February 2004

DRAFT

SCREENING-LEVEL ECOLOGICAL AND HUMAN HEALTH RISK ASSESSMENT

Poplar Point
Washington, DC

PREPARED FOR:

Ridolfi Inc
Seattle, WA

PREPARED BY:

EVS environment consultants

North Vancouver, BC

SCREENING LEVEL ECOLOGICAL AND HUMAN HEALTH RISK ASSESSMENT

POPLAR POINT

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Prepared for

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EVS Project No.

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The screening-level ERA was prepared by Blair McDonald and John Wilcockson with assistance from Peter Kickham. The screening-level HHRA was prepared by Audrey Wagenaar with assistance from Leigh Holt. Mapping and graphics support was provided by Gavin Castle and Christa Wall. Audrey Wagenaar was the overall EVS project manager.

LIST OF ACRONYMS

AOC	Architect of the Capitol
ATSDR	Agency for Toxic Substances and Disease Registry
BCF	Bioconcentration factor
BTAG	Biological Technical Advisory Group
COPC	Contaminant of potential concern
EHHRA	Ecological and human health risk assessment
ERA	Ecological risk assessement
EVS	EVS Environment Consultants
Kow	Octanol-water partitioning coefficient
HEAST	USEPA Health Effects Summary Tables
HHRA	Human health risk assessment
HQ	Hazard quotient
ILCR	Incremental lifetime cancer risk
IRIS	Integrated Risk Information System
LC50	Lethal concentration that causes mortality in 50% of test organisms
LOAEL	Lowest observed adverse effect level
MVUE	Minimum variance unbiased estimate
ND	Non-detect
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No observed adverse effect level
ORNL	Oak Ridge National Laboratory
PAH	Polycyclic aromatic hydrocarbon
QA/QC	Quality assurance/quality control
PCB	Polychlorinated biphenyls
ROPC	Receptor of potential concern
RBC	Risk based concentration
RBSL	Risk based screening levels
RfD	Reference dose
RPF	Relative potency factor
TEF	Toxic equivalency factor
TRV	Toxicity reference value
UCL	Upper confidence limit of the mean
UF	Uptake factor
USEPA	United States Environmental Protection Agency
USNRS	United States Naval Receiving Station

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EXECUTIVE SUMMARY

The Poplar Point site consists of a 44-acre property located on the south bank of the Anacostia River, just upstream of the confluence with the Potomac River, in Washington, D.C. The site has been subject to numerous historical impacts, including the deposition of dredged sediment to build up lowland areas near the river, as well as plant nursery operations (i.e., the District of Columbia's Lanham Tree Nursery). Natural site drainage patterns have been altered, which required that storm water from the site be pumped to a nearby storm water sewer line. Pump operation ceased in 1993, resulting in an increase in on-site wetland area. The storm water system is currently not operational. A review of site photos taken in 2002 indicate a broad variety of vegetation present at the site, including wetland areas (with standing water and surrounding aquatic vegetation), meadow in the eastern portion of the site, and dense underbrush and young trees throughout the remainder of the property. Redevelopment of the site for parkland use (that may have wetlands and visitor facilities) is anticipated. As part of the redevelopment process, a screening-level ecological and human health risk assessment was prepared based on the available site chemistry data.

Screening-Level Ecological Risk Assessment — Risks to a broad selection of ecological receptors were estimated using a hazard quotient (HQ) approach. Conservative assumptions, which are appropriate for a screening-level ERA, were made wherever possible. This approach reflects the intent of the screening-level ERA, which is to identify COPCs that present negligible risks (defined as those with HQs less than 1), and identify COPCs and exposure pathways (defined as those with HQs greater than 1) that may contribute risk, and thus require additional consideration and/or appropriate risk management. Specific findings from our screening-level ERA include:

- Soil Invertebrates and Plants — Multiple COPCs are present in soil at concentrations that exceed the lowest available toxicity reference value, and therefore, further consideration of the risks to soil invertebrates and plants is warranted. Significant COPCs (i.e., those with a substantial number of HQs > 1) include barium, chromium, cyanide, lead, mercury, zinc, DDT (and its metabolites) and PAHs. Several COPCs have clusters of elevated soil concentrations that appear to indicate former site activities.

- Aquatic Life — The available surface water chemistry data were screened against numerical guidelines for the protection of aquatic life in order to provide an estimate of potential risks. Several metals, including aluminum, barium, lead and zinc, had concentrations that exceeded numerical standards, and therefore, further consideration of the risks to aquatic life is indicated. Risk estimates for the protection of aquatic life from surface water contain a relatively high degree of uncertainty, because supporting data necessary for the evaluation of metal toxicity

(e.g., water pH, hardness) was not available. Additionally, future water quality in the tidal wetlands will likely be influenced by off-site general water quality conditions in the Anacostia River as a result of water exchange, and therefore, potential risks are likely different from those described in this report.

- Benthos — The available sediment chemistry data were screened against numerical guidelines for the protection of benthos in order to provide an estimate of potential risks. Concentrations of several metals and PAHs exceeded the available numerical guideline and therefore, further consideration of the risks to benthos is indicated. Risk estimates for the protection of benthos contain a relatively high degree of uncertainty, since supporting data necessary for the evaluation of COPC bioavailability (e.g., organic carbon content; presence of sulphides) was not available. Current estimates of exposure via sediment (and therefore risks) may not be representative of future conditions given the need to remove material from the site to drop the soil surface to tidal horizons. Potential risks in the future are likely different from those described in this report.

- Amphibians — The maximum concentrations of COPCs in surface water were screened against conservative toxicity reference values derived from readily available data compilations. Several metals had maximum concentrations that exceeded the TRV, and therefore, further consideration of the potential risk to amphibians is warranted. Risk estimates for the protection of amphibians contain a relatively high degree of uncertainty, since the available chemistry and toxicological data were insufficient to allow a comprehensive examination of all potential COPCs and exposure routes.

- Wildlife Species — A mechanistic food chain model was constructed to evaluate the potential risks of site COPCs to a number of wildlife receptors, including short-tailed shrew, raccoon, American robin, willow flycatcher, great blue heron, mallard duck and red-tailed hawk. Multiple exposure pathways were evaluated, including consumption of food items as well as ingestion of soil and water. All seven wildlife receptors had one or more COPCs with a hazard quotient greater than 1, indicating potential risks may exist. COPC and receptor combinations with relatively high risk estimates include DDT and its metabolites to all avian receptors; dieldrin and pentachlorophenol to shrew, raccoon, willow flycatcher and American robin; and di-n-butylphthalate and methoxychlor to willow flycatcher and American robin.

A screening-level ERA relies heavily on literature-based toxicity data and conservative exposure assumptions in lieu of site-specific sampling. For example, hazard quotients for the protection of soil invertebrates, plants, aquatic life and amphibians are based on the lowest available regulatory numerical guideline value, which may or may not correspond

to an adverse biological effect relevant to the unique conditions of the site. The mechanistic food chain model relies heavily on literature-based bioaccumulation factors to predict dietary concentrations, which may not reflect the actual uptake of COPCs by dietary items (e.g., sediment benthos, soil invertebrates and plants) at the Poplar Point site.

Overall, the results from the screening-level ERA presented in this report indicate that a potential for ecological risks to various receptors exists. Supplemental evaluation as part of the implementation of a site remediation plan is recommended to reduce the uncertainty typical of a screening-level ERA. Screening-level ERAs are typically used to prioritize subsequent sample collection activities, and identify priority contaminants of concern and exposure pathways that remedial activities should begin to focus on. The information and results within this screening level ERA are not considered appropriate for use in deriving site-specific clean-up numbers. Generic clean-up goals, (e.g., Oak Ridge Preliminary Remediation Goals) may be appropriate for the site (augmented by site specific data as appropriate). As a result, hazard quotients greater than 1 estimated from this screening-level ERA do not necessarily indicate that adverse effects are likely, but that further evaluation focused on areas with the greatest uncertainty may be warranted as part of the implementation of a risk management plan for the site.

Screening-Level Human Health Risk Assessment — A baseline risk assessment was not conducted for the groundwater ingestion pathway; currently this exposure pathway is incomplete. The proposed future land use, as described in the Park Service Management Plan and the Anacostia Waterfront Initiative, does not have complete exposure pathways for groundwater ingestion. (Dermal exposure to groundwater was evaluated in a potential future exposure pathway to a construction worker on the site.) However, per District of Columbia regulations, groundwater shall be protected for beneficial uses including potential future use as a raw drinking water source in the District of Columbia (21 DCMR 1104.2).

In order to address D.C. regulatory issues and to assess potential risk associated with a future groundwater ingestion pathway, concentrations of contaminants in groundwater were screened against EPA Region III risk-based concentrations (RBCs) as well as applicable standards, including MCLs and DC groundwater standards (DCR Title 21 1155). This identified areas of the site with potential groundwater impacts (see Table 3-5). Seven inorganic chemicals had concentrations exceeding either MCLs or DC groundwater standards. One organic chemical, benzene, had a concentration exceeding the DC groundwater standard, which is equivalent to the MCL. Other inorganic and organic chemicals had concentrations exceeding RBCs.

Hazard and risk results are presented with and without fish consumption because for many receptor and COPC combinations fish consumption significantly drives the risk results. There are currently no fish on the site as the surface water bodies are ephemeral

and, therefore, fish tissues have not been analyzed for contaminants of concern. Hypothetical fish tissue data were modeled using maximum surface water concentrations and water-to-fish bioconcentration factors. While modeled fish tissue data provides an approximation of fish tissue concentration of COPCs for a screening level assessment, there is a great deal of uncertainty contained within these estimates. The high degree of uncertainty with fish tissue concentration estimates suggest that this potential pathway should be evaluated in greater detail prior to creation of a channel from the Anacostia River to the site in order to create an increased wetland area.

In summary, multiple COPCs were identified for which, hazard quotients exceeded 1 or ILCR values exceeded 1E-6 (i.e., 1×10^{-6}), as detailed below.

For a summary of exposure scenarios that do not include fish consumption, the following COPCs were identified for further assessment as hazard quotients exceeded 1or ILCR values exceeded 1E-6:

- Metals — aluminum, arsenic, beryllium, cadmium, chromium, cobalt, manganese, vanadium
- PAHs — benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i) perylene, benzo(k)fluoranthene, dibenz(a)anthracene, and indeno(1,2,3-cd)pyrene
- Pesticides — 4,4'-DDT, 4,4'-DDD, 4,4'-DDE, Aroclor 1248 and Aroclor 1260
- Organics — benzene, bis(2-ethylhexyl)phthalate, and vinyl chloride

COPCs which contribute the greatest potential hazard/risk based on magnitude of HQ and/or ILCR, include benzene, chromium, manganese, PAHs and Aroclor 1260. The primary exposure pathways that contribute to hazard/risk are incidental soil ingestion and dust inhalation (metals and pesticides) and dermal contact with surface water (PAHs, organics and pesticides). Off-site residents were the least likely to be impacted, with the park and construction workers generally demonstrating the greatest ILCR and hazard quotient values, respectively.

Under exposure scenarios that included hypothetical fish consumption, the following COPCs were identified that had hazard quotients greater than 1 or ILCR values greater than 1E-6:

- Metals — aluminum, arsenic, beryllium, cadmium, chromium, cobalt, iron, manganese, mercury, thallium, vanadium and zinc
- PAHs — acenaphthylene, benz(a)anthracene, benzo(a)pyrene, benzo(b) fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a) anthracene, indeno(1,2,3-cd)pyrene, and phenanthrene
- Pesticides — 4,4'-DDT, 4,4'-DDD, 4,4'-DDE, Aroclor 1248 and Aroclor 1260

- Organics — benzene, beta-BHC, bis(2-ethylhexyl)phthalate, bromodichloromethane and vinyl chloride

The primary exposure pathway that contributes to the observed hazard/risk is generally fish consumption by park users and park users who are also off-site residents. Incidental soil ingestion/dust inhalation and dermal contact with surface water are the primary exposure pathways for adult trespassers, construction workers and park workers, as these receptors do not consume fish from the site. Off-site residents (current and future) were the least likely to be impacted, with the park users and park users who are also off-site residents demonstrating the greatest ILCR and hazard quotient values.

Multiple conservative assumptions were made in this screening level risk assessment and, therefore exceedances of acceptable hazard quotient and incremental lifetime cancer risk levels do not necessarily indicate that adverse effects are likely, but that further evaluation is necessary. The primary sources of uncertainty in the risk characterization for human health risk assessment include:

- Future Media Concentrations — The site currently contains limited surface water bodies and sediments, although some future plans for the park include re-establishment of a tidal wetland area and a channel connecting the site to the Anacostia River. It is not possible to precisely predict future surface water and sediment concentrations at this time and therefore, the limited number of surface water and sediment samples collected to date are assumed to be representative of future conditions. Current estimates of exposure resulting from surface water and sediment could either be over- or underestimated, depending on how similar future conditions are to the current data set. As noted above, future water and sediment quality within the tidal wetlands may be influenced by water exchange with the Anacostia River, as well as removal of site material necessary for the creation of the wetland area. Site management based on the exposure estimates (and therefore, risk characterization) should consider this uncertainty.

- Fish Tissue Concentrations — There are currently no fish on the site. In order to assess possible future consumption of fish from the site, fish tissue concentrations were estimated using maximum surface water concentrations and bioconcentration factors generated by USEPA (1999) or estimated from reported log K_{ow} values (USEPA, 1999). In addition to the uncertainty outlined above with representativeness of current surface water and sediment concentrations for future site conditions, the use of the USEPA (1999) bioconcentration factors to predict fish tissue concentrations contributes substantial uncertainty to the screening level HHRA. Data used to generate the BCFs were not necessarily specific to the organism in question. Additionally, BCFs are typically highly site-specific, and are strongly influenced by geochemical considerations (e.g., pH, total organic

carbon, major ion concentrations, percent moisture) that were not considered in the derivation of the BCFs by USEPA (1999). The uncertainty with respect to BCF selection may lead to over- or underestimates of risks for fish tissue data for many COPCs.

- Exposure Assumptions — It was assumed for the purposes of the screening level risk assessment that receptors spend a relatively large amount of time on the site and come into contact with all site media; even though it is likely that activities (swimming, wading, and fishing) that would result in contact with site media (surface water, sediment and fish) may not be encouraged in a passive recreational park with sensitive wetland areas. It is, therefore, possible that the above assumptions may overestimate risks to the general population.

Results from this screening-level assessment were compared to Environ (2002). Predicted exposure doses for multiple COPCs and receptor combinations were identified in this screening level risk assessment which result in hazard quotients greater than 1 and/or ILCR values greater than 1E-6. Environ (2002) identified only arsenic and benzo(a)pyrene as substances which exceeded the risk-based screening levels that they had developed for the site. There are several major differences between the two assessments including:

- Different Target Risk Levels — Environ (2002) used a ILCR level of 1E-5 to develop their risk-based screening levels, in comparison to the 1E-6 level used in this risk assessment.

- Consideration of Additional Media — Additional media were considered in this risk assessment as future development plans of the park have changed between the Environ (2002) and EVS (2004). When Environ (2002) conducted their assessment, the plans for the park included an active recreational site, however current plans include restoration of wetlands and a much more passive recreational use. The restoration of the wetland areas lead to the inclusion of surface water (only one sample was available when Environ conducted their assessment), sediment and fish in the current risk assessment.

- Additional Data Sampling — As part of a site characterization study conducted by Ridolfi (2003), additional soil, sediment and surface water samples were collected. The expanded data set led to the identification of (a) additional COPCs in soil or surface water, (b) new COPCs in sediment, (c) inclusion of hypothetical fish tissue concentrations based on modeling and the expanded surface water data set, and (d) increased estimates of 95% UCL and/or maximum values (for media with a limited number of samples) as the result of the additional sampling.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

Site Location — The Poplar Point site (the study area) is a 44-acre property located on the south bank of the Anacostia River, just upstream of the confluence with the Potomac River, in Washington, D.C. The site formerly housed two plant nurseries: the D.C. Lanham Nursery and the Architect of the Capitol (AOC) nursery. A map of the study site is provided in Figure 1-1. An Implementation Plan between the D.C. Department of Health and the National Oceanic and Atmospheric Administration (NOAA) was used to define the operational boundaries of the site, as follows:

- Section One is located at 1900 Anacostia Drive SE in Washington, D.C. and is bounded by Anacostia Drive to the north, by Howard Road and Interstate 295 to the south, by numerous government buildings to the east and by South Capitol Street to the west. Section One includes areas that are associated with the former nursery operations.

- Section Two consists of areas that are owned by or fall under the jurisdiction of the District of Columbia. Section Two contains several private properties including Green Fuel Oil, P&P Auto Body and Howard Road Warehouse.

A U.S. Naval Receiving Station was located on the property adjacent to the former Architect of the Capitol nursery. The majority of the Naval Receiving Station was excluded from the site with respect to site characterization and risk assessment purposes. Other significant site features include:

- The Washington Metropolitan Area Transit Authority Metrorail (METRO) Green Line runs beneath the eastern section of the study area. The Anacostia METRO Station is located to the southeast of the site.

- The Stickfoot sewer also runs under the eastern portion of the site and conveys storm waterand Stickfoot Creek from areas south of the site to the Anacostia River (Ridolfi, 2003).

- Residential neighborhoods are located to the south of the site, adjacent to Howard Road. An elementary school is also located on Howard Road. There are no official residences on the site; however, debris noted during site investigations indicates the presence of transients trespassing in the former greenhouses. A locked gate at the site entrance located just north of Howard Road controls site

access. A chain link fence encompasses the perimeter of the site, however the fence is breached in at least one location.

- Small industrial and commercial properties are located adjacent to the site on the north and south sides of Howard Road (Green Fuel Oil Company, several autobody repair, towing, storage and scrap yard shops). There are also several vacant lots and buildings on Howard Street.

Site History — The study area consisted of submerged, tidally influenced mudflats until about 1910. Between 1910 and 1920, the site was created by emplacement of dredge spills from the Anacostia River during navigational improvements in the area onto the mudflats. As a result, a substantial portion of the site consists of fill, ranging up to 20 feet in depth. Site substrates are relatively impermeable to groundwater flow, with the exception of several sand and gravel deposits (Ridolfi, 2003; Environ, 2002). At least two different permeable units are connected to several low-lying wetland areas (Ridolfi, 2003); however, the major source of water in the wetland areas is likely overland flow and precipitation. Site drainage channels were altered around 1949 as part of road construction, which required the installation of a pump system to move water from site storm drains to a nearby storm water sewer line. Pump operation ceased in 1993, trapping surface water runoff in low-lying areas of the site, and causing an increase in wetland area (Environ, 2002). The storm water system is currently not operational. A review of site photos taken in 2002 indicate a broad variety of vegetation present at the site, including wetland areas (with standing water and surrounding aquatic vegetation), meadow in the eastern portion of the site, and dense underbrush and young trees throughout the remainder of the property.

Scope of Work — The study area has been the subject of numerous investigations, including various site characterizations (e.g., Brown, 1997; E&E, 1998; Environ, 2002), as well as a screening-level ecological and human health risk assessment (EHHRA; Environ, 2002) based on the data available at the time. A description of previous site investigations is provided in Ridolfi (2003).

Ridolfi (2003) also conducted additional site characterization activities, including collection of additional soil, surface water, groundwater and sediment chemistry data. As a result, a screening-level EHHRA based on an integrated data set (i.e., both historical and data collected by Ridolfi, 2003) was necessary.

1.2 OVERVIEW OF THE RISK ASSESSMENT PROCESS

Ecological and human health risk assessment (EHHRA) is the process used to evaluate the likelihood that adverse biological effects may occur or are occurring as the result of

exposure to one or more stressors. Risk assessment provides a framework for integrating and presenting scientific data and conclusions about:

- Source of stressors (what contaminants and/or physical effects are present?)
- Pathways (how do the stressors exert an adverse influence on receptors?)
- Receptors (which organisms or human populations are affected by the stressors?)
- Exposure (how much stressor does the receptor encounter?)

A risk cannot occur unless a stressor, pathway, receptor and exposure occur in the same place at the same time.

The main components of a risk assessment are summarized in Figure 1-2 as follows:

Problem Formulation — The problem formulation defines the scope of the entire risk assessment and brings together technical study team members as well as input from site managers, regulatory agencies, and interested members of the public. The problem formulation provides a focus for data collection, analysis and reporting; it reduces overall project costs by targeting investigative effort on key issues. The problem formulation helps to build consensus between different parties involved in the risk assessment process, thus facilitating communication throughout the life of the project and ensuring that the end product meets everyone's needs. Separate problem formulations for the screening-level ecological and human health risk assessments are provided in Section 2.1 and Section 3.1, respectively.

Exposure Analysis — The exposure analysis describes the spatial extent and magnitude of contamination, as well as the movement of contaminants through different environmental media (e.g., groundwater, soil, surface water, air) to receptors present at a site. An overview of the statistical methods used to quantify the exposure of ecological and human health receptors to contaminants of potential concern (COPCs) at the Poplar Point site is provided in Section 1.3, with additional exposure analyses (e.g., food chain modeling) described in the appropriate risk assessment section as needed.

Effects/Toxicity Analysis — The effect analysis quantifies the adverse biological effects associated with the contaminant concentrations developed in the exposure analysis. Typical tools used in the effects analysis include the comparison of exposure estimates to benchmark values from regulatory agencies or scientific literature. Separate ecological and human health effect analyses are provided in their respective document sections (Section 2 and Section 3).

Risk Characterization — Risk characterization involves the preparation of clear estimates of the potential for unacceptable ecological or human health impacts. The risk characterization describes sources of uncertainty and assumptions in the risk assessment,

identifies other plausible interpretations, and separates scientific conclusions from policy recommendations. Risk characterizations are one factor used by site managers and policy-makers (i.e., they are integrated with economic or legal factors) to make decisions about site management or remedial alternatives. Separate ecological and human health effect risk characterizations are provided in their respective document sections (Section 2 and Section 3), with an overall summary and conclusions provided in Section 4.

1.3 CALCULATION OF EXPOSURE ESTIMATES FOR ECOLOGICAL AND HUMAN HEALTH RISK ASSESSMENTS

The screening-level ecological and human health risk assessments shared multiple exposure estimates for different environmental media, including surface water, sediment and surface soil samples. Ridolfi (2003) conducted a quality assurance/quality control (QA/QC) review of all available site data and provided EVS with a master database of all relevant chemistry data for soil, surface water, sediment and groundwater. This data set (i.e., the Ridolfi data) formed the basis for all subsequent ecological and human health risk assessment activities, and included data from previous site investigations, as well as additional analyses conducted by Ridolfi.

As a highly conservative screening tool, EVS initially identified COPCs by comparing the maximum detected concentrations for each analyte against the lowest available regulatory criteria. However, the use of maximum concentrations is not necessarily appropriate for a screening-level risk assessment—for example, it ignores the spatial distribution of COPCs across the site. Consequently, for risk assessment purposes, reasonable worst-case exposure concentrations were calculated for each compound and matrix as maximum concentrations do not reflect the spatial distribution across the site. Reasonable worst-case exposure concentrations included 95th percentile, 95% upper confidence limit of the mean (95% UCL) or maximum, depending on the availability and distribution of the data.

Reasonable worst-case exposure estimates were prepared for both the screening-level ERA and the screening-level human health risk assessment (HHRA). Exposure estimates required for the screening-level ERA included:

- Surface soil (i.e., 0-4 feet deep)
- Surface water
- Sediment

Exposure estimates required for the screening-level HHRA included:

- Surface soil (i.e., 0-2 feet deep)

- Sub-surface soil (i.e., >2 feet deep)
- Surface water
- Groundwater
- Sediment

A summary of the statistical approach used to determine the reasonable worst-case exposure concentration is presented in Figure 1-3, and summarized below:

Compounds with less than 20 samples —

- For those compounds that had non-detect values in 95% or more of samples, the COPC was eliminated from the risk assessment if the highest detected value was less than 5 times the lowest regulatory criteria. The maximum detected value was selected as the reasonable worst-case exposure estimate if the highest detected value was greater than 5 times the lowest regulatory criteria.

- For those compounds that had non-detect values in less than 95% of samples, the maximum detected value was selected as the reasonable worst-case exposure estimate.

Compounds with more than 20 samples —

- For those compounds that had non-detect values in 0 to 50% of samples, the non-detected values were replaced with one half the detection limit values and the 95% UCL was calculated based on all samples (see below).

- For those compounds that had non-detect values in 50 to 95% of samples, the 95th percentile was calculated. In several instances, the available detection limits exceeded the maximum detected concentration, rendering a 95^{th} percentile estimate meaningless (i.e., the 95^{th} percentile would have been based on a non-detect value). The maximum detected value was selected as the reasonable worst-case exposure estimate for those cases.

- For those compounds that had non-detect values in 95% or more of samples, the COPC was eliminated from the risk assessment if the highest detected value was less than 5 times the lowest regulatory criteria. The maximum detected value was selected as the reasonable worst-case exposure estimate if the highest detected value was greater than 5 times the lowest regulatory criteria.

Calculating a 95% UCL — All 95% UCLs were calculated following the approaches described in USEPA (2000a; 2002a; 2003a) using USEPA-approved software (ProUCL

2.1; USEPA, 2003). A summary of the approach used to calculate the 95% UCL is presented in Figure 1-4, and summarized below:

- A histogram was generated for each compound in order to determine the overall shape of the distribution and to identify any potential outliers. A number of potential outliers were identified (e.g., within the data sets for copper and several PAHs). However, a review of the raw data indicated that these numbers were legitimate concentrations. Consequently, no outliers were removed from the dataset.

- Data were tested for normality using either the Lillifors test (for sample sizes greater than 50) or the Shapiro-Wilk's test (for sample sizes under 50). If the distribution was not normal, the distribution was also tested for log normality.

- The 95% UCL for normally distributed data was calculated using the Student's t-statistic. For log-normally distributed data, the 95% UCL was calculated using either the UCL based on the H-statistic (H-UCL) or Chebyshev minimum variance unbiased estimate (MVUE) depending on the sample size and the standard deviation of the log normalized data set.

- For data sets that were neither normal nor log-normally distributed, the Chebyshev (mean, std) UCL was calculated. A 95% UCL was calculated for all distributions with standard deviations between 0 and 1, a 97.5% UCL was calculated for all distributions with standard deviations between 1 and 2; and a 99% UCL was calculated for all distributions with standard deviations between 2 and 3 (i.e., consistent with guidance provided in ProUCL).

Reasonable worst-case estimates were calculated for all COPCs irrespective of media (i.e., if a COPC was identified in soil, reasonable worst-case estimates were also calculated in surface water and sediment even if the lowest applicable regulatory criteria was not exceeded).

Figure 1-1: Overview of the study area

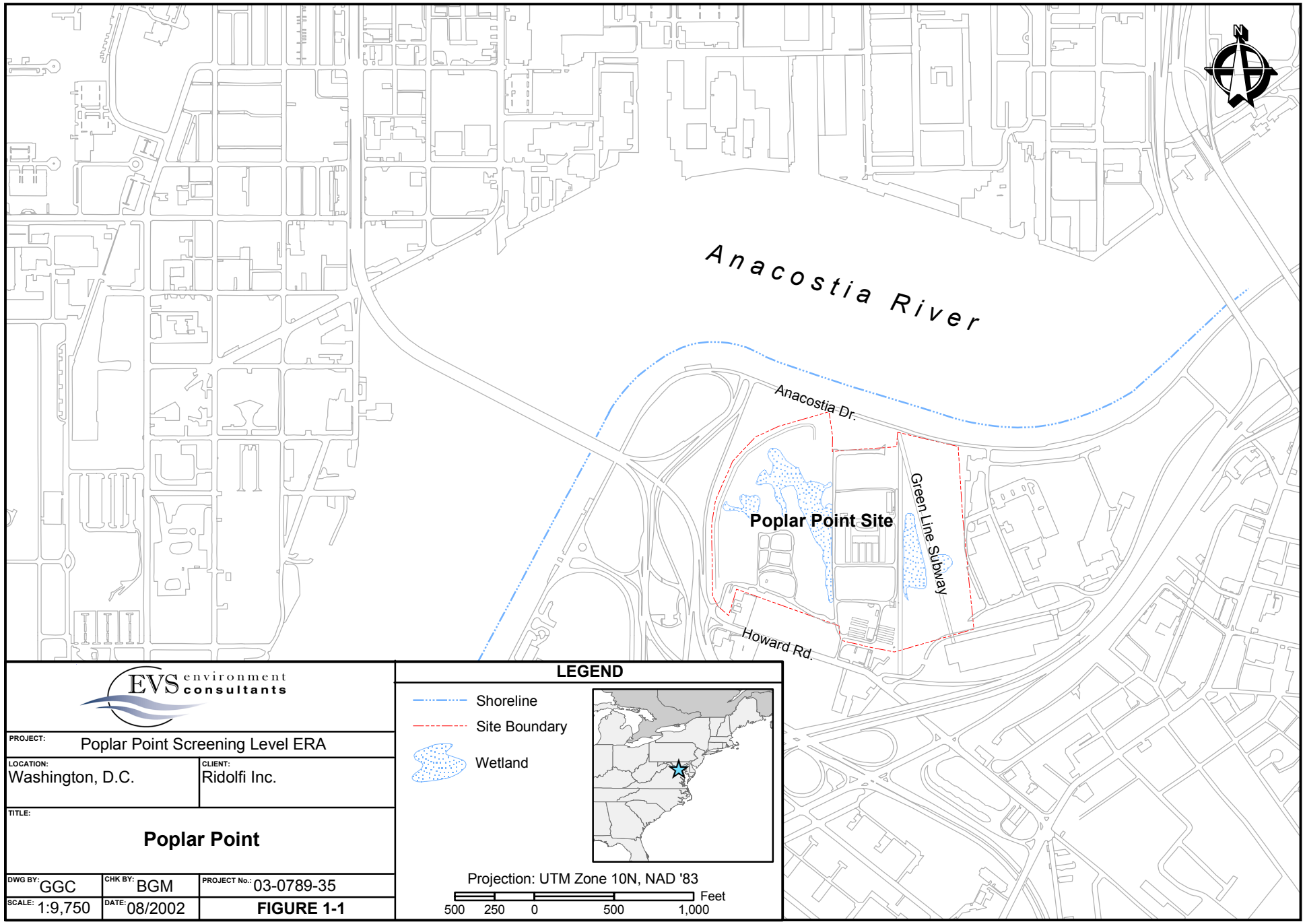


Figure 1-2: Overview of the risk assessment process

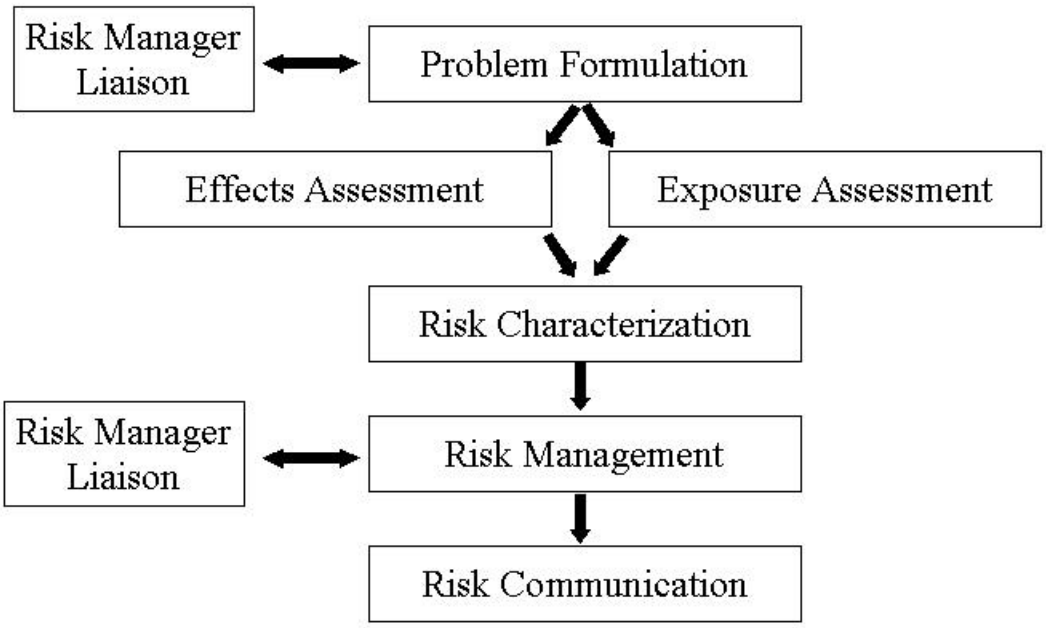
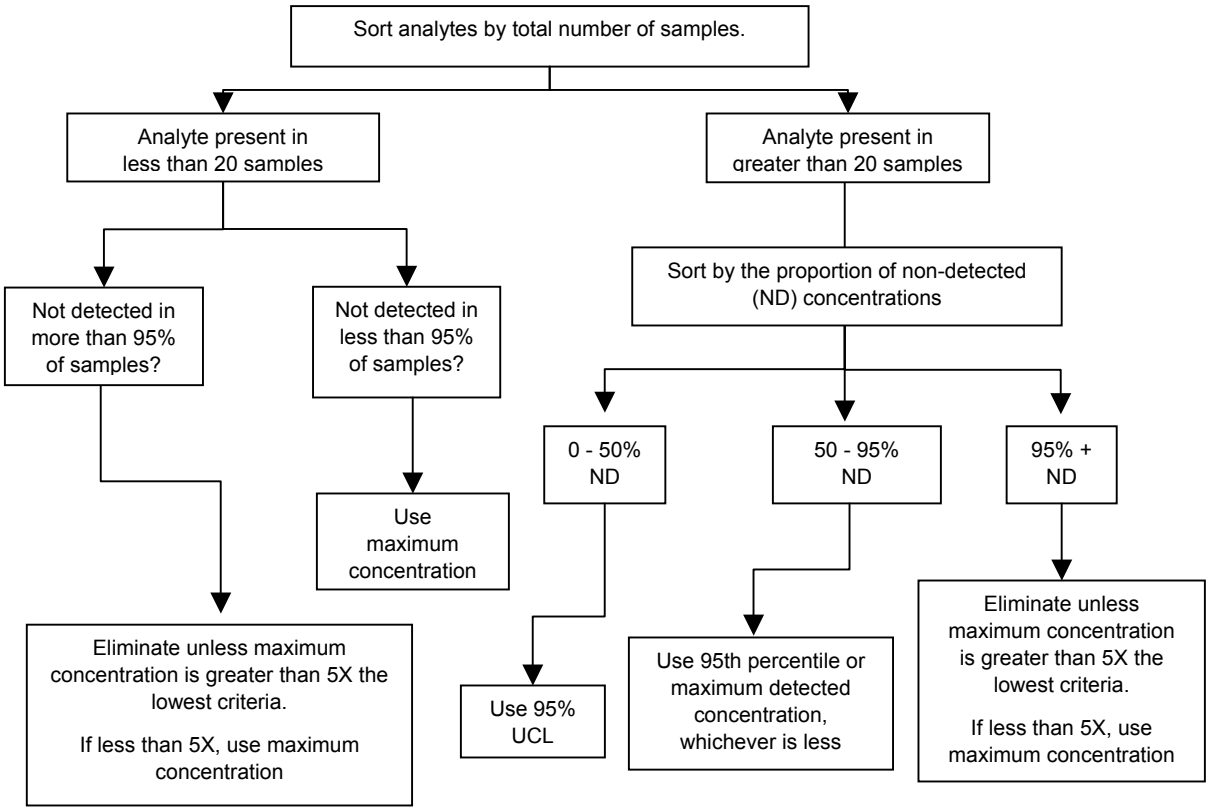
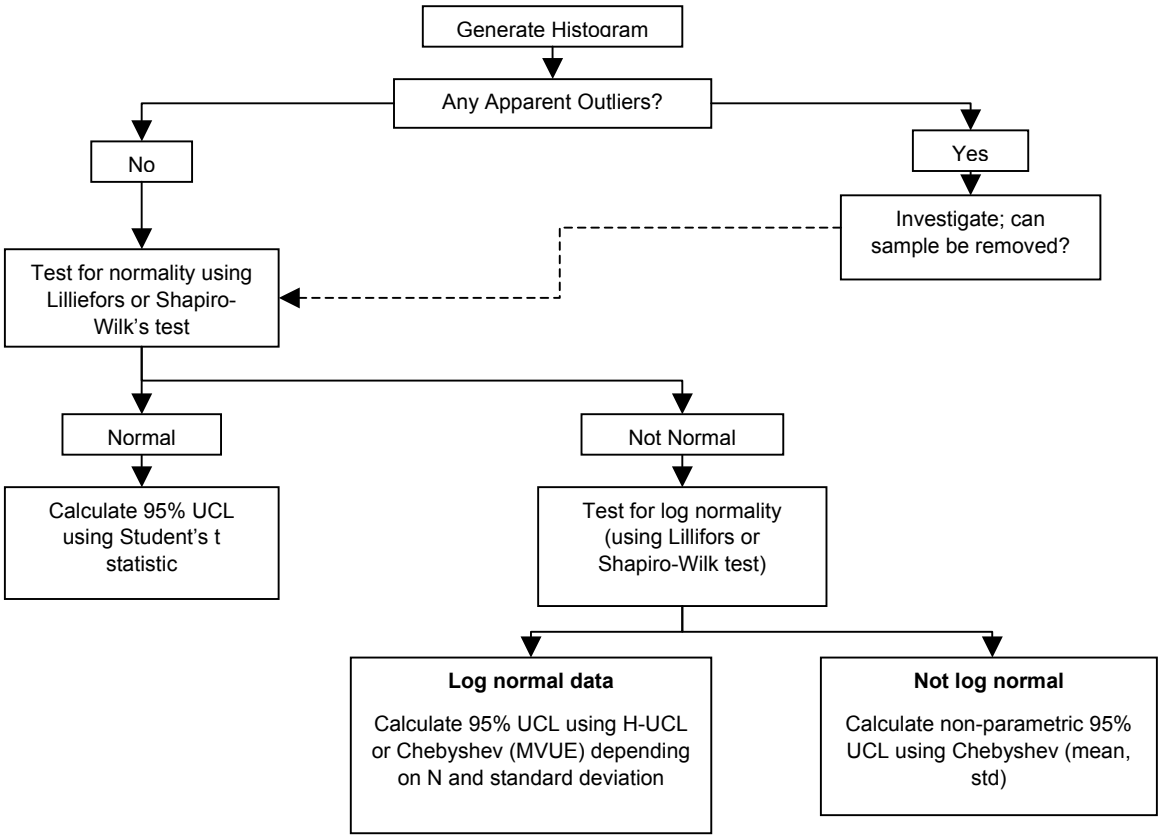


