0.17%
SWSA 5 Trib 1	SW5-1	BE	1/4	1.12E-03	8.00E-04		5.00E-01	1.60E-03		0.00%
SWSA 5 Trib 1	SW5-1	CO	1/4	6.81E-03	7.00E-03		6.00E-02	1.17E-01		0.26%
SWSA 5 Trib 1	SW5-1	FE	3/4	6.26E+00	7.46E+00	7.77	1.00E+01	7.46E-01		1.65%
SWSA 5 Trib 1	SW5-1	FL	2/4	5.64E-01	3.20E-01		5.00E+00	6.40E-02		0.14%
SWSA 5 Trib 1	SW5-1	MN	3/3	7.30E+00	5.41E+00	26.30	4.00E+00	1.35E+00		2.99%
SWSA 5 Trib 1	SW5-1	TL	1/2	1.48E+00	4.20E-01		2.00E-02	2.10E+01		46.57%
SWSA 5 Trib 1	SW5-1	V	2/4	2.51E-02	2.87E-02		2.00E-01	1.44E-01	4.51E+01	0.32%
SWSA 5/WOC	05.SP004	AL	1/2	4.36E+00	1.20E+00	3.54	2.00E-01	6.00E+00		69.57%
SWSA 5/WOC	05.SP004	AS	1/2	5.36E-03	2.30E-03		1.00E-03	2.30E+00		26.67%
SWSA 5/WOC	05.SP004	CU	1/2	2.26E-02	7.70E-03		5.00E-02	1.54E-01		1.79%
SWSA 5/WOC	05.SP004	FE	1/2	5.41E+00	1.49E+00	1.85	1.00E+01	1.49E-01		1.73%
SWSA 5/WOC	05.SP004	FL	1/1		9.00E-02		5.00E+00	1.80E-02		0.21%
SWSA 5/WOC	05.SP004	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5/WOC	05.SP004	TETRACHLOROETHENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5/WOC	05.SP004	TOLUENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5/WOC	05.SP004	XYLENE (TOTAL)	2/3	1.32E-02	1.00E-02		1.00E+02	1.00E-04	8.62E+00	0.00%
SWSA 5/WOC	SW5-2	AL	2/3	1.56E+00	1.20E+00	3.54	2.00E-01	6.00E+00		90.08%
SWSA 5/WOC	SW5-2	B	3/3	1.89E-01	1.75E-01		1.00E+00	1.75E-01		2.63%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA 5/WOC	SW5-2	BE	1/3	8.63E-04	7.00E-04		5.00E-01	1.40E-03		0.02%
SWSA 5/WOC	SW5-2	CU	1/3	9.66E-03	7.70E-03		5.00E-02	1.54E-01		2.31%
SWSA 5/WOC	SW5-2	FE	2/3	1.93E+00	1.49E+00	1.85	1.00E+01	1.49E-01		2.24%
SWSA 5/WOC	SW5-2	FL	3/3	1.28E-01	1.20E-01		5.00E+00	2.40E-02		0.36%
SWSA 5/WOC	SW5-2	V	2/4	3.52E-02	3.13E-02		2.00E-01	1.57E-01	6.66E+00	2.36%
SWSA4main	BTT	B	3/8	8.67E-02	1.13E-01		1.00E+00	1.13E-01		9.81%
SWSA4main	BTT	BE	2/7	6.27E-04	8.00E-04		5.00E-01	1.60E-03		0.14%
SWSA4main	BTT	CD	1/6	1.88E-03	1.00E-04		1.00E-01	1.00E-03		0:09%
SWSA4main	BTT	CO	1/7	4.13E-03	2.80E-03		6.00E-02	4.67E-02		4.06%
SWSA4main	BTT	CR	1/8	2.46E-03	3.00E-03		5.00E-02	6.00E-02		5.21%
SWSA4main	BTT	CU	2/7	4.62E-03	5.70E-03		5.00E-02	1.14E-01		9.90%
SWSA4main	BTT	FL	6/7	8.34E-01	1.10E+00		5.00E+00	2.20E-01		19.11%
SWSA4main	BTT	MO	6/8	1.01E-01	1.71E-01		5.00E-01	3.42E-01		29.71%
SWSA4main	BTT	NI	7/8	4.45E-02	5.09E-02		5.00E-01	1.02E-01		8.86%
SWSA4main	BTT	V	1/7	1.39E-02	3.02E-02		2.00E-01	1.51E-01	1.15E+00	13.12%
SWSA4main	SCS1B	AG	1/1		5.00E-03		1.00E-01	5.00E-02		0.09%
SWSA4main	SCS1B	AS	1/1		5.00E-02		1.00E-03	5.00E+01		92.76%
SWSA4main	SCS1B	B	1/1		1.00E-01		1.00E+00	1.00E-01		0.19%
SWSA4main	SCS1B	BE	1/1		1.00E-03		5.00E-01	2.00E-03		0.00%
SWSA4main	SCS1B	CD	1/1		5.00E-03		1.00E-01	5.00E-02		0.09%
SWSA4main	SCS1B	CO	1/1		4.50E-03		6.00E-02	7.50E-02		0.14%
SWSA4main	SCS1B	CR	1/1		4.00E-03		5.00E-02	8.00E-02		0.15%
SWSA4main	SCS1B	CU	1/1		7.00E-03		5.00E-02	1.40E-01		0.26%
SWSA4main	SCS1B	FL	1/1		1.00E+00		5.00E+00	2.00E-01		0.37%
SWSA4main	SCS1B	LI	1/1		2.40E-02		3.00E+00	8.00E-03		0.01%
SWSA4main	SCS1B	MN	1/1		6.50E-01	3.16	4.00E+00	1.63E-01		0.30%
SWSA4main	SCS1B	MO	1/1		4.00E-02		5.00E-01	8.00E-02		0.15%
SWSA4main	SCS1B	NI	1/1		2.00E-02		5.00E-01	4.00E-02		0.07%
SWSA4main	SCS1B	PB	1/1		5.00E-02	3.57	2.00E-02	2.50E+00		4.64%
SWSA4main	SCS1B	SE	1/1		5.00E-02		7.00E-01	7.14E-02		0.13%
SWSA4main	SCS1B	SN	1/1		5.00E-02		1.00E+02	5.00E-04		0.00%
SWSA4main	SCS1B	TI	1/1		2.00E-02		6.00E-02	3.33E-01		0.62%
SWSA4main	SCS1B	V	1/1		2.00E-03		2.00E-01	1.00E-02	5.39E+01	0.02%
SWSA4main	SW4-1	AS	3/5	5.53E-03	6.20E-03		1.00E-03	6.20E+00		20.52%
SWSA4main	SW4-1	B	2/4	1.72E-01	1.71E-01		1.00E+00	1.71E-01		0.57%
SWSA4main	SW4-1	BE	1/5	9.99E-04	8.00E-04		5.00E-01	1.60E-03		0.01%