Figure 1-3: Statistical approach used to determine reasonable worst-case exposure concentrations



(Note: One half detection limits used where appropriate)

Figure 1-4: Statistical approach used to calculate 95% UCL



2. SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

2.1 OVERALL APPROACH

The risk estimates presented in this screening-level ERA are based on a quotient method (i.e., the ratio of the exposure estimate to the effect estimate as described in Section 1.2). These ratios are typically referred to as "hazard quotients", and were calculated as follows:

$$\text{Hazard Quotient (HQ)} = \frac{\text{Exposure Estimate}}{\text{Effect Estimate}}$$

The approaches used to estimate exposure and effect for each component of this screening-level ERA are described below:

- ***Section 2.3 —*** Risks to soil invertebrates and plants were estimated by comparing COPC concentrations for individual soil samples (exposure estimate) to the lowest available numerical soil quality guidelines for the protection of soil invertebrates and plants (effect estimate).

- ***Section 2.4 —*** Risks to aquatic life were estimated by comparing COPC concentrations for the available individual surface water samples (exposure estimate) to the lowest available numerical water quality guidelines for the protection of aquatic life (effect estimate).

- ***Section 2.5 —*** Risks to sediment-dwelling organisms were estimated by comparing COPC concentrations for individual sediment samples (exposure estimate) to the lowest available numerical sediment quality guidelines (effect estimate)

- ***Section 2.6 —*** Risks to amphibians were estimated by comparing the maximum surface water concentrations (exposure estimate) to a TRV obtained from a review of the available literature (effect estimate)

- ***Section 2.7 —*** Risks to small mammals and birds were estimated by modeling the daily ingested dose for each COPC for each receptor species (exposure estimate). The estimated daily ingested dose was then compared to a TRV intended to represent a "safe" dose (effect estimate).

Interpretation of the resulting hazard quotients was based on guidance from USEPA (1998), with any HQ greater than 1 considered a potential risk. This approach reflects the intent of the screening-level ERA, which is to exclude COPCs that present negligible risks (i.e., HQs less than 1). Individual HQs were not added to create hazard index values.

Hazard quotients provide an easy-to-communicate, rapid means for determining if risks are high or low (USEPA, 1998), however, they also have inherent limitations that should be considered when making site management decisions. Hazard quotient, for example, rely on a single value for both the exposure and effect estimates, which may not reflect the variability present under field conditions. Additionally, a hazard quotient approach is limited to lines of evidence that are based on chemical analyses of bulk COPC concentrations in various environmental media (e.g., sediment, soil, surface water). Other lines of evidence based on biological observations (e.g., assessment of plant health; diversity of soil invertebrates; abundance of amphibians; health of nesting birds) also provide valuable information about potential risks associated with COPC exposure.

In a screening-level ERA, HQs greater than 1 do not necessarily mean that adverse ecological effects are occurring, rather, they identify COPCs and exposure pathways that may require additional investigation. The magnitude of the HQ (if greater than 1) should also be interpreted in the context of any available biological data for a site. Examples of balancing HQ estimates with biological information (personal communication, James Rosenstock, National Park Service, January 2004) about Poplar Point includes:

- Any HQs greater than 1 for the protection of plants should consider that areas of suspiciously dead and diseased vegetation have not been observed on-site.

- Any HQs greater than 1 for the protection of amphibians should consider that frogs have been noted as present on-site.

We have also provided an explicit summary of the uncertainty associated with each risk estimate, in order to describe the degree of confidence in using the hazard quotient approach for site management purposes, as well as assist site managers focus any subsequent investigation on those areas that will lead to the greatest reduction in uncertainty (USEPA, 1998).

2.2 PROBLEM FORMULATION

2.2.1 Selection of Contaminants of Potential Concern (COPCs)

The primary method for selecting COPCs was to compare chemical concentrations in soil, sediment, groundwater or surface water to the lowest applicable numerical benchmark of each chemical analyzed, as follows:

- Comparison of site-wide soil concentrations (as calculated in Section 1.3) to: 1) the USEPA Region III Biological Technical Advisory Group (BTAG) screening levels (USEPA, 1995); 2) interim final or draft USEPA Eco-SSL benchmark values (USEPA, 2003b; 2000b) for the protection of soil invertebrates and plants and; 3) benchmark values from Oak Ridge National Laboratory (ORNL; Efroymson et al., 1997a,b).

- Comparison of individual sediment concentrations to: 1) USEPA Region III BTAG screening levels (USEPA, 1995) and; 2) USEPA Ecotox thresholds (USEPA, 1996a).

- Comparison of individual surface water concentrations to 1) USEPA ambient water quality criteria (i.e., criterion continuous concentrations; CCC) cited in USEPA (2002b); USEPA Region III BTAG screening levels (USEPA, 1995) and; 3) USEPA Ecotox thresholds (USEPA, 1996a).

A substance was considered a COPC if the maximum concentration in one or more environmental media exceeds the lowest available guideline value. Analytes with greater than 95% non-detect values were subsequently excluded from consideration as a COPC, provided that there were more than 20 samples. Essential elements (e.g., iron, calcium, magnesium, potassium) were also excluded from assessment since it is unlikely that those compounds will present unacceptable risks.

This conservative approach was intended to maximize the number of COPCs included in the screening-level ERA in that a COPC identified based on the available surface water or sediment data was automatically included for assessment of terrestrial exposure pathways. A summary of COPCs in soil, sediment and surface water is provided in Table 2-1.

For the purposes of the screening-level ERA, soil data were limited to the biologically active layer, which was defined as the upper 4 feet based on the following considerations:

- Several studies indicate that soil invertebrate activity is typically found in the upper soil horizons, including Shuster et al. (2002), who noted that both epigenic

(i.e., litter-foraging) and endogeic (i.e., deep-burrowing) earthworm species are found in the upper 20 cm (8 inches) of soil, although burrowing activity as deep as 30 cm (12 inches) was observed.

- Jegou et al. (2001) constructed 3-D models of earthworm tunnels in soil mesocosms and found that the maximum activity was found in the upper 5 to 8 cm (2 to 3.25 inches), but that maximum depths could reach 25 cm (10 inches). Conversely, several studies demonstrated that soil invertebrate activity may extend deeper than the near-surface horizons. Butt (2002) found that earthworms utilized an entire 1-meter (3.3 ft) deep soil mesocosm.

- Maximum plant rooting depths reported in the literature include Cernak et al. (2000) who found the maximum root depth of maple trees growing in an urban area was 1.4 meters (4.6 feet), and Sundstrom and Keane (1999), who found that the maximum rooting depth of 10-year old Douglas fir was 0.70 meters (2.3 feet). Dobson and Moffat (1995) conducted a literature review and found that most tree species (i.e., ash, fir, maple, and pine) had maximum rooting depths that were greater than 1.0 meter (3.3 feet), and in most instances, were greater than 2.0 meters (6.6 feet).

- Schenk and Jackson (2002) found that the D_{95} (i.e., the depth to which 95% of all roots penetrated) for cool-temperature forests was 1.04 m (3.4 feet), based on an integration of 209 root profiles from different ecosystems).

Based on the literature reviewed, soil chemistry data from the upper 4 feet (1.2 m) were used as the basis for the screening-level ERA. This layer contains the majority of soil invertebrates and plant roots, and also increases the number of samples included in the calculation of site-wide exposure estimates for soil pathways (e.g., 95% UCL for COPC concentrations in soil; Section 1.3).

2.2.2 Contaminant Exposure Pathways

Several potential exposure pathways were identified for the Poplar Point screening-level ecological risk assessment. Exposure pathways under consideration included:

- Direct contact of plants and soil invertebrates with COPCs in soil.

- Direct contact of amphibian receptors and aquatic life with COPCs in water.

- Ingestion of soil and/or sediment, surface water, and dietary items with elevated COPC concentrations by mammalian or avian receptors.

2.2.3 Receptors of Potential Concern

2.2.3.1 Rationale for Selection

A functioning ecosystem involves interaction of multiple species ranging in size and complexity from bacteria to predators; each species responds differently to COPCs. Since it is not possible to directly assess the risk for each individual species, the overall ecosystem at Poplar Point was divided into different components (e.g., plants and soil invertebrates, as well as different feeding guilds such as mammalian insectivores, avian herbivores, predator birds). A representative species (i.e., the receptor) was then selected for each ecosystem component. The risks calculated for each receptor are interpreted as applying to all members of each ecosystem component.

Several factors were considered in the selection of appropriate receptors of potential concern (ROPC) selection:

- Ecological relevance — The selected ROPCs should play a measurable role in the functioning of the ecosystem (e.g., primary food items for other organisms, provide valuable habitat, or act as top-level predators).

- Availability of toxicological data — Toxicological data are available for a limited number of species, although extrapolation of potential adverse biological effects from one mammalian or avian species to another is possible.

- Representative of different exposure pathways — Organisms are exposed through a number of pathways; the selected receptors of concern should cover multiple pathways to ensure a complete risk characterization.

- Receptors were also selected in order to facilitate comparison to previous investigations, and to reflect input from site managers.

2.2.3.2 Site Development and Land Use Influences

The study area currently supports a functional plant community (i.e., site photos indicates trees, underbrush, grass areas) that may support both avian and mammalian populations. Future site development plans involve a park with substantial natural vegetation, and therefore, the site may be capable of supporting a broader set of avian and mammalian receptors than would otherwise be typically expected for a heavily developed residential/industrial area.

Additionally, several on-site wetlands have formed since the Stickfoot Sewer ceased operation, although seasonal influences on the extent of wetland areas are uncertain at

this time. We have conservatively assumed that the wetland areas are currently capable of supporting both amphibian and sediment benthos communities. Our understanding is that wetland enhancement, as well as establishment of a connection to the Anacostia River is anticipated. As a result, we have included aquatic life (i.e., fish and other aquatic organisms) as a potential receptor. Piscivorous birds were also included as a potential receptor.

As discussed in Section 1.2, an ecological risk cannot occur unless a stressor, pathway, receptor and exposure occur in the same place at the same time. Inclusion of fish and piscivorous birds as receptors in this screening-level ERA is intended to provide a conservative assessment of a potential hypothetical scenario for the site. At present, on-site risks to fish and piscivorous birds does not exist because the receptors are not currently present on-site.

We have opted for conservative assumptions regarding the ability of the site to support a diverse assemblage of organisms, and as a result, this screening-level ERA includes multiple receptors that may not be relevant for current conditions. This approach is consistent with the intent of a screening-level ERA—the purpose is to identify any potential receptors that may occupy the site under current and future conditions. Further refinement of the receptor list, based on site-specific habitat inventories (i.e., is there sufficient nesting and feeding habitat to support the selected receptor population) is typically conducted as part of a baseline ERA (versus a screening-level ERA).

2.2.3.3 Selected Receptors of Potential Concern

Soil Invertebrates — Earthworms were used as a surrogate for the entire soil invertebrate community due to their tendency to take up both inorganic and organic contaminants, their functional role in promoting soil aeration and drainage, the availability of biological and toxicological data, and their importance as a prey item for higher trophic levels. The accumulation of COPCs by earthworms represents a worst-case scenario since earthworms are in constant direct contact with soil, ingest relatively large volumes of soil, and have a soft-tissue body that facilitates COPC uptake (Efryomson et al., 1997a).

Plants — Plants are a suitable receptor for terrestrial risk assessment, in part, because plant root systems are in direct contact with elevated COPC concentrations in soil and groundwater, and many COPCs have a demonstrated ability to accumulate in plant tissues (Efryomson et al., 1997b). COPCs can also have a direct effect on plants (i.e., phytotoxicity), which may limit the ability of the plant community to provide habitat and food to higher-level organisms. Measurements of potential ecological effects to terrestrial

plants generally do not isolate a single representative species, therefore, a specific surrogate species has not been chosen as part of the screening level ERA.

Benthos — Benthos are in constant direct contact with sediment, and tend to have a soft-tissue body that facilitates COPC uptake. Benthos are an important prey item for multiple receptors, including fish. There is a substantial body of literature with respect to the effects of COPCs on benthic species.

Aquatic Organisms (Including Fish) — Aquatic organisms (including fish) are included as a receptor due to their importance in the food chain in the event that the wetland portions of the site are enhanced and connected to the Anacostia River. There is a substantial body of literature with respect to the effects of COPCs on aquatic species.

Amphibians — Amphibians play an important role in the interaction between aquatic and terrestrial trophic levels, are often present at densities that exceed mammalian receptors, and are thought to be highly sensitive indicators of environmental impact (Sparling et al., 2000). During development, rapid morphological changes occur, creating an ideal opportunity for chemically mediated effects (Cooke, 1981). Amphibians also have highly permeable skin, gills and eggs that typically results in greater chemical exposure than other aquatic species (Cowman, 2000). Amphibians were included in this screening level because they are an important component of both aquatic and terrestrial food chains. Many terrestrial species (e.g., herons, raccoons) and aquatic species (e.g., fish) feed on developing or adult amphibians. Amphibians are also significant predators on insects (Sparling, 2000).

Mammals — The following mammals were included as receptors:

- Short-tailed Shrew — Short-tailed shrews (*Blarina brevicauda*) are found in a range of habitats, including grasslands, wetlands and forests, and are common in areas with abundant cover. Shrews require cool, moist habitats because of their relatively high metabolic rate and water needs and generally inhabit underground nests and pathways, usually near the surface of the soil. Shrews are primarily insectivores, although predation on other small mammals occurs when insect availability is low (USEPA, 1993). Short-tailed shrews were selected as a surrogate for all small mammal insectivores.

- Raccoon — Raccoons (*Procyon lotor*) are opportunistic omnivores and will consume virtually any animal and vegetable material, with the precise dietary proportions depending on season and location. Raccoons are the most abundant medium-sized omnivore in North America and has readily adapted to suburban environments. Favored natural environments focus on areas adjacent to

waterbodies, including wetlands and marshes (USEPA, 1993). Raccoons were selected as a surrogate for all small mammal omnivores.

Birds — The following birds were included as receptors:

- American Robin — American robins (*Turdus migratorius*) are omnivorous, with a diet that changes with the season: they feed mainly on invertebrates during the breeding season, and switch to plant material during the remainder of the year. Robins can utilize a wide variety of habitats ranging from swamps to forests, and forage on the ground in open areas and above-ground in shrubs and the lower branches of trees (USEPA, 1993). American robins were selected as a surrogate for all avian omnivores.

- Willow Flycatcher — The willow flycatcher (*Empidonax trailli*) is insectivorous (Gough et al., 1998), and consumes various insect types, including beetles, spiders, beetles, and other insects living on vegetation (Cal/Ecotox, 2003). COPC concentrations in earthworms (which are in direct contact with soil) were assumed to represent COPC concentrations in all terrestrial insects consumed by the willow flycatcher. The willow flycatcher prefers areas with sufficient low vegetation (e.g., shrubs) for nesting and feeding, and has been observed nesting in wetland areas of the site. Willow flycatchers were selected as a surrogate for all avian insectivores, and therefore, were assumed to consume 100% earthworms in order to provide a conservative risk estimate that is applicable to the entire receptor group.

- Red-tailed Hawk — The red-tailed hawk (*Buteo jamaicensis*) is an opportunistic predator that will feed on whichever species is the most abundant, although the most common food item is small mammals (e.g., shrew, vole, rabbit). Red-tailed hawks occupy a broad range of habitat types, including woodlands, pastures and wetlands. They hunt primarily from an elevated perch, often near woodland edges (USEPA, 1993). Red-tailed hawk has been chosen as a surrogate for bald eagles, because bald eagles (even if foraging partly on the Poplar Point site) will derive a significant portion of their diet from off-site sources (i.e., fish from the Anacostia River) (personal communication, James Rosenstock, National Park Service, July 2003). Red-tailed hawks will derive a larger proportion of their diet from on-site small mammals, and therefore were selected as a conservative surrogate for all carnivorous birds, including bald eagles.

- Mallard Duck —Mallard ducks (*Anas platyrhynchos*) feed mostly on aquatic plants, seeds and aquatic invertebrates, typically by filtering bottom sediments in ponds and wetland habitats. Mallards prefer shallow water environments that

provide adequate surrounding vegetation for concealment and nesting (USEPA, 1993). Mallard ducks were selected as a surrogate for all aquatic avian omnivores.

- Great Blue Heron — The great blue heron (*Ardea herodias*) inhabit both saltwater and freshwater environments—including small lakes, lagoons and brackish marshes. The primary food item for blue herons is fish, although other food items such as amphibians, small mammals, and large insects are consumed when available (USEPA, 1993). Great blue herons were selected as a surrogate for all aquatic avian carnivores.

2.2.4 Management Goals, Assessment Endpoints and Measures of Effect

Management Goals — Management goals are the desired ecological values that are being protected at the site. Typical management goals might include "clean water", "a functional wetland", "protection of species currently at the site", or other reasonable restoration goals. Management goals for a particular site may be specified in the applicable legislation (e.g., the Clean Water Act), or might result from interpretation of the law by appropriate regulatory agencies, desired outcomes voiced by community leaders and/or the public, or input from interested stakeholder groups (USEPA, 1998). The management goals assist the risk assessment team in designing the scope and approach used in subsequent data collection and interpretation activities.

The following preliminary management goals are provided for illustrative purposes and to assist the risk assessment team in the selection of appropriate measurement endpoints:

- Avian, mammalian and amphibian species inhabiting and/or visiting the site will not be placed at risk.

- The continued functioning of diverse and functionally complex plant and invertebrate communities (terrestrial and wetland) will be maintained at a level capable of sustaining higher order organisms (i.e., providing the necessary habitat and food).

Assessment Endpoints — Assessment endpoints are explicit expressions of the actual environmental value that is to be protected, as defined by the ecological entity and its attribute (USEPA, 1998). An example of assessment endpoints adopted for this screening-level ERA includes "maintenance of a healthy robin population".

Measure of Effect — Measures of effect (formerly measurement endpoints) refer to an actual change in the assessment endpoint that is being measured (USEPA, 1998). A clear statement of "what is being measured?" is an important part of the problem formulation;

it helps clarify what data are needed for the exposure and effects analysis phases of the risk assessment and improves risk communication. For this screening-level ecological risk assessment, several different measures of effect were used:

- For plants and soil invertebrates, COPC concentrations in soil were compared to the lowest of the numerical guideline values that have been associated with the protection of soil fauna and flora (i.e., USEPA Region III BTAG screening levels, final interim/draft USEPA Eco-SSL benchmark values, or ORNL benchmark values). Background COPC concentrations for inorganic compounds were also considered (see Section 2.3).

- For aquatic organisms (including fish), surface water COPC concentrations were compared to numerical water guideline values (e.g., USEPA, 2002) associated with the protection of aquatic life (e.g., from acute and chronic toxicity) (see Section 2.4).

- For sediment benthos, COPC concentrations were compared to numerical sediment guideline values (USEPA, 1996a) associated with the protection of benthos (e.g., from acute and chronic toxicity) (see Section 2.5).

- Amphibians, unlike the other wildlife species, are exposed to elevated COPC concentrations via direct contact as well as dietary ingestion. Risks to amphibians were evaluated by comparing COPC concentrations to the available toxicity data in the peer-reviewed scientific literature (i.e., water-only exposure data) (see Section 2.6). For amphibians, a mechanistic food chain model approach was not feasible due to a lack of necessary data regarding dietary selection and food/water consumption rates.

- For wildlife receptors (i.e., mammals and birds), the measurement endpoint was based on a mechanistic food chain model approach, which estimates their total daily ingested dose of each COPC through all applicable exposure pathways (e.g., consumption of food, soil and water). The total daily ingested dose was compared to a no-observed adverse effect level (NOAEL) based toxicity reference value (TRV) (see Section 2.7).

A summary of management goals, assessment endpoints and measures of effect for the Poplar Point screening-level ERA is provided in Table 2-2.

2.2.5 Conceptual Model

Conceptual models provide a depiction of the relationship between receptors and contaminants. Creation of the conceptual model requires the risk assessment team to

evaluate all available site data, and often provides a visual basis for presenting the essential information. A visual representation of the conceptual model for the Poplar Point screening-level ecological risk assessment is provided in Figure 2-1.

2.3 RISK CHARACTERIZATION FOR SOIL INVERTEBRATES AND PLANTS

Risks to soil invertebrates and plants were evaluated using a hazard quotient (HQ) approach. Hazard quotients were calculated for individual soil samples rather than based on site wide exposure estimates since soil invertebrates and plants are immobile. Use of a site-wide exposure estimate for estimating risks to soil invertebrates and plants was not used since it effectively dilutes the potential risks associated with elevated COPC concentrations near former site activities.

2.3.1 Derivation of Toxicity Reference Values

For organic compounds, the lowest of the following available numerical screening criteria were adopted as the TRV for characterizing potential risks to soil invertebrates and plants:

- USEPA Region III BTAG screening levels for flora and fauna (USEPA, 1995).

- Interim final USEPA Eco-SSL benchmark values for the protection of soil invertebrates and plants (USEPA, 2003b). Draft Eco-SSL benchmark values (USEPA, 2000b) were used if interim final values were not available.

- Benchmark values for the protection of soil invertebrates and plants from Oak Ridge National Laboratory (ORNL; Efroymson et al., 1997a,b).

For inorganic COPCs, "background" concentrations were also considered—the TRV was set to the "background" concentration or the lowest of the available numerical screening values described above, whichever was higher. This approach is intended to reflect the fact that metals and metalloids are naturally present in soil, and therefore, elevated concentrations of those COPCs do not necessarily reflect site-specific impacts associated with historical or ongoing land uses. For the purposes of this screening-level ERA, "background" was defined as the average COPC concentration from different areas in proximity to the study area that were considered unlikely to have been impacted by former site uses (Ridolfi, 2003). These areas included:

- Seven samples collected from the eastern portion of the study area.
- Three samples collected south of Howard Road (the southern site boundary).

- Four samples collected from the northern site boundary near Anacostia Drive.

Historical and ongoing anthropogenic COPC sources (e.g., Anacostia River sediment used as on-site fill; surrounding industrial land uses; adjacent highways; atmospheric deposition) are likely influencing the observed chemistry in the "background" samples collected by Ridolfi (2003). As a result, the application of these "background" COPC concentration should be limited—these concentrations are not intended to represent the natural concentrations of metals and metalloids that would be present in the absence of human activity, nor are they intended to represent a cleanup level for any remediation activity. The objective in including the calculated "background" concentrations from Ridolfi (2003) in estimating risks to soil invertebrates and plants is to prioritize any subsequent data collection activities onto those COPCs that are connected to the former land use at Poplar Point and present the largest potential for adverse biological effects.

A summary of the selected TRVs for the protection of soil invertebrates and plants is provided in Table 2-3.

2.3.2 Calculated Hazard Quotients

A summary of the number of samples with hazard quotients greater than 1 is provided in Table 2-4. The majority of COPCs had one or more samples with concentrations present above the detection limit (i.e. quantifiable) that also exceeded the lowest available TRV, and therefore, were considered to present a potential risk to soil invertebrates and plants. Many COPCs had a limited number of samples that exceeded the TRVs, suggesting that adverse ecological effects, if present, would likely be limited in spatial extent or magnitude. Significant COPCs (i.e., those COPCs with a substantial number of HQs based on quantifiable data) included:

- Chromium, lead, mercury, zinc
- DDT and its metabolites
- PAHs

These COPCs were selected for mapping to provide a worst-case graphical representation of the spatial extent of the potential risks to soil invertebrates and plants:

- Chromium — Thirty-seven (37) of 154 samples had HQs greater than 1 for soil invertebrates and plants. There were no HQs greater than 10. Figure 2-2 shows that chromium exceedances were broadly distributed across the site, with no obvious relationship between their location and former site buildings.

- Lead — One hundred and ten (110) of 154 samples had HQs greater than 1 for soil invertebrates and plants. There were no HQs greater than 10. Figure 2-3 shows that lead exceedances were broadly distributed across the site, although largely limited to the AOC area and the DC Lanham area. No lead exceedances were noted in the eastern portion of the site (i.e., the former USNRS area).

- Mercury — Seventy-seven (77) of 151 samples had HQs greater than 1 for soil invertebrates and plants. There were no HQs greater than 10. Figure 2-4 shows that mercury exceedances were broadly distributed across the site, although largely limited to the AOC area and the DC Lanham area. No mercury exceedances were noted in the eastern portion of the site (i.e., the former USNRS area). Additionally, risks to soil invertebrates appear to be greater than risks to plants, although in many instances, the analytical detection limit was greater than the lowest numerical standard for the protection of soil invertebrates.

- Zinc — Forty-nine (49) of 154 samples had HQs greater than 1 for soil invertebrates, while two additional samples had HQs greater than 10. Ninety-eight (98) of 154 samples had HQs greater than 1 for plants, with 6 additional samples had HQs greater than 10. Figure 2-5 shows that zinc exceedances were broadly distributed across the site, although largely limited to the AOC area and the DC Lanham area. No zinc exceedances were noted in the eastern portion of the site (i.e., the former USNRS area).

- 4,4'-DDT — Forty-nine (49) of 151 samples had HQs greater than 1 for soil invertebrates and plants (based on quantifiable concentrations), while an additional 15 samples had HQs greater than 10. This COPC was selected for graphing since it had the largest number of HQs greater than 1 for all pesticides (e.g., dieldrin, pentachlorophenol, cyanide). Figure 2-6 shows that DDT exceedances were widespread in the AOC and DC Lanham areas, with the worst-case samples clustered east and north of the DC Lanham area.

- Fluoranthene — One hundred and two (102) of 138 samples had HQs greater than 1 for soil invertebrates and plants, based on quantifiable concentrations, while an additional 18 samples had HQs greater than 10. This COPC was selected as a worst-case example of the spatial distribution of elevated PAH soil concentrations (i.e., it had the greatest percentage of HQs greater than one based on quantifiable concentrations). Figure 2-7 shows that fluoranthene exceedances were widespread across the site, with the worst-case samples clustered near buildings in the AOC area.

In addition to the HQs greater than 1 that were based on quantifiable chemistry data, Table 2-4 also provides a summary of the number of HQs > 1 based on an analytical

detection limit value that was greater than the TRV. The purpose of this summary was to acknowledge the fact that the available analytical detection limits for multiple COPCs (e.g., PAHs, dieldrin, pentachlorophenol) were frequently greater than the lowest available TRV. As a result, potential risks associated with samples with a HQ > 1 based on an analytical detection limit value that was greater than the TRV cannot be excluded. The number of samples with detection limits greater than the TRV for the COPCs selected for maps was as follows:

- Mercury — Thirty-five (35) samples had HQs greater than 1 based on an analytical detection limit value that was greater than the TRV.

- 4,4'-DDT — Three (3) samples had HQs greater than 1 based on an analytical detection limit value that was greater than the TRV.

- Fluoranthene — Thirteen (13) samples had HQs greater than 1 based on an analytical detection limit value that was greater than the TRV.

2.3.3 Uncertainty Analysis

Multiple sample locations had COPC concentrations that exceeded numerical standards for the protection of soil invertebrates and plants. Our estimates of potential risks to soil invertebrates and plants are likely highly conservative, due to the design of laboratory-based soil toxicity tests, which often maximize COPC bioavailability through the following factors:

- Numerical guidelines are often based on laboratory-based toxicity tests where a clean or artificial soil is spiked with a highly soluble form of the COPC. This approach does not necessarily represent conditions in the field where the total COPC concentrations may consist of multiple chemical species with varying degrees of solubility (e.g., Cook and Hendershot, 1996).

- Bioavailability of most COPCs typically decreases with soil aging; the majority of laboratory-spiked toxicity tests do not reflect the lower bioavailability of organic compounds (e.g., DDT) generally found at contaminated sites (Alexander, 2000; Morrison et al., 2000).

- Field collected soils are subject to numerous site-specific factors (e.g., organic carbon) that can alter COPC bioavailability (Lock and Janssen, 2001).

As a result, numerical guidelines based on laboratory-based soil toxicity data may be overly conservative when interpreting bulk soil chemistry data as indicative of adverse

effects to soil invertebrates and plant under field conditions. Additionally, as shown in Table 2-3, the majority of the TRVs are based on the BTAG screening levels, which are "based on the lowest value from a combination of sources considered to be protective of the most sensitive organism in a media" (USEPA, 1995). Derivation and original toxicity data were not available in USEPA (1995), however, given the factors noted above, it is likely that these screening levels represent a highly conservative TRV. Use of the lowest available value as the basis of the TRV is appropriate for a screening-level ERA.

2.4 RISK CHARACTERIZATION FOR AQUATIC ORGANISMS

Risks to aquatic organisms were evaluated using a hazard quotient approach. Hazard quotients were calculated for individual surface water samples due to the uncertainty regarding seasonal effects on water quality in the wetland areas—it is not clear at this time how COPC concentrations in the on-site surface waterbodies may vary over time. Surface water samples were typically collected from ephemeral areas fed from storm water flow, and surrounded by wetland vegetation. Our understanding is that these waterbodies are seasonal, extremely shallow, and as of yet, do not support fish (i.e., no connection to the Anacostia River). The relevance of these samples for risk characterization for future conditions is limited.

2.4.1 Derivation of Toxicity Reference Values

Individual surface water COPC concentrations for metals and metalloids were compared to the lowest of the following numerical criteria:

- Federal recommended water quality criteria for the protection of aquatic life (continuous criterion concentration; USEPA, 2002b).
- USEPA Region III BTAG surface water screening levels for flora and fauna (USEPA, 1995).
- USEPA Ecotox surface water threshold values (USEPA, 1996a).

Surface water concentrations for PAHs and other organic COPCs were limited, and therefore, risk estimates for those compounds were not calculated.

2.4.2 Calculated Hazard Quotients and Uncertainty Analysis

A summary of hazard quotients for the protection of aquatic life is provided in Table 2-5. Multiple surface water samples had HQs greater than 1, indicating a potential risk to aquatic life. However, substantial uncertainty with respect to the screening-level risk estimates for the protection of aquatic life exists, including the fact that the majority of

numerical water quality criteria for metals and metalloids are dependent on other water quality parameters such as pH or water hardness, however, no such data were available for surface waters at the Poplar Point site. Consequently, the lowest available numerical water quality standards (i.e., assuming a water hardness of 100 mg/L $CaCO_3$) were adopted. Future water quality within the wetland areas is anticipated to be substantially different than the available surface data in the event that a connection to the Anacostia River is established.

As a result of these limitations, risk estimates for the protection of aquatic life contain a relatively high degree of uncertainty. Risk estimates should only be interpreted as an indication that further evaluation of potential risks associated with introducing aquatic life to a constructed wetland system at the Poplar Point site may be appropriate as part of the implementation of a risk management strategy.

2.5 RISK CHARACTERIZATION FOR BENTHOS

Risks to benthos were evaluated using a hazard quotient approach. Hazard quotients were calculated for individual sediment samples because the precise boundaries of the wetlands are uncertain, and therefore, what constitutes a sediment versus a soil sample is poorly defined at the site. We have opted to follow the sediment sample classification provided in Ridolfi (2003) for the purposes of this screening-level ERA.

2.5.1 Derivation of Toxicity Reference Values

Individual sediment COPC concentrations for were compared to the lowest of the following numerical criteria:

- USEPA Region III BTAG screening levels for flora and fauna (USEPA, 1995).
- USEPA Ecotox sediment threshold values (USEPA, 1996a).

2.5.2 Calculated Hazard Quotients and Uncertainty Analysis

A summary of hazard quotients for the protection of sediment benthos is provided in Table 2-6. Multiple sediment samples had HQs greater than 1, indicating a potential risk to organisms that requires further investigation. Substantial uncertainty with respect to these screening-level risk estimates for the protection of sediment benthos exists, including:

- The use of numerical sediment quality criteria for predicting risks to sediment benthos is limited by the lack of information regarding bioavailability of COPCs

under field conditions. Data for several factors that typically limit bioavailability (such as the presence of sulphides that bind several metals; organic carbon can sorb hydrocarbons and other organic COPCs) have not been collected for this site.

- Sediment samples were collected from ephemeral areas, which may dry out during portions of the year. The availability of adequate habitat to support the benthic community may be limited (i.e., the benthic community may also be ephemeral); additionally, the lack of connection to the Anacostia River means that a tidal sediment benthic community may not yet be established. As a result, the relevance of the existing samples for risk characterization for future conditions is limited. If and when a connection is established to the Anacostia River is made, the sediment characterization is likely to change.

- Future surface sediment quality within the wetland areas is anticipated to be substantially different than the available sediment data in the event that a tidal connection to the Anacostia River is established (i.e., material would be removed from the wetland areas to maintain an appropriate elevation).

As a result of these limitations, risk estimates for the protection of sediment benthos contain a relatively high degree of uncertainty. Risk estimates should only be interpreted as an indication of possible current risks, and that further evaluation of potential risks associated with the establishment of a tidal benthic community in a constructed wetland system at the Poplar Point site may be appropriate as part of the implementation of a risk management plan.

2.6 RISK CHARACTERIZATION FOR AMPHIBIANS

Maximum surface water concentrations of all aquatic COPCs were compared to TRVs derived from the available amphibian toxicity data (e.g., data compilations such as Linder and Grillitsch, 2000; Harfenist et al., 1989) using a hazard quotient approach.

Toxicity data were only available for exposure to water, and therefore, other relevant exposure pathways (i.e., direct contact with sediment) were not evaluated. Use of a water-only exposure pathway provides a conservative estimate of potential adverse effects to the overall amphibian populations because amphibians are generally most sensitive to COPCs during early life-stages (i.e., eggs and/or larvae) in the water column (Sparling, 2000). However, COPC concentrations that exceed a TRV for adverse effects in a water-only laboratory experiment does not necessarily indicate that adverse effects to amphibians at Poplar Point are likely; it only indicates that supplemental evaluation may be appropriate (i.e., incorporating multiple exposure pathways; bioavailability considerations, etc) as part of the implementation of a risk management plan.

2.6.1 Derivation of Toxicity Reference Values

TRVs were derived from the available toxicity data using the following criteria:

- Cited studies were not considered if the endpoint reported wasn't ecologically relevant. For instance, studies measuring enzyme induction were only adopted if there were clear links to an ecological effect. Impairment of development, reductions in growth and the presence of mortality were the most common toxicological endpoints reported in the literature compilations reviewed.

- The lowest reported value was adopted as the basis of the TRV, irrespective of the test endpoint (i.e., chronic/acute or non-lethal/mortality).

- If the lowest reported value was based on amphibian mortality (i.e., an LC_{50}), a safety factor of 50 was applied to extrapolate to a TRV intended to be protective of other, sublethal effects (e.g., effects on growth and reproduction). Rationale for the selection of a 50-fold safety factor is provided below:

Selection of an Appropriate Safety Factor — A conservative safety factor of 50 was based on the following LC50-to-NOAEL ratios available from the literature:

- A ratio of 167 was calculated based on toxicity data presented in Canton and Sloof (1982) using cadmium chloride. Nebeker et al. (1994) reported LC_{50}-to-NOAEL ratios of 48.9 and 12.8, based on 48 day and 10 day exposures using cadmium chloride.

- Ratios of 3.25 and 1.88 were calculated from toxicity data presented in Linder et al. (1991) using zinc sulfate and sodium selenite, respectively.

- Ratios of 10 and 20 were reported by Howe et al. (1998) for atrazine and alachlor, respectively.

2.6.2 Calculated Hazard Quotients and Uncertainty Analysis

A summary of the TRV derivation, and resulting hazard quotients are provided in Table 2-7. Only two COPC had HQs of less than 1 (i.e., beryllium and cadmium). Multiple COPCs had maximum measured surface water concentrations that exceeded the TRV, including arsenic (HQ of 46.3), chromium (HQ of 21.7), copper (HQ of 57.7), lead (HQ of 221.3), manganese (HQ of 18.4), mercury (HQ of 15.0), nickel (HQ of 21.9) and zinc (HQ of 2,375).

The majority of COPCs lacked sufficient data for evaluation of potential risks to amphibians. The following COPCs lacked readily available toxicity data, and therefore, no TRVs was available:

- Metals (aluminum, antimony, barium, cobalt, vanadium, cyanide)
- Other compounds (cyanide, dibenzofuran, and di-n-butylphthalate)

Additionally, multiple COPCs were either not detected or not measured in surface water, and therefore, were not evaluated:

- Metals (selenium, silver, thallium)
- Pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin, methoxychlor, pentachlorophenol)
- PAHs
- PCBs (Aroclor 1248, Aroclor 1260)
- Other compounds (4-methylphenol and butylbenzylphthalate)

As a result of these limitations, risk estimates for the protection of amphibians contain a relatively high degree of uncertainty. Risk estimates should only be interpreted as an indication that further supplemental evaluation of potential risks associated with maintaining a healthy population of amphibians at the Poplar Point site. Further evaluation may be appropriate as part of the implementation of a risk management plan.

2.7 RISK CHARACTERIZATION FOR WILDLIFE RECEPTORS

2.7.1 Overall Approach

A mechanistic food chain model was used to estimate the total dietary exposure and potential effects associated with the intake of COPCs from food items and soil by selected wildlife ecological receptors. This food chain model incorporates many site-specific and receptor-specific factors, including:

- Receptors have a varied diet consisting of multiple food items, as well as water.
- Receptors ingest a certain amount of soil as part of their feeding activities.
- Receptors move throughout different portions of their home range, and therefore, are exposed to a variety of site conditions.

The mechanistic food chain model requires four different types of data in order to generate a risk estimate:

- Receptor parameterization, including estimates of body weight, ingestion rates for food, water and soil, dietary preferences and home range size (Section 2.7.2.1).

- Site-wide environmental COPC concentrations (i.e., in soil, sediment and water) were calculated based on the available chemistry data (Section 2.7.2.2)

- Food item COPC concentrations were estimated using bioconcentration factors (BCFs) and COPC concentrations in soil, sediment or water. (Section 2.7.2.3).

- Toxicity reference values (TRVs), which represent the daily ingested COPC dose for each receptor that is considered "acceptable". A no observed adverse effect levels (NOAEL)-based TRV was used (Section 2.7.2.4).

The total daily COPC dose (i.e., the sum of COPC intake from soil, food and water ingestion) is estimated using mathematical equations that incorporate both receptor and environmental concentration parameters. The potential risks to each receptor are estimated using a hazard quotient approach. Food chain model output for each receptor and COPC concentration is provided in Appendix A.

2.7.2 Food Chain Model Parameterization

Individual model pages for each receptor, outlining all food chain model parameters, equations and the resulting HQ calculations is provided in Appendix A.

2.7.2.1 Receptor Parameterization

Receptor parameters used in the food chain model for the Poplar Point screening-level ERA are summarized in Table 2-8. Receptor parameters were available from the following data sources:

- Short-tailed shrew, American robin, red-tailed hawk, and great blue heron (Sample and Suter, 1994).
- Raccoon and mallard duck (USEPA, 1993 and Cal/Ecotox, 2003).
- Willow flycatcher (Cal/Ecotox, 2003).

Body Weight — Body weight (kg) is the basis for calculating many different parameters in a mechanistic food chain model. Standardized body weight values from Sample and Suter (1994) or the average of data provided by USEPA (1993) or Cal/Ecotox (2003) were used.

Dietary Preferences — Dietary preferences (% of total food intake) for all receptors were based on the standardized receptor parameters (e.g., Sample and Suter, 1994;

USEPA, 1993; Cal/Ecotox, 2003) and modified where necessary to represent generic trophic guilds (i.e., insectivore, omnivore, carnivore) rather than the site-specific feeding behavior of any individual organisms. As an example, willow flycatchers, as described in Section 2.2.3.3, are unlikely to consume earthworms. However, the purpose of including willow flycatchers in this screening-level ERA was to act as a surrogate for the overall small avian insectivore receptor group. As a result, the dietary preferences for willow flycatcher were adjusted (i.e., it was assumed that 100% of their diet consists of earthworms to reflect their feeding on terrestrial insects). This conservative approach is consistent with the USEPA (1999) guidance for screening-level ERAs, although we recognize that it adds uncertainty to the risk estimates for the specific species selected as the surrogate.

Food Ingestion Rates — Food ingestion (kg food/day) for all receptors were based on available standardized receptor parameters (e.g., Sample and Suter, 1994; USEPA, 1993; Cal/Ecotox, 2003), with the exception of:

- A food ingestion rate for the willow flycatcher was calculated using an allometric scaling equation for passerine birds (USEPA, 1993; dry food ingestion rate (g) = 0.398 x [body weight (g)]$^{0.850}$), the average moisture content of common food items (USEPA, 1993; 79%), and the standardized body weight (Cal/Ecotox, 2003; 0.0129 kg). The calculated food ingestion rate was 0.0167 kg/day.

- A food ingestion rate for the raccoon was calculated using an allometric scaling equation for mammals (USEPA, 1993; dry food ingestion rate (g) = 0.235 x [body weight (g)]$^{0.822}$), the average moisture content of common food items (USEPA, 1993; 75%), and the average body weight (USEPA; 5.78 kg). The calculated food ingestion rate was 1.16 kg/day.

Soil Ingestion Rates — Soil ingestion rates (kg soil/day) for all receptors were based on available standardized receptor parameters (e.g., Sample and Suter, 1994; USEPA, 1993; Cal/Ecotox, 2003), with the exception of:

- A soil ingestion rate for the willow flycatcher was calculated as 2% of the estimated dry food intake rate, following the guidance in USEPA (1993). The calculated soil ingestion rate was 0.00007 kg/day.

- A soil ingestion rate for the raccoon was calculated as 9.4% of the estimated dry food intake rate, following the guidance in USEPA (1993). The calculated soil ingestion rate was 0.0273 kg/day.

Water Ingestion Rates — Water ingestion rates (L/day) for all receptors were based on an available standardized receptor parameter (e.g., Sample and Suter, 1994; USEPA, 1993; Cal/Ecotox, 2003), with the exception of:

- The USEPA (1993) allometric scaling equation for birds (water ingestion rate (L) = 0.059 x [body weight (kg)]$^{0.67}$) was used to estimate a water ingestion rate of 0.0032 L/day for willow flycatchers.

Home Range — An average home range size (square meters) was estimated for each receptor. Home range data is used to estimate the overall percentage of time (i.e., a habitat use factor) that a receptor spends in different parts of the study area. This approach assumes that an organism spends an equal amount of time (and therefore has an equal food intake rate) in all parts of its home range. Home range sizes were based on available standardized receptor parameters (e.g., Sample and Suter, 1994; USEPA, 1993; Cal/Ecotox, 2003) with the exception of:

- Average of values presented in USEPA (1993) was used to estimate a home range of 1,560,000 m^2 for raccoons. Raccoons are capable of utilizing suburban areas, and therefore, are not likely limited to the site.

- Lowest available habitat area value presented in USEPA (1993) was used as the estimated home range of 40,000 m^2 for mallard duck. The lowest available home range was used instead of an average in order to reflect the fact that mallard ducks may congregate at the site based on the availability of suitable wetland habitat.

- Sample and Suter (1994) comment that great blue herons have home ranges of up to 24 km of river length, however, an appropriate home range size (in terms of square meters) for great blue heron was not available. Instead, a habitat use factor of 0.25 was selected, in part, to acknowledge that great blue heron will likely utilize the Anacostia River for feeding and nesting, and therefore, are not restricted to on-site wetland habitats.

2.7.2.2 Environmental Concentration Parameterization

COPC concentrations in different environmental media (i.e., soil, sediment and water) are an essential component of the food chain model. Environmental concentrations for the Poplar Point food chain model are summarized in Table 2-9 for the following media:

- Soil
- Surface water
- Sediment

For the purposes of the mechanistic food chain model, environmental concentrations were selected using the following guidelines:

- 95% UCL values were preferred over 95th percentile values. Maximum detected concentrations were used if a 95% UCL or 95th percentile was not available.

- A value of zero was used for those compounds that were not measured in samples collected from the site (reflecting a lack of data), or were measured but not detected (reflecting the assumption that exposure via this pathway is likely negligible).

2.7.2.3 Food Item Concentrations

COPC concentrations in various dietary items were estimated based on environmental concentrations and screening-level BCFs provided by USEPA (1999) or other readily available data compilations. For the purposes of the screening-level food chain model, all different items within each broad category (e.g., plants, soil invertebrates, fish) were assumed to have equivalent BCFs, and therefore, division of feeding preferences beyond these broad categories was not necessary.

A summary of all BCFs used in the mechanistic food chain model is provided in Table 2-10. In order to simplify the terminology used in this screening-level ERA, we have opted to refer to all uptake factors used to estimate food item concentrations from environmental media as "bioconcentration factors" following USEPA (1999).

Plant Concentrations — Soil-to-plant BCFs were available from USEPA (1999) for all compounds, with the exception of:

- Cobalt: A data report prepared by the Oak Ridge National Laboratory (Bechtel Jacobs, 1998) provided a BCF of 0.0115. This value represents the average of 28 observations compiled from a single field study (PTI, 1995).

- Manganese: A data report prepared by the Oak Ridge National Laboratory (Bechtel Jacobs, 1998) provided a BCF of 0.113. This value represents the average of 28 observations compiled from a single field study (PTI, 1995).

- Vanadium: A data report prepared by the Oak Ridge National Laboratory (Bechtel Jacobs, 1998) provided a BCF of 0.00548. This value represents the average of 21 observations compiled from a single field study (PTI, 1995).

- DDT, DDE, DDD, 4-methylphenol, butylbenzylphthalate, dieldrin, di-n-butylphthalate, methoxychlor, acenaphthene, anthracene, fluoranthene, fluorene, naphthalene and pyrene: BCFs were estimated using the formula provided by USEPA (1999; log BCF = 1.588 - 0.578 x log K_{ow}) and log K_{ow} values provided by USEPA (1996b).

- Aroclor 1248, Aroclor 1260, dibenzofuran, acenaphthylene, benzo(g,h,i)perylene and phenanthrene: BCFs were estimated using the formula provided by USEPA (1999; log BCF = 1.588 - 0.578 x log K_{ow}) and log K_{ow} values provided by Mackay et al. (2000).

Soil Invertebrate Concentrations — Soil-to-soil invertebrate BCFs were available from USEPA (1999) for all compounds with the exception of:

- Beryllium, cobalt, manganese and vanadium: The average of all other available inorganic soil-to-soil invertebrate BCFs (i.e., 0.22) was substituted, as per the guidance provided by USEPA (1999).

- 4-methylphenol, butylbenzylphthalate, dieldrin, di-n-butylphthalate, methoxychlor: BCFs were estimated using the formula provided by USEPA (1999; log BCF = 0.819 x log K_{ow} – 1.146) and log K_{ow} values provided by USEPA (1996b).

- Dibenzofuran: BCFs were estimated using the formula provided by USEPA (1999; log BCF = 0.819 x log K_{ow} – 1.146) and log K_{ow} values provided by Mackay et al. (2000).

- Acenaphthene, anthracene acenaphthylene, benzo(g,h,i)perylene, benzo(k)fluoranthene fluoranthene, fluorene, naphthalene, phenanthrene and pyrene: The highest soil-to-soil invertebrate BCF (i.e., 0.08) for PAHs cited by USEPA (1999) was used.

- Aroclor 1248, Aroclor 1260: The BCF for Aroclor 1016 and Aroclor 1254 cited by USEPA (1999) was substituted. This BCF of 1.13 was based on the geometric mean of 7 laboratory values using a mixture of different PCB congeners.

- 4,4'-DDT, 4,4'-DDD: The BCF for 4,4'-DDE cited by USEPA (1999) was substituted. This BCF of 1.26 was based on the geometric mean of 13 laboratory values using 4,4'-DDT.

The use of the soil-to-soil invertebrate BCFs were intended to provide a conservative estimate of potential COPC concentrations in the overall food item population (which includes insects that dwell on living vegetation or in leaf litter on the soil surface).

Small Mammal Concentration — The soil-to-small mammal BCF values provided by USEPA (1999) were intended to calculate an ingested dose for selected wildlife receptors for a single exposure pathway, and as such, were not considered suitable for predicting overall whole-body tissue concentrations in small mammals. Whole-body tissue concentrations in small mammals were required to estimate the potential risks to carnivorous receptors (e.g., red-tailed hawk).

Soil-to-small mammal uptake factors (UFs) for metals were available in Sample et al. (1998). These empirical UFs were derived from a database of soil and whole-body tissue concentrations for small mammals. The average UFs from Sample et al. (1998) based on all available small mammal data were used in this screening-level ERA. UFs were available for all inorganic compounds, with the exception of antimony and beryllium. The geometric mean of the UFs (for all other inorganic compounds) was substituted for those compounds, following the approach used by USEPA (1999).

No uptake factors or BCFs were available for organic compounds, and therefore, a BCF of 1 was substituted (i.e., tissue concentrations are equal to soil concentrations) as a conservative estimate.

Aquatic Insects — Water-to-aquatic insect BCFs were available from USEPA (1999) for all compounds with the exception of:

- Cobalt, manganese and vanadium: The average of all available inorganic water-to-aquatic insect BCFs was substituted, as per the guidance provided by USEPA (1999).

- 4,4'-DDT, 4,4'-DDD, 4-methylphenol, butylbenzylphthalate, dieldrin, di-n-butylphthalate, methoxychlor, acenaphthene, anthracene, fluoranthene, fluorene, naphthalene and pyrene: BCFs were estimated using the formula provided by USEPA (1999; log BCF = 0.819 x log K_{ow} – 1.146) and log K_{ow} values provided by USEPA (1996b).

- Dibenzofuran, Aroclor 1248, Aroclor 1260, acenaphthylene, benzo(g,h,i)fluoranthene and phenanthrene: BCFs were estimated using the formula provided by USEPA (1999; log BCF = 0.819 x log K_{ow} – 1.146) and log K_{ow} values provided by Mackay et al. (2000).

Water-to-aquatic insect BCFs were used rather than sediment-to-insect BCFs for the following reasons:

- There were limited sediment data, which restricted the ability of sediment-to-insect BCFs to provide a conservative estimate of potential COPC concentrations in the overall food item population.

- The water-to-aquatic insect BCFs from USEPA (1999) include a formula to estimate BCFs based on chemical properties, which allowed the estimation of potential tissue concentrations for a broader range of COPCs than the ORNL sediment-to-insect BCFs.

Fish — Water-to-fish BCFs were available from USEPA (1999) for all compounds with the exception of:

- Cobalt, manganese and vanadium: The average of all available inorganic water-to-fish BCFs was substituted, as per the guidance provided by USEPA (1999).

- Acenaphthene, anthracene acenaphthylene, benzo(g,h,i)perylene, benzo (k)fluoranthene, fluoranthene, fluorene, naphthalene, phenanthrene and pyrene: The BCF for benzo(a)pyrene was substituted for all other PAHs as per the guidance provided by USEPA (1999).

- 4,4'-DDT, 4,4'-DDD, 4-methylphenol, butylbenzylphthalate, dieldrin, di-n-butylphthalate, methoxychlor: BCFs were estimated using the formula provided by USEPA (1999; $\log BCF = 0.91 \times \log K_{ow} - 1.975 \times \log [6.8 \times 10^{-7} \times K_{ow} + 1.0] - 0.786$) and $\log K_{ow}$ values provided by USEPA (1996b).

- Dibenzofuran, Aroclor 1248, Aroclor 1260: BCFs were estimated using the formula provided by USEPA (1999; $\log BCF = 0.91 \times \log K_{ow} - 1.975 \times \log [6.8 \times 10^{-7} \times K_{ow} + 1.0] - 0.786$) and $\log K_{ow}$ values provided by Mackay et al. (2000).

Benthos — Sediment-to-benthos BCFs were available from USEPA (1999) for all compounds with the exception of:

- Cobalt, manganese and vanadium: The average of all available inorganic sediment-to- benthos BCFs (i.e., 0.9) was substituted, as per the guidance provided by USEPA (1999).

- Acenaphthene, anthracene acenaphthylene, benzo(g,h,i)perylene, benzo (k)fluoranthene, fluoranthene, fluorene, naphthalene, phenanthrene and pyrene:

The BCF for benzo(a)pyrene was substituted for all other PAHs as per the guidance provided by USEPA (1999).

- Aroclor 1248, Aroclor 1260: The BCF for Aroclor 1016 and Aroclor 1254 cited by USEPA (1999) was substituted.

- 4,4'-DDT, 4,4'-DDD: The BCF for 4,4'-DDE cited by USEPA (1999) was substituted.

- 4-methylphenol, butylbenzylphthalate, dieldrin, di-n-butylphthalate, methoxychlor: BCFs were estimated using the formula provided by USEPA (1999; log BCF = 0.819 x log K_{ow} – 1.146) and log K_{ow} values provided by USEPA (1996b).

- Dibenzofuran: BCFs were estimated using the formula provided by USEPA (1999; log BCF = 0.819 x log K_{ow} – 1.146) and log K_{ow} values provided by Mackay et al. (2000).

2.7.2.4 Derivation of Toxicity Reference Values

NOAEL-based TRVs were selected as the basis of this screening-level ERA following the guidance specified by USEPA (1998). Exceedance of the NOAEL-based TRV does not necessarily suggest adverse effects are likely, but that further evaluation may be appropriate. Lowest-observed adverse effect level (LOAEL)-based TRVs were not used since the purpose of a screening-level ERA is to identify those COPCs and pathways that can safely be excluded from further assessments since ecological risks are negligible (USEPA, 1998).

Table 2-11 provides a summary of laboratory-based mammalian TRVs (e.g., TRVs for mouse or rat) which was allometrically scaled using the formula below in order to generate TRVs for the two mammalian receptors included in this screening-level ERA (i.e., raccoon and shrew).

$$TRV_{WILDLIFE} = TRV_{LABORATORY}\left(\frac{\text{Body Weight}_{\ LABORATORY}}{\text{Body Weight}_{\ WILDLIFE}}\right)^{0.25}$$

Avian-specific TRVs were adopted directly from the available data compilation (e.g., Sample et al., 1996), and did not involve allometric scaling as per the guidance provided by Sample et al. (1996). The majority of NOAEL-based TRVs (i.e., mammalian laboratory TRVs or avian TRVs) used in this screening-level ERA were adopted directly from Sample et al. (1996), with the following exceptions:

- The mammalian TRV for cobalt and silver was adopted from the most conservative TRV cited by USACHPPM (2001).The avian TRV for cobalt, silver, thallium, cyanide and pentachlorophenol was adopted from the most conservative TRV cited by USACHPPM (2001).

- The avian TRV for antimony, beryllium, and benzo[a]pyrene was adopted from the mammalian test species NOAEL used by Sample et al. (1996) with a 10-fold safety factor to compensate for potential differences between taxonomic groups. All other avian TRVs were based on avian toxicity data; the 10-fold safety factor approach was used for antimony, beryllium, and benzo[a]pyrene only because avian-specific toxicity data were not available for these compounds.

- The avian and mammalian TRVs for DDT (Sample et al., 1996) were substituted for 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE.

- The mammalian TRV for Aroclor 1248 (lowest available PCB TRV provided by Sample et al., 1996) was substituted for Aroclor 1260.

- The avian TRV for Aroclor 1254 (lowest available PCB TRV provided by Sample et al., 1996) was substituted for Aroclor 1248 and Aroclor 1260.

- The mammalian TRV for benzo(a)pyrene provided by Sample et al. (1996) was substituted for all other PAHs, with the exception of benz(a)anthracene, dibenz(a,h)anthracene and naphthalene, which had mammalian TRVs available.

- The avian TRVs for benzo(a)pyrene provided by USACHPPM (2001) was substituted for all other PAHs.

A summary of all TRVs used in the food chain model is provided in Table 2-11.

2.7.3 Calculated Hazard Quotients

HQs for each of the seven wildlife receptors is provided in Table 2-12 and summarized below:

Short-tailed Shrew — Hazard quotients greater than 1 (indicating a potential risk) were identified for the following 16 COPCs:

- Metals (i.e., aluminum, antimony, arsenic, chromium, thallium and vanadium)
- PAHs (i.e., benz[a]anthracene and dibenz[a,h]anthracene)

- Other organic compounds (i.e., DDT and its metabolites, PCBs, dieldrin, di-n-butylphthalate, methoxychlor, and pentachlorophenol)

COPCs with the highest HQs were pentachlorophenol (HQ of 6,117), dieldrin (HQ of 2,244), aluminum (HQ of 989), methoxychlor (HQ of 55), and Aroclor 1248 (HQ of 50). The dominant exposure pathway for these compounds was the ingestion of soil invertebrates.

Raccoon — Hazard quotients greater than 1 (indicating a potential risk) were identified for the following 11 COPCs:

- Metals (i.e., aluminum, antimony, arsenic, lead, thallium and vanadium)
- PAHs (i.e., dibenz[a,h]anthracene)
- Other organic compounds (i.e., PCBs, dieldrin, methoxychlor, and pentachlorophenol)

COPCs with the highest HQs were pentachlorophenol (HQ of 259), dieldrin (HQ of 95) and aluminum (HQ of 88). All other HQs were less than 10. The dominant exposure pathway for these compounds was the ingestion of soil invertebrates.

Willow Flycatcher — Hazard quotients greater than 1 (indicating a potential risk) were identified for the following 33 COPCs:

- Metals (i.e., aluminum, antimony, beryllium, cadmium, cobalt, lead, thallium and zinc)
- PAHs (i.e., all PAHs except benzo[k]fluoranthene and dibenz[a,h]anthracene)
- Other organic compounds (i.e., DDT and its metabolites, PCBs, cyanide, dieldrin, di-n-butylphthalate, methoxychlor, and pentachlorophenol)

COPCs with the highest HQs were di-n-butylphthalate (HQ of 20,307), 4,4'-DDD (HQ of 7,015), 4,4'-DDT (HQ of 6,470), dieldrin (HQ of 2,765), methoxychlor (HQ of 2,620), pentachlorophenol (HQ of 1,722), 4,4'-DDE (HQ of 801) and antimony (HQ of 378). The dominant exposure pathway for these compounds was the ingestion of earthworms (which were used as a conservative surrogate for all terrestrial insects, including many that are not direct contact with soil) in order to evaluate potential risks to all small avian insectivores.

American Robin — Hazard quotients greater than 1 (indicating a potential risk) were identified for the following 34 COPCs:

- Metals (i.e., aluminum, antimony, beryllium, cadmium, chromium, cobalt, lead, thallium and zinc)

- PAHs (i.e., all PAHs except benzo[k]fluoranthene and dibenz[a,h]anthracene)
- Other organic compounds (i.e., DDT and its metabolites, PCBs, cyanide, dieldrin, di-n-butylphthalate, methoxychlor, and pentachlorophenol)

COPCs with the highest HQs were di-n-butylphthalate (HQ of 9,502), 4,4'-DDD (HQ of 3,047), 4,4'-DDT (HQ of 3,130), dieldrin (HQ of 1,289), methoxychlor (HQ of 1,226), pentachlorophenol (HQ of 806), 4,4'-DDE (HQ of 389) and antimony (HQ of 221). The dominant exposure pathway for these compounds was the ingestion of soil invertebrates.

Red-tailed Hawk — Hazard quotients greater than 1 (indicating a potential risk) were identified for the following 4 COPCs:

- Metals (i.e., antimony)
- Other organic compounds (i.e., DDT and its metabolites)

COPCs with the highest HQs were 4,4'-DDD (HQ of 32) and 4,4'-DDT (HQ of 29). All other HQs were less than 10. The dominant exposure pathway for these compounds was the ingestion of small mammals, however, it should be noted that the food chain model assumed a BCF of 1 for the transfer of DDT to small mammal tissue (i.e., a literature BCF for this uptake pathway was not available in USEPA, 1999).

Mallard Duck — Hazard quotients greater than 1 (indicating a potential risk) were identified for the following 19 COPCs:

- Metals (i.e., aluminum, antimony, lead, and zinc)
- PAHs (i.e., anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b] fluoranthene, benzo[k]fluoranthene, chrysene, fluoranthene, indeno[1,2,3-cd] pyrene, phenanthrene and pyrene)
- Other organic compounds (i.e., DDT and its metabolites, , cyanide, and dieldrin)

COPCs with the highest HQs were 4,4'-DDT (HQ of 645), 4,4'-DDD (HQ of 51), 4,4'-DDE (HQ of 31) and lead (HQ of 14). All other HQs were less than 10. The dominant exposure pathway for these compounds was the ingestion of benthic invertebrates.

Great Blue Heron — Hazard quotients greater than 1 (indicating a potential risk) were identified for the following 9 COPCs:

- Zinc
- Other organic compounds (i.e., DDT and its metabolites, cyanide, dieldrin, di-n-butylphthalate, methoxychlor, and pentachlorophenol)

COPCs with the highest HQs were di-n-butylphthalate (HQ of 30) and 4,4'-DDD (HQ of 11). All other HQs were less than 10. The dominant exposure pathway for these compounds was the ingestion of fish.

2.7.4 Summary of Findings

As discussed above, several COPCs were identified as presenting significant potential risks to multiple wildlife receptors, including:

- DDT and its metabolites
- Dieldrin
- Di-n-butylphthalate
- Methoxychlor
- Pentachlorophenol

Other COPCs (i.e., metals, PAHs, PCBs) were also present at concentrations that may present unacceptable risks to wildlife receptors (i.e., HQs greater than 1), however, the risks from these compounds are likely less than the risks presented by the organic compounds listed above.

Two dominant exposure pathways were evident—ingestion of COPC via consumption of food items (especially soil invertebrates) as well as incidental ingestion of soil. The highest HQs were observed for short-tailed shrew and willow flycatcher, which were in part, a result of their feeding preferences (i.e., 100% soil invertebrates). The assumption regarding dietary preferences for short-tailed shrew and willow flycatcher was intended to provide conservative risk estimates for the overall mammalian and avian insectivore receptor groups, following the screening-level ERA guidance provided in USEPA (1997). These risk estimates do not necessarily reflect species- or site-specific feeding patterns of individual species at Poplar Point.

2.7.5 Uncertainty Analysis

Multiple COPCs resulted in calculated doses that exceeded the NOAEL-based TRV. This screening-level ERA relies heavily on literature-based data and conservative assumptions. COPC selection was equally conservative—for example, COPCs that were identified in water but not soil were still assessed for terrestrial routes of exposure. As a result, hazard quotients greater than 1 from a screening-level ERA food chain model do not necessarily indicate that adverse effects are likely, but that further evaluation may be appropriate.Four primary sources of uncertainty in the risk characterization for wildlife receptors include:

Bioconcentration Factors — The use of the USEPA (1999) bioconcentration factors to predict food item concentrations contributes substantial uncertainty in the screening-level food chain model. Data used to generate the BCFs were not necessarily specific to the organism in question (i.e., USEPA (1999) used a study on the uptake of COPCs by *Daphnia pulex* (an aquatic invertebrate) as the basis for the equation to estimate soil-to-soil invertebrate and sediment-to- benthos BCFs). Additionally, BCFs are typically highly site-specific, and are strongly influenced by geochemical considerations (e.g., soil pH, total organic carbon, major ion concentrations, percent moisture) that were not considered in the derivation of the BCFs by USEPA (1999).