SWSA4main	SW4-1	CO	1/5	6.88E-03	8.20E-03		6.00E-02	1.37E-01		0.45%
SWSA4main	SW4-1	FE	4/4	2.55E+01	2.88E+01	31.60	1.00E+01	2.88E+00		9.53%
SWSA4main	SW4-1	FL	5/5	1.46E+01	1.57E+01		5.00E+00	3.14E+00		10.39%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA4main	SW4-1	MN	4/4	3.69E+00	3.81E+00	17.90	4.00E+00	9.53E-01		3.15%
SWSA4main	SW4-1	TETRACHLOROETHENE	3/5	8.09E-03	7.00E-04		1.00E+01	7.00E-05		0.00%
SWSA4main	SW4-1	TL	1/4	2.79E-01	3.31E-01		2.00E-02	1.66E+01		54.94%
SWSA4main	SW4-1	V	1/5	1.79E-02	2.61E-02		2.00E-01	1.31E-01	3.02E+01	0.43%
SWSA4main	SW4-2	B	4/7	1.90E-01	2.31E-01		1.00E+00	2.31E-01		1.08%
SWSA4main	SW4-2	BE	2/7	6.29E-04	8.00E-04		5.00E-01	1.60E-03		0.01%
SWSA4main	SW4-2	CD	1/6	2.02E-03	6.00E-05		1.00E-01	6.00E-04		0.00%
SWSA4main	SW4-2	CO	4/7	3.05E-02	3.32E-02		6.00E-02	5.53E-01		2.57%
SWSA4main	SW4-2	CU	2/7	4.39E-03	5.10E-03		5.00E-02	1.02E-01		0.47%
SWSA4main	SW4-2	FE	6/7	4.17E+00	7.06E+00	5.17	1.00E+01	7.06E-01		3.29%
SWSA4main	SW4-2	FL	8/8	1.50E+00	2.26E+00		5.00E+00	4.52E-01		2.10%
SWSA4main	SW4-2	HG	1/5	1.06E-04	6.00E-05		5.00E-03	1.20E-02		0.06%
SWSA4main	SW4-2	LI	1/1		1.13E-01		3.00E+00	3.77E-02		0.18%
SWSA4main	SW4-2	MN	7/7	1.03E+00	1.23E+00	5.00	4.00E+00	3.08E-01		1.43%
SWSA4main	SW4-2	MO	1/7	9.19E-03	7.70E-03		5.00E-01	1.54E-02		0.07%
SWSA4main	SW4-2	NI	7/7	8.43E+00	9.46E+00		5.00E-01	1.89E+01		88.01%
SWSA4main	SW4-2	TETRACHLOROETHENE	2/4	1.09E-02	3.00E-03		1.00E+01	3.00E-04		0.00%
SWSA4main	SW4-2	TOLUENE	2/4	1.09E-02	3.00E-03		1.00E+01	3.00E-04		0.00%
SWSA4main	SW4-2	V	1/7	1.41E-02	3.11E-02		2.00E-01	1.56E-01		0.73%
SWSA4main	SW4-2	XYLENE (TOTAL)	2/3	2.96E-03	1.00E-03		1.00E+02	1.00E-05	2.15E+01	0.00%
SWSA4main	W4TRIB-11	AG	1/7	2.84E-03	3.90E-03		1.00E-01	3.90E-02		1.54%
SWSA4main	W4TRIB-11	AS	1/4	2.15E-02	5.50E-04		1.00E-03	5.50E-01		21.71%
SWSA4main	W4TRIB-11	B	2/9	1.14E-01	1.85E-01		1.00E+00	1.85E-01		7.30%
SWSA4main	W4TRIB-11	BE	1/7	5.40E-04	2.00E-04		5.00E-01	4.00E-04		0.02%
SWSA4main	W4TRIB-11	CD	2/6	1.85E-03	2.10E-03		1.00E-01	2.10E-02		0.83%
SWSA4main	W4TRIB-11	CO	1/8	3.89E-03	2.90E-03		6.00E-02	4.83E-02		1.91%
SWSA4main	W4TRIB-11	CU	6/9	2.57E-02	3.40E-02		5.00E-02	6.80E-01		26.84%
SWSA4main	W4TRIB-11	FE	9/9	2.35E+00	1.46E+00	1.81	1.00E+01	1.46E-01		5.76%
SWSA4main	W4TRIB-11	FL	9/10	6.65E-01	1.01E+00		5.00E+00	2.02E-01		7.97%
SWSA4main	W4TRIB-11	MN	7/9	2.23E+00	2.10E+00	10.20	4.00E+00	5.25E-01		20.72%
SWSA4main	W4TRIB-11	MO	5/9	2.74E-02	4.70E-02		5.00E-01	9.40E-02		3.71%
SWSA4main	W4TRIB-11	NI	4/8	1.59E-02	2.13E-02		5.00E-01	4.26E-02	2.53E+00	1.68%
SWSA4main	W4TRIB-5	AL	4/4	1.86E+00	2.11E+00	5.48	2.00E-01	1.06E+01		279781.33%
SWSA4main	W4TRIB-5	B	1/4	1.39E-01	1.44E-01		1.00E+00	1.44E-01		279057.18%
SWSA4main	W4TRIB-5	CR	1/4	3.58E-03	3.80E-03		5.00E-02	7.60E-02		279057.18%
SWSA4main	W4TRIB-5	FE	4/4	1.75E+00	2.00E+00	2.17	1.00E+01	2.00E-01		279781.33%
SWSA4main	W4TRIB-5	FL	4/4	7.74E+00	7.55E+00		5.00E+00	1.51E+00		279781.33%
SWSA4main	W4TRIB-5	NI	1/4	1.90E-02	1.83E-02		5.00E-01	3.66E-02	1.26E+01	279057.18%
SWSA4main	W4TRIB-7	B	4/5	4.10E-01	4.13E-01		1.00E+00	4.13E-01		1669040.16%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA4main	W4TRIB-7	CR	1/5	3.66E-03	4.30E-03		5.00E-02	8.60E-02		1664720.40%
SWSA4main	W4TRIB-7	FL	2/5	6.95E-01	7.73E-01		5.00E+00	1.55E-01		1666191.97%
SWSA4main	W4TRIB-7	MN	5/5	3.69E+00	5.70E+00	17.90	4.00E+00	1.43E+00		1670464.26%
SWSA4main	W4TRIB-7	MO	1/5	1.18E-02	1.13E-02		5.00E-01	2.26E-02	2.11E+00	1664720.40%
SWSA4main	WAG4 MS1	B	6/13	1.81E-01	1.96E-01		1.00E+00	1.96E-01		1.00%
SWSA4main	WAG4 MS1	BE	3/10	1.01E-03	1.50E-03		5.00E-01	3.00E-03		0.02%
SWSA4main	WAG4 MS1	CD	2/8	3.18E-04	2.80E-04		1.00E-01	2.80E-03		0.01%
SWSA4main	WAG4 MS1	CO	3/12	5.54E-03	7.00E-03		6.00E-02	1.17E-01		0.60%