A potential option to reduce the uncertainty associated with the use of these screening-level BCFs involves targeted site-specific sampling of relevant dietary items. The uncertainty with respect to BCF selection may lead to overestimates of risks (e.g., actual uptake of metals and metalloids by soil invertebrates and plants is likely less than predicted by a numerical equation), or to underestimates of risk (e.g., actual uptake of bioaccumulative compounds such as PCBs by small mammals is likely higher than predicted by the assumed BCF of 1).

Dietary Selections — We have used earthworm tissue data as a conservative surrogate for potential body burdens in all invertebrates and maximized the proportion of earthworms in receptors where appropriate following USEPA (1997) guidance for screening-level ERAs. Realistically, robins, willow flycatchers, and shrews (as well as other species represented by these receptors) are likely consuming a diverse selection of dietary items, including many invertebrate species that are not in constant contact with soil contaminants and, therefore, have lower tissue concentrations. For example, Roth (1993) found that lead tissue concentrations of soil invertebrates in a lead-contaminated forest soil ecosystem were strongly influenced by trophic level and taxonomic group. Earthworms and mites had the highest body burdens, while arthropods, spiders and beetles exhibited body burdens ranging from 1/100 to 1/10 of the average earthworm concentration. Similar results were observed by Ma et al. (1991) and Pascoe et al. (1996) for different soil invertebrate taxa at metal-contaminated sites—earthworms typically have the highest metal body burdens of all soil invertebrate groups. Differences in metal uptake by plants have also been observed, with seeds having lower metal concentrations than roots (Torres and Johnson, 2001).

Consequently, the actual COPC ingestion by all receptors (who consume a variety of soil invertebrates and/or plants) is likely lower than that predicted by the use of earthworms or a single plant species as the sole surrogates. A potential option to reduce the uncertainty associated with the use of assumed dietary concentrations involves targeted site-specific sampling of food items that comprise the diet of the selected wildlife receptors (e.g., sample multiple types of invertebrates in order to reduce the uncertainty

associated with the use of earthworm COPC concentrations for insectivorous wildlife receptors).

TRV Selection — For the purposes of this screening-level ERA, NOAEL-based TRVs were used as per USEPA (1998). However, a NOAEL-based TRV is often influenced by the selection of concentrations in the original laboratory study—it is often preferable to use an ecologically relevant LOAEL-based TRV that represents an "acceptable" effect to site managers. This approach requires careful consideration of toxicological data beyond the summaries provided by Sample et al. (1996) in order to account for new data, as well as to determine what constitutes an "acceptable" biological effect. Development of appropriate LOAEL-based TRVs will reduce the uncertainty associated with the use of the NOAEL-based TRVs provided by Sample et al. (1996).

2.7.6 Comparison to Environ (2002) Food Chain Model

Environ (2002) concluded that "no significant ecological risks were associated with the site". Major findings from Environ (2002) included:

- Lead and zinc doses exceeded NOAEL-based TRVs for the American robin, but Environ (2002) concluded that concentrations of lead and zinc were within the range of background concentrations from urbanized areas, such as Minneapolis and New Orleans, and therefore, posed minimal risk. Environ (2002) also cited background concentrations for the eastern United States. Elimination of COPCs in this manner without consideration of background concentrations relevant to the specific site in question does not appear to be consistent with the objectives of a screening-level ERA, although we agree that the relative impacts associated with the site should certainly be placed in context.. Additionally, we found that multiple HQs greater than 1 were present for COPCs in addition to lead and zinc.

- Concentrations of phthalates were found in excess of NOAEL-based TRVs for wildlife receptors, however Environ (2002) assumed that phthalates were introduced during sampling and analysis activities. Wide ranges of phthalate concentrations in soil were present (e.g., di-n-butylphthalate were detected in 37 of 113 samples, with concentrations ranging from 0.05 to 4.94 mg/kg). The available chemistry data does not appear to be consistent with the Environ (2002) hypothesis (i.e., we assume that the laboratory-contamination hypothesis would result in similar concentrations in all samples, rather than a range of values). Additionally, we were unable to find information to support the Environ (2002) hypothesis within the Environ (2002) report (e.g., laboratory QA/QC findings). As a result, phthalate esters were retained for the purposes of this screening-level

ERA. We found that HQs greater than 1 were present for several wildlife receptors for phthalate esters.

- Aroclor 1260 doses exceeded the NOAEL-based TRV for American robin, short-tailed shrew and raccoon. However, Environ (2002) found Aroclor 1260 at one location only (which was attributed to a transformer spill) and therefore concluded that exposure to birds and omnivorous mammal populations would be unlikely. Subsequent data collection activities by Ridolfi found elevated PCB concentrations in multiple samples (detected in 51 out of 135 samples with a range of 0.023 to 3.380 mg/kg) and therefore, PCBs were retained for the purposes of this screening-level ERA. We found that HQs greater than 1 were present for several wildlife receptors for PCBs.

- DDT (and DDD and DDE) doses exceeded the NOAEL-based TRV for American robin; however, Environ (2002) concluded that it was unlikely that impacts to American robin would result from exposure to DDT and its metabolites since concentrations were less than the LOAEL-based TRV. Consideration of LOAEL-based TRVs is not typically part of a screening-level ERA (USEPA, 1998), and therefore, we felt it was appropriate to retain DDT and its metabolites for the purposes of this screening-level ERA. We found that HQs greater than 1 were present for several wildlife receptors for DDT and its metabolites.

Differences in the risk estimates generated by Environ (2002) and this screening-level ERA are in part, influenced by differences in the chemistry data available for the site, as well as differences in the approaches incorporated into the mechanistic food chain model. A summary of significant differences between Environ (2002) and the screening-level ERA presented in this report is provided below in order to illustrate factors that may have contributed to differences in the overall conclusions.

2.7.6.1 Differences in Environmental Concentrations

There were substantial differences in the environmental concentrations of various COPCs included in the mechanistic food chain model prepared by Environ (2002) and this document, including the following:

- The inclusion of the additional soil chemistry data provided by Ridolfi resulted in an increased site-wide soil COPC concentration for a substantial number of COPCs (see Table 2-13). For example, site-wide soil COPC concentrations increased by a factor of approximately 5 for DDT and its metabolites.

- Sufficient sediment and surface water chemistry data were not available in Environ (2002). Site-wide sediment COPC concentrations for several primary

COPCs including arsenic, zinc, DDT metabolites and PAHs were higher in sediment than in soil.

2.7.6.2 Differences in Bioconcentration Factors

A major difference between the food chain models used by Environ (2002) and this document was in the selection of BCFs. For example, Environ (2002) used a soil-to-soil invertebrate BCF of 1 for any compound that did not have a BCF cited by USEPA (1999), even for compounds such as PCBs and pesticides that are known to be bioaccumulative. Environ (2002) commented that the use of a BCF of 1 for these compounds was appropriate because the potential for exposure was relatively low (i.e., low concentrations with low frequency of detection).

However, USEPA (1999) provides formulae for estimating BCFs for organic compounds based on their physiochemical properties (i.e., octanol-water partitioning coefficient; K_{OW}). BCFs used in this document are based on K_{OW} when no compound-specific BCF was provided in USEPA (1999), with the exception of soil-to-small mammal BCFs (see Section 2.7.2.3). As a result, BCFs are frequently larger than those used by Environ (2002). For example, Environ (2002) assumed that the soil-to-soil invertebrate BCF for methoxyclor was 1, whereas the formula provided by USEPA (1999) results in an estimated BCF of 1033 (i.e., three orders of magnitude larger). Inclusion of targeted tissue sampling (e.g., earthworms) as part of the implementation of a risk management plan for the site will reduce the uncertainty regarding the use of literature-based BCFs in the food chain model.

2.7.6.3 Differences in Exposure Pathways Under Consideration

There were several differences in the exposure pathways included in the food chain models presented by Environ (2002) and this document, including:

- Environ (2002) appears to have excluded the contribution of incidental soil ingestion to the overall COPC dose to wildlife receptors. Wildlife receptors, especially insectivorous receptors such as robins or shrew, consume a certain amount of soil as a result of their feeding behavior. As a result, the resulting dose estimates (and risk conclusions) presented by Environ (2002) may be underestimating the potential exposure for wildlife receptors.

- This risk assessment also included several exposure pathways and receptors (i.e., water-to-fish BCFs and subsequent ingestion of fish by piscivores; soil-to-small mammal BCFs and subsequent ingestion of small mammals by carnivores) that were not considered by Environ (2002) (due to a lack of data at the time).

2.7.6.4 Differences in Receptor Parameterization

There were minor differences in receptor body weight and home range values between Environ (2002) and the screening-level ERA presented in this report, however, these variations are considered unlikely to substantially alter risk estimates. Differences in dietary composition (in addition to the differences in direct consumption of soil noted above) will result in different risk estimates. Differences included:

- Environ (2002) assumed that shrew had a diet consisting of 89% soil invertebrates, whereas this risk assessment assumed that shrew had a diet of 100% soil invertebrates in order to reflect that shrew are a surrogate for all small mammal insectivores.

- Environ (2002) assumed that robins had a diet of 40% soil invertebrates whereas this risk assessment assumed a diet of 50% soil invertebrates in order to reflect that robins are a surrogate for small avian omnivores, and therefore, were assumed to have a diet consisting of 50% soil invertebrates and 50% plant material.

- Environ (2002) assumed that raccoons had a dietary composition of 40% soil invertebrates whereas this risk assessment assumed 25% in order to reflect that raccoons are a surrogate for small mammal omnivores. Raccoons were assumed to have a diet consisting of 25% plant material, 25% soil invertebrates, 25% small mammals, and 25% aquatic insects. Modification of the raccoon's dietary preference was necessary to allow inclusion of food items not available in Environ (2002), such as aquatic insects and small mammals.

There were also substantial differences in the food ingestion rates for raccoon. Environ (2002) used a food ingestion rate of 0.453 kg/day, based on data presented by Beyer et al. (1994). We were unable to verify this food ingestion rate based on a review of Beyer et al. (1994) because the paper deals with soil ingestion rates. We have opted to use a food ingestion rate of 1.16 kg/day, based on allometric scaling equations presented in USEPA (1993) and a raccoon body weight of 5.78 kg (i.e., the average of values presented in USEPA, 1993). The use of an allometric scaling equation and a conservative body weight estimate for estimating a food ingestion rate is preferred for a screening-level ERA in the absence of species-specific information.

2.7.6.5 Differences in Toxicity Reference Value Selection

Calculation of Raccoon TRVs — Environ (2002) calculated raccoon TRVs from the available shrew TRVs provided by Sample et al. (1996). However, this approach means that the resulting raccoon TRV is extrapolated from another wildlife TRV, which was already extrapolated from the original laboratory TRV.

Sample et al. (1996) provides an allometric scaling formula for extrapolating wildlife TRVs from the laboratory test species toxicity data. Raccoon TRVs used in this document were extrapolated directly from the available test species toxicity data cited by Sample et al. (1996), as shown in Table 2-11. As a result, the raccoon TRVs presented by Environ (2002) are consistently higher than those used in this document (i.e., a COPC is considered less toxic in Environ (2002) than in this report).

PAH TRV for Avian Receptors — Environ (2002) adopted a TRV of 10 mg/kg/day for avian receptors exposed to all PAHs, citing Trust et al. (1994) who exposed nestling starlings (*Sturnus vulgaris*) to 2 mg/kg/day of 7,12-dimethylbenz[a]anthracene (DMBA) for five consecutive days via oral gavage. However, Environ (2002) selected the total experimental dose (i.e., 10 mg/kg DMBA; 2 mg/kg/day x 5 days) as the NOAEL-based TRV when in fact the daily dose corresponding to a NOAEL was 2 mg/kg/day DMBA. We opted to use a conservative avian TRV of 0.1 mg/kg/day for all PAHs in this screening-level ERA, based on the mammalian TRV for benzo[a]pyrene cited by Sample et al. (1996) and a safety factor of 10. The use of a 10-fold interspecies safety factor to extrapolate from mammalian to avian species is consistent with the conservative safety factors used by both Sample et al. (1996) and USEPA (1997).

DDT TRV for Avian Receptors — Environ (2002) also substituted avian TRVs for DDT and its metabolites based on data presented by Jeffries et al. (1971)—however, an avian TRV for DDT was readily available from Sample et al. (1996). TRVs provided by Sample et al. (1996) are preferred for a screening-level ERA given the broad acceptance of the Sample et al. (1996) TRVs by regulatory agencies.

2.8 CONCLUSIONS

Overall, the results from the screening-level ERA presented in this report indicate that a potential for ecological risks to various receptors exists. Supplemental evaluation as part of the implementation of a site remediation plan is recommended to reduce the uncertainty typical of a screening-level ERA. Screening-level ERAs typically provide a desktop-level exercise that can be used to prioritize subsequent sample collection activities, and identify priority contaminants of concern and exposure pathways that remedial activities should begin to focus on. The information and results within this screening level ERA are not considered appropriate for use in deriving site-specific

clean-up numbers. Generic clean-up goals, (e.g., Oak Ridge Preliminary Remediation Goals) may be appropriate for the site (augmented by site specific data as appropriate). As a result, we emphasize that the hazard quotients greater than 1 estimated from this screening-level ERA do not necessarily indicate that adverse effects are likely, but that further evaluation focused on areas with the greatest uncertainty may be warranted as part of the implementation of a risk management plan for the site.

This screening level ecological risk characterization is substantially different than that presented by Environ (2002), in part, due to the following reasons:

- The screening-level ERA presented in this report evaluated additional exposure pathways, COPCs and receptors than evaluated by Environ (2002). Environ (2002) was limited to soil invertebrates, short-tailed shrew, raccoon, American robin and mallard ducks exposed primarily to terrestrial conditions. This screening-level ERA included surface water and sediment exposure routes as well as an expanded list of ecological receptors.

- Additional chemistry data were collected for this screening-level ERA that was not available for Environ (2002), resulting in different site-wide estimates of COPC concentrations.

- The screening-level ERA presented in this report used the most conservative numerical standards and toxicity reference values, while Environ (2002) selected values that were considered more appropriate to a baseline ERA.

- We identified several issues in Environ (2002) that may limit their conclusions including: the use of site-wide soil concentrations to evaluate risks to soil invertebrates; incorrect extrapolation of TRVs and parameterization of food ingestion rates for the raccoon receptor; inappropriate TRVs for PAHs and DDT; failure to consider soil ingestion as a exposure pathway for birds and mammals; inappropriate use of default BCF of 1 for bioaccumulative compounds; failure to evaluate risks of pesticides to soil invertebrates. We recognize that some issues may be the result of differences in professional judgment, however, the overall risk estimates for mammals and birds presented by Environ (2002) may not be sufficiently protective, given issues such as the absence of soil ingestion as a significant exposure pathway.

Specific findings from our screening-level ERA include:

Soil Invertebrates and Plants — Multiple COPCs are present in soil at concentrations that exceed the lowest available toxicity reference value, and therefore, further evaluation of the risks to soil invertebrates and plants is indicated. Significant

COPCs (i.e., those with a substantial number of HQs > 1) include barium, chromium, cyanide, lead, mercury, zinc, DDT (and its metabolites) and PAHs. Several COPCs have clusters of elevated soil concentrations that correspond to locations of former site activities.

Aquatic Life — The available surface water chemistry data were screened against numerical guidelines for the protection of aquatic life in order to provide a qualitative estimate of potential risks. Several metals, including aluminum, barium, lead and zinc, had concentrations that exceeded numerical standards, and therefore, further evaluation of the risks to aquatic life is indicated. Risk estimates for the protection of aquatic life from surface water contain a relatively high degree of uncertainty, since supporting data necessary for the evaluation of metal toxicity (e.g., water pH, hardness) were not available.

Benthos — The available sediment chemistry data were screened against numerical standards for the protection of benthos in order to provide a qualitative estimate of potential risks. Several metals and PAHs exceeded the available numerical standard and therefore, further evaluation of the risks to aquatic life is indicated. Risk estimates for the protection of benthos contain a relatively high degree of uncertainty, since supporting data necessary for the evaluation of COPC bioavailability (e.g., organic carbon content; presence of sulphides) were not available.

Amphibians — Maximum surface water chemistry were screened against conservative toxicity reference values derived from readily available data compilations. Several metals COPCs had maximum concentrations that exceeded the TRV, and therefore, further evaluation of the potential risk to amphibians is warranted. Risk estimates for the protection of amphibians contain a relatively high degree of uncertainty, since the available chemistry and toxicological data were insufficient to allow a comprehensive examination of all potential COPCs and exposure routes.

Wildlife Species —Mechanistic food chain models were constructed to evaluate the potential risks of site COPCs to selected wildlife receptors, including short-tailed shrew, raccoon, American robin, willow flycatcher, great blue heron, mallard duck and red-tailed hawk. Multiple exposure pathways were evaluated, including consumption of food items as well as ingestion of soil and water. All seven wildlife receptors had one or more COPCs with a hazard quotient greater than 1, indicating that a potential risk may exist. Significant COPC and receptor combinations (without limiting future evaluation to only these combinations) include:

- DDT (and its metabolites) to all avian receptors
- Dieldrin and pentachlorophenol to shrew, raccoon, willow flycatcher and American robin

- Di-n-butylphthalate and methoxychlor to willow flycatcher and American robin

Table 2-1: Contaminants of potential concern (COPCs) for the Poplar Point screening level ERA

	COPC IN SOIL?	COPC IN WATER?	COPC IN SEDIMENT?
Aluminum	Yes	Yes	
Antimony	Yes		Yes
Arsenic	Yes	Yes	Yes
Barium	Yes	Yes	
Beryllium	Yes		
Cadmium		Yes	Yes
Chromium	Yes	Yes	Yes
Cobalt		Yes	
Copper	Yes	Yes	Yes
Lead	Yes	Yes	Yes
Manganese	Yes	Yes	
Mercury	Yes		Yes
Nickel	Yes	Yes	
Selenium	Yes		
Silver	Yes		
Thallium	Yes		
Vanadium	Yes	Yes	
Zinc	Yes	Yes	Yes
4,4'-DDD	Yes		Yes
4,4'-DDE	Yes		Yes
4,4'-DDT	Yes		Yes
4-Methylphenol	Yes		Yes
Aroclor 1248	Yes		Yes
Aroclor 1260	Yes		Yes
Butylbenzylphthalate			Yes
Dibenzofuran			Yes
Cyanide	Yes		
Dieldrin	Yes		Yes
Di-n-butylphthalate	Yes	Yes	
Methoxychlor	Yes		
Pentachlorophenol	Yes		
Acenaphthene	Yes		Yes
Acenaphthylene	Yes		
Anthracene	Yes		
Benzo(a)anthracene	Yes		Yes
Benzo(a)pyrene	Yes		Yes
Benzo(b)fluoranthene	Yes		Yes
Benzo(g,h,i)perylene	Yes		Yes
Benzo(k)fluoranthene	Yes		
Chrysene	Yes		Yes
Dibenz(a,h)anthracene	Yes		Yes
Fluoranthene	Yes		Yes
Fluorene	Yes		Yes
Indeno(1,2,3-cd)pyrene	Yes		Yes
Naphthalene	Yes		
Phenanthrene	Yes		Yes
Pyrene	Yes		Yes

Table 2-2: Receptors and associated endpoints for the Poplar Point screening-level ERA

RECEPTOR GROUP	REPRESENTATIVE SPECIES	ASSESSMENT ENDPOINT	MEASURE OF EFFECT	EXPOSURE PATHWAY
Soil invertebrates and plants	Not applicable	Maintenance of a functional population capable of supporting higher-level organisms	Comparison of individual soil sample concentrations to numerical guidelines	Direct contact
Aquatic organisms	Not applicable	Maintenance of a functional population capable of supporting higher-level organisms	Comparison of individual water concentrations to numerical guidelines	Direct contact
Benthos	Not applicable	Maintenance of a functional population capable of supporting higher-level organisms	Comparison of individual sediment sample concentrations to numerical guidelines	Direct contact
Amphibians	Not applicable	Maintenance of a healthy population	Comparison of site-wide maximum water concentrations to toxicity reference values from the literature	Direct contact
Omnivorous mammals	Raccoon	Maintenance of a healthy population	Comparison of the daily ingested dose of individual COPCs (as estimated using a mechanistic food chain model) to a NOAEL-based TRV	Ingestion of food, water and soil
Insectivorous mammals	Short-tailed shrew	Maintenance of a healthy population	Same as above	Ingestion of food, water and soil
Omnivorous birds	American robin	Maintenance of a healthy population	Same as above	Ingestion of food, water and soil
Insectivorous birds	Willow flycatcher	Maintenance of a healthy population	Same as above	Ingestion of food, water and soil
Waterfowl	Mallard duck	Maintenance of a healthy population	Same as above	Ingestion of food, water and soil
Predatory birds	Red-tailed hawk	Maintenance of a healthy population	Same as above	Ingestion of food, water and soil
Piscivorous birds	Great blue heron	Maintenance of a healthy population	Same as above	Ingestion of food, water and soil

Notes: A “healthy” wildlife receptor population is one where the daily ingested COPC dose is less than the NOAEL-based TRV.

Table 2-3: Selected toxicity reference values for the protection of soil invertebrates and plants

COPC	Soil Invertebrates (mg/kg)					Plants (mg/kg)				
	BTAG	ECO-SSL	ORNL	Background	TRV	BTAG	ECO-SSL	ORNL	Background	TRV
Metals										
Aluminum				10356	**None**	1		50	10356	**10356**
Antimony		78		13.8	**78**	0.48		5	13.8	**13.8**
Arsenic			60	3.1	**60**	328	37	10	3.1	**10**
Barium	44	330		55.3	**55**	440		500	55.3	**440**
Beryllium		40		0.5	**40**	0.02		10	0.5	**0.506**
Cadmium		140	20	0.4	**20**	2.5	32	4	0.4	**2.5**
Chromium	0.008	330	0.4	27.3	**27.3**	0.02	5	1	27.3	**27.3**
Cobalt	200			5.9	**200**	100	13	20	5.9	**13**
Copper		61	50	17.9	**50**	15		100	17.9	**17.91**
Lead	0.01	1700	500	40.1	**40**	2		50	40.1	**40.14**
Manganese	330			171	**330**	330		500	171	**330**
Mercury	0.058		0.1	0.13	**0.13**	0.58		0.3	0.13	**0.3**
Nickel			200	14.2	**200**	2		30	14.2	**14.2**
Selenium	1.8		70	0.53	**1.8**	2.8		1	0.53	**1**
Silver				0.9	**None**	1E-05		2	0.9	**0.943**
Thallium				0.8	**None**	0.001		1	0.8	**0.845**
Vanadium	58			31.5	**58**	0.5		2	31.5	**31.5**
Zinc		120	200	62.7	**120**	10	190	50	62.7	**62.7**
Pesticides										
4,4'-DDD	0.1				**0.1**	0.1		200		**0.1**
4,4'-DDE	0.1				**0.1**					**None**
4,4'-DDT	0.1				**0.1**	<0.1				**0.1**
4-Methylphenol	0.1				**0.1**	<0.3				**0.3**
Aroclor 1248					**None**	<0.1				**0.1**
Aroclor 1260					**None**	<0.1				**0.1**

Table 2-3: continued

COPC	Soil Invertebrates (mg/kg)					Plants (mg/kg)				
	BTAG	ECO-SSL	ORNL	Background	TRV	BTAG	ECO-SSL	ORNL	Background	TRV
Butylbenzylphthalate					**None**					**None**
Cyanide	0.005				**0.005**	<0.1				**0.1**
Dibenzofuran					**None**					**None**
Dieldrin	<0.1	0.015			**0.015**	<0.1				**0.1**
Di-n-butylphthalate					**None**					**None**
Methoxychlor	0.1				**0.1**	0.1				**0.1**
Pentachlorophenol	0.1		6		**6**					**None**
PAHs										
Acenaphthene	0.1				**0.1**	0.1		20		**0.1**
Acenaphthylene	0.1				**0.1**	0.1				**0.1**
Anthracene	0.1				**0.1**	0.1				**0.1**
Benzo(a)anthracene	0.1				**0.1**	0.1				**0.1**
Benzo(a)pyrene	0.1				**0.1**					**None**
Benzo(b)fluoranthene	0.1				**0.1**	0.1				**0.1**
Benzo(g,h,i)perylene	0.1				**0.1**	0.1				**0.1**
Benzo(k)fluoranthene	0.1				**0.1**	0.1				**0.1**
Chrysene	0.1				**0.1**	0.1				**0.1**
Dibenz(a,h)anthracene	0.1				**0.1**	0.1				**0.1**
Fluoranthene	0.1				**0.1**	0.1				**0.1**
Fluorene	0.1		30		**0.1**	0.1		200		**0.1**
Indeno(1,2,3cd)pyrene	0.1				**0.1**	0.1				**0.1**
Naphthalene	0.1				**0.1**	0.1				**0.1**
Phenanthrene	0.1				**0.1**	0.1				**0.1**
Pyrene	0.1				**0.1**	0.1				**0.1**

TRV Sources: BTAG = USEPA (1995); ECO-SSL = USEPA (2003b) or USEPA (2000b); ORNL = Efryomson et al. (1997a;b); Background = Ridolfi (2003)

Table 2-4: Distribution of hazard quotients for the protection of soil invertebrates and plants

COPC	N	Number of Samples (Soil Invertebrates) With:			Number of Samples (Plants) With:		
		HQ > 10	HQ > 1 - 10	HQ > 1 (ND)	HQ > 10	HQ > 1 - 10	HQ > 1 (ND)
Aluminum	108		No TRV available		0	40	0
Antimony	47	0	0	0	0	1	16
Arsenic	162	0	5	0	0	38	0
Barium	108	1	71	0	0	2	0
Beryllium	154	0	0	0	0	86	1
Cadmium	139	0	0	0	0	17	0
Chromium*	154	0	37	0	0	37	0
Cobalt	108	0	0	0	0	0	0
Copper	154	1	15	0	1	89	0
Lead*	154	0	110	0	0	110	0
Manganese	108	0	33	0	0	33	0
Mercury*	151	0	77	35	0	30	3
Nickel	154	0	1	0	1	86	0
Selenium	106	0	2	1	0	13	21
Silver	131	0	0	0	0	13	27
Thallium	154		No TRV available		1	2	37
Vanadium	108		No TRV available		0	45	0
Zinc*	154	2	49	0	6	98	0
4,4'DDD	149	14	40	2	14	40	2
4,4'DDE	156	13	65	1		No TRV available	
4,4'DDT*	151	15	49	3	15	49	3
4-Methylphenol	109	0	3	59	6	1	61
Aroclor 1248	6		No TRV available		1	3	0
Aroclor 1260	51		No TRV available		2	16	0
Cyanide	39	24	1	14	0	0	0
Dieldrin	133	0	4	53	1	0	12
Methoxychlor	135	2	6	41	2	5	42
Pentachlorophenol	66	1	1	65		No TRV available	
Acenaphthene	110	1	5	53	7	3	55
Acenaphthylene	109	1	10	51	6	10	51
Anthracene	112	3	24	44	7	23	45
Benzo(a)anthracene	126	8	72	23	11	72	23
Benzo(a)pyrene	125	10	75	18		No TRV available	
Benzo(b)fluoranthene	129	16	90	11	19	92	9
Benzo(g,h,i)perylene	118	5	43	33	8	44	32
Benzo(k)fluoranthene	89	6	52	10	9	52	10
Chrysene	128	9	88	20	12	90	18
Dibenz(a,h)anthracene	110	1	12	49	5	12	49
Fluoranthene*	138	18	102	13	20	100	15
Fluorene	110	1	7	51	7	6	52
Indeno(1,2,3cd)pyrene	120	4	42	36	7	42	36
Naphthalene	117	1	6	52	7	6	52
Phenanthrene	127	8	76	24	11	76	24
Pyrene	135	14	100	16	16	100	16

Notes: Asterisks indicate a COPC selected for graphical presentation of HQ distribution. See text for rationale. "HQ>1 (ND)" indicates the number of samples in which the available detection limit was higher than the selected TRV.

Table 2-5: Derivation of toxicity reference values and calculated hazard quotients for the protection of aquatic life

	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Vanadium	Zinc
BTAG Flora (ug/L)	460			10000		1.1	2						340		30
BTAG Fauna (ug/L)	25	30	874	10000	5.3	0.53	11	35000	6.5	320	3.2	14500	160	<10000	110
USEPA CCC (ug/L)			150			0.25	11		9		2.5		52		120
USEPA Ecotox Thresholds (ug/L)			190	3.9	5.1	1.0 h	10 h	3	11 h	1000	2.5	80	160 h	19	100 h
Toxicity Reference Value	**25**	**30**	**150**	**3.9**	**5.1**	**0.25**	**2**	**3**	**6.5**	**320**	**2.5**	**80**	**52**	**19**	**30**
SW-1/1	**2.5**	0.1	0.0	**17.4**			0.5	0.7	0.8	**3.3**	**1.2**	**5.0**	0.1	0.1	**2.0**
SW-1/4	**6.0**		0.0	**13.4**			0.6		0.6	**2.8**	**1.2**	**1.7**	0.0		**1.1**
SW-1/6			0.0	**13.3**					0.3	**2.9**	***1.2***	**2.1**	0.0		**1.0**
SW-1/5	**4.7**		0.0	**12.6**					0.3	**1.8**	***1.2***	**1.5**			0.5
SW-1/3	**12.0**		0.0	**13.6**			0.5		0.5	**3.3**	**5.2**	**1.7**	0.1	0.1	**2.1**
SW-1/2D	**2.1**		0.0	**15.4**					0.6	**3.3**	0.8	**4.4**	0.0		**1.3**
SW-1/2	**3.7**		0.0	**12.8**	0.1					**1.6**	***1.2***	**1.5**		0.1	0.5
WL04		***1.7***	0.2		0.4	**8.8**			**5.3**		**70.8**		0.4		**15.8**

Notes: Bold text on black background indicates a HQ > 10. Bold text on grey background indicates HQ > 1. Italics indicates a HQ > 1 that is caused by a less than detection limit value. " h " indicates a screening value that is hardness dependent.

TRV Sources: BTAG Fauna and BTAG Flora = USEPA, 1995; USEPA CCC = USEPA, 2002b; USEPA Ecotox = USEPA, 1996

Table 2-6: Derivation of toxicity reference values and calculated hazard quotients for the protection of sediment benthos

	Acenaphthene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Aroclor 1260	Aroclor 1248	4,4'-DDD	4,4'-DDE	4,4'-DDT	Dieldrin	Endrin
BTAG Fauna (mg/kg)	0.016	0.261	0.430	3.200	0.670	0.384	0.063	0.600	0.019	0.600	0.160	0.240	0.665	0.0227	0.0227	<0.016	0.002	0.002		
USEPA Ecotox (mg/kg)	0.62							2.9				8.3							0.052	0.02
Toxicity Reference Value	**0.016**	**0.261**	**0.430**	**3.200**	**0.670**	**0.384**	**0.063**	**0.600**	**0.019**	**0.600**	**0.160**	**0.240**	**0.665**	**0.0227**	**0.0227**	**0.016**	**0.002**	**0.002**	**0.052**	**0.02**
SD-1/5s		0.6	0.4	0.1	-	0.5		0.4				0.5	0.4			**369**	**1682**	**48101**		
SD-1/3s		**1.7**	0.9	0.1	-	**1.3**		**1.2**		0.4		**1.8**	**1.1**			**2.6**	**173**	**696**		
SD-1/2S														**2.7**	**2.7**	0.7	**15**	**16**		0.3
SD-1/2d	**56**	**21**	**13**	**1.5**	**3.0**	**14**	**15**	**20**	**45**	**4.2**		**42**	**17**	**4.8**		**4.8**	**40**	**35**	0.1	
SD-1/4s		**1.7**	0.9	0.2	0.4	**1.1**		**1.3**		0.5		**1.6**	**1.1**	**1.7**		0.5	**11**	**24**		
SD-1/2D																**18**	**545**	**1835**		
SD-1/1s																**11**	**355**	**1139**		
SD-1/6s																**144**	**591**	**361**		
SD-1/4d														**1.6**	**3.4**	**11**	**105**	**139**		
SD-1/3d		**16**	**7.9**	**1.5**		**10**		**15**				**28**	**11**			0.6	**55**	**101**	0.1	0.6
SD-1/5d		**1.1**	0.6	0.1	0.2	0.9		0.8		0.3	0.8	**1.6**	0.7			0.8	**19**	**34**		

Notes: Bold text on black background indicates a HQ > 10. Bold text on grey background indicates HQ > 1.
Italics indicates a HQ > 1 that is caused by a less than detection limit value.
TRV Sources: BTAG Fauna = USEPA, 1995; USEPA Ecotox = USEPA, 1996a

Table 2-6: continued

	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc
BTAG Fauna (mg/kg)	150	8.2	1.2	0.26	34	46.7	0.15	1	150
USEPA Ecotox (mg/kg)									
Toxicity Reference Value	**150**	**8.2**	**1.2**	**0.26**	**34**	**46.7**	**0.15**	**1**	**150**
SD-1/5s	0.1	**6.0**	0.3	**95**	**1.0**	**2.3**	0.9	-	0.7
SD-1/3s	0.0	**6.6**	0.7	**108**	0.9	**5.2**	1.0	0.6	**6.7**
SD-1/2s	0.0	**1.1**	0.3	**85**	**1.6**	**2.6**	0.8	0.6	**2.3**
SD-1/2d	0.0	**1.1**	0.2	**76**	**1.4**	**3.7**	**2.0**	1.0	**1.2**
SD-1/4s	0.1	0.8	0.3	**72**	**1.7**	**3.4**	**1.1**	-	**1.2**
SD-1/2D	0.1	**1.8**	**1.2**	**122**	0.7	**4.2**	**1.2**	0.3	**7.8**
SD-1/1s	0.1	**1.9**	**1.2**	**116**	0.7	**3.7**	**1.1**	0.2	**8.1**
SD-1/6s	0.1	**1.1**	0.3	**55**	0.6	**1.9**	0.9	-	0.9
SD-1/4d	0.1	0.4	-	**52**	0.3	**3.0**	0.7	-	0.2
SD-1/3d	0.1	**5.6**	0.7	**66**	**1.0**	**6.1**	**1.7**	0.7	**4.5**
SD-1/5d	0.1	0.9	0.2	**72**	0.6	**3.4**	0.9	-	0.6

Notes: Bold text on black background indicates a HQ > 10. Bold text on grey background indicates HQ > 1.
Italics indicates a HQ > 1 that is caused by a less than detection limit value.