SWSA4main	WAG4 MS1	CR	1/12	3.82E-03	5.90E-03		5.00E-02	1.18E-01		0.60%
SWSA4main	WAG4 MS1	CU	4/12	5.07E-03	7.30E-03		5.00E-02	1.46E-01		0.75%
SWSA4main	WAG4 MS1	FL	15/17	1.30E+00	1.69E+00		5.00E+00	3.38E-01		1.73%
SWSA4main	WAG4 MS1	HG	1/6	1.45E-04	2.00E-04		5.00E-03	4.00E-02		0.20%
SWSA4main	WAG4 MS1	MN	12/13	9.50E-01	6.47E+00	4.62	4.00E+00	1.62E+00		8.28%
SWSA4main	WAG4 MS1	MO	2/11	7.23E-03	7.00E-03		5.00E-01	1.40E-02		0.07%
SWSA4main	WAG4 MS1	NI	13/14	3.91E-02	6.66E-02		5.00E-01	1.33E-01		0.68%
SWSA4main	WAG4 MS1	TL	1/8	2.62E-01	3.34E-01		2.00E-02	1.67E+01		85.36%
SWSA4main	WAG4 MS1	V	1/10	8.87E-03	2.73E-02		2.00E-01	1.37E-01	1.96E+01	0.70%
SWSA5N/WOC	05.SP002	AL	1/2	1.61E+00	4.46E-01	1.32	2.00E-01	2.23E+00		99.86%
SWSA5N/WOC	05.SP002	NAPHTHALENE	1/2	2.33E-02	1.00E-02		1.00E+01	1.00E-03		0.04%
SWSA5N/WOC	05.SP002	TETRACHLOROETHENE	1/2	2.33E-02	1.00E-02		1.00E+01	1.00E-03		0.04%
SWSA5N/WOC	05.SP002	TOLUENE	1/2	2.33E-02	1.00E-02		1.00E+01	1.00E-03		0.04%
SWSA5N/WOC	05.SP002	XYLENE (TOTAL)	1/2	8.66E-03	6.00E-03		1.00E+02	6.00E-05	2.23E+00	0.00%
SWSA5N/WOC	5NW-1	AL	1/2	1.59E+00	4.46E-01	1.32	2.00E-01	2.23E+00		85.16%
SWSA5N/WOC	5NW-1	B	1/1		2.07E-02		1.00E+00	2.07E-02		0.79%
SWSA5N/WOC	5NW-1	BE	1/2	1.43E-03	5.00E-04		5.00E-01	1.00E-03		0.04%
SWSA5N/WOC	5NW-1	MN	2/2	2.99E+00	9.22E-01	4.48	4.00E+00	2.31E-01		8.82%
SWSA5N/WOC	5NW-1	V	1/2	9.63E-02	2.71E-02		2.00E-01	1.36E-01	2.62E+00	5.19%
SWSA5N/WOC	5NW-2	AL	4/5	9.09E-01	9.80E-01	2.68	2.00E-01	4.90E+00		73.47%
SWSA5N/WOC	5NW-2	B	1/2	1.78E-01	5.60E-02		1.00E+00	5.60E-02		0.84%
SWSA5N/WOC	5NW-2	BE	1/4	9.23E-04	5.00E-04		5.00E-01	1.00E-03		0.01%
SWSA5N/WOC	5NW-2	CO	2/4	4.74E-03	3.00E-03		6.00E-02	5.00E-02		0.75%
SWSA5N/WOC	5NW-2	CR	1/5	4.24E-03	3.60E-03		5.00E-02	7.20E-02		1.08%
SWSA5N/WOC	5NW-2	FE	5/5	1.13E+00	1.20E+00	1.40	1.00E+01	1.20E-01		1.80%
SWSA5N/WOC	5NW-2	FL	2/6	5.41E-01	5.20E-02		5.00E+00	1.04E-02		0.16%
SWSA5N/WOC	5NW-2	MN	5/5	4.17E+00	5.33E+00	20.30	4.00E+00	1.33E+00		19.94%
SWSA5N/WOC	5NW-2	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA5N/WOC	5NW-2	TETRACHLOROETHENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA5N/WOC	5NW-2	TOLUENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA5N/WOC	5NW-2	V	1/4	2.18E-02	2.53E-02		2.00E-01	1.27E-01		1.90%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA5N/WOC	5NW-2	XYLENE (TOTAL)	2/4	1.09E-02	1.00E-02		1.00E+02	1.00E-04	6.67E+00	0.00%
W6MS3	ETF-14	CU	2/2	1.52E+00	4.29E-01		5.00E-02	8.58E+00		99.30%
W6MS3	ETF-14	NI	1/2	8.46E-02	3.04E-02		5.00E-01	6.08E-02	8.64E+00	0.70%
W6MS3	WAG6 MS3A	AS	1/5	4.91E-03	3.00E-03		1.00E-03	3.00E+00		170884.90%
W6MS3	WAG6 MS3A	B	1/3	1.04E-01	8.30E-02		1.00E+00	8.30E-02		170875.16%
W6MS3	WAG6 MS3A	BE	1/2	2.33E-03	5.00E-04		5.00E-01	1.00E-03		170870.29%
W6MS3	WAG6 MS3A	FE	4/5	1.56E+00	1.70E+00	1.93	1.00E+01	1.70E-01		171328.33%
W6MS3	WAG6 MS3A	FL	1/3	6.28E-01	3.00E-01		5.00E+00	6.00E-02		170875.16%
W6MS3	WAG6 MS3A	MN	5/5	6.30E+00	5.94E+00	28.90	4.00E+00	1.49E+00		171474.52%
W6MS3	WAG6 MS3A	TL	3/6	2.25E-01	3.12E-01		2.00E-02	1.56E+01		171182.15%
W6MS3	WAG6 MS3A	V	1/2	7.30E-02	2.36E-02		2.00E-01	1.18E-01	2.05E+01	1.37%
W6MS3	WAG6 MS3A-1	AS	1/2	7.58E-03	2.80E-03		1.00E-03	2.80E+00		21.25%
W6MS3	WAG6 MS3A-1	FE	2/2	2.21E+00	1.84E+00	2.28	1.00E+01	1.84E-01		1.40%
W6MS3	WAG6 MS3A-1	MN	2/2	6.50E+00	5.94E+00	28.90	4.00E+00	1.49E+00		11.31%
W6MS3	WAG6 MS3A-1	TL	1/2	4.37E-01	1.74E-01		2.00E-02	8.70E+00	1.32E+01	66.04%
W6MS3	WAG6 MS3B	AS	1/4	6.35E-03	5.00E-03		1.00E-03	5.00E+00		21.95%
W6MS3	WAG6 MS3B	B	5/5	1.65E-01	1.82E-01		1.00E+00	1.82E-01		0.80%
W6MS3	WAG6 MS3B	BE	1/2	2.59E-03	4.00E-04		5.00E-01	8.00E-04		0.00%
W6MS3	WAG6 MS3B	CO	1/4	1.08E-02	1.20E-02		6.00E-02	2.00E-01		0.88%
W6MS3	WAG6 MS3B	CR	1/4	4.33E-02	5.10E-02		5.00E-02	1.02E+00		4.48%
W6MS3	WAG6 MS3B	FL	1/3	6.92E-01	2.00E-01		5.00E+00	4.00E-02		0.18%
W6MS3	WAG6 MS3B	MN	4/5	2.03E+00	2.76E+00	9.86	4.00E+00	6.90E-01		3.03%
W6MS3	WAG6 MS3B	NI	1/4	2.24E-02	2.50E-02		5.00E-01	5.00E-02		0.22%
W6MS3	WAG6 MS3B	SE	1/5	3.40E-03	4.00E-03		7.00E-01	5.71E-03		0.03%
W6MS3	WAG6 MS3B	TETRACHLOROETHENE	3/3	6.00E-04	6.00E-04		1.00E+01	6.00E-05		0.00%
W6MS3	WAG6 MS3B	TL	3/6	2.88E-01	3.10E-01		2.00E-02	1.55E+01		68.06%
W6MS3	WAG6 MS3B	V	1/2	4.96E-02	1.72E-02		2.00E-01	8.60E-02	2.28E+01	0.38%
W6MS1	FRENCH DR S	B	1/1		1.30E-01		1.00E+00	1.30E-01		1.20%
W6MS1	FRENCH DR S	TETRACHLOROETHENE	4/4	1.07E-01	9.90E-02		1.00E+01	9.90E-03		0.09%
W6MS1	FRENCH DR S	TL	1/1		2.14E-01		2.00E-02	1.07E+01	1.08E+01	98.71%
W6MS1	FRENCH DRAIN	B	1/1		1.30E-01		1.00E+00	1.30E-01		1.20%
W6MS1	FRENCH DRAIN	TL	1/1		2.14E-01		2.00E-02	1.07E+01	1.08E+01	98.80%
W6MS1	WAG6 MS1	B	3/3	1.31E-01	1.12E-01		1.00E+00	1.12E-01		0.55%
W6MS1	WAG6 MS1	BE	1/2	2.06E-03	6.00E-04		5.00E-01	1.20E-03		0.01%
W6MS1	WAG6 MS1	FL	1/3	7.56E-01	1.00E-01		5.00E+00	2.00E-02		0.10%
W6MS1	WAG6 MS1	MN	3/3	5.94E+00	3.93E+00	19.10	4.00E+00	9.83E-01		4.81%
W6MS1	WAG6 MS1	TL	2/4	3.77E-01	3.84E-01		2.00E-02	1.92E+01		93.87%
W6MS1	WAG6 MS1	V	1/2	8.69E-02	2.74E-02		2.00E-01	1.37E-01	2.05E+01	0.67%
W6MS1	WAG6 MS1-1	AS	2/2	5.33E-03	4.00E-03		1.00E-03	4.00E+00		17.66%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
W6MS1	WAG6 MS1-1	B	2/2	8.25E-02	8.14E-02		1.00E+00	8.14E-02		0.36%
W6MS1	WAG6 MS1-1	FE	1/1		1.65E+00	2.05	1.00E+01	1.65E-01		0.73%
W6MS1	WAG6 MS1-1	MN	1/1		1.22E+01	59.30	4.00E+00	3.05E+00		13.46%
W6MS1	WAG6 MS1-1	MO	1/1		2.80E-02		5.00E-01	5.60E-02		0.25%
W6MS1	WAG6 MS1-1	TL	1/1		3.05E-01		2.00E-02	1.53E+01	2.27E+01	67.54%
W6MS1	WAG6 MS2	B	3/3	1.58E-01	1.30E-01		1.00E+00	1.30E-01		1.56%
W6MS1	WAG6 MS2	BE	1/2	2.33E-03	5.00E-04		5.00E-01	1.00E-03		0.01%
W6MS1	WAG6 MS2	TL	1/4	1.48E-01	1.62E-01		2.00E-02	8.10E+00		97.06%
W6MS1	WAG6 MS2	V	1/2	7.01E-02	2.28E-02		2.00E-01	1.14E-01	8.35E+00	1.37%
WAG 7 WOC	WCTRIB-2	BE	1/2	5.00E-04	5.00E-04		5.00E-01	1.00E-03		0.78%
WAG 7 WOC	WCTRIB-2	V	1/2	8.36E-02	2.54E-02		2.00E-01	1.27E-01	1.28E-01	99.22%
WCTRIB-1	SW7-6	AL	1/3	9.90E-01	7.61E-01	2.24	2.00E-01	3.81E+00		98.40%
WCTRIB-1	SW7-6	BE	1/3	6.18E-04	2.00E-04		5.00E-01	4.00E-04		0.01%
WCTRIB-1	SW7-6	V	1/2	3.57E-02	1.23E-02		2.00E-01	6.15E-02	3.87E+00	1.59%
West Seep	RS-1	AS	1/5	1.03E-02	1.40E-02		1.00E-03	1.40E+01		48.18%
West Seep	RS-1	B	1/3	1.12E-01	8.90E-02		1.00E+00	8.90E-02		0.31%
West Seep	RS-1	BE	1/5	7.73E-04	4.00E-04		5.00E-01	8.00E-04		0.00%
West Seep	RS-1	FE	4/4	1.17E+00	1.27E+00	1.45	1.00E+01	1.27E-01		0.44%
West Seep	RS-1	MN	4/4	6.34E+00	7.33E+00	30.80	4.00E+00	1.83E+00		6.30%
West Seep	RS-1	NI	2/4	1.51E-02	1.24E-02		5.00E-01	2.48E-02		0.09%
West Seep	RS-1	TL	1/4	2.18E-01	2.57E-01		2.00E-02	1.29E+01		44.40%
West Seep	RS-1	V	2/4	1.68E-02	1.70E-02		2.00E-01	8.50E-02	2.91E+01	0.29%
West Seep	RS-3	AL	2/2	5.35E+00	1.57E+00	4.63	2.00E-01	7.85E+00		22.73%
West Seep	RS-3	AS	1/3	2.72E-02	2.20E-02		1.00E-03	2.20E+01		63.70%
West Seep	RS-3	B	2/2	9.28E-01	2.81E-01		1.00E+00	2.81E-01		0.81%
West Seep	RS-3	BE	1/2	2.59E-03	4.00E-04		5.00E-01	8.00E-04		0.00%
West Seep	RS-3	CO	2/2	1.80E-02	1.80E-02		6.00E-02	3.00E-01		0.87%
West Seep	RS-3	CR	2/2	1.38E-01	6.40E-02		5.00E-02	1.28E+00		3.71%
West Seep	RS-3	CU	1/2	9.39E-03	6.20E-03		5.00E-02	1.24E-01		0.36%
West Seep	RS-3	FL	2/2	2.77E+01	1.10E+01		5.00E+00	2.20E+00		6.37%
West Seep	RS-3	HG	2/2	1.44E-03	5.40E-04		5.00E-03	1.08E-01		0.31%
West Seep	RS-3	MO	2/2	6.52E-02	4.10E-02		5.00E-01	8.20E-02		0.24%
West Seep	RS-3	NI	2/2	1.39E-01	9.10E-02		5.00E-01	1.82E-01		0.53%