Table 2-7: Derivation of toxicity reference values and calculated hazard quotients for the protection of amphibian receptors

COPC	Duration and Endpoint	Developmental Stage	Test Concentration (µg/L)	TRV (µg/L)	Maximum Measured Concentration (µg/L)	Hazard Quotient
Arsenic	7d LC_{50}	Embryo	40	0.8	37	**46**
Beryllium	96h LC_{50}	Larvae	3150	63	0.41	0.0065
Cadmium	100d NOEC (development)	Tadpole	9	9	2.2	0.24
Chromium	7d LC_{50}	Embryo	30	0.6	13	**22**
Copper	96h LC_{50}	Tadpole	39	0.78	45	**58**
Lead	7d LC_{50}	Embryo	40	0.8	177	**221**
Manganese	7d LC_{50}	Embryo	1420	28.4	522	**18**
Mercury	7d LC_{50}	Embryo	1	0.02	0.3	**15**
Nickel	7d LC_{50}	Embryo	50	1	21.9	**22**
Zinc	7d LC_{50}	Embryo	10	0.2	475	**2,375**

Notes: All TRVs used a safety factor of 50, except cadmium, for which a long-term no-effect concentration was already available. See text for derivation of the 50x safety factor. Bold underlined values indicate a HQ greater than 1.

Table 2-8: Receptor parameterization

	Short-tailed Shrew	Raccoon	Willow Flycatcher	American Robin	Red-tailed Hawk	Mallard Duck	Great Blue Heron
Body Mass (kg)	1.5E-02	5.8E+00	1.3E-02	7.7E-02	1.1E+00	1.2E+00	2.4E+00
Food Intake (kg wet/d)	9.0E-03	1.2E+00	1.7E-02	9.3E-02	1.1E-01	1.3E-01	4.2E-01
Soil Intake (kg/d)	1.2E-03	2.7E-02	7.0E-05	1.9E-03	0.0E+00	2.6E-04	0.0E+00
Water Intake (L/d)	3.3E-03	4.8E-01	3.2E-03	1.1E-02	6.4E-02	6.6E-02	1.1E-01
Habitat Range (m^2)	3.9E+03	1.6E+06	3.0E+03	4.2E+03	2.3E+06	4.0E+05	N/A
Habitat Use Factor	1.00	0.11	1.00	1.00	0.08	0.45	0.25
Dietary Preferences (%)							
Plants	0.00	0.25	0.00	0.50	0.00	0.25	0.00
Soil Invertebrates	1.00	0.25	1.00	0.50	0.00	0.00	0.03
Small Mammals	0.00	0.25	0.00	0.00	1.00	0.00	0.03
Aquatic Insects	0.00	0.25	0.00	0.00	0.00	0.25	0.00
Fish	0.00	0.00	0.00	0.00	0.00	0.00	0.95
Sediment Benthos	0.00	0.00	0.00	0.00	0.00	0.50	0.00

Notes: See individual receptor model output (Appendix A) for receptor parameter data source information.

Table 2-9: Environmental concentration parameterization for food chain model

COPC	WATER (MG/L)	SEDIMENT (MG/KG)	SOIL (MG/KG)
Aluminum	0.3 (a)	7030 (c)	10808.5 (a)
Antimony	0.002 (a)	2.6 (a)	16.3 (a)
Arsenic	0.037 (a)	54.3 (a)	20.5 (a)
Barium	0.068 (a)	132 (c)	105.4 (a)
Beryllium	0.00041 (a)	0.92 (c)	0.8 (a)
Cadmium	0.0022 (a)	1.4 (a)	1.8 (a)
Chromium	0.0011 (a)	31.6 (a)	37.3 (a)
Cobalt	0.006 (a)	8 (c)	9.0 (a)
Copper	0.034 (a)	56.7 (a)	33.6 (a)
Lead	0.177 (a)	287 (a)	124.3 (a)
Manganese	0.402 (a)	416 (c)	388.0 (a)
Mercury	0 (b)	0.3 (a)	0.2 (a)
Nickel	0.0219 (a)	54.2 (c)	23.5 (a)
Selenium	0 (b)	2 (c)	0.8 (a)
Silver	0 (b)	0.97 (a)	1.3 (a)
Thallium	0 (b)	0 (b)	2.6 (a)
Vanadium	0.002 (a)	26.5 (c)	33.4 (a)
Zinc	0.475 (a)	1210 (a)	230.8 (a)
4,4'-DDD	0 (b)	5.9 (a)	12.0 (a)
4,4'-DDE	0 (b)	3.7 (a)	1.4 (a)
4,4'-DDT	0 (b)	76 (a)	11.1 (a)
4-Methylphenol	0 (b)	3.9 (a)	0.3 (a)
Aroclor 1248	0 (b)	0.078 (a)	2.8 (a)
Aroclor 1260	0 (b)	0.11 (a)	0.5 (a)
Butylbenzylphthalate	0 (b)	1.6 (a)	9.9 (c)
Cyanide	0.002 (a)	0.44 (c)	1.4 (a)
Dibenzofuran	0 (b)	0.67 (a)	0.6 (c)
Dieldrin	0 (b)	0.0046 (a)	0.092 (a)
Di-n-butylphthalate	0.013 (a)	0 (d)	4.1 (a)
Methoxychlor	0 (b)	0 (b)	0.8 (a)
Pentachlorophenol	0 (b)	0 (d)	5.2 (a)
Acenaphthene	0 (b)	0.89 (a)	1.1 (a)
Acenaphthylene	0 (b)	0 (d)	1.1 (a)
Anthracene	0 (b)	3.3 (c)	1.6 (a)
Benzo(a)anthracene	0 (b)	5.6 (a)	3.2 (a)
Benzo(a)pyrene	0 (b)	5.6 (a)	4.2 (a)
Benzo(b)fluoranthene	0 (b)	4.8 (a)	6.3 (a)
Benzo(g,h,i)perylene	0 (b)	2 (a)	2.0 (a)
Benzo(k)fluoranthene	0 (b)	5 (c)	0.9 (a)
Chrysene	0 (b)	5.2 (a)	3.1 (a)
Dibenz(a,h)anthracene	0 (b)	0.94 (a)	0.9 (a)
Fluoranthene	0 (b)	12 (a)	7.7 (a)
Fluorene	0 (b)	0.86 (a)	1.0 (a)
Indeno(1,2,3-cd)pyrene	0 (b)	2.5 (a)	1.5 (a)
Naphthalene	0 (b)	0.12 (a)	1.4 (a)
Phenanthrene	0 (b)	10 (a)	2.3 (a)
Pyrene	0 (b)	11 (a)	4.1 (a)

Notes: **(a)** Maximum detected, 95% UCL or 95th percentile used as appropriate.

(b) Analyte not detected. A value of zero substituted since exposure via this medium likely negligible.

(c) Analytes measured and detected. Insufficient data to calculate 95% UCL or 95th percentile. Maximum detected concentration substituted.

(d) Analyte not measured in this media. A value of zero was substituted.

Table 2-10: Summary of BCFs used to estimate food item concentrations

	Log K_{ow}	Soil-to-Plant	Soil-to-Invert	Soil-to-Small Mammal	Water-to-Aquatic Insect	Water-to-Fish	Sediment-to-Invert
Aluminum		4.0E-03	2.2E-01	3.7E-02	4.1E+03	2.7E+00	9.0E-01
Antimony		2.0E-02	2.2E-01	1.2E-01	7.0E+00	4.0E+01	9.0E-01
Arsenic		3.6E-02	1.1E-01	6.0E-03	7.3E+01	1.1E+02	9.0E-01
Barium		1.5E-01	2.2E-01	1.7E-02	2.0E+02	6.3E+02	9.0E-01
Beryllium		1.0E-02	2.2E-01	1.2E-01	4.5E+01	6.2E+01	9.0E-01
Cadmium		3.6E-01	9.6E-01	2.6E+00	3.5E+03	9.1E+02	3.4E+00
Chromium		7.5E-03	1.0E-02	1.3E-01	3.0E+03	1.9E+01	3.9E-01
Cobalt		1.2E-02	2.2E-01	1.1E-01	7.2E+03	1.8E+03	9.0E-01
Copper		4.0E-01	4.0E-02	5.5E-01	3.7E+03	7.1E+02	3.0E-01
Lead		4.5E-02	3.0E-02	1.9E-01	5.1E+03	9.0E-02	6.3E-01
Manganese		1.1E-01	2.2E-01	2.9E-02	7.2E+03	1.8E+03	9.0E-01
Mercury		3.8E-02	4.0E-02	1.2E-01	2.0E+04	3.5E+03	6.8E-02
Nickel		3.2E-02	2.0E-02	3.7E-01	2.8E+01	7.8E+01	9.0E-01
Selenium		1.6E-02	2.2E-01	3.6E-01	1.3E+03	1.3E+02	9.0E-01
Silver		4.0E-01	2.2E-01	1.1E-01	3.0E+02	8.8E+01	9.0E-01
Thallium		4.0E-03	2.2E-01	1.1E-01	1.5E+04	1.0E+04	9.0E-01
Vanadium		5.5E-03	2.2E-01	1.2E-02	7.2E+03	1.8E+03	9.0E-01
Zinc		1.2E-12	5.6E-01	1.5E+00	4.6E+03	2.1E+03	5.7E-01
4,4'-DDD	6.10	1.2E-02	1.3E+00	1.0E+00	7.1E+03	5.8E+04	9.5E-01
4,4'-DDE	6.76	9.4E-03	1.3E+00	1.0E+00	1.2E+04	2.6E+04	9.5E-01
4,4'-DDT	6.53	6.5E-03	1.3E+00	1.0E+00	1.6E+04	1.4E+05	9.5E-01
4-Methylphenol	1.99	2.7E+00	3.0E+00	1.0E+00	3.0E+00	1.1E+01	3.0E+00
Aroclor 1248	6.11	1.1E-02	1.1E+00	1.0E+00	7.2E+03	5.9E+04	5.3E-01
Aroclor 1260	6.91	3.9E-03	1.1E+00	1.0E+00	3.3E+04	3.2E+05	5.3E-01
Butylbenzylphthalate	4.84	6.2E-02	6.6E+02	1.0E+00	6.6E+02	4.2E+03	6.6E+02
Cyanide		1.1E-01	1.1E+00	1.0E+00	4.1E+03	6.3E+02	9.0E-01
Dibenzofuran	4.17	1.5E-01	1.9E+02	1.0E+00	1.9E+02	1.0E+03	1.9E+02
Dieldrin	5.37	3.0E-02	1.8E+03	1.0E+00	1.8E+03	1.3E+04	1.8E+03
Di-n-butylphthalate	4.61	8.4E-02	4.3E+02	1.0E+00	4.3E+02	2.6E+03	4.3E+02
Methoxychlor	5.08	4.5E-02	1.0E+03	1.0E+00	1.0E+03	6.9E+03	1.0E+03
Pentachlorophenol	5.09	4.5E-02	1.0E+03	1.0E+00	5.2E+01	1.1E+02	1.0E+03
Acenaphthene	3.92	2.1E-01	8.0E-02	1.0E+00	1.2E+02	5.0E+02	1.6E+00
Acenaphthylene	4.07	1.7E-01	8.0E-02	1.0E+00	1.5E+02	5.0E+02	1.6E+00
Anthracene	4.55	9.1E-02	8.0E-02	1.0E+00	3.8E+02	5.0E+02	1.6E+00
Benzo(a)anthracene		2.0E-02	3.0E-02	1.0E+00	1.2E+04	5.0E+02	1.5E+00
Benzo(a)pyrene		0.0E+00	7.0E-02	1.0E+00	4.7E+03	5.0E+02	1.6E+00
Benzo(b)fluoranthene		1.0E-02	7.0E-02	1.0E+00	4.7E+03	5.0E+02	1.6E+00
Benzo(g,h,i)perylene	7.01	3.4E-03	8.0E-02	1.0E+00	3.9E+04	5.0E+02	1.6E+00
Benzo(k)fluoranthene	6.84	1.0E-02	8.0E-02	1.0E+00	1.3E+04	5.0E+02	1.6E+00
Chrysene		1.9E-02	4.0E-02	1.0E+00	9.8E+02	5.0E+02	1.4E+00
Dibenz(a,h)anthracene		6.4E-03	7.0E-02	1.0E+00	7.1E+02	5.0E+02	1.6E+00
Fluoranthene	5.12	4.3E-02	8.0E-02	1.0E+00	1.1E+03	5.0E+02	1.6E+00
Fluorene	4.21	1.4E-01	8.0E-02	1.0E+00	2.0E+02	5.0E+02	1.6E+00
Indeno(1,2,3-cd)pyrene		3.9E-03	8.0E-02	1.0E+00	4.7E+03	5.0E+02	1.6E+00
Naphthalene	3.36	4.4E-01	8.0E-02	1.0E+00	4.0E+01	5.0E+02	1.6E+00
Phenanthrene	4.46	1.0E-01	8.0E-02	1.0E+00	3.2E+02	5.0E+02	1.6E+00
Pyrene	5.11	4.3E-02	8.0E-02	1.0E+00	1.1E+03	5.0E+02	1.6E+00

Notes: Underlined values represent a BCF cited by USEPA (1999). All other BCFs were derived based on formulas provided by USEPA (1999) and log K_{ow} values, or adopted from other sources using best professional judgment. See text for details.

Table 2-11: Summary of no observed adverse effect level (NOAEL)-based TRVs

		Laboratory TRVs			Mammalian TRVs		Avian TRVs				
		Species	BW (kg)	NOAEL (mg/kg/day)	Shrew	Raccoon	Willow Flycatcher	American Robin	Red-tailed Hawk	Mallard Duck	Great Blue Heron
	Aluminum	Mouse	0.03	1.93	2.3E+00	5.2E-01	1.1E+02	1.1E+02	1.1E+02	1.1E+02	1.1E+02
3	Antimony	Mouse	0.03	0.125	1.5E-01	3.4E-02	1.5E-02	1.5E-02	1.5E-02	1.5E-02	1.5E-02
	Arsenic	Mouse	0.03	0.126	1.5E-01	3.4E-02	5.1E+00	5.1E+00	5.1E+00	5.1E+00	5.1E+00
	Barium	Rat	0.35	5.1	1.1E+01	2.5E+00	2.1E+01	2.1E+01	2.1E+01	2.1E+01	2.1E+01
3	Beryllium	Rat	0.35	0.66	1.5E+00	3.3E-01	1.5E-01	1.5E-01	1.5E-01	1.5E-01	1.5E-01
	Cadmium	Rat	0.303	1	2.1E+00	4.8E-01	1.5E+00	1.5E+00	1.5E+00	1.5E+00	1.5E+00
1	Chromium	Rat	0.35	3.28	7.2E+00	1.6E+00	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0E+00
2,9	Cobalt		Not applicable		1.0E+01	1.0E+01	1.3E+00	1.3E+00	1.3E+00	1.3E+00	1.3E+00
	Copper	Mink	1	11.71	3.3E+01	7.6E+00	4.7E+01	4.7E+01	4.7E+01	4.7E+01	4.7E+01
	Lead	Rat	0.35	8	1.8E+01	4.0E+00	1.1E+00	1.1E+00	1.1E+00	1.1E+00	1.1E+00
	Manganese	Rat	0.35	88	1.9E+02	4.4E+01	9.8E+02	9.8E+02	9.8E+02	9.8E+02	9.8E+02
	Mercury	Mink	1	1.01	2.9E+00	6.5E-01	4.5E-01	4.5E-01	4.5E-01	4.5E-01	4.5E-01
	Nickel	Rat	0.35	40	8.8E+01	2.0E+01	7.7E+01	7.7E+01	7.7E+01	7.7E+01	7.7E+01
	Selenium	Rat	0.35	0.2	4.4E-01	9.9E-02	4.0E-01	4.0E-01	4.0E-01	4.0E-01	4.0E-01
2,9	Silver	Mouse	0.03	0.375	4.5E-01	1.0E-01	1.8E+02	1.8E+02	1.8E+02	1.8E+02	1.8E+02
9	Thallium	Rat	0.365	0.0074	1.6E-02	3.7E-03	3.5E-01	3.5E-01	3.5E-01	3.5E-01	3.5E-01
	Vanadium	Rat	0.26	0.21	4.3E-01	9.7E-02	1.1E+01	1.1E+01	1.1E+01	1.1E+01	1.1E+01
	Zinc	Rat	0.35	160	3.5E+02	7.9E+01	1.4E+01	1.4E+01	1.4E+01	1.4E+01	1.4E+01
6	4,4'-DDD	Rat	0.35	0.8	1.8E+00	4.0E-01	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03
6	4,4'-DDE	Rat	0.35	0.8	1.8E+00	4.0E-01	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03
6	4,4'-DDT	Rat	0.35	0.8	1.8E+00	4.0E-01	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03
	4-Methylphenol		No data		No data	No data	No data	No data	No data	No data	No data
7	Aroclor 1248	Monkey	5	0.01	4.3E-02	9.6E-03	1.8E-01	1.8E-01	1.8E-01	1.8E-01	1.8E-01
4,7	Aroclor 1260	Monkey	5	0.01	4.3E-02	9.6E-03	1.8E-01	1.8E-01	1.8E-01	1.8E-01	1.8E-01
	Butylbenzylphthalate		No data		No data	No data	No data	No data	No data	No data	No data
9	Cyanide	Rat	0.273	68.7	1.4E+02	3.2E+01	4.0E-02	4.0E-02	4.0E-02	4.0E-02	4.0E-02
	Dibenzofuran		No data		No data	No data	No data	No data	No data	No data	No data
	Dieldrin	Rat	0.35	0.02	4.4E-02	9.9E-03	7.7E-02	7.7E-02	7.7E-02	7.7E-02	7.7E-02
	Di-n-butylphthalate	Mouse	0.03	550	6.5E+02	1.5E+02	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
3	Methoxychlor	Rat	0.35	4	8.8E+00	2.0E+00	4.0E-01	4.0E-01	4.0E-01	4.0E-01	4.0E-01

Table 2-11: continued

		Laboratory TRVs			Mammalian TRVs		Avian TRVs				
		Species	BW (kg)	NOAEL (mg/kg/day)	Shrew	Raccoon	Willow Flycatcher	American Robin	Red-tailed Hawk	Mallard Duck	Great Blue Heron
9	Pentachlorophenol	Rat	0.35	0.24	5.3E-01	1.2E-01	4.0E+00	4.0E+00	4.0E+00	4.0E+00	4.0E+00
5,8	Acenaphthene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Acenaphthylene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Anthracene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
2,8	Benzo(a)anthracene	Mouse	0.03	0.176	2.1E-01	4.7E-02	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
3	Benzo(a)pyrene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Benzo(b)fluoranthene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Benzo(g,h,i)perylene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Benzo(k)fluoranthene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Chrysene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
2,8	Dibenz(a,h)anthracene	Rat	0.35	0.002	4.4E-03	9.9E-04	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Fluoranthene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Fluorene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Indeno(1,2,3-cd)pyrene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
2,8	Naphthalene	Rat	0.35	50	1.1E+02	2.5E+01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Phenanthrene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01
5,8	Pyrene	Mouse	0.03	1	1.2E+00	2.7E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01	1.0E-01

Notes: Mammalian TRVs (i.e., shrew and raccoon) were extrapolated from the laboratory mammalian toxicity data (e.g., rat or mouse) and the allometric scaling equation provided by Sample et al. (1996). Mammalian receptor body weights are summarized in Table 2-8.

Avian TRVs (i.e., willow flycatcher, robin, hawk, mallard duck and heron) were based on laboratory avian toxicity data (not summarized in this table) provided by Sample et al. (1996) without allometric scaling.

TRV Source: Sample et al. (1996) with the exception of COPC marked with the following notes (see far left column; also described in body of report):

1 Hexavalent Cr TRV used for mammals; trivalent Cr TRV used for birds
2 Most conservative TRV for mammals provided in ARAMS Terrestrial Toxicity Database (USACHPPM 2001)
3 Safety factor of 10 applied to test species mammalian TRV value to generate avian TRV
4 Data for Aroclor 1248 substituted for mammals
5 Data for benzo[a]pyrene substituted for mammals
6 Data for DDT cited by Sample et al. (1998) substituted for mammals and birds
7 Lowest TRV for PCBs (Aroclor 1254) cited by Sample et al. (1998) substituted for birds.
8 Data for benzo[a]pyrene substituted for birds
9 Most conservative TRV for birds provided in ARAMS Terrestrial Toxicity Database (USACHPPM 2001)

Table 2-12: Summary of NOAEL-based HQs for wildlife receptors

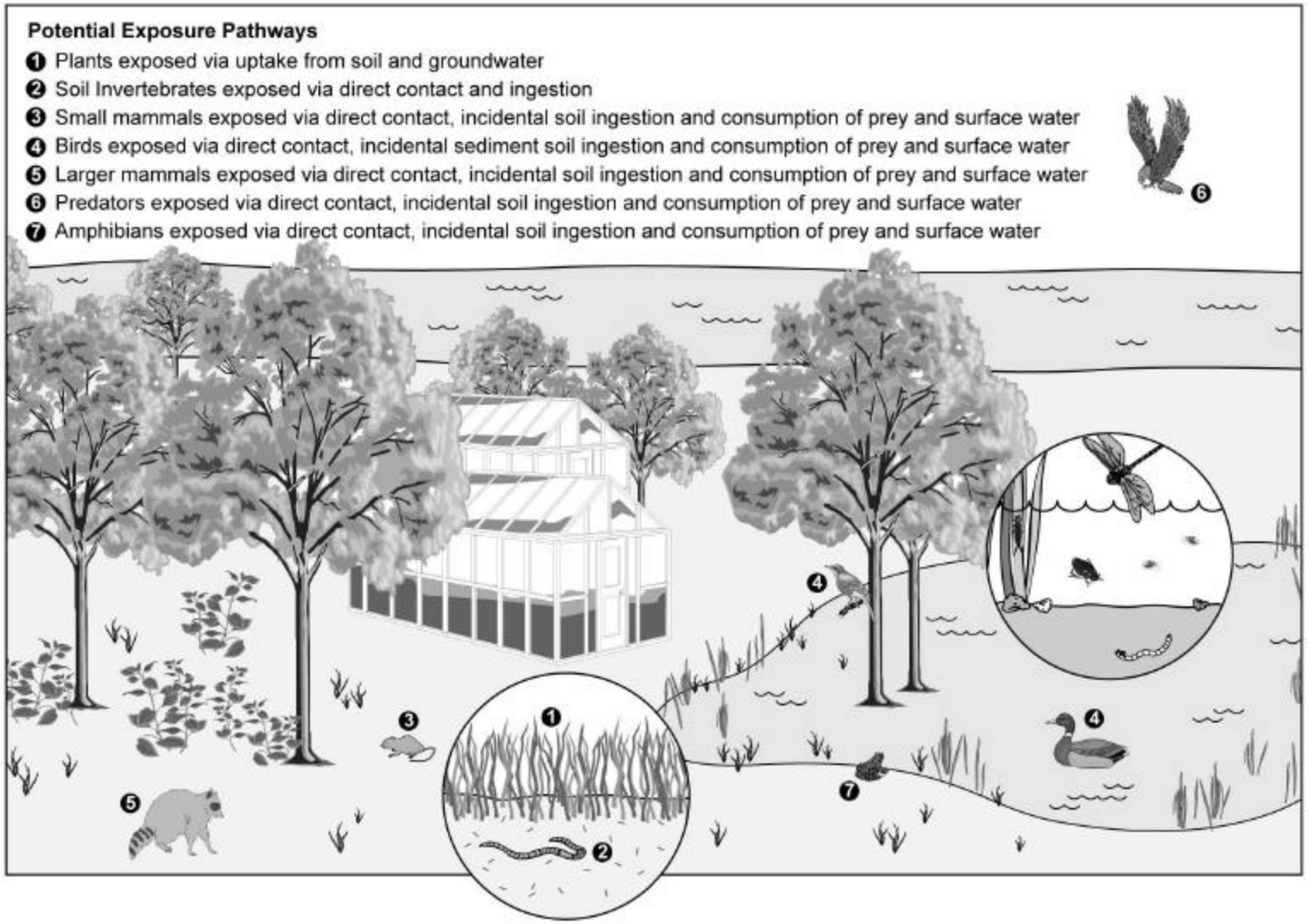
	Shrew	Raccoon	Willow Flycatcher	American Robin	Red-tailed Hawk	Mallard Duck	Great Blue Heron
Aluminum	989	56	29	16	0.0	1.6	0.0
Antimony	23	1.3	378	221	1.1	5.0	0.8
Arsenic	20	1.3	0.6	0.5	0.0	0.2	0.0
Chromium	2.0	0.1	1.5	1.3	0.0	0.2	0.1
Beryllium	0.1	0.0	3.4	1.9	0.0	0.3	0.0
Cadmium	0.6	0.2	1.6	1.0	0.0	0.2	0.1
Chromium	0.4	0.0	0.7	1.3	0.0	0.4	0.0
Cobalt	0.2	0.0	2.0	1.1	0.0	0.6	0.4
Copper	0.1	0.1	0.0	0.2	0.0	0.0	0.0
Lead	0.7	1.4	4.9	7.7	0.2	14	0.0
Manganese	0.4	0.4	0.1	0.1	0.0	0.0	0.0
Mercury	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nickel	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Selenium	0.4	0.0	0.6	0.3	0.0	0.1	0.0
Silver	0.6	0.1	0.0	0.0	0.0	0.0	0.0
Thallium	33	1.7	2.1	1.2	0.0	0.0	0.0
Vanadium	16	1.5	0.9	0.5	0.0	0.1	0.0
Zinc	0.3	0.2	12	5.8	0.2	3.1	2.9
4,4'-DDD	5.7	0.4	7015	3407	32	51	11
4,4'-DDE	0.7	0.0	801	389	3.6	31	1.2
4,4'-DDT	5.3	0.4	6470	3130	29	645	9.8
4-Methylphenol							
Aroclor 1248	50	3.7	23	11	0.1	0.0	0.0
Aroclor 1260	8.4	0.6	3.9	1.9	0.0	0.0	0.0
Butylbenzylphthalate							
Cyanide	0.0	0.0	50	26	0.3	2.8	1.4
Dibenzofuran							
Dieldrin	2244	95	2756	1289	0.0	2.7	2.3
Di-n-butylphthalate	1.6	0.1	20307	9502	0.3	0.7	30
Methoxychlor	55	2.3	2620	1226	0.0	0.0	2.2
Pentachlorophenol	6117	259	1722	806	0.0	0.0	1.5
Acenaphthene	0.1	0.0	1.2	2.2	0.1	0.4	0.0
Acenaphthylene	0.1	0.0	1.2	1.9	0.1	0.0	0.0
Anthracene	0.2	0.0	1.7	2.0	0.1	1.3	0.0
Benzo(a)anthracene	1.5	0.4	1.4	1.8	0.2	2.0	0.0
Benzo(a)pyrene	0.4	0.1	4.1	2.8	0.3	2.2	0.0
Benzo(b)fluoranthene	0.6	0.2	6.0	4.6	0.5	1.9	0.1
Benzo(g,h,i)perylene	0.2	0.0	2.1	1.5	0.1	0.8	0.0
Benzo(k)fluoranthene	0.1	0.0	1.0	0.7	0.1	2.0	0.0
Chrysene	0.3	0.1	1.8	1.9	0.2	1.8	0.0
Dibenz(a,h)anthracene	25	6.2	0.9	0.7	0.1	0.4	0.0
Fluoranthene	0.8	0.2	8.4	7.6	0.6	4.8	0.1
Fluorene	0.1	0.0	1.1	1.6	0.1	0.4	0.0
Indeno(1,2,3-cd)pyrene	0.2	0.0	1.7	1.2	0.1	1.0	0.0
Naphthalene	0.0	0.0	1.6	4.9	0.1	0.1	0.0
Phenanthrene	0.2	0.1	2.5	3.2	0.2	4.0	0.0
Pyrene	0.4	0.1	4.4	4.0	0.3	4.4	0.0

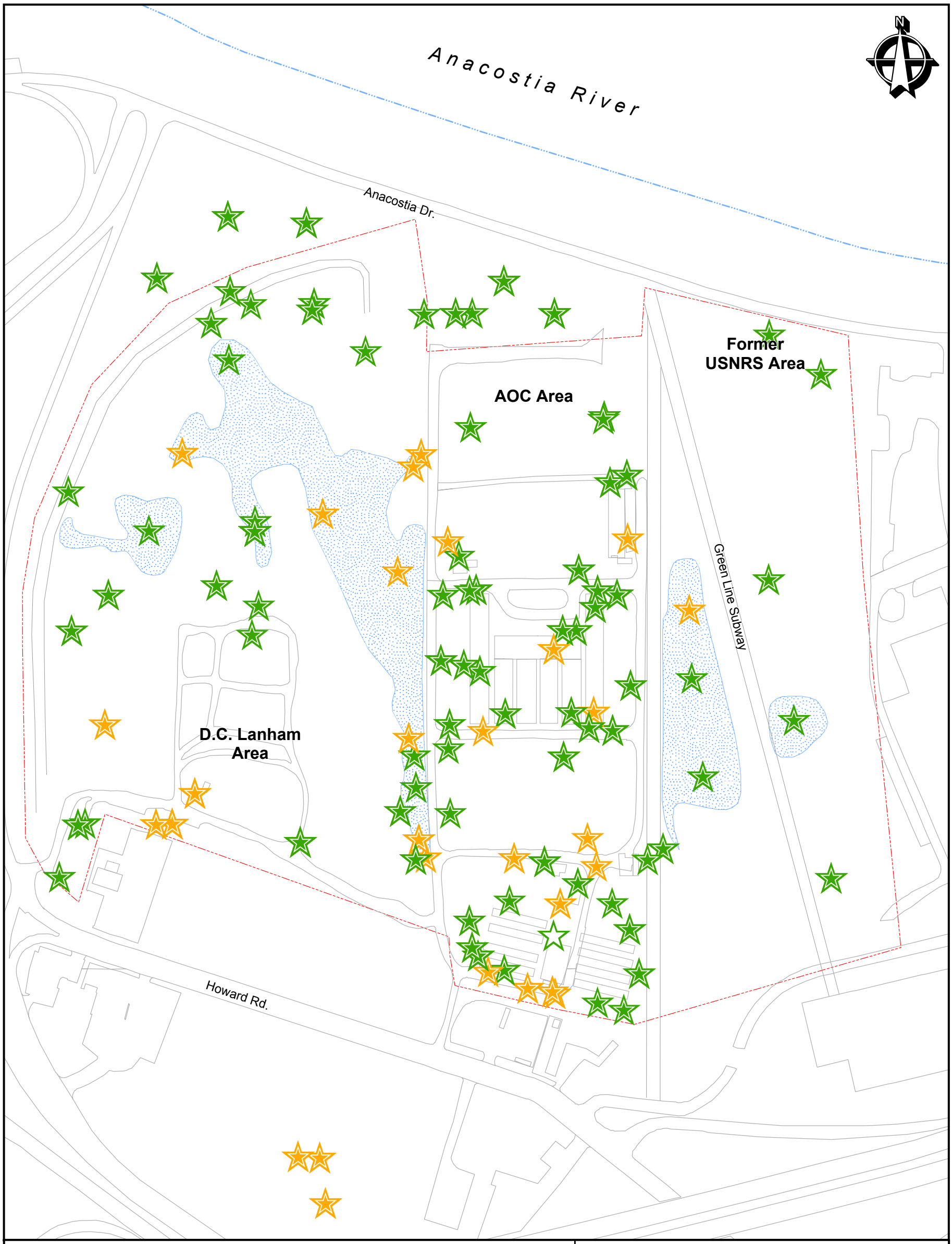
Notes: HQs greater than 10 are indicated by white text on a dark background while HQs greater than 1 are indicated by black text on a shaded background.