West Seep	RS-3	V	1/2	7.92E-02	2.53E-02		2.00E-01	1.27E-01	3.45E+01	0.37%
West Seep	RS-3A	AG	3/9	5.29E-03	6.40E-03		1.00E-01	6.40E-02		0.05%
West Seep	RS-3A	AL	10/10	1.27E+01	1.77E+01	37.60	2.00E-01	8.85E+01		73.71%
West Seep	RS-3A	AS	8/8	2.00E-02	2.36E-02		1.00E-03	2.36E+01		19.66%
West Seep	RS-3A	B	3/10	1.11E-01	1.18E-01		1.00E+00	1.18E-01		0.10%
West Seep	RS-3A	BE	4/9	1.11E-03	1.10E-03		5.00E-01	2.20E-03		0.00%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
West Seep	RS-3A	CD	2/8	1.71E-03	2.10E-03		1.00E-01	2.10E-02		0.02%
West Seep	RS-3A	CO	9/10	3.14E-02	3.63E-02		6.00E-02	6.05E-01		0.50%
West Seep	RS-3A	CR	10/10	8.39E-02	9.64E-02		5.00E-02	1.93E+00		1.61%
West Seep	RS-3A	CU	8/10	2.35E-02	2.76E-02		5.00E-02	5.52E-01		0.46%
West Seep	RS-3A	FE	10/10	9.84E+00	1.39E+01	12.20	1.00E+01	1.39E+00		1.16%
West Seep	RS-3A	FL	10/10	1.11E+01	1.21E+01		5.00E+00	2.42E+00		2.02%
West Seep	RS-3A	HG	9/9	1.00E-03	1.10E-03		5.00E-03	2.20E-01		0.18%
West Seep	RS-3A	MN	10/10	3.31E-01	5.31E-01	1.61	4.00E+00	1.33E-01		0.11%
West Seep	RS-3A	MO	10/10	5.19E-02	5.63E-02		5.00E-01	1.13E-01		0.09%
West Seep	RS-3A	NI	9/9	1.02E-01	1.08E-01		5.00E-01	2.16E-01		0.18%
West Seep	RS-3A	SE	1/7	5.41E-02	1.70E-03		7.00E-01	2.43E-03		0.00%
West Seep	RS-3A	SN	1/2	1.52E-01	5.22E-02		1.00E+02	5.22E-04		0.00%
West Seep	RS-3A	V	9/10	2.66E-02	3.43E-02		2.00E-01	1.72E-01	1.20E+02	0.14%
West Seep	RS-3B	AL	2/2	1.82E+00	1.42E+00	4.19	2.00E-01	7.10E+00		96.58%
West Seep	RS-3B	B	1/2	1.30E-01	3.36E-02		1.00E+00	3.36E-02		0.46%
West Seep	RS-3B	FE	2/2	1.16E+00	1.08E+00	1.34	1.00E+01	1.08E-01		1.47%
West Seep	RS-3B	FL	1/2	6.76E-01	5.48E-01		5.00E+00	1.10E-01	7.35E+00	1.50%
West Seep	SW6-2	AS	2/2	2.00E-03	2.00E-03		1.00E-03	2.00E+00		10.95%
West Seep	SW6-2	B	2/2	6.25E-02	6.20E-02		1.00E+00	6.20E-02		0.34%
West Seep	SW6-2	FE	1/1		1.55E+00	1.92	1.00E+01	1.55E-01		0.85%
West Seep	SW6-2	MN	1/1		1.76E+00	8.56	4.00E+00	4.40E-01		2.41%
West Seep	SW6-2	TL	1/1		3.11E-01		2.00E-02	1.56E+01	1.83E+01	85.45%
West Seep	SW7-1	BE	1/2	7.66E-04	4.00E-04		5.00E-01	8.00E-04		0.03%
West Seep	SW7-1	FE	3/3	7.65E+00	6.57E+00	8.15	1.00E+01	6.57E-01		27.72%
West Seep	SW7-1	FL	1/1		2.00E-01		5.00E+00	4.00E-02		1.69%
West Seep	SW7-1	MN	3/3	6.60E+00	6.40E+00	31.10	4.00E+00	1.60E+00		67.50%
West Seep	SW7-1	V	1/2	4.37E-02	1.45E-02		2.00E-01	7.25E-02	2.37E+00	3.06%
West Seep	SW7-2	AL	4/6	4.47E-01	6.52E-01	1.32	2.00E-01	3.26E+00		49.13%
West Seep	SW7-2	B	2/5	1.85E-01	1.43E-01		1.00E+00	1.43E-01		2.16%
West Seep	SW7-2	BE	1/4	9.19E-04	4.00E-04		5.00E-01	8.00E-04		0.01%
West Seep	SW7-2	CO	4/4	1.52E-01	1.42E-01		6.00E-02	2.37E+00		35.72%
West Seep	SW7-2	CU	1/5	1.69E-02	2.54E-02		5.00E-02	5.08E-01		7.66%
West Seep	SW7-2	FL	2/5	7.20E-01	8.32E-01		5.00E+00	1.66E-01		2.50%
West Seep	SW7-2	MN	5/5	2.12E-01	2.55E-01	1.03	4.00E+00	6.38E-02		0.96%
West Seep	SW7-2	V	1/4	2.14E-02	2.48E-02		2.00E-01	1.24E-01	6.64E+00	1.87%
West Seep	WSS-025	AG	1/1		5.00E-03		1.00E-01	5.00E-02		0.01%
West Seep	WSS-025	AL	1/1		9.70E+01	286.00	2.00E-01	4.85E+02		92.83%
West Seep	WSS-025	AS	1/1		1.00E-02		1.00E-03	1.00E+01		1.91%
West Seep	WSS-025	B	1/1		8.00E-02		1.00E+00	8.00E-02		0.02%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
West Seep	WSS-025	BE	1/1		5.80E-03		5.00E-01	1.16E-02		0.00%
West Seep	WSS-025	CD	1/1		5.00E-03		1.00E-01	5.00E-02		0.01%
West Seep	WSS-025	CO	1/1		4.60E-02		6.00E-02	7.67E-01		0.15%
West Seep	WSS-025	CR	1/1		1.30E-01		5.00E-02	2.60E+00		0.50%
West Seep	WSS-025	CU	1/1		5.30E-02		5.00E-02	1.06E+00		0.20%
West Seep	WSS-025	FE	1/1		9.80E+01	122.00	1.00E+01	9.80E+00		1.88%
West Seep	WSS-025	HG	1/1		4.10E-04		5.00E-03	8.20E-02		0.02%
West Seep	WSS-025	LI	1/1		1.30E-01		3.00E+00	4.33E-02		0.01%
West Seep	WSS-025	MN	1/1		2.50E+00	12.20	4.00E+00	6.25E-01		0.12%
West Seep	WSS-025	MO	1/1		4.00E-02		5.00E-01	8.00E-02		0.02%
West Seep	WSS-025	NI	1/1		1.20E-01		5.00E-01	2.40E-01		0.05%
West Seep	WSS-025	PB	1/1		3.20E-02	2.29	2.00E-02	1.60E+00		0.31%
West Seep	WSS-025	SE	1/1		5.00E-03		7.00E-01	7.14E-03		0.00%
West Seep	WSS-025	SN	1/1		5.00E-02		1.00E+02	5.00E-04		0.00%
West Seep	WSS-025	TI	1/1		5.40E-01		6.00E-02	9.00E+00		1.72%
West Seep	WSS-025	V	1/1		1.40E-01		2.00E-01	7.00E-01		0.13%
West Seep	WSS-025	ZN	1/1		2.60E-01	1.21	4.00E-01	6.50E-01	5.22E+02	0.12%
SWSA 5 Drainage D-2	05.SP007	AL	2/2	1.96E+01	5.80E+00	17.10	2.00E-01	2.90E+01		90.46%
SWSA 5 Drainage D-2	05.SP007	BE	1/2	1.36E-03	4.80E-04		5.00E-01	9.60E-04		0.00%
SWSA 5 Drainage D-2	05.SP007	CO	1/2	1.96E-02	6.40E-03		6.00E-02	1.07E-01		0.33%
SWSA 5 Drainage D-2	05.SP007	CR	1/2	1.90E-02	6.40E-03		5.00E-02	1.28E-01		0.40%
SWSA 5 Drainage D-2	05.SP007	FE	2/2	3.94E+01	1.68E+01	20.80	1.00E+01	1.68E+00		5.24%
SWSA 5 Drainage D-2	05.SP007	FL	1/1		1.00E-01		5.00E+00	2.00E-02		0.06%
SWSA 5 Drainage D-2	05.SP007	MN	2/2	4.89E+00	4.49E+00	21.80	4.00E+00	1.12E+00		3.49%
SWSA 5 Drainage D-2	05.SP007	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Drainage D-2	05.SP007	TETRACHLOROETHENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Drainage D-2	05.SP007	TOLUENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.00%
SWSA 5 Drainage D-2	05.SP007	XYLENE (TOTAL)	2/3	1.32E-02	1.00E-02		1.00E+02	1.00E-04	3.21E+01	0.00%
SWSA 5 Drainage D-2	05.SP014	AL	1/2	8.33E+00	2.29E+00	6.76	2.00E-01	1.15E+01		90.30%
SWSA 5 Drainage D-2	05.SP014	CO	1/2	8.85E-03	3.80E-03		6.00E-02	6.33E-02		0.50%
SWSA 5 Drainage D-2	05.SP014	FE	2/2	2.37E+01	8.21E+00	10.20	1.00E+01	8.21E-01		6.45%
SWSA 5 Drainage D-2	05.SP014	FL	2/2	1.05E-01	1.00E-01		5.00E+00	2.00E-02		0.16%
SWSA 5 Drainage D-2	05.SP014	MN	2/2	2.05E+00	1.15E+00	5.59	4.00E+00	2.88E-01		2.26%
SWSA 5 Drainage D-2	05.SP014	NAPHTHALENE	2/3	1.32E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Drainage D-2	05.SP014	NI	1/2	2.52E-02	9.10E-03		5.00E-01	1.82E-02		0.14%
SWSA 5 Drainage D-2	05.SP014	TETRACHLOROETHENE	3/3	4.67E-02	3.50E-02		1.00E+01	3.50E-03		0.03%
SWSA 5 Drainage D-2	05.SP014	TOLUENE	2/4	1.09E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Drainage D-2	05.SP014	V	1/2	9.51E-03	3.80E-03		2.00E-01	1.90E-02		0.15%
SWSA 5 Drainage D-2	05.SP014	XYLENE (TOTAL)	2/3	1.32E-02	1.00E-02		1.00E+02	1.00E-04	1.27E+01	0.00%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
SWSA 5 Drainage D-2	05.SP019	FL	1/1		2.00E-01		5.00E+00	4.00E-02		36.43%
SWSA 5 Drainage D-2	05.SP019	LI	1/1		2.00E-01		3.00E+00	6.67E-02		60.75%
SWSA 5 Drainage D-2	05.SP019	NAPHTHALENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
SWSA 5 Drainage D-2	05.SP019	TETRACHLOROETHENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
SWSA 5 Drainage D-2	05.SP019	TOLUENE	1/1		1.00E-02		1.00E+01	1.00E-03		0.91%
SWSA 5 Drainage D-2	05.SP019	XYLENE (TOTAL)	1/1		1.00E-02		1.00E+02	1.00E-04	1.10E-01	0.09%
SWSA 5 Drainage D-2	05.SW002	AL	3/10	5.27E-01	1.22E+00	1.56	2.00E-01	6.10E+00		51.32%
SWSA 5 Drainage D-2	05.SW002	AS	3/9	1.58E-03	2.20E-03		1.00E-03	2.20E+00		18.51%
SWSA 5 Drainage D-2	05.SW002	CR	7/13	4.67E-03	7.10E-03		5.00E-02	1.42E-01		1.19%
SWSA 5 Drainage D-2	05.SW002	CU	5/12	3.59E-03	5.30E-03		5.00E-02	1.06E-01		0.89%
SWSA 5 Drainage D-2	05.SW002	FE	13/15	5.82E+00	2.16E+01	7.22	1.00E+01	2.16E+00		18.17%
SWSA 5 Drainage D-2	05.SW002	FL	5/5	2.12E-01	2.00E-01		5.00E+00	4.00E-02		0.34%
SWSA 5 Drainage D-2	05.SW002	LI	3/3	2.00E-01	2.00E-01		3.00E+00	6.67E-02		0.56%
SWSA 5 Drainage D-2	05.SW002	MN	14/14	3.02E+00	4.07E+00	14.70	4.00E+00	1.02E+00		8.58%