Table 2-13: Comparison of soil COPC concentrations used for food chain model between Environ (2002) and this screening-level ERA

	CURRENT DOCUMENT (MG/KG)	ENVIRON (2002) (MG/KG	OVERALL DIFFERENCE IN COPC CONCENTRATION
Aluminum	1.1E+04	Not included	Unknown
Antimony	1.6E+01	Not included	Unknown
Arsenic	2.1E+01	Not included	Unknown
Barium	1.1E+02	Not included	Unknown
Beryllium	7.6E-01	6.16E-01	Increased
Cadmium	1.8E+00	2.06E+00	Decreased
Chromium	3.7E+01	2.07E+01	Increased
Cobalt	9.0E+00	Not included	Unknown
Copper	3.4E+01	3.21E+01	Increased
Lead	1.2E+02	1.08E+02	Increased
Manganese	3.9E+02	Not included	Unknown
Mercury	2.5E-01	1.81E-01	Increased
Nickel	2.4E+01	1.73E+01	Increased
Selenium	7.9E-01	Not included	Unknown
Silver	1.3E+00	Not included	Unknown
Thallium	2.6E+00	1.49E-01	Increased
Vanadium	3.3E+01	Not included	Unknown
Zinc	2.3E+02	1.31E+02	Increased
4,4'-DDD	1.2E+01	6.51E-01	Increased
4,4'-DDE	1.4E+00	6.00E-01	Increased
4,4'-DDT	1.1E+01	5.13E-01	Increased
4-Methylphenol	3.4E-01	Not included	Unknown
Aroclor 1248	2.8E+00	Not included	Unknown
Aroclor 1260	4.8E-01	9.59E-01	Decreased
Butylbenzylphthalate	9.9E+00	Not included	Unknown
Cyanide	1.4E+00	Not included	Unknown
Dibenzofuran	6.0E-01	Not included	Unknown
Dieldrin	9.2E-02	Not included	Unknown
Di-n-butylphthalate	4.1E+00	1.49E+00	Increased
Methoxychlor	7.9E-01	1.00E+00	Decreased
Pentachlorophenol	5.2E+00	Not included	Unknown
Acenaphthene	1.1E+00	6.73E-01	Increased
Acenaphthylene	1.1E+00	6.49E-01	Increased
Anthracene	1.6E+00	1.19E+00	Increased
Benzo(a)anthracene	3.2E+00	4.26E+00	Decreased
Benzo(a)pyrene	4.2E+00	5.47E+00	Decreased
Benzo(b)fluoranthene	6.3E+00	8.64E+00	Decreased
Benzo(g,h,i)perylene	2.0E+00	2.32E+00	Decreased
Benzo(k)fluoranthene	9.2E-01	Not included	Unknown
Chrysene	3.1E+00	4.13E+00	Decreased
Dibenz(a,h)anthracene	9.2E-01	8.63E+00	Decreased
Fluoranthene	7.7E+00	1.14E+01	Decreased
Fluorene	1.0E+00	7.63E-01	Increased
Indeno(1,2,3-cd)pyrene	1.5E+00	1.81E+01	Decreased
Naphthalene	1.4E+00	7.49E-01	Increased
Phenanthrene	2.3E+00	Not included	Unknown
Pyrene	4.1E+00	5.83E+00	Decreased

Figure 2-1: Conceptual model for Poplar Point screening-level ERA





LEGEND

Chromium
Hazard Quotients (HQ)

- HQ > 10 based on a quantifiable concentration
- HQ > 1 based on a quantifiable concentration
- HQ > 1 based on a non-detect concentration
- HQ < 1
- No colour indicates data not available for that sample.

Wetland

Soil Invertebrates HQ (Middle Color)

Plants HQ (Outside Color)

Projection: State Plane, Zone 1900, NAD 83

100 0 100 200 300 400 Feet

EVS environment consultants

PROJECT: Poplar Point Screening Level ERA

LOCATION: Washington, D.C.

CLIENT: Ridolfi Inc.

TITLE:

Potential Risks to Plants and Soil Invertebrates (Chromium)

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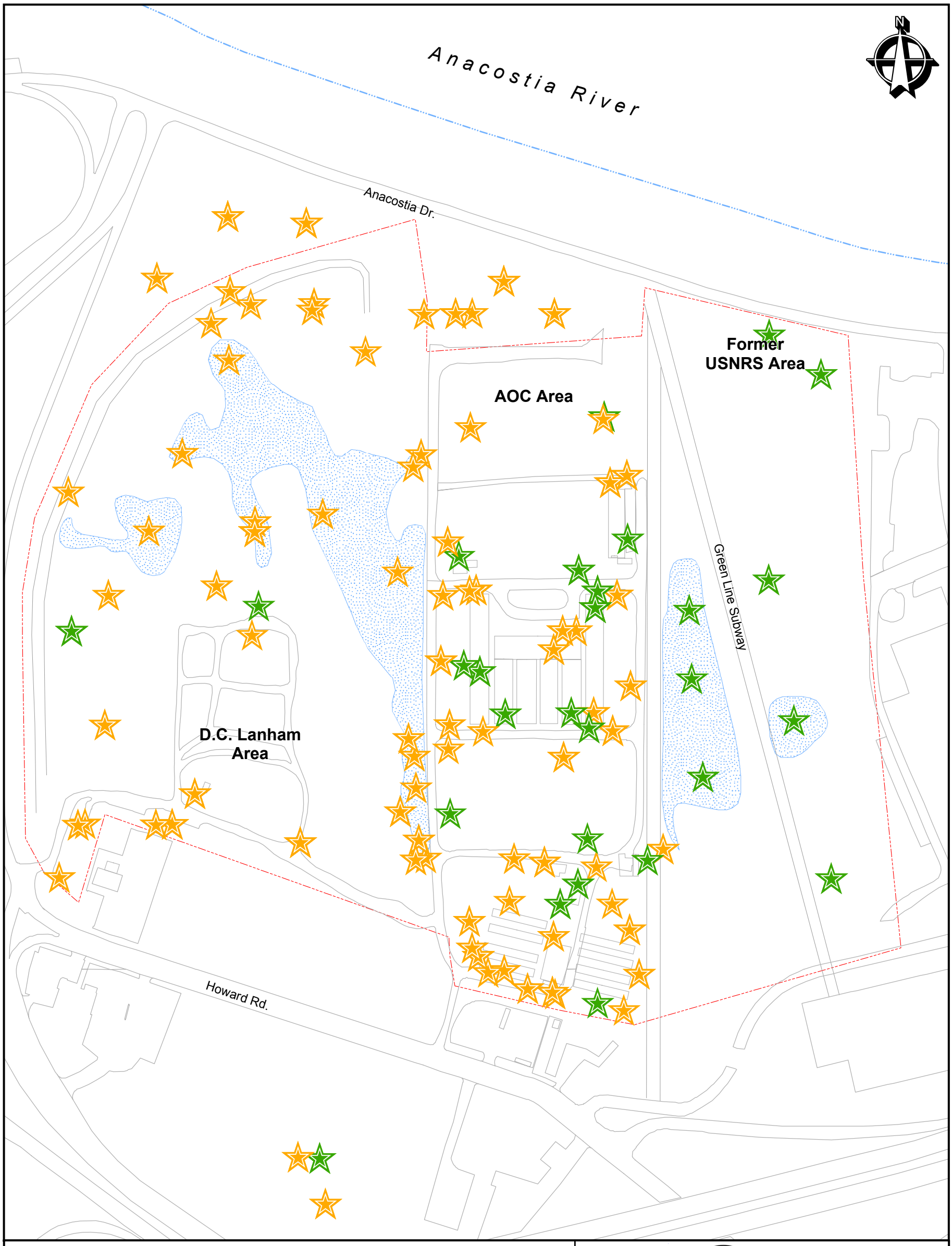
GGC	BGM	03-0789-35
SCALE: 1:2300	DATE: 01/2004	**FIGURE 2-2**



LEGEND

Lead
Hazard Quotients (HQ)

- HQ > 10 based on a quantifiable concentration
- HQ > 1 based on a quantifiable concentration
- HQ > 1 based on a non-detect concentration
- HQ < 1
- No colour indicates data not available for that sample.

Wetland

Soil Invertebrates HQ (Middle Color)

Plants HQ (Outside Color)

Projection: State Plane, Zone 1900, NAD 83

100 0 100 200 300 400 Feet

EVS environment consultants

PROJECT: Poplar Point Screening Level ERA

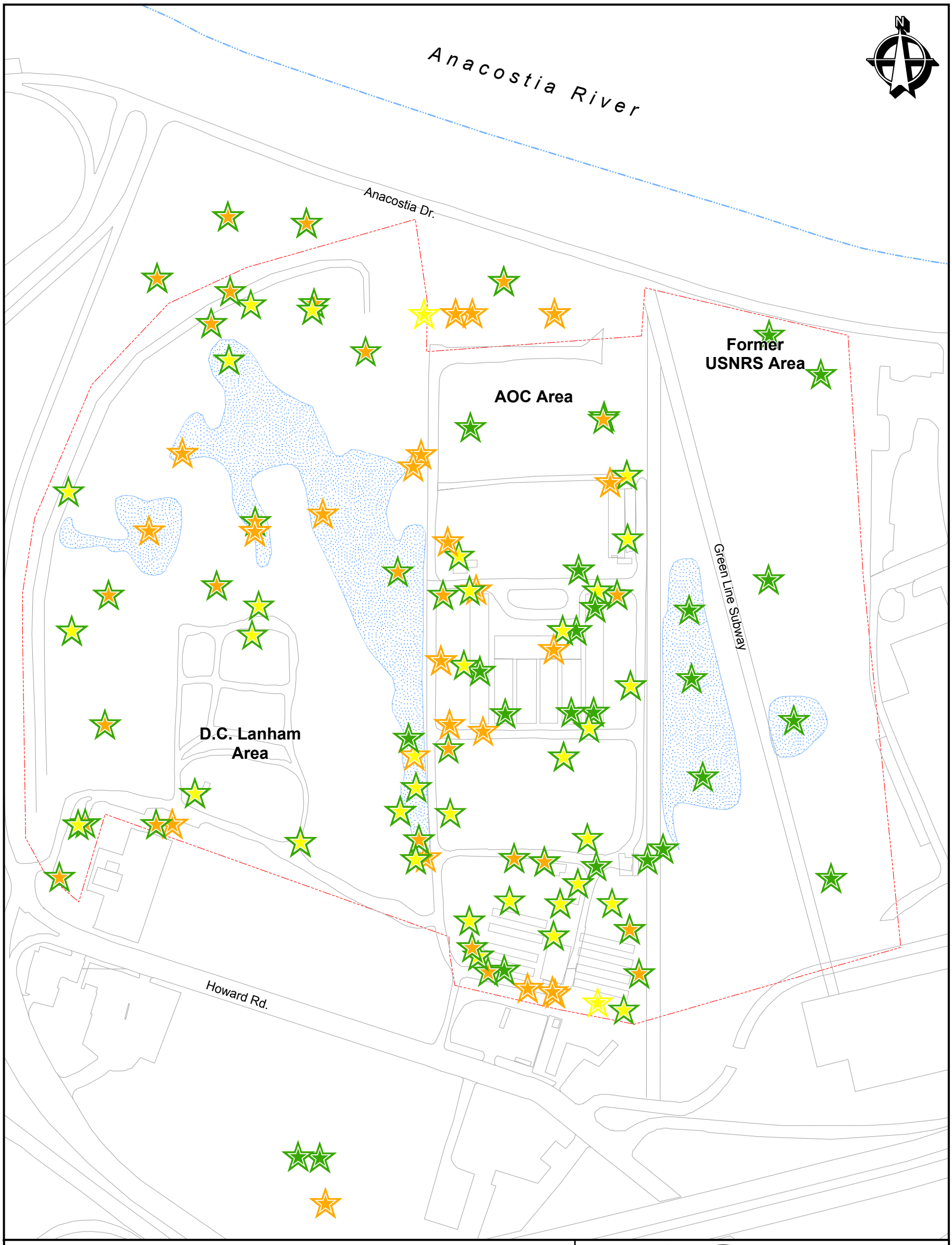
LOCATION: Washington, D.C.

CLIENT: Ridolfi Inc.

TITLE:

Potential Risks to Plants and Soil Invertebrates (Lead)

DWG BY:	CHK BY:	PROJECT No.:
GGC	BGM	03-0789-35
SCALE: 1:2300	DATE: 01/2004	**FIGURE 2-3**



LEGEND

Mercury
Hazard Quotients (HQ)

- HQ > 10 based on a quantifiable concentration
- HQ > 1 based on a quantifiable concentration
- HQ > 1 based on a non-detect concentration
- HQ < 1
- No colour indicates data not available for that sample.

Wetland

Soil Invertebrates HQ (Middle Color)

Plants HQ (Outside Color)

Projection: State Plane, Zone 1900, NAD 83

100 0 100 200 300 400 Feet

EVS environment consultants

PROJECT: Poplar Point Screening Level ERA

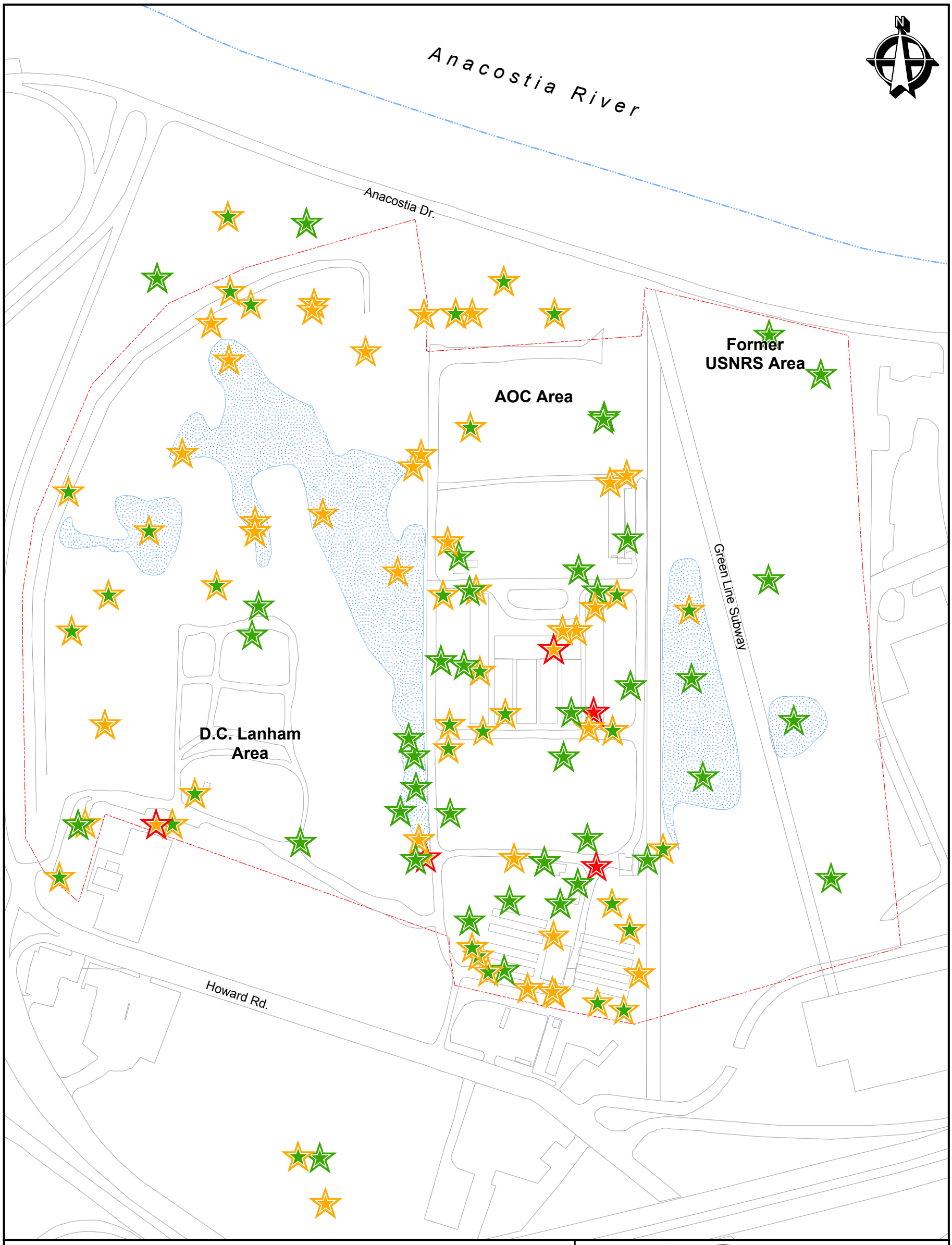
LOCATION: Washington, D.C.

CLIENT: Ridolfi Inc.

TITLE:

Potential Risks to Plants and Soil Invertebrates (Mercury)

DWG BY:	CHK BY:	PROJECT No.:
GGC	BGM	03-0789-35
SCALE: 1:2300	DATE: 01/2004	**FIGURE 2-4**



LEGEND

Zinc
Hazard Quotients (HQ)

- HQ > 10 based on a quantifiable concentration
- HQ > 1 based on a quantifiable concentration
- HQ > 1 based on a non-detect concentration
- HQ < 1
- No colour indicates data not available for that sample.

Wetland

Soil Invertebrates HQ (Middle Color)

Plants HQ (Outside Color)

Projection: State Plane, Zone 1900, NAD 83

100 0 100 200 300 400 Feet

EVS environment consultants

PROJECT: Poplar Point Screening Level ERA

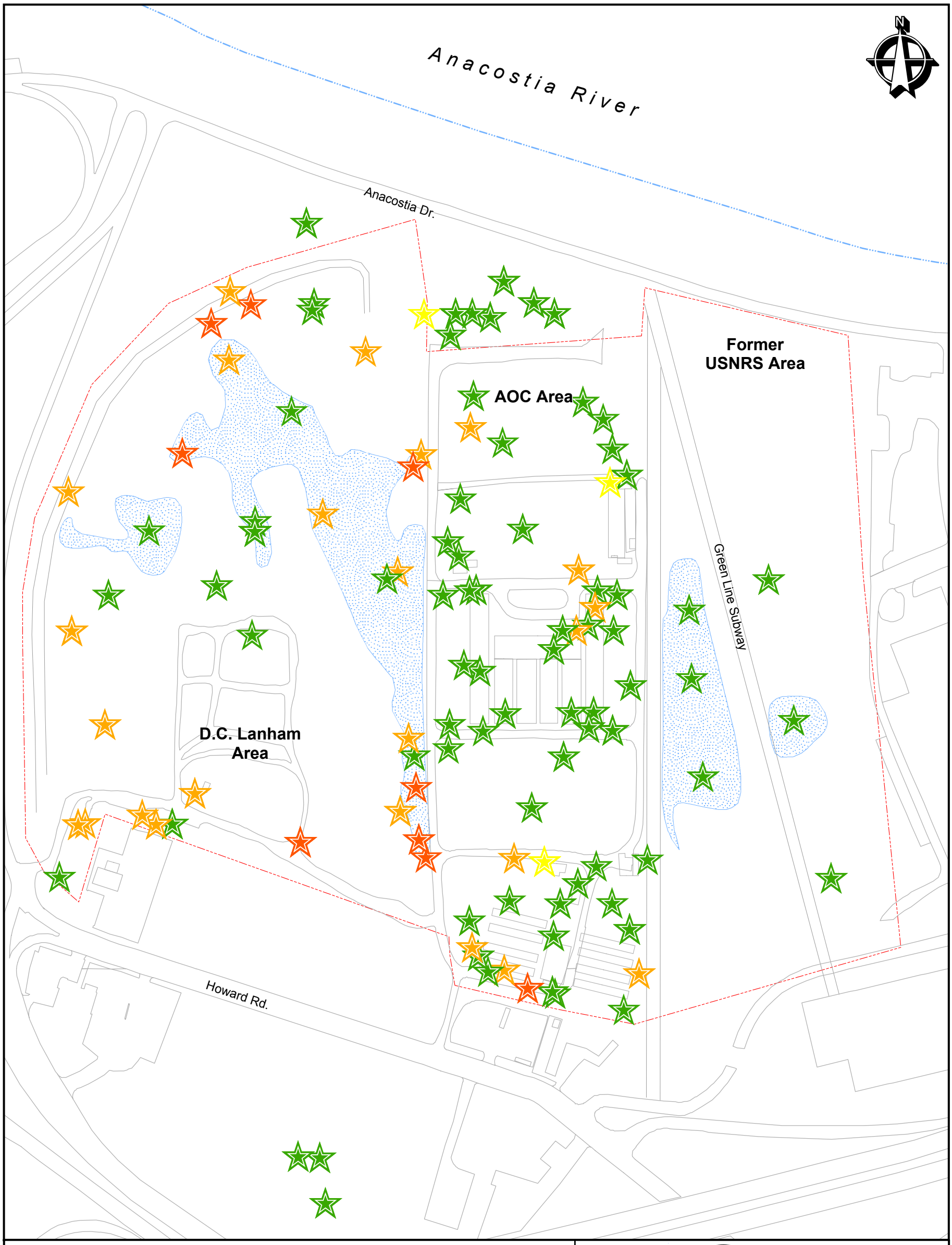
LOCATION: Washington, D.C.

CLIENT: Ridolfi Inc.

TITLE:

Potential Risks to Plants and Soil Invertebrates (Zinc)

DWG BY:	CHK BY:	PROJECT No.:
GGC	BGM	03-0789-35
SCALE: 1:2300	DATE: 01/2004	**FIGURE 2-5**



LEGEND

4,4' DDT
Hazard Quotients (HQ)

- HQ > 10 based on a quantifiable concentration
- HQ > 1 based on a quantifiable concentration
- HQ > 1 based on a non-detect concentration
- HQ < 1
- No colour indicates data not available for that sample.

Wetland

Soil Invertebrates HQ (Middle Color)

Plants HQ (Outside Color)

Projection: State Plane, Zone 1900, NAD 83

100 0 100 200 300 400 Feet

EVS environment consultants

PROJECT: Poplar Point Screening Level ERA

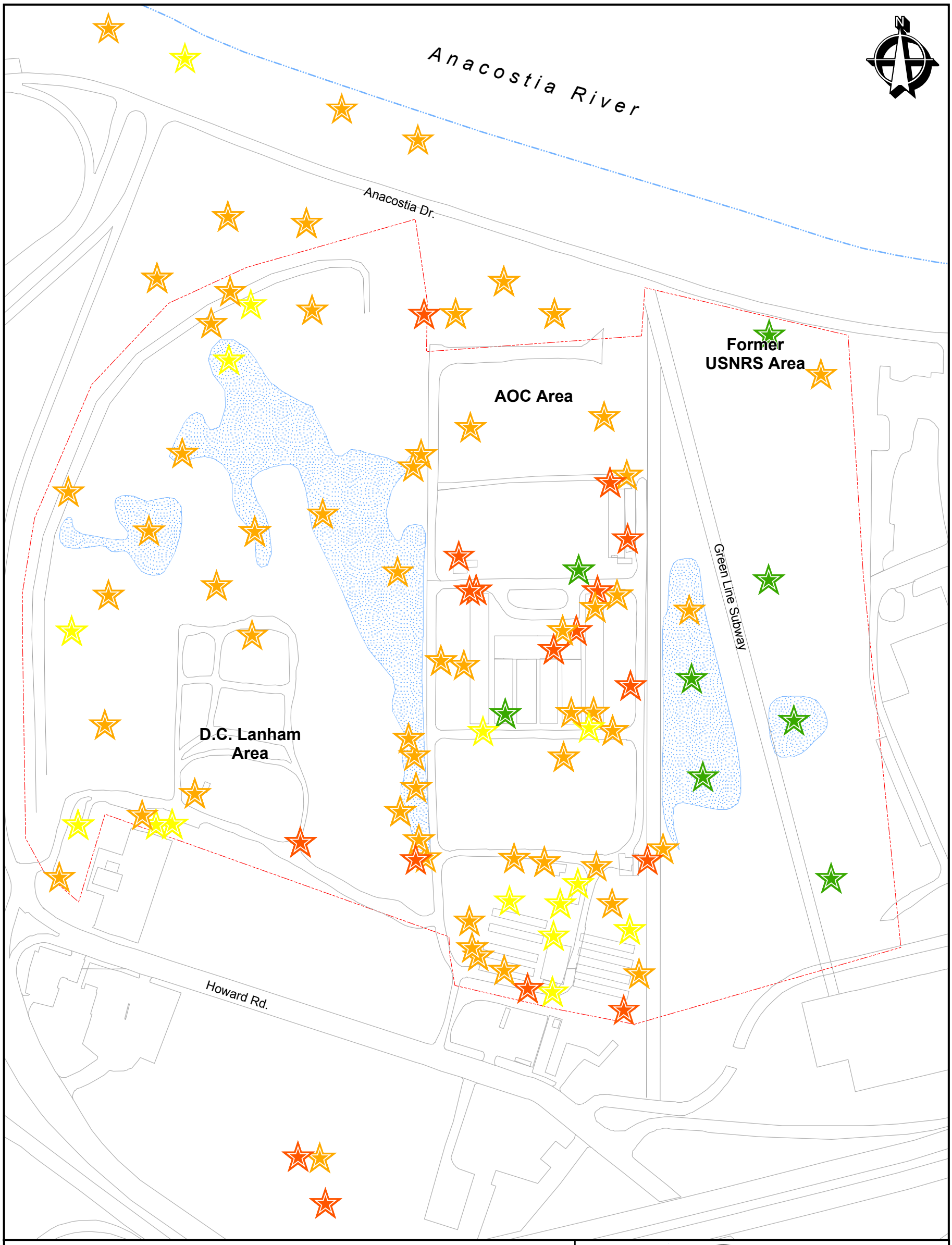
LOCATION: Washington, D.C.

CLIENT: Ridolfi Inc.

TITLE:

Potential Risks to Plants and Soil Invertebrates (4,4' DDT)

DWG BY:	CHK BY:	PROJECT No.:
GGC	BGM	03-0789-35
SCALE: 1:2300	DATE: 01/2004	**FIGURE 2-6**



LEGEND

Fluoranthene
Hazard Quotients (HQ)

- HQ > 10 based on a quantifiable concentration
- HQ > 1 based on a quantifiable concentration
- HQ > 1 based on a non-detect concentration
- HQ < 1
- No colour indicates data not available for that sample.

Wetland

Soil Invertebrates HQ (Middle Color)

Plants HQ (Outside Color)

Projection: State Plane, Zone 1900, NAD 83

100 0 100 200 300 400 Feet

EVS environment consultants

PROJECT: Poplar Point Screening Level ERA

LOCATION: Washington, D.C.

CLIENT: Ridolfi Inc.

TITLE:

Potential Risks to Plants and Soil Invertebrates (Fluoranthene)

DWG BY:	CHK BY:	PROJECT No.:
GGC	BGM	03-0789-35
SCALE: 1:2300	DATE: 01/2004	**FIGURE 2-7**

3. SCREENING-LEVEL HUMAN HEALTH RISK ASSESSMENT

3.1 HUMAN HEALTH PROBLEM FORMULATION

3.1.1 Background Information

The Problem Formulation is conducted to understand (1) what potentially harmful substances (i.e., contaminants present at concentrations in excess of generic criteria) are present at the site, (2) how human receptors may use the site and (3) the pathways of contact that are possible between the receptors and these substances. The conceptual site model for the human health risk assessment, which graphically presents the results of the problem formulation, is illustrated in Figure 3-1. The COPCs, site users and corresponding exposure pathways are examined in detail to identify "reasonably anticipated" combinations that contribute to potential risk.

The following components are typically used to generate a conceptual site model:

- Assessment of current and future land use conditions.
- Identification of potential current and future site users.
- Identification of substances located on-site in concentrations that exceed appropriate generic criteria.
- Identification of the media in which COPCs are located (i.e., soil, groundwater, air, surface water, and sediment).
- Identification of routes by which site users may come into contact with COPCs.
- Identification of possibility that COPCs may migrate off-site.

After careful evaluation of the potential risks to site users, it is possible to identify whether scenarios exist that could pose a risk. If a potentially unacceptable risk scenario is identified, then a more detailed examination or quantitative risk assessment of the site is warranted. A more detailed examination of the site involves conducting the remaining stages of the risk assessment (exposure and toxicity assessments and risk characterization).

3.1.2 Summary of Previous Human Health Risk Assessments

Environ (2002) conducted a human health risk-based evaluation for the Poplar Point site and found that only surface soil arsenic and benzo(a)pyrene 95 % UCL values exceeded the risk based screening levels that were developed utilizing current USEPA guidance. Risk based screening levels (RBSLs) were derived utilizing a carcinogenic risk threshold of one in 100,000 (e.g. 1E-5) and a hazard index of 1. Environ then developed contour

concentrations for arsenic and benzo(a)pyrene utilizing kriging to enable the calculation of a weighted site-wide average concentration for each chemical. Only the arsenic weighted site-wide average concentration exceeded the RBSL. There were no other exceedances in the other media assessed (subsurface soil, shallow groundwater [construction workers only] and surface water). EVS will be conducting a subsequent human health risk assessment to incorporate additional data that have been collected since the Environ report by Ridolfi (2003) and because the intended future land use has changed somewhat since Environ conducted its assessment.

3.1.3 Assessment of Current and Future Land Use Conditions

3.1.3.1 Population Demographics in Surrounding Area

The census tract within which the Poplar Point Site is situated consists of 2,996 people (US Census, 2000). Of the population living near the Poplar Point site, 42% are male and 58% are female. The median age is 20.8 years and children under 15 account for 38.7% of the population. Only 4.9% of the population is 65 or older, while 10.5% is younger than 5 years old. The majority of the housing units are rented (98%) and 58.7% of the families live below the 1999 poverty level. The park, which is planned for the Poplar Point site will become a part of the National Park Services' Anacostia Park, which is one of Washington, D.C.'s largest and most important recreation areas encompassing over 1200 acres. Anacostia Park is part of the National Capital Parks East, which includes 12 major park areas that offer a wide array of historic, natural, and recreational opportunities in Washington, D.C. and its eastern environs. As a result, park users are expected to come from all areas of Washington, D.C. and will not be limited to adjacent residents as is often the case with small, urban parks.

3.1.3.2 Current Land Use

The site has remained vacant for the past 10 years. Some site buildings have been destroyed and limited remedial activities have been conducted (i.e., removal of underground and above ground storage tanks). The site is returning to its original state and is becoming highly vegetated. Site access is controlled by a locked gate at the site entrance located just north of Howard Road and a chain link fence encompassing the perimeter of the site. Although the fence is breached in at least one location, the site does not appear to be used for recreational purposes by off-site residents from adjacent neighborhoods. There is an elementary school in the vicinity of the site, but the children are supervised and do not appear to access the site.

3.1.3.3 Future Land Use

The future land use scenario for the site is a park that may have wetlands and a visitor center (i.e., a semi-natural area that is heavily vegetated, with increased wetland areas rather than an urban park). The park is anticipated to contain a series of boardwalks across the wetland areas, to allow visitors opportunities to view wildlife. There will be limited opportunity to access site soils and surface water bodies, if visitors remain on boardwalks as indicated. Exposure will likely only occur if visitors stray from marked boardwalks and walking paths. The park is expected to be a passive recreational area without playground or other recreational facilities (i.e., playing fields). Another possible modification to current site conditions includes the construction of a channel linking the wetland areas to the river, thereby, allowing fish from the Anacostia to migrate to surface water bodies on-site. Currently, the wetlands are seasonal, dry in the summer and fall months and wet in the winter and early spring. However, with the cessation of the operation of the Stickfoot sewer and associated pumping of surface water away from the site, the wetland areas are expected to increase over time.

3.1.3.4 Assessment of Potential Current and Future Site Users

Based on the current knowledge of current and future proposed land use the following receptors of potential concern have been identified. If the proposed future land use changes, then selection of receptors of concern should be revisited in order to ensure that these assumptions are protective of activities which make take place on and off-site.

Current Land Use Scenario—

Adult trespassers/transients: During recent field investigations, site investigators have noted the presence of adult trespassers that appear to be residing in the green houses on-site. The adult trespassers could potentially come into (1) direct contact (inhalation of particulates/dust, incidental ingestion and dermal contact) with the surface soil on-site, (2) dermal contact with and/or ingestion of surface water and (3) dermal contact with and/or ingestion of sediment (seasonal). There are currently no fish present in the surface water bodies on-site and therefore this exposure scenario is not operable at the present time.

Current off-site Residents: Current exposures to off-site residents, who live adjacent to the site, are limited, as residents do not appear to access the site. The site is also well vegetated, reducing the potential for dust and particulate matter to reach adjacent neighborhoods. Inhalation of fugitive dust and particulates from site surface soils was included for evaluation in this risk assessment.

Future Land Use Scenario —

Park visitors (child, adult and combined receptors): Park visitors are expected to come to enjoy the wildlife viewing opportunities in a controlled setting (i.e., network of boardwalk paths). Park users could be expected to have limited opportunities to come into contact with site media, if they participate in activities other than those permitted (i.e., walking off the boardwalks, wading in the wetlands etc.). Therefore, potential operable exposure pathways include direct surface soil contact (incidental ingestion, inhalation of particulates/dust and dermal contact), direct surface water contact (incidental ingestion and dermal contact), direct sediment contact (incidental ingestion and dermal contact) and ingestion of fish caught on-site. One would assume, that fishing would not be expected to be an encouraged activity within the wetland park. However, for purposes of the risk assessment, the assumption will be made that this pathway is operable as the surrounding area is a popular fishing spot, despite a current fish advisory. It is also unlikely, that there will be sufficient fish in the surface water bodies for a receptor population to regularly consume a fish meal from fish caught in the park. Surface water and sediment contact may be expected from seasonal wading in the wetland areas, although this activity is not likely to be sanctioned as an acceptable use of the park. The combined receptor is a hypothetical receptor that approximates exposure over the first 30 years of life for assessment of carcinogens.

Park workers: Park workers will be involved in a variety of activities on site, ranging from park maintenance to staffing an interpretive nature center and possibly leading nature walks/educational activities. Park workers are expected to come into contact direct contact with surface soil (incidental ingestion, dermal contact and inhalation of dust/soil particulate), surface water (dermal contact only; no swimming) and sediment (incidental ingestion, and dermal contact). Park workers are not expected to come into contact with subsurface soil or groundwater because they will not be accessible during typical activities conducted by a worker on site. It is assumed that park workers will not swim or fish on-site and, therefore, ingestion of surface water and fish will not occur.

Construction workers: Construction workers are expected to be involved in short-term construction/remediation activities on-site to assist in development of the park. Construction workers will be expected to come into direct contact with surface and subsurface soil (incidental ingestion, dermal contact and inhalation of dust and particulate material), dermal contact with ground water (possible in excavation trenches), direct contact with surface water (incidental ingestion and dermal contact) and sediment (incidental ingestion and dermal contact). The construction worker is not expected to fish on-site and therefore ingestion of fish is not considered an operable exposure pathway for the construction worker.

Future Off-site residents (child, adult and combined receptors): Future off-site residents are those living in the residential neighborhoods in the vicinity of the site during and after the development of the park. Off-site residents have the potential to be impacted by particulate matter and dust originating from surface and subsurface soil, particularly during construction activities, as the site is and will be quite well vegetated. All other direct contact pathways with site materials are inoperable for off-site residents.