SWSA 5 Drainage D-2	05.SW002	NAPHTHALENE	6/9	9.88E-03	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Drainage D-2	05.SW002	NI	6/10	1.89E-02	2.28E-02		5.00E-01	4.56E-02		0.38%
SWSA 5 Drainage D-2	05.SW002	SE	2/10	3.28E-03	1.60E-03		7.00E-01	2.29E-03		0.02%
SWSA 5 Drainage D-2	05.SW002	TETRACHLOROETHENE	6/12	1.13E-02	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Drainage D-2	05.SW002	TOLUENE	6/12	8.85E-03	1.00E-02		1.00E+01	1.00E-03		0.01%
SWSA 5 Drainage D-2	05.SW002	XYLENE (TOTAL)	6/12	8.85E-03	1.00E-02		1.00E+02	1.00E-04	1.19E+01	0.00%
SWSA 5 Drainage D-2	SW5-5	AL	1/2	2.12E+01	5.80E+00	17.10	2.00E-01	2.90E+01		89.79%
SWSA 5 Drainage D-2	SW5-5	B	1/1		1.75E-01		1.00E+00	1.75E-01		0.54%
SWSA 5 Drainage D-2	SW5-5	BE	1/2	1.49E-03	4.80E-04		5.00E-01	9.60E-04		0.00%
SWSA 5 Drainage D-2	SW5-5	CO	1/2	1.41E-02	6.40E-03		6.00E-02	1.07E-01		0.33%
SWSA 5 Drainage D-2	SW5-5	CR	1/2	1.68E-02	6.40E-03		5.00E-02	1.28E-01		0.40%
SWSA 5 Drainage D-2	SW5-5	FE	2/2	5.04E+01	1.68E+01	20.80	1.00E+01	1.68E+00		5.20%
SWSA 5 Drainage D-2	SW5-5	FL	2/2	1.04E-01	1.01E-01		5.00E+00	2.02E-02		0.06%
SWSA 5 Drainage D-2	SW5-5	MN	2/2	7.76E+00	4.49E+00	21.80	4.00E+00	1.12E+00		3.47%
SWSA 5 Drainage D-2	SW5-5	V	1/2	3.43E-02	1.30E-02		2.00E-01	6.50E-02	3.23E+01	0.20%
WOC	5NST	B	1/3	4.32E-02	3.89E-02		1.00E+00	3.89E-02		0.28%
WOC	5NST	BE	1/3	1.26E-03	6.00E-04		5.00E-01	1.20E-03		0.01%
WOC	5NST	TL	2/3	4.33E-01	2.72E-01		2.00E-02	1.36E+01		98.54%
WOC	5NST	V	1/3	4.05E-02	3.22E-02		2.00E-01	1.61E-01	1.38E+01	1.17%
WOC	SW2-3	BE	1/2	5.00E-04	5.00E-04		5.00E-01	1.00E-03		0.79%
WOC	SW2-3	V	1/2	8.25E-02	2.51E-02		2.00E-01	1.26E-01	1.27E-01	99.21%
WOC	SW2-4	AG	1/4	5.63E-03	3.00E-03		1.00E-01	3.00E-02		0.11%
WOC	SW2-4	AS	2/4	3.09E-03	3.00E-03		1.00E-03	3.00E+00		11.19%
WOC	SW2-4	B	2/4	7.53E-02	5.22E-02		1.00E+00	5.22E-02		0.19%
WOC	SW2-4	FE	3/3	1.24E+00	9.83E-01	1.22	1.00E+01	9.83E-02		0.37%

Table 6.1. (continued)

Subasin	Station	Analyte	Detection Frequency	UCL95	Maximum Detected Concentration	Background Quotient	Soil Solution Benchmark	Hazard Quotient	Hazard Index	Percent Contribution
WOC	SW2-4	FL	1/4	5.76E-01	1.41E-01		5.00E+00	2.82E-02		0.11%
WOC	SW2-4	HG	1/3	2.31E-04	2.00E-04		5.00E-03	4.00E-02		0.15%
WOC	SW2-4	MN	3/3	1.34E+01	1.06E+01	51.50	4.00E+00	2.65E+00		9.89%
WOC	SW2-4	TL	1/3	5.44E-01	4.17E-01		2.00E-02	2.09E+01	2.68E+01	77.99%

Table 6.2. Summary of Potential Risks to Plants Exposed to Contaminants in Soil in the White Oak Creek Watershed

		Hazard quotients for risk driving analytes													
Subbasin	**Hazard Index**	**Ag**	**As**	**Cd**	**Co**	**Cr**	**Cu**	**Hg**	**Mo**	**Ni**	**Sb**	**Se**	**Sn**	**Tl**	**Zn**
IntermediatePond	287.0	8.7						255.0	2.6	10.3					6.6
SWSA 4 Main	267.6									262.0		2.0			2.4
Lower WOC	150.0	3.4				116.0		17.0	2.0			1.3			8.2
HRE	110.5			1.1		104.0									4.8
WOC	53.7	12.6					1.6	16.0	2.0			1.6			18.2
SWSA 5 Trib 1	20.6	1.6						14.3				3.3			
SWSA 5 Seep C	15.2	2.5			2.6				3.7		2.4			1.4	
SWSA 5 Seep A	13.8	1.1										5.1			6.4
SWSA 5 Seep B West	11.7							6.7	1.7		1.2	1.3			
SWSA 5 WOC	10.6	1.1						3.2				1.7			2.4
West Seep	9.6	1.4		1.7	2.0					2.3			1.7		
SWSA 6 East	6.9			1.8						2.0					2.6
Pit 4 South	5.8								2.1			1.2		1.2	
W6MS3	5.4	1.8	1.5	1.4											
W6MS1	5.4		1.3	1.6						2.2					
East Seep	4.3											1.2		2.5	
SWSA 6 South	4.2		2.2	1.1											
SWSA 5 N WOC	2.5	1.1										1.4			
SWSA 5 Drainage D-2	1.6	1.1													

Notes:
Abbreviations: Ag = silver, As = arsenic, Cd = cadmium, Co = cobalt, Cr = chromium, Cu =copper, Hg = mercury, Mo = molybdenum, Ni = nickel, Sb = antimony, Se = selenium, Sn = tin, Tl = thallium, Zn = zinc
Risk driving analytes = any detected contaminant present above background concentrations that contributes a HQ above 1.