Park visitor and adjacent resident (child, adult and combined receptors): Park visitors who reside in the neighborhoods in the vicinity of the site will also be considered and will be a combined receptor (park visitor and off-site resident) to address potential impacts to frequent visitors who could also be potentially impacted by the site in their neighborhoods. Exposure pathways for park visitors and adjacent residents include direct contact with surface soil (incidental ingestion, inhalation of dust and particulates and dermal contact), inhalation of fugitive dust/particulates originating from subsurface soils during construction activities, direct contact with surface water (incidental ingestion and dermal contact) and sediment (incidental ingestion and dermal contact) and consumption of fish from the site. As with park visitor receptors, consumption of fish from the site is a conservative estimate because it is unlikely that the site will have enough fish to sustain a receptor population to regularly consume a fish meal from fish caught in the park.

3.1.4 Selection of Contaminants of Potential Concern

Maximum chemical concentrations in soil, groundwater, surface water and sediment were screened against both USEPA's Region 3 Risk Based Concentrations (RBCs, April/October 2003) and the District of Columbia's Risk Based Corrective Action Tier 1 Risk Based Screening Levels (RBSLs) for an Extended List of Chemicals to identify potential contaminants of concern (COPCs). Soil and sediment were screened using residential soil RBCs and RBSLs. Groundwater and surface water were screened using both residential tap water RBCs and residential groundwater RBSLs. Non-cancer RBCs were adjusted downward by an order of magnitude to reflect current USEPA Region III screening process (USEPA Region III 2003a). Surface water was also screened against the National Recommended Water Quality Criteria for Protection of Human Health (2000) for uptake by aquatic organisms (i.e., to protect against consumption of fish and biota potentially found in surface water bodies on site).

A summary of COPC screening by media is provided in Tables 3-1 through 3-6. Essential nutrients and vitamins have been eliminated from further consideration in the risk assessment, unless screening criteria were available. Background concentrations were considered for inorganic COPCs. For the purposes of this screening-level EHHRA, "background" was defined as the average COPC concentration from different areas in proximity to the study area that were considered unlikely to have been impacted by former site uses (Ridolfi, 2003). These areas included:

- Seven samples collected from the eastern portion of the study area.
- Three samples collected south of Howard Road (the southern site boundary).
- Four samples collected from the northern site boundary near Anacostia Drive.

Historical and ongoing anthropogenic COPC sources (e.g., Anacostia River sediment used as on-site fill; surrounding industrial land uses; adjacent highways; atmospheric deposition) are likely influencing the observed chemistry in the "background" samples collected by Ridolfi (2003). As a result, the application of these "background" COPC concentration should be limited—these concentrations are not intended to represent the natural concentrations of metals and metalloids that would be present in the absence of human activity, nor are they intended to represent a cleanup level for any remediation activity. The objective in including the calculated "background" concentrations from Ridolfi (2003) is to prioritize any subsequent data collection activities onto those COPCs that are connected to the former land use at Poplar Point. No inorganic COPCs were eliminated from the HHRA on the basis of comparison to the background concentrations developed by Ridolfi (2003).

Determination of an appropriate surface soil depth interval, adequacy of spatial coverage of soil samples and proportion of non-detects for COPCs were examined as part of the problem formulation and the findings are presented below.

3.1.4.1 Surface Depth Interval

The DC RBCA defines surficial soil as 0-1 ft below ground surface (bgs) in unpaved areas and EPA Region III defines surficial soil as (0-0.25 ft). EPA (RAGS, 1989) suggests the shallowest depth that can practically be obtained as preferable over the 0-2 ft interval. However, a significant portion of the surface soil data collected historically for this site were sampled from 0-2 ft bgs. The majority of the data in the 0-2 ft interval were collected by Brown in 1997 and 1999. Subsequent soil investigations conducted by Ridolfi (2003) were focused on addressing data gaps and utilized a narrower definition of surface soil (0-0.25 feet) in accordance with EPA policy.

A preliminary statistical analysis was conducted utilizing a Kolmogorov-Smirnov goodness-of-fit test to determine whether the data sets (0-0.25 ft and all samples between 0-2 ft) were comparable and whether a bias would be added to the data set by incorporating a "deeper", potentially clean layer. The results of the Kolmogorov-Smirnov goodness-of-fit test indicate that the two datasets for each of the following chemicals, Aroclor 1248, Aroclor 1260, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene, anthracene, dibenz(a,h)anthracene, chromium, and benzo(k)fluoranthene, were statistically different ($p<0.05$). Non-detect values were included in the data sets as the detection limit. A

parallel comparison was conducted by examining the mean, geometric mean, minimum, maximum, range, first quartile, third quartile and the interquartile range for the two data sets. The analysis suggests that of the eighteen analytes identified as potential soil contaminants of concern, six would be biased low if the 0-2 ft range was utilized for the risk assessment, however four of these potentially biased low data sets incorporated the maximum sample value collected on site within the 0-2 ft range.

In order to fully utilize available data, surface soil is considered to be 0-2 ft bgs for the purposes of this risk assessment so that maximum spatial coverage of the site will be retained without unduly biasing the dataset.

3.1.4.2 Spatial Coverage

Spatial coverage of the site was evaluated for COPCs identified in both the surface (0 – 2ft, inclusive) and subsurface (> 2ft) soil intervals for surface. The locations of all soil sampling sites are used as a rough indicator of the site area (i.e. locations of sampling stations provide good coverage of the site). As an informal procedure, graphs were constructed to quickly visually assess whether any of the COPCs showed a lack of sampling in a particular area of the site that would limit the risk assessment of the COPC to a particular portion of the site. In total, 153 soil-sampling stations were located on the site (not including samples SS-32, SS-30, SS-31, SB05, SB04, SB03, SB02 and SB01 which are outside the area of interest). Sampling locations covered the entire site with a greater density in the central southern section of the site and fewer stations along the western edge of the site.

Graphs showed that not all chemicals are sampled with the same frequency but generally were sampled throughout the entire site area. In general, there was greater sampling of the COPCs in the surface soil interval in comparison to the subsurface depth. As well, subsurface sampling of the COPCs was generally not conducted in the stations located in the western section of the site. In the surface soil, total chromium and Aroclor 1248 were sampled less frequently than the other COPCs, but stations were located over the majority of the site area. Antimony at surface depth was the only COPC that did not have extensive sampling coverage of the site; sampling was focused in the northern and center sections. Nonetheless, antimony was sampled estimated in approximately 65% of the site area.

3.1.4.3 Non-detected Values

Within the 0-2 ft depth interval, non-detects comprised a significant portion (>20%) of the datasets for the following COPCs:

- Anthracene (73%)
- Arcochlor 1248 (92%)
- Aroclor 1260 (59%)
- Benzo(a)anthracene (31%)
- Benzo(a)pyrene (27%)
- Benzo(b)fluoranthene (22%)
- Benzo(g,h,i)perylene (45%)
- Benzo(k)fluoranthene (32%
- Chrysene (28%)
- Dibenz(a,h)anthracene (85%)
- Fluoranthene (24%) and,
- Indeno (1,2,3-cd)pyrene (46%)

3.1.4.4 Chemical Concentrations Selected for HHRA Exposure Dose Modeling

Section 1.3 outlines how the 95% UCL values were calculated for each of the COPCs identified in the screening exercise, using bounding procedures outlined in USEPA (2002 b) as appropriate. Some media did not contain sufficient sample numbers to calculate a 95% UCL and in those cases (i.e., surface water, groundwater and sediment), the maximum value was used for risk assessment purposes. A multimedia approach was utilized in the risk assessment, as outlined in Table 3-7, in that if a COPC screened into the risk assessment on the basis of one particular media, it was assessed in all other media in which it was present. Chemical concentrations utilized in the HHRA are summarized in Table 3-8. If a COPC was not detected in a particular medium, but had been screened through in other media, half of the highest detection limit was utilized for risk assessment purposes of the medium in which the COPC concentration was not detected.

The surface water data set contained two sampling stations located outside the wetland areas: SW-01, taken south-west of wetland 2 at the pump house, and SU-01 taken from a sump pump at the greenhouse office building. While it is possible that adult trespassers and construction workers may come into contact with surface water from the pump or sump, it is unlikely that future recreational users of the site would contact this surface water while wading/swimming in the restored wetland. As a result, the surface water data set for adult trespassers and construction workers contained all samples collected on the site. Samples SW-01 and SU-01 were removed from the dataset for assessment of the future recreational users of the site and for prediction of COPC concentration fish tissue. The maximum values in the two surface water data sets are summarized in Table 3-3 and 3-4.

Fish tissue data were modeled using maximum surface water concentrations (without samples SW-01 and SU-01) and either (1) water-to-fish bioconcentration factors (BCFs) (USEPA 1999) or (2) BCFs were estimated using the formula provided by USEPA (1999) and log K_{ow} values provided by Mackay et al. (2000).

$$\log BCF = 0.91 \times \log K_{ow} - 1.975 \times \log [6.8 \times 10^{-7} \times K_{ow} + 1.0] - 0.786)$$

Chemical properties data used in the risk assessment modeling are summarized in Table 3-9.

3.1.5 Selection of Potential Exposure Pathways

Exposure pathway analysis is illustrated in Figure 3-1. USEPA (RAGS) and DC RBCA were used as a guide to determining exposure pathways for consideration, in conjunction with proposed site land use. A summary by media is provided below:

3.1.5.1 Air

Air vapors were eliminated from consideration, as there is no ongoing source on site that could potentially release air vapors. Concentrations of volatile chemicals in the soil and groundwater were also examined to determine the potential for inhalation (indoors and outdoors) of vapors. Concentrations of volatile chemicals in soil and groundwater are below those that would cause concern for volatilization and inhalation of vapors (DC RBCA, 2002).

3.1.5.2 Surface Soil

Surficial (inhalation of soil particulate, incidental ingestion and dermal contact) soil pathways are operable at this site. Inhalation of soil vapors (both indoors and outdoors) is not an operable pathway as concentrations of volatile contaminants of concern are below vapor screening levels (DC RBCA, 2002).

3.1.5.3 Subsurface Soil

Only construction workers, future off-site residents and park visitors/future off-site residents have the potential to be exposed to subsurface soil. Possible exposure pathways include dermal contact, incidental ingestion and inhalation of particulates. Although, DC defines surficial soil for construction workers as ground surface to the typical depth of construction, this scenario is evaluated in the subsurficial soil exposure scenario. The entire data set collected at soil depths greater than 2 ft was utilized to calculate potential subsurface soil exposure risks.

Indoor and outdoor inhalation of vapors from volatile chemicals in the surface soil are not operable exposure pathways as concentrations are too low to be of a concern from volatilization into indoor or outdoor air (DC RBCA, 2002).

3.1.5.4 Groundwater

The only potential exposure pathway for groundwater contact is dermal contact for construction workers. Groundwater is not currently used for drinking water purposes and and future drinking water supplies would originate from the District of Columbia's treated water system. Construction workers may come into contact with ground water while working in excavation trenches. Other potential receptors are not able to come into direct contact (dermal or ingestion) with groundwater.

The groundwater on-site will not be used for potable purposes and therefore, ingestion of groundwater was not considered further in this risk assessment. Based on comparison to DC RBCA standards, volatile chemicals are not present in groundwater concentrations that are sufficient to cause an adverse risk for indoor or outdoor inhalation of vapors.

3.1.5.5 Surface Water

Surface water is only present on-site seasonally in the wetland areas, but this is expected to change as the wetlands continue to reestablish their presence on-site and with the potential construction of a channel between the wetland areas to the Anacostia River. Potential exposure with surface water may occur if wading takes place within the wetland areas, resulting in incidental ingestion of and dermal contact with the surface water. Wading in the wetlands is not likely to be a permitted activity as it may disturb the ecological environment and wildlife, but it is possible that it may occur anyway and, therefore, needs to be accounted for. For purposes of the risk assessment, it is necessary to assume that the surface water reaching the site from the Anacostia River will be as clean or "cleaner" than the current surface water on-site. If this is not the case, engineering modeling may be required to predict future surface water conditions, which is beyond the scope of this risk assessment.

3.1.5.6 Sediment

Similarly, the sediment on site is located within the wetland areas and is only submerged with surface water seasonally. Human receptors may come into contact with sediment while wading (if the sediments are submerged) or via direct contact (if the sediments are dry).

3.1.5.7 Fish

Fish do not currently reside in the wetland areas, however, may exist on site if a channel is constructed between the Anacostia River and the wetland areas and therefore

hypothetical fish consumption was considered in this HHRA. However, it should be noted that fishing will probably not be an encouraged activity within the park and that there would not likely be enough fish in the wetlands areas for park visitors to regularly consume a meal from fish caught within the site. Additionally, the risk assessment only evaluates the potential impact of the current chemical concentrations in surface water. It is not possible to account for potential contamination that fish may be exposed to prior to reaching the site, within this risk assessment.

3.2 TOXICITY ASSESSMENT

The toxicity assessment was conducted for all contaminants of potential concern and involved the identification of the potential toxic effects of these chemicals and the selection of toxicity-based reference values for each chemical. Toxicity-based reference values include both reference doses (RfD) for non-carcinogens and cancer potency or slope factors for carcinogens. A reference dose represents an estimated daily intake, which can be received by human receptors each day over a lifetime without experiencing any significant or adverse health risks. Slope factors are used to estimate carcinogenic risk and are defined as a plausible upper bound probability of an individual developing cancer as a result of a lifetime exposure to a potential carcinogen. Both hazard quotients and ILCR values were calculated for carcinogens.

Toxicity values used in this risk assessment were obtained primarily from USEPA Integrated Risk Information System (IRIS). In the case that reference values were not available on USEPA IRIS for particular contaminants of concern, other sources such as USEPA Health Affects Summary Tables (HEAST), the National Center for Environmental Assessment Superfund Health Risk Technical Support Center were used to determine an appropriate reference value.

3.2.1 Specific Toxicity Reference Values

Toxicity profiles for all contaminants of potential concern, outlining pharmacokinetics, toxicity and toxicity-based reference values selected for use in the risk assessment, are compiled in Appendix B. A summary of the toxicity reference values selected for use in the risk assessment is also provided in Table 3-10. Toxicity reference value assumptions for several COPCs are outlined as follows:

Chromium

Total chromium and chromium (III or VI was not specified) were measured at the site, however Cr(VI) was not measured at the site. As chromium speciation is not well quantified at the site, toxicity reference values for Cr(VI) were conservatively used screening and risk assessment.

Lead

Toxicity reference values are unavailable from USEPA related sources at this time due to its unique pharmacokinetics that are vary with individuals and lack of threshold for effects. Lead will be evaluated qualitatively in this assessment.

Polycyclic Aromatic Hydrocarbons (PAHs)

Toxicity reference values are only available benzo(a)pyrene from USEPA related sources and therefore, in order to assess the other PAHs present at the site a toxic equivalency factor (TEF) approach, similar to that used for polychlorinated dibenzo-p-dioxins. Data are currently insufficient to calculate slope factors for PAHs other than benzo(a)pyrene (USEPA, 1993). The advantage of using the TEF approach is that it can be used to quantitatively assess the carcinogenicity of mixtures of PAHs. The PAHs have been divided into two classes – carcinogens and noncarcinogens. The carcinogens have been assigned relative potency factors (RPFs) that indicate the carcinogenic potency of each PAH relative to benzo(a)pyrene. Multiplying the RPF of each PAH by the cancer slope factor for benzo(a)pyrene provides an estimated cancer slope factor for each compound. The oral and inhalation slope factors used for PAHs in this risk assessment are summarized in Appendix B (PAHs). The TEF approach utilized in this risk assessment is based on USEPA (1993) and WDNR (1997), which provide RPFs for a wide range of PAHs. Modifications to WDNR (1997) inhalation slope factor for benzo(a)pyrene have been made to reflect the current, provisional value derived by USEPA NCEA (3.1 $(mg/kg/day)^{-1}$) (USEPA Region 3, 2003; ORNL, 2004).

3.2.2 Toxicity Reference Values Unavailable

In the case that toxicity reference values were not available for a particular route of intake, the following procedure was followed:

If an inhalation slope factor was not available, but a unit inhalation risk value was available from USEPA IRIS or other sources, the following conversion (USEPA, 1998) was used to derive an inhalation slope factor:

$$Sf_i\ (mg/kg/day)^{-1} = \frac{\text{Unit inhalation risk } (\mu g/m^3)^{-1} \times 70\ kg \times 10^3\ (\mu g/mg)}{20\ m^3/day}$$

Where:

Sf_i = inhalation slope factor
BW = adult body weight (70 kg)
UCF = unit conversion factor for µg to mg is 10^3
Ir_i = daily adult inhalation rate (20 m^3/day)

If a reference dose was unavailable, but a reference concentration was available from USEPA IRIS or other sources, the following conversion (USEPA, 1998) was used to derive a reference dose factor:

$$\text{RfD (mg/kg/day)} = \frac{\text{Reference concentration(mg/m}^3\text{) x 20 m}^3\text{/day}}{\text{70 kg}}$$

Where:

RfD = Reference dose (mg/kg/day)
BW = Adult body weight (70 kg)
Ir_i = Daily adult inhalation rate (20 m^3/day)

3.2.3 Route-to-Route Extrapolation

For the purposes of this screening level risk assessment, route-to-route extrapolation was conducted if a toxicity reference value was not available from USEPA IRIS, HEAST or USEPA NCEA for an exposure route. Although, toxicity of a substance can differ from route-to-route (i.e., oral versus inhalation) and a toxicity reference value for one route may not always accurately estimate toxicity via another route, route-to-route extrapolation was conducted in the absence of an appropriate toxicity reference value in order to provide an estimate of potential risk.

For non-carcinogens, if an oral RfD was unavailable, but an inhalation RfD was available, then the inhalation RfD was used to assess the oral exposure pathway. Conversely, an oral RfD was used to assess inhalation exposure, if an inhalation RfD was unavailable. Oral RfD values were also used to assess dermal exposure.

For carcinogens, if an oral slope factor is unavailable, but an inhalation slope factor is available, then the inhalation slope factor was used to assess the oral exposure pathway. Conversely, an oral slope factor was used to assess inhalation exposure, if an inhalation slope factor was unavailable. Oral slope factors values were also used to assess dermal exposure.

3.3 EXPOSURE ASSESSMENT

Exposure estimates were calculated in accordance with USEPA exposure assessment methods (USEPA 1989; 1992a; 2001a, and 2001b) and recommended default exposure factors were used when possible (USEPA, 1997; USEPA Region III, 2003). Exposure estimates were conducted on a site-wide basis, utilizing the 95% UCL per EPA guidance,

where possible, depending on total number of samples collected (USEPA 1992; 2002b). Receptor exposure parameters that were used in the risk assessment are outlined below by media and summarized in Table 3-11.

3.3.1 Exposure Calculations

The exposure assessment consists of a summary of exposure equations that were used to calculate exposure doses for each COPC and receptor combination. A summary of exposure doses calculated for each media is summarized by receptor type in Tables 3-12 to 3-32. The following equations were used to estimate exposure doses of the COPCs to receptors of concern.

Inadvertent Ingestion of Soil/Dust or Sediment

$$\text{Dose} = \frac{C_s \times IR_{ings} \times UCF \times FC \times EF \times ED}{BW \times AT}$$

Dose = dose from incidental soil ingestion (mg/kg body weight/day)
C_s = concentration of chemical in soil (mg/kg)
IR_{ings} = soil ingestion rate (mg/day)
UCF = unit conversion factor (1×10^{-6} kg/mg)
FC = fraction ingested from contaminated source (unitless)
EF = exposure frequency (days/year)
ED = exposure duration (years)
BW = body weight (kg)
AT = averaging time (days). Averaging time is defined as the number of days in a lifetime for carcinogens and as the number of days in the exposure duration for non-carcinogens.

Dermal Contact with Soil or Sediment

$$\text{Dose} = \frac{C_s \times SA \times AD \times ABS \times UCF \times EF \times ED}{BW \times AT}$$

Dose = dose from dermal contact with soil (mg/kg body weight/day)
C_s = concentration of chemical in soil (mg/kg)
SA = surface area of exposed skin (cm^2/event)
AD = adherence factor (soil to skin; mg/cm^2)
ABS = dermal absorption value (unitless)
UCF = unit conversion factor (1×10^{-6} kg/mg)

EF = exposure frequency (days/year)
ED = exposure duration (years)
BW = body weight (kg)
AT = averaging time (days). Averaging time is defined as the number of days in a lifetime for carcinogens and as the number of days in the exposure duration for non-carcinogens.

Inhalation of Soil Dust and Particulates

$$\text{Dose} = \frac{C_s \times IR_{inh} \times (1/PEF) \times EF \times ET \times ED \times PDD}{BW \times AT}$$

Dose = dose from dust/particulates inhalation (mg/kg body weight/day)
C_s = concentration of chemical in soil (mg/kg)
IR_{inh} = inhalation rate (m^3/hr)
PEF = particulate emission factor (m^3/kg)
EF = exposure frequency (days/year)
ET = exposure time (hr/day)
ED = exposure duration (years)
PDD = portion of dry days (unitless)
BW = body weight (kg)
AT = averaging time (days). Averaging time is defined as the number of days in a lifetime for carcinogens and as the number of days in the exposure duration for non-carcinogens.

Dermal Contact with Surface Water or Groundwater

$$\text{Dose} = \frac{C_w \times SA \times PC \times UCF \times ET \times EF \times ED}{BW \times AT}$$

Dose = dose from dermal contact with surface water/groundwater (mg/kg body weight/day)
C_w = concentration of chemical in water (mg/L)
SA = surface area of exposed skin (cm^2)
PC = partitioning coefficient (cm/hr)
UCF = unit conversion factor (1L/1000 cm^3)
ET = exposure time per event (hours/day)
EF = exposure frequency (days/year)
ED = exposure duration (years)
BW = body weight (kg)

AT = averaging time (days). Averaging time is defined as the number of days in a lifetime for carcinogens and as the number of days in the exposure duration for non-carcinogens.

Inadvertent Ingestion of Surface Water while Swimming or Wading

$$\text{Dose} = \frac{C_w \times IR_{ingw} \times EF \times ED \times ET}{BW \times AT}$$

Dose = dose from incidental surface water ingestion (mg/kg body weight/day)
C_s = concentration of chemical in soil (mg/L)
IR = water ingestion rate (L/hr)
EF = exposure frequency (days/year)
ED = exposure duration (years)
ET = exposure time (hrs/day)
BW = body weight (kg)
AT = averaging time (days). Averaging time is defined as the number of days in a lifetime for carcinogens and as the number of days in the exposure duration for non-carcinogens.

Ingestion of Fish from the Site

$$\text{Dose} = \frac{C_f \times IR_{ingf} \times UCF \times FC \times EF \times ED}{BW \times AT}$$

Dose = dose from fish ingestion (mg/kg body weight/day)
C_f = concentration of chemical in fish (mg/kg)
IR_{ingf} = fish ingestion rate (mg/day)
UCF = unit conversion factor (1×10^{-6} kg/mg)
FC = fraction ingested from contaminated source (unitless)
EF = exposure frequency (days/year)
ED = exposure duration (years)
BD = body weight (kg)
AT = averaging time (days). Averaging time is defined as the number of days in a lifetime for carcinogens and as the number of days in the exposure duration for non-carcinogens.

3.3.2 Standard Parameters for all Exposure Pathways

The following standard parameters were used in all exposure calculations:

Body Weight

Body weights were selected from USEPA (1989) and (USEPA, 1998) as follows

- All adult receptors 70 kg
- All child receptors 15 kg
- All combined (child-adult) receptors 70 kg

Averaging Times

Carcinogens (70 years x 365 days) 25550 days

Non-carcinogens (exposure duration x 365 days)

- Adult trespasser (5 years) 1825 days
- All child receptors (6 years) 2190 days
- All adult park visitors (24 years) 8760 days
- All combined (child-adult) receptors (30 years) 10950 days
- Park workers (30 years) 10950 days
- Construction worker (1 year) 365 days

3.3.3 Variable Receptor Parameters by Media

The following variable receptor parameters were used in exposure calculations. Rationale for selection of variable receptor parameters follows and is provided by media.

3.3.3.1 Soil Ingestion Rate

Soil ingestion rates were selected from USEPA (1989) as follows:

- Adult trespasser/Adult Park Visitor/ Park Worker 100 mg/day
- Adult Park Visitor-Off-site Resident 100 mg/day
- Park Visitor – Child 200 mg/day
- Park Visitor – Combined 114 mg-y/kg-day
- Adult Park Visitor-Off-site Resident - Combined 114 mg-y/kg-day
- Construction Worker 480 mg/day

Soil ingestion rates were adjusted for combined (child-adult) receptors by averaging soil ingestion rates over exposure duration and body weight in each life stage, using the following formula (USEPA Region III 2003d).

$$IFS_{adj}\ (\text{mg-y/kg-day}) = \frac{ED_c \times IRS_c}{BW_c} + \frac{(ED_{tot}-ED_c) \times IRS_a}{BW_a}$$

Where:

IFS_{adj}	=	Ingestion soil factor adjusted for combined exposure (i.e., adult and child lifestages) (mg-y/kg-day)
ED_c	=	Exposure duration, child (6 years)
ED_{tot}	=	Exposure duration, adult (30 years)
IRS_c	=	Soil ingestion rate, child (200 mg/day)
IRS_a	=	Soil ingestion rate, adult (100 mg/day)
BW_c	=	Body weight, child (15 kg)
BW_a	=	Body weight, adult (70 kg)

3.3.3.2 Frequency and Duration of Exposure

Historical (1871 to 2003) weather statistics have been compiled by the National Weather Service Forecast Office of NOAA (NOAA, 2003). Weather conditions in the Washington, DC area are relatively mild with an annual average temperature of 57.5 F (range 34.9 to 79.2F) and precipitation of 41.94 inches (monthly range 3.00 to 3.98 inches). Historically (1962-2003), snow has fallen from October to April, although snowfall has never exceeded 1 inch in October, November, or April. The average annual snowfall is 21.2 inches. Snowfall in 2002-2003 was well above average with 50.1 inches falling throughout the winter season.

It is assumed that soil exposure will be minimal when the ground is covered with snow and/or frozen. For the purposes of the risk assessment, it is assumed that soil exposure will not occur during December – February. Frequency of soil exposure to visitors in the park is expected to be 117 days a year (39 weeks without potential snow cover x 3 visits per week). The park visitor-off-site resident receptors may visit the site 5 days a week when there is no snow cover, resulting in 195 days for potential exposure. Current plans indicate that Poplar Point will likely be used as a passive recreational area. Playground facilities and other recreational attractions are not planned for the site. Ninetieth (90^{th}) percentile estimates indicate that young children spend 120 minutes per day playing outside on unpaved surfaces and adults about 100 minutes a day (USEPA, 1997). Ninety-fifth percentiles indicate exposures greater than 120 minutes for both young children and adults, but exposures cannot be quantified (USEPA, 1997). As the park is expected to be

a passive recreational area, park visits are conservatively assumed to be 2.5 hours per visit.

Park workers are expected to be potentially exposed 195 days a year (39 weeks without potential snow cover x 5 days per week). Park workers are expected to spend 8 hours per day on the site. Construction workers are expected to spend 180 days a year on the site for 8 hours per day. Adult trespassers, currently living on the site, will likely be exposed every day when there is no snow cover (39 weeks without potential snow cover x 7 visits per week). Adult trespasser exposure frequency is 273 days per year. Off-site residents are not exposed to the soil, but could be exposed to soil dust and particulates, on days when there is no snow cover (273 days).

The fraction of soil ingested from the site in comparison to soil ingested from other sources (i.e., home garden) is conservatively estimated to 100% for adult trespassers, park workers and construction workers and 50% for park visitors and the combined park visitor-off-site resident receptors. USEPA (1997) indicates that children spend five hours per day outdoors during the week and seven hours per day outside on weekends. Individuals, who are older than 12, are estimated to spend 1.5 hours per day outside. A park visit will account for roughly half of a child's daily outdoor exposure and therefore fraction of total soil ingested that is attributable to the Poplar Point site is approximately 0.5.

3.3.3.3 Soil Dermal Absorption Factor

Soil dermal absorption factors are chemical specific and are summarized in Table 3-9. Soil dermal absorption factors were selected following USEPA Region III (2003; 1995) guidance on dermal assessment. USEPA Region III (2003) recommends the class-specific defaults outlined in USEPA Region III (1995) are retained and that chemical specific dermal absorption factors be selected from USEPA RAGS Part E (USEPA, 2001). Class specific default dermal absorption factors that were utilized in this risk assessment include:

- Metals (except arsenic and cadmium) 0.1
- PAHs (class specific data not available in USEPA Region III (1995)) 0.13
- Pesticides (except chlordane and DDT) 0.1
- Volatile organic compounds (vapour pressure □ benzene) 0.0005
- Volatile organic compounds (vapour pressure □ benzene) 0.03
- Semivolatile organic compounds 0.10

3.3.3.4 Skin Surface Area Available for Contact

USEPA Region III (2003) recommends the use of the following skin surface area values

from USEPA RAGS Part E (USEPA, 2001):

- Adult residents, park users and trespassers 5700 cm^2
- Child residents and park users 2800 cm^2
- Adult workers (park and construction workers) 3300 cm^2

Skin surface area available for contact was calculated for combined (child-adult) receptors by adjusting skin surface area available for contact with exposure duration and body weight for each life stage.

3.3.3.5 Soil-to-Skin Adherence Factor

Based on USEPA RAGS Part E (USEPA, 2001), USEPA Region III (2003) recommends the use of soil-to-skin adherence factors of 0.2 mg/cm^2 for children and adult workers and 0.07 mg/cm^2 for adult residents. In this risk assessment, a soil-to-skin adherence factor of 0.2 mg/cm^2 is used for all child receptors and park and construction workers and a soil-to-skin adherence factor of 0.07 mg/cm^2 is used for trespassers and all adult park user receptors. A soil-to-skin adherence factor was calculated for combined (child-adult) receptors by adjusting the soil-to-skin adherence factor exposure duration and body weight in each life stage.

3.3.3.6 Inhalation Rate

Inhalation rates for receptors likely to be physically active in the park such as park visitors and park and construction workers were selected from USEPA (1997). Receptors that could potentially continually be exposed to soil dust and particulates passively such as off-site residents and trespassers who live on the site were selected from USEPA (1989). Hourly inhalation rates were selected for active receptors so that inhalation rate would most likely be representative of that while engaged in soil contact activities. Hourly inhalation rates in USEPA (1997) correspond to activity level. Moderate activity levels were selected for park visitors and park workers, while the heavy activity level was selected for construction workers. Hourly rates selected include:

- Child park visitors 1.2 m^3/hr
- Adult park visitors 1.6 m^3/hr
- Park workers 1.5 m^3/hr
- Construction workers 2.5 m^3/hr

For receptors that are likely to be continually exposed during passive activities such as trespassers living on the site and off-site residents, daily inhalation rates of 20 m^3/day (for adults; USEPA, 1989) and 12 m^3/day (for children: USEPA Region III 2003c)

recommended were divided by 24 hours, resulting in hourly values of 0.83 m^3/hr and 0.5 m^3/hr for adults and children, respectively. For combined (child-adult) receptors, inhalation rates were calculated by adjusting inhalation rates for exposure duration and body weight in each life stage.

3.3.3.7 Particulate Emission Factor

A particulate emission factor, used to estimate fugitive dust emissions, was determined for the site using a box dispersion approach (USEPA 1991, Cowherd 1985). The model estimated the inhalable fraction of dust (particles less than 10 μm in diameter, PM_{10}) within the breathing zone of workers and recreational users of the site. The concentrations of the chemicals of potential concern associated with the PM_{10} were then used in exposure equations to determine the dose received by a receptor present on Site. Details regarding the model used to estimate fugitive dust emissions from wind are presented in Appendix C. The particulate emission factor derived from the model and used in the exposure calculations is 3.67×10^6 m^3/kg.

3.3.3.8 Portion of Dry Days

Local climatological data (NOAA, 2002) for Ronald Reagan National Airport (DCA) was used to estimate a factor for the portion of dry days in the Washington, DC area. NOAA (2002) indicates that DCA received greater than 0.01 inch of precipitation on 109 days in 2002. Therefore, it was conservatively assumed that there was rain on 109 days and that the remaining 256 days were dry. The portion of dry days was calculated to be 0.70 (i.e., 256/365).

3.3.4 Subsurface Soil

Only construction workers and off-site residents will be potentially exposed to subsurface soils. Assumptions used to calculate exposure estimates are the same as those utilized to determine potential surface soil exposure estimates for construction workers and off-site residents.

3.3.5 Surface Water/Groundwater

3.3.5.1 Ingestion of Surface Water while Swimming

USEPA (1989) recommends an ingestion rate of 50 mL/hour while swimming.

3.3.5.2 Frequency and Duration of Exposure of Swimming/Wading

Current plans for Poplar Point Park include restoration of wetland areas. Surface water bodies on-site are limited to potentially restored wetland areas. Swimming in the Anacostia River is not included in this assessment. Although wetlands may not be suitable for swimming (seasonal or shallow), swimming has conservatively been included as an exposure scenario. Swimming and wading may occur during the summer months when outdoor air temperatures are warm (60 F and above); therefore it is assumed that swimming and wading could occur between May and September. Swimming and wading may occur during the 22 weeks per year when the weather is warm. A park visitor may potentially swim/wade twice a week for a maximum of 44 days per year.

Exposure statistics are not available for swimming outdoors in surface water bodies, however USEPA (1997) has compiled statistics for swimming in freshwater swimming pools. The 50^{th} percentile of swimming event duration is 60 minutes and the 95^{th} percentile is 180 minutes, based on a single swimming event per month (USEPA, 1997). The maximum duration of the swimming and wading events on-site is expected to be 2 hours. Dermal wading exposure will not be considered for receptors who are also swimming, as the dermal exposure due to swimming will be greater than that due to wading because of the much larger skin surface area exposed during swimming. Park workers and construction workers are not expected to swim on-site.