Table 6.3. Summary of risks to plants from contaminants in seeps in White Oak Creek subbasins

Subbasin	Station ID	Hazard Index	Hazard quotients for risk driving analytes											
			Al	As	B	Co	Cr	Cu	Fe	Fl	Mn	Ni	Pb	Tl
East Seep	SW7-4	16.7									1.9			**14.5**
	SW7-3	11.7	3.9	**4.2**			1.8							
	SW7-7	8.6												**8.1**
	SW7-8	2.1	2.1											
HF-2	05.SW005	224.0	**202.0**	3.1			2.9	2.4	5.4		1.8	1.3	3.3	
HRE	05.SW004	98.2	**88.5**	3.6			1.2		2.9		1.4			
	SW9-2	9.2	**7.3**											
	SW9-1	1.3								1.1				
Intermediate Pond	WCTRIB-4	14.0												**13.6**
	WAG4 T2A	6.8	5.0											
Lower WOC	SW2-5	27.1												**25.6**
	SW7-5	25.5	**19.0**	1.0				1.0						3.0
	SW6-1	24.8							1.5					**22.5**
	WCTRIB-1	18.6	4.8											**13.4**
	05.SW006	18.5	**17.5**											
	WSTRIB-1	17.5												**17.3**
	MBTRIB-3	16.8												**16.6**
	SW2-7	3.9		1.4					**1.7**					
MV Drive	5NNT	17.2	**12.0**	1.0										3.3
PIT4/South	East Seep	197.0	**150.0**	28.2	2.0				3.6	2.1				7.8
SWSA 5 Seep A	05.SP016	63.9	**61.5**						1.4					
	05.SW003	46.3	**44.5**											
	SW5-6	35.4	6.8								2.0			**25.3**
	SW5-9	31.9	3.6	3.0							1.3			**21.9**
	SW5-8	24.5									1.2			**22.0**
	05.SP017	9.9	1.9	**3.6**					1.7		2.6			
	05.SP009	9.6	**6.8**	2.2										
	SW5-7	6.7		**3.0**							2.2			
SWSA 5 Seep C	SW5-3	15.2	**11.5**							3.2				
	05.SP005	11.8	**11.5**											
	SW5-4	6.3		**3.0**							1.4			
SWSA 5 Trib 1	SW5-1	45.1	18.1	3.5							1.4			**21.0**
	05.SW001	24.3	**20.2**	3.7										
	05.SP003	23.3	**18.1**	3.5										
	05.SP015	8.3				**4.9**					2.0			
SWSA 5/WOC	05.SP004	8.6	**6.0**	2.3										
	SW5-2	6.7	**6.0**											
SWSA4main	SCS1B	53.9		**50.0**									2.5	
	SW4-1	30.2		6.2					2.9	3.1				**16.6**
	SW4-2	21.5										**18.9**		
	WAG4 MS1	19.6									**1.6**			**16.7**
	W4TRIB-5	12.6	**10.6**							1.5				
	W4TRIB-7	2.1									**1.4**			
SWSA5N/WOC	5NW-2	6.7	**4.9**								1.3			
	5NW-1	2.6	**2.2**											

Table 6.3. (continued)

Subbasin	Station ID	Hazard Index	Hazard quotients for risk driving analytes											
			Al	As	B	Co	Cr	Cu	Fe	Fl	Mn	Ni	Pb	Tl
	WAG6 MS3A	20.5		3.0							1.5			**15.6**
	WAG6 MS3A-1	13.2		2.8							1.5			**8.7**
	ETF-14	8.6						**8.6**						
W6MS1	WAG6 MS1-1	22.7		4.0							3.1			**15.3**
	WAG6 MS1	20.5												**19.2**
	FRENCH DR S	10.8												**10.7**
	FRENCH DRAIN	10.8												**10.7**
	WAG6 MS2	8.4												**8.1**
WCTRIB-1	SW7-6	3.9	**3.8**											
West Seep	WSS-025	522.0	**485.0**	10.0			2.6	1.1	9.8				1.6	9.0
	RS-3A	120.0	**88.5**	23.6			1.9		1.4	2.4				
	RS-3	34.5	7.9	**22.0**			1.3			2.2				
	RS-1	29.1		**14.0**							1.8			1.3
	SW6-2	18.3		2.0										**15.6**
	RS-3B	7.4	**7.1**											
	SW7-2	6.6	**3.3**			2.4								
	SW7-1	2.4									**1.6**			
SWSA 5 Drainage D-2	SW5-5	32.3	**29.0**						1.7		1.1			
	05.SP007	32.1	**29.0**						1.7		1.1			
	05.SP014	12.7	**1.2**											
	05.SW002	11.9	**6.1**	2.2					2.2		1.0			
WOC	SW2-4	26.8		3.0							2.7			**20.9**
	5NST	13.8												**13.6**