Park workers could potentially wade at the site 5 days a week for 22 weeks of the year (110 days). Although a typical workday is 8 hours, it is unlikely that the park worker will spend the entire day wading and therefore, 4 hours is conservatively assumed to be the maximum duration of the wading event for park workers. Construction workers may however, spend an entire day wading should they be involved in constructing a channel or boardwalks through the wetland areas. Therefore, a construction worker may spend up to 180 days wading for 8 hours per day. Estimates for park workers and construction workers may be somewhat conservative, depending on the type of protective equipment available and the depth of the surface water (i.e., although they may be present in the water, if it is shallow and they are wearing rubber boots – contact may be minimal).

Adult trespassers may use the limited (i.e., seasonal) surface water currently on-site for swimming/bathing purposes. As the presence of surface water on the site is limited to approximately 6 months of the year, adult trespasser exposure to surface water is conservatively expected to be 183 days.

3.3.5.3 Skin Surface Area Available for Dermal Contact with Surface Water

Swimming

USEPA (2001) recommends the following skin surface areas available for dermal contact with surface water while swimming:

- All adult receptors: 6,600 cm^2
- Children: 18,000 cm^2

Skin surface area available for contact was calculated for combined (child-adult) receptors by adjusting skin surface area available for contact with exposure duration and body weight for each life stage.

Wading

Skin surface areas available for dermal contact with surface water while wading are not readily available. For adults, skin surface area available for dermal contact while wading were calculated by adding up surface areas of the forearems, lower legs, hands and feet for an average adult receptor, resulting in a potentially exposed skin surface area of 5,672 cm^2 (USEPA, 2001).

Exposed skin surface area for wading children was calculated by adding up the percentage of the total body surface area was comprised by the upper and lower limbs (including hands and feet) and multiplying this percentage (41.6%) by the total surface area (0.0.656 m^2) of a child (1-6 years old), resulting in an exposed skin surface area of 2,729 cm^2. Mean surface areas were selected for the above calculations as mean surface area corresponds better to default body weight than 95th percentile values (USEPA, 1989).

As these skin surface areas available for dermal contact with surface water while wading are virtually identical to those skin surface areas available for dermal contact with soil, the default soil skin surface areas will be utilized for dermal contact with surface water while wading.

3.3.6 Sediment

3.3.6.1 Skin Surface Area Available for Contact

The same skin surface area values as for dermal contact with surface water via wading will be used for skin surface area values for sediment contact during wading. The same body area is assumed be exposed to surface water and sediment during wading activities.

3.3.6.2 Soil-to-Skin Adherence Factor

The soil-to-skin adherence factor of 0.2 mg/cm^2 value used for soil exposure is based on children playing in wet soil (USEPA, 2001), which is likely to have similar adherence properties as sediment. USEPA (2001) also presents weighted soil adherence factors for adult exposure scenarios including pipe layers in wet soil (0.6 mg/cm^2) and reed gatherers of 0.3 mg/ cm^2. The reed gather scenario is the most representative scenario for wading activities and 0.3 mg/m^3 will be used for adult park visitors and park workers. A soil adherence factor of 0.6 mg/m^3 will be used for construction workers as they may be involved in wetland construction activities, an activity scenario that is better represented by the pipe layers in wet soil. A soil-to-skin adherence factor was calculated for combined (child-adult) receptors by adjusting the soil-to-skin adherence factor exposure duration and body weight in each life stage.

3.3.7 Fish

3.3.7.1 Ingestion Rate

USEPA (1997) indicates that the 95th percentile value for long time fish consumption in the US is 63 g/day (based on a value of 42 g/day which has been adjusted upwards by 50% to account for a recent increase in fish consumption). Using the same approach for children (summary data only available for children aged 0-9 years), a value of 16.5 g/day was selected and similarly adjusted, resulting in a fish ingestion rate of 24.75 g/day. The ingestion rate specified above is a compilation of fish intake from multiple sources – canned fish, fresh fish purchased at a market or grocery store, recreationally caught fish, fish received as gifts and fish eaten at restaurants (USEPA, 1997).

3.3.7.2 Fraction of Fish Ingested from the Site

Another study presented in USEPA (1997) indicates that recreational fishermen and their families eat roughly half of their meals from fish that they have caught themselves. For example, household members of a recreational fisherman eat 0.686 fish meals per week, of which 0.332 meals consist of fish caught recreationally. Recreationally caught fish corresponds to 48% of the fish consumed in households of recreational fisherman. Licensed anglers (i.e., recreational fisherman) eat slightly more fish meals (0.873) per week than other household members, and approximately 45% of these meals (0.398) are from fish caught by the anglers. In addition, the surface water bodies in Poplar Point will be restricted to wetland areas where fish populations may have been reintroduced as part of wetland reconstruction and it is unlikely that fish will be present in sufficient numbers to provide daily fish meals to the recreational fishers who would potentially utilize the park.

3.4 RISK CHARACTERIZATION

The estimated human exposures of contaminants of concern will be compared to their respective toxicity values to obtain a quantitative estimate of risk for carcinogenic substances or a hazard index for non-carcinogens. Hazard quotients (HQ) will be added across exposure routes for each COPC to determine a total hazard quotient for that COPC.

The magnitude of the incremental lifetime cancer risk for carcinogens and the hazard index for non-carcinogens will be discussed in the context of potential health risks. For the purposes of this risk assessment, an incremental lifetime cancer risk of 1E-6 and a hazard quotient of less than one will be considered acceptable (District of Columbia Department of Health, 2002). The risk characterization component of the risk assessment will identify and discuss the significance of areas of uncertainty and indicate how these uncertainties were treated within the risk assessment.

The risk characterization step indicates the significance of the concentrations of the contaminants of potential concern on the site.

3.4.1 Estimation of Hazard Quotients

Hazard quotients (HQs) were calculated to determine whether or not concentrations contaminants of potential concern in site media present a potential risk to identified current and future human on- and off-site receptors. The equation for calculating the HQ associated with exposure pathways:

$$HQ = \frac{DR_{site\ total}}{TRV}$$

Where:

$DR_{sitetotal}$ = Total dose from site exposure (mg/kg-day);
TRV = Toxicity Reference Value (mg/kg-day)

A HQ that exceeds 1 indicates a potentially unacceptable exposure scenario that may result in adverse health effects. Conversely, a HQ less than or equal to 1 indicates that the predicted exposure is unlikely to cause potential health risks. When evaluating the magnitude of HQs, especially ones that are marginally different from 1, it is important to consider the sources of uncertainty and assumptions that may have influenced the calculations.

3.4.2 Estimation of Cancer Risk

Incremental lifetime cancer risk (ILCR) is determined by the following formula:

Cancer Risk = Estimated Exposure x (Potency or Slope factor)

Where:

Exposure = exposure dose (mg/kg-day)
Slope factor = $(mg/kg\text{-}day)^{-1}$

The excess lifetime cancer risk determined by this equation is then compared to the acceptable risk level as determined by the appropriate regulatory agency. In this case, the District of Columbia Department of Health (Environmental Health) considers an acceptable ILCR to be 1E-6 (District of Columbia Department of Health, 2002). An ILCR that exceeds 1E-6 indicates the potential for an unacceptable exposure scenario that may result in adverse health effects. Conversely, a ILCR less than or equal to 1E-6 indicates that the predicted exposure is unlikely to cause potential health risks. When evaluating the magnitude of ILCR values, especially ones that are marginally different from 1E-6, it is important to consider the sources of uncertainty and assumptions that may have influenced the calculations.

3.4.3 Summary of Risk Characterization Results

Risk assessment results (hazard quotients and ILCR values) are summarized for each of the receptors in Tables 3-33 to 3-36. Risk results are presented without (Tables 3-33 to 3-34) and including fish consumption (Tables 3-35 to 3-36), because for some contaminants of concern fish consumption drives the risk results. There are currently no fish on the site as the surface water bodies are ephemeral and, therefore, fish tissues have not been analyzed for contaminants of concern. Fish tissue data were modeled using maximum surface water concentrations and either (1) water-to-fish bioconcentration factors (BCFs) (USEPA 1999) or (2) BCFs were estimated using the formula provided by USEPA (1999) and log K_{ow} values provided by Mackay et al. (2000). While modeled fish tissue data provides an approximation of fish tissue concentration of COPCs for a screening level assessment, there is a great deal of uncertainty contained within these estimates. The high degree of uncertainty with fish tissue estimates indicate that this pathway should be analyzed in greater detail prior to creation of a channel from the Anacostia River to the site in order to create an increased wetland area.

A baseline risk assessment was not conducted for the groundwater ingestion pathway; currently this exposure pathway is incomplete. The proposed future land use, as described in the Park Service Management Plan and the Anacostia Waterfront Initiative,

does not have complete exposure pathways for groundwater ingestion. (Dermal exposure to groundwater was evaluated in a potential future exposure pathway to a construction worker on the site.) However, per District of Columbia regulations, groundwater shall be protected for beneficial uses including potential future use as a raw drinking water source in the District of Columbia (21 DCMR 1104.2).

In order to address D.C. regulatory issues and to assess potential risk associated with a future groundwater ingestion pathway, concentrations of contaminants in groundwater were screened against EPA Region III risk-based concentrations (RBCs) as well as applicable standards, including MCLs and DC groundwater standards (DCR Title 21 1155). This identified areas of the site with potential groundwater impacts (see Table 3-5). Seven inorganic chemicals had concentrations exceeding either MCLs or DC groundwater standards. One organic chemical, benzene, had a concentration exceeding the DC groundwater standard, which is equivalent to the MCL. Other inorganic and organic chemicals had concentrations exceeding RBCs.

Lead was not assessed quantitatively in this risk assessment. Lead has unique pharmacokinetics that varies with individuals and demonstrates a lack of threshold for effects, which preclude the development of toxicity reference values. USEPA Region III uses a screening level of 400 mg/kg, based on a directive provided by the US Office of Solid Waste. The soil screening level is meant to be protective for residential use. Only subsurface soils exceed the screening level (maximum 440 mg/kg), so lead in soils on the site is not expected to have the potential to cause adverse health effects as direct exposure to subsurface soil is limited to construction workers. Lead concentrations in surface and groundwater also exceed USEPA drinking water MCLs and although site surface and groundwater will not be used for potable purposes, limited incidental ingestion and dermal contact with surface water can occur while swimming. Fish could also take up the lead in surface water if current surface water concentrations are representative of future conditions. Water pathways cannot be assessed at this time.

3.4.3.1 Non-Carcinogenic Assessment (No Fish Consumption)

Results for all non-carcinogens are summarized in Tables 3-33 (not including fish consumption) and Table 3-35 (including fish consumption). COPCs, which exceed a hazard quotient of 1, in exposure scenarios without fish consumption include:

Aluminum

Hazard quotients exceed 1 for child current (HQ= 1.2) and future off-site residents (HQ= 1.5) and child park users who are also off-site residents (HQ= 1.5). Exceedances are driven primarily by the soil dust pathway as elevated aluminum soil concentrations were found in both the surface and subsurface soil.

Arsenic

Construction workers are the only receptors for which the hazard quotient exceeds 1 (HQ=1.02). Exceedances are driven by soil (surface and subsurface) and sediment ingestion and dermal contact with groundwater.

Manganese

Hazard quotients exceed 1 for adult trespassers (HQ=1.2), construction workers (HQ=2.3), adult (HQ=1.1) and child (HQ=3.2) current off-site residents, adult (HQ=1.2) and child (HQ=4.1) future off-site residents, and adult (HQ=1.2) and child (HQ=4.1) future off-site residents who are park users. Exceedances are driven primarily by the soil dust pathway as elevated manganese soil concentrations were found in both the surface and subsurface soil.

Vanadium

Construction workers are the only receptors for which the hazard quotient exceeds 1 (HQ=1.3). Exceedances are driven by soil (surface and subsurface) ingestion and dermal contact with groundwater.

Benzene

Construction workers are the only receptors for which the hazard quotient exceeds 1 (HQ=4.4) and the hazard quotient exceedance is attributable to potential dermal contact with groundwater.

3.4.3.2 Non-Carcinogenic Assessment (Including Fish Consumption)

Aluminum

Hazard quotients exceed 1 for child current (HQ= 1.2) and future off-site residents (HQ= 1.5) and child park users who are also off-site residents (HQ= 1.5). Exceedances (HQ>1) are driven primarily by the soil dust pathway, as elevated aluminum soil concentrations were found in both the surface and subsurface soil.

Arsenic

Park users and park users/future off-site residents (children [HQ=1.2]; adults [HQ=6.2] and combined users [HQ=3.1] and construction workers (HQ=1.02) all demonstrate hazard quotients that exceed 1. Hazard quotients for park users and park/users future off-site residents are driven entirely by fish consumption. The hazard quotient exceedance for construction workers is due primarily to dermal contact with groundwater (i.e., fish consumption is not an exposure pathway for construction workers).

Cadmium

Child park users and child park users/future off-site residents show hazard quotients that exceed 1 (HQ=1.7 for both receptors) and exceedances are driven entirely by fish consumption.

Iron

Park users and park users/future off-site residents (children [HQ=5.6]; adults [HQ=2.9] and combined users [HQ=1.5] demonstrate hazard quotients that exceed 1. Hazard quotients for park users and park/users future off-site residents are driven entirely by fish consumption.

Manganese

Hazard quotients exceed 1 for park users (adult [HQ=16], child [HQ=30], and combined [HQ=8]), and park users/future off-site residents (adult [HQ=17.5], child [HQ=34], and combined [HQ=8.9]). In addition, lesser hazard quotient exceedances were also noted for construction workers (HQ=2.3) and future off-site residents (HQ=4.1 [child] and HQ=1.2 [adult]) and adult trespassers (HQ=1.2).

Hazard quotient exceedances for the construction worker, adult trespassers and future off-site residents are driven primarily by the soil dust pathway as elevated manganese soil concentrations were found in both the surface and subsurface soil. Hazard quotient exceedances for park users and park users/future off-site residents are driven primarily by fish consumption.

Mercury

Hazard quotients exceed 1 for park users and park users/future off-site residents (adult [HQ=9.2], child [HQ=16.9], and combined [HQ=4.6]) and exceedances are almost entirely driven by fish consumption.

Thallium

Hazard quotients exceed 1 for park users and park users/future off-site residents (adult [HQ=321], child [HQ=589], and combined [HQ=161]) and exceedances are entirely driven by fish consumption.

Vanadium

Hazard quotients exceed 1 for park users and park users/future off-site residents (adult [HQ=5.5], child [HQ=10.3], and combined [HQ=2.8]) and construction workers (HQ=1.3). Exceedances are driven primarily by fish consumption for park users and park users/future off-site residents and by soil (surface and subsurface) ingestion and dermal contact with groundwater for construction workers.

Zinc

Hazard quotients exceed 1 for park users and park users/future off-site residents (adult [HQ=1.5] and child [HQ=2.8]) and are driven primarily by fish consumption.

4,4'-DDT

Hazard quotients exceed 1 for park users and park users/future off-site residents (adult [HQ=12.7], child [HQ=23.4], and combined [HQ=6.4]) are driven primarily by fish consumption.

Benzene

Construction workers are the only receptors for which the hazard quotient exceeds 1 (HQ=4.4) and the hazard quotient exceedance is attributable to potential dermal contact with groundwater.

Bis(2-ethylhexyl)phthalate

Hazard quotients exceed 1 for park users and park users/future off-site residents (adult [HQ=4.2], child [HQ=7.7], and combined [HQ=2.1]) are driven primarily by fish consumption.

3.4.3.3 Carcinogenic Assessment (No Fish Consumption)

Risk assessment results (ILCR values) for all carcinogens are summarized in Tables 3-34 (not including fish consumption) and Table 3-36 (including fish consumption). COPCs with ILCR values that exceed a risk level of 1E-6, in exposure scenarios without fish consumption include:

Arsenic

ILCR exceeds the 1E-6 risk level in all the receptors considered in the risk assessment. ILCR values range from 2.6E-6 (combined current off-site resident) to 2.4E-6 (park worker). Direct contact with soil (ingestion, dust inhalation and dermal contact) and sediment (no dust inhalation) and dermal contact with surface water all contribute to the elevated ILCR.

Beryllium

ILCR exceeds the 1E-6 risk level in all the receptors, except future off-site residents, considered in the risk assessment. ILCR values greater than 1E-6 range from 1.2E-6 for adult park users to 2.9E-6 for park workers. Ingestion of surface soil is the primary contributor to the exceedance of the 1E-6 risk level.

Cadmium

ILCR exceeds the 1E-6 risk level in all the receptors, except future off-site residents, considered in the risk assessment. ILCR values greater than 1E-6 range from 2.1E-6 (adult trespasser) to 5.0E-6 for park workers. Ingestion of surface soil is the primary contributor to the exceedance of the 1E-6 risk level.

Chromium

ILCR exceeds the 1E-6 risk level in all the receptors considered in the risk assessment. ILCR values greater than 1E-6 range from 1.7E-5 for current off-site residents (combined receptor) to 7.3E-6 for park workers. Direct contact (ingestion, inhalation and dermal contact) with surface soil and sediment (no inhalation) contribute to the exceedance of the 1E-6 risk level. Chromium has conservatively assumed to be present at the site in Cr(VI) form, as the type of chromium analyzed is unspecified.

Cobalt

ILCR exceeds the 1E-6 risk level in all the receptors considered in the risk assessment. ILCR values greater than 1E-6 range from 1.2E-6 for future off-site residents (adult) to 3.6E-5 for park workers. Surface soil dust and incidental surface soil ingestion contribute to the exceedance of the 1E-6 risk level for the future off-site residents and park workers, respectively.

PAHs

The following PAHs demonstrated exceedances of the 1E-6 acceptable ILCR for all receptors considered in this risk assessment, except future off-site residents:

Benzo(a)anthracene

Exceedances of the 1E-6 acceptable ILCR, ranged from 1.9E-5 for construction workers to 8.7E-5 for park workers.

Benzo(a)pyrene

Exceedances of the 1E-6 acceptable ILCR, ranged from 2.5E-4 for construction workers to 1.1E-3 for park workers.

Benzo(b)fluoranthene

Exceedances of the 1E-6 acceptable ILCR, ranged from 1.4E-5 for construction workers to 6.6E-5 for park workers.

Benzo(g,h,i)perylene

Exceedances of the 1E-6 acceptable ILCR, ranged from 3.9E-6 for construction workers to 1.8E-5 for park workers.

Benzo(k)fluoranthene

Exceedances of the 1E-6 acceptable ILCR, ranged from 2.4E-6 for construction workers to 1.1E-5 for park workers.

Dibenz(a)anthracene

Exceedances of the 1E-6 acceptable ILCR, ranged from 3.3E-4 for construction workers to 1.5E-3 for park workers.

Indeno(1,2,3-cd)pyrene

Exceedances of the 1E-6 acceptable ILCR, ranged from 4.4E-5 for construction workers to 2E-4 for park workers.

Dermal contact with surface water and to a lesser extent direct contact with surface soil and sediment are the major contributors to the elevated risk levels observed for the PAHs.

4,4'-DDD and 4,4'-DDE

For 4,4'-DDD and 4,4'-DDE, only construction workers were predicted to have ILCR values exceeding 1E-6, ranging from 1.3E-6 (4,4'-DDE) to 2.4E-6 (4,4'-DDD). Surface soil ingestion is the major pathway contributing to the ILCR for 4,4'-DDD and 4,4'-DDE.

4,4'-DDT

Receptors whose predicted ILCR values exceed 1E-6 for 4,4'-DDT include adult trespassers, park users and park users/future off-site residents, and construction workers. ILCR values for these receptors range from 3.0E-6 for the park user/future off-site resident (combined receptor) to 5.9E-6 for park workers. Surface soil ingestion and sediment ingestion/dermal contact are the major contributors to the ILCR for 4,4'-DDT.

Aroclor 1248

ILCR exceeds the 1E-6 risk level in all the receptors considered in the risk assessment, except adult trespassers and future off-site residents. ILCR values greater than 1E-6 range from 3E-6 for construction workers to 2.8E-5 for park workers. Dermal exposure to surface water is the primary path contributing to the ILCR values.

Aroclor 1260

All receptors, except future off-site residents, are predicted to have ILCR values that exceed 1E-6, with values ranging from 5.9E-5 for construction workers to 2.7E-4 for park workers. Dermal exposure to surface water is the primary path contributing to the ILCR values.

Benzene

Park and construction workers are the only receptors predicted to have ILCR values that exceed 1E-6 for benzene, with values ranging from 1.2E-6 for park workers to 1.4E-5 for construction workers. Dermal contact with surface and groundwater drive the ILCR values for park and construction workers, respectively.

Bis(2-ethylhexylphthalate)

The park worker is the only receptor for which bis(2-ethylhexyl)phthalate ILCR values exceed 1E-6, with an ILCR value of 1.3E-6. Dermal contact with surface water is the primary pathway contributing to the ILCR value.

Vinyl Chloride

The park worker is the only receptor for which vinyl chloride ILCR values exceed 1E-6, with an ILCR value of 1.3E-6. Dermal contact with surface water is the primary pathway contributing to the ILCR value.

3.4.3.4 Carcinogenic Assessment (Including Fish Consumption)

COPCs with ILCR values that exceed a risk level of 1E-6, in exposure scenarios with fish consumption include:

Arsenic

ILCR exceeds the 1E-6 risk level in all the receptors considered in the risk assessment. ILCR values range from 2.6E-6 (current off-site resident; combined receptor) to 9.6E-4 (park visitor and future off-site resident; combined receptor). Fish consumption is the primary contributor to the elevated ILCR values.

Beryllium

ILCR exceeds the 1E-6 risk level in all the receptors, except future off-site residents, considered in the risk assessment. ILCR values greater than 1E-6 range from 1.3E-6 for construction workers to 3.4E-5 for the park visitor and future off-site resident (combined receptor). Fish consumption is the primary contributor to the elevated ILCR values.

Cadmium

ILCR exceeds the 1E-6 risk level in all the receptors considered in the risk assessment, except future off-site residents. ILCR values greater than 1E-6 range from 2E-6 for adult trespassers to 1.9E-3 for park visitors and future off-site residents. Ingestion of fish is the primary contributor to the exceedance of the 1E-6 risk level.

Chromium

ILCR exceeds the 1E-6 risk level in all the receptors considered in the risk assessment. ILCR values greater than 1E-6 range from 8.7E-6 for current adult off-site residents to 7.0E-4 for adult park visitors. Ingestion of fish is the primary contributor to the exceedance of the 1E-6 risk level. Chromium has conservatively assumed to be present at the site in Cr(VI) form, as the type of chromium analyzed is unspecified.

Cobalt

ILCR values exceed the 1E-6 risk level in all the receptors considered in the risk assessment. ILCR values greater than 1E-6 range from 1.1E-6 for current off-site residents (adult) to 5.5E-3 for adult park visitors. Fish consumption is the primary contributor to the exceedance of the 1E-6 risk level.

PAHs

The following PAHs demonstrated exceedances of the acceptable ILCR level of 1E-6:

Acenaphthylene

ILCR values exceed the 1E-6 risk level for park visitors and park visitors/future off-site residents (adult and combined receptors). ILCR values greater than 1E-6 range from 1.8E-6 for combined receptor park visitors and park visitors/future off-site residents to 2.9E-6 for adult park visitors and park visitors/future off-site residents.

Benzo(a)anthracene

Exceedances of the 1E-6 acceptable ILCR, ranged from 1.9E-5 for construction workers to 3.3E-4 for adult park visitors and park visitors/future off-site residents.

Benzo(a)pyrene

Exceedances of the 1E-6 acceptable ILCR, ranged from 2.5E-4 for construction workers to 3.5E-3 for adult park visitors and park visitors/future off-site residents.

Benzo(b)fluoranthene

Exceedances of the 1E-6 acceptable ILCR, ranged from 1.4E-5 for construction workers to 3.2E-4 for adult park visitors and park visitors/future off-site residents.

Benzo(g,h,i)perylene

Exceedances of the 1E-6 acceptable ILCR, ranged from 3.9E-6 for construction workers to 3.8E-5 for adult park visitors and park visitors/future off-site residents.

Benzo(k)fluoranthene

Exceedances of the 1E-6 acceptable ILCR, ranged from 2.4E-6 for construction workers to 3.4E-5 for adult park visitors and park visitors/future off-site residents.

Chrysene

ILCR values exceed the 1E-6 risk level for park visitors and park visitors/future off-site residents (adult and combined receptors). ILCR values for the above receptors range from 2.1E-6 for combined receptor park visitors and park visitors/future off-site residents to 3.4E-6 for adult combined receptor park visitors and park visitors/future off-site residents.

Dibenz(a)anthracene

Exceedances of the 1E-6 acceptable ILCR, ranged from 3.3E-4 for construction workers to 3.7E-3 adult park visitors and park visitors/future off-site residents.

Indeno(1,2,3-cd)pyrene

Exceedances of the 1E-6 acceptable ILCR, ranged from 4.4E-5 for construction workers to 4.0E-4 for adult park visitors and park visitors/future off-site residents.

Phenanthrene

ILCR values exceed the 1E-6 risk level for park visitors and park visitors/future off-site residents (adult and combined receptors). ILCR values for the above receptors range from 1.9E-6 for combined receptor park visitors and park visitors/future off-site residents to 3.0E-6 for adult park visitors and park visitors/future off-site residents.

Consumption of fish and dermal contact with surface water are the major contributors to the elevated risk levels observed for the PAHs.

1,2-Dichloroethane

ILCR values exceed the 1E-6 risk level for park visitors and park visitors/future off-site residents (adult and combined receptors). ILCR values for the above receptors range from 2.2E-6 for combined receptor park visitors and park visitors/future off-site residents to 3.5E-6 for adult park visitors and park visitors/future off-site residents.

4,4'-DDD

Park workers, park visitors (adult and combined receptors) and park visitors/future off-site residents (adult and combined receptors) are predicted to have ILCR values that exceed 1E-6. ILCR values for the above receptors range from 2.4E-6 for park workers to 2.2E-4 for adult park visitors and park visitors/future off-site residents. Fish consumption is a major contributing pathway to elevated ILCR levels.

4,4'-DDE

Receptors whose predicted ILCR values exceed 1E-6 for 4,4'-DDE include park workers, park users and park users/future off-site residents. ILCR values for these receptors range from 1.3E-6 for park workers to 1.4E-4 for combined receptor park visitors and park

visitors/future off-site residents. Ingestion of fish is a primary contributor to elevated ILCR values.

4,4'-DDT

Receptors whose predicted ILCR values exceed 1E-6 for 4,4'-DDT include adult trespassers, park workers, park users, park users/future off-site residents, and construction workers. ILCR values for these receptors range from 3.7E-6 for adult trespasser to 7.4E-4 for adult park visitors and park visitors/future off-site resident. Consumption of fish and surface soil/sediment ingestion are the major contributors to the ILCR for 4,4'-DDT.

Aroclor 1248

ILCR exceeds the 1E-6 risk level in all the receptors considered in the risk assessment, except adult trespassers and future off-site residents. ILCR values greater than 1E-6, range from 3E-6 for construction workers to 1E-2 for adult park users and park users/future off-site residents. Ingestion of fish and dermal exposure to surface water are the primary pathways contributing to the ILCR values.

Aroclor 1260

All receptors, except future off-site residents, are predicted to have ILCR values that exceed 1E-6, with values ranging from 5.9E-5 for construction workers to 9.9E-2 for adult park users and park users/future off-site residents. Fish consumption and dermal exposure to surface water is the primary exposure routes contributing to the ILCR values.

Benzene

All receptors, except adult trespassers and future off-site residents, are predicted to have ILCR values that exceed 1E-6 for benzene, with values ranging from 1.2E-6 for park workers to1.4E-5 for construction workers. Dermal contact with surface and groundwater drive the ILCR values for park and construction workers, respectively.

Bis(2-ethylhexyl)phthalate)

Receptors whose predicted ILCR values exceed 1E-6 for bis(2-ethylhexyl)phthalate include park workers, park users and park users/future off-site residents. ILCR values for these receptors range from 1.3E-6 for park workers to 4.E-4 for adult receptor park visitors and park visitors/future off-site residents. Ingestion of fish and dermal contact with surface water are the primary pathways contributing to the ILCR values.

Bromodichloromethane

The adult park visitor and adult park visitor/future off-site resident are the only receptors for which predicted ILCR values exceed 1E-6. ILCR values for both of the above receptors is 1.5E-6 with fish consumption being the primary exposure pathway.

Vinyl Chloride

Receptors whose predicted ILCR values exceed 1E-6 include park workers, park users and park users/future off-site residents. ILCR values for these receptors range from 1.3E-6 for park workers to 2.0E-6 for park users and park users/future off-site residents (combined receptor). Consumption of fish and dermal contact with surface water are the primary exposure pathways contributing to the ILCR value.

Beta-BHC

Receptors whose predicted ILCR values exceed 1E-6 include park users and park users/future off-site residents. ILCR values for these receptors range from 2.0E-5 for park users and park users/future off-site residents (combined receptor) to 3.2E-5 for adult park users and park users/future off-site residents. Fish consumption is the primary exposure pathway contributing to the ILCR value.

3.5 RISK CONCLUSIONS

In summary, multiple COPCs were identified for which, hazard quotients exceeded 1 or ILCR values exceeded 1E-6, as detailed below.

Exposure Scenarios not Considering Fish Consumption

For a summary of exposure scenarios that do not include fish consumption, the following COPCs were identified for further assessment as hazard quotients exceeded 1or ILCR values exceeded 1E-6:

Metals:	aluminum, arsenic, beryllium, cadmium, chromium, cobalt, manganese, vanadium
PAHs:	benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, dibenz(a)anthracene, and indeno(1,2,3-cd)pyrene)
Pesticides:	4,4'-DDT, 4,4'-DDD, 4,4'-DDE, Arochlor 1248 and Arochlor 1260
Organics:	benzene, bis(2-ethylhexyl)phthalate, and vinyl chloride

COPCs, which contribute the greatest potential hazard/risk based on magnitude of HQ and/or ILCR, include benzene, chromium, manganese, PAHs and Arochlor 1260. The primary exposure pathways that hazard/risk are incidental soil ingestion and dust inhalation (metals and pesticides) and dermal contact with surface water (PAHs, organics and pesticides). Off-site residents were the least likely to be impacted, with the park and construction workers generally demonstrating the greatest ILCR and hazard quotient values, respectively.

Exposure Scenarios Considering Fish Consumption

For a summary of exposure scenarios that do not include fish consumption, the following COPCs were identified for further assessment as hazard quotients exceeded 1or ILCR values exceeded 1E-6:

Metals:	aluminum, arsenic, beryllium, cadmium, chromium, cobalt, iron, manganese, mercury, thallium, vanadium and zinc
PAHs:	acenaphthylene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a)anthracene, indeno(1,2,3-cd)pyrene, and phenanthrene
Pesticides:	4,4'-DDT, 4,4'-DDD, 4,4'-DDE, Arochlor 1248 and Arochlor 1260
Organics:	benzene, beta-BHC, bis(2-ethylhexyl)phthalate, bromodichloromethane and vinyl chloride

The primary exposure pathways that contribute to hazard/risk are generally fish consumption for park users and park users who are also off-site residents. Incidental soil ingestion/dust inhalation and dermal contact with surface water are the primary exposure pathways for adult trespassers, construction workers and park workers; these receptors do not consume fish from the site. Off-site residents were the least likely to be impacted, with the park users and park users who are also off-site residents demonstrating the greatest ILCR and hazard quotient values.

3.6 UNCERTAINTY ANALYSIS

Predicted exposure doses for multiple COPCs and receptors result in hazard quotients greater than 1 and ILCR values greater than 1E-6. Multiple conservative assumptions were made in this screening level risk assessment and, therefore exceedances of acceptable hazard quotient and incremental lifetime cancer risk levels do not necessarily indicate that adverse effects are likely, but that further evaluation is necessary. The primary sources of uncertainty in the risk characterization for human health risk assessment include:

Future Media Concentrations — The site currently contains limited surface water bodies and sediments, although future plans for the park include re-establishment of a wetland area and a channel connecting the site to the Anacostia River. It is not possible to precisely predict future surface water and sediment concentrations at this time and therefore, the limited number of surface water and sediment samples collected to date are assumed to be representative of future conditions. Current estimates of exposure resulting from surface water and sediment could either be over- or underestimated, depending on how similar future conditions are to the current data set.

Fish Tissue Concentrations — There are currently no fish on the site. In order to assess possible future consumption of fish from the site, fish tissue concentrations were estimated using maximum surface water concentrations and bioconcentration factors (generated by USEPA (1999) or estimated from estimated log K_{ow} values (USEPA, 1999)). In addition to the uncertainty outlined above regarding the representativeness of current surface water concentrations for future site conditions, the use of the USEPA (1999) bioconcentration factors to predict fish tissue concentrations contributes substantial uncertainty to the screening level HHRA. Data used to generate the BCFs were not necessarily specific to the organism or chemical in question. Additionally, BCFs are typically highly site-specific, and are strongly influenced by geochemical considerations (e.g., pH, total organic carbon, major ion concentrations, percent moisture) that were not considered in the derivation of the BCFs by USEPA (1999). The uncertainty with respect to BCF selection may lead to overestimates of risks for fish tissue data for many COPCs.

Exposure Assumptions — It has been assumed for the purposes of the screening level risk assessment that receptors spend a relatively large amount of time on the site and come into contact with all site media; even though it is likely that activities (swimming, wading, and fishing) that would result in contact with the following media (surface water, sediment and fish) may not be encouraged in a passive recreational setting with sensitive wetland areas. It is, therefore, possible that the above assumptions may overestimate risks to the general population.

3.6.1 Comparison to Environ (2002) Human Health Risk Assessment

Predicted exposure doses for multiple COPCs and receptor combinations, which resulted in hazard quotients greater than 1 and/or ILCR values greater than 1E-6 were identified in this screening level risk assessment. Environ (2002) identified only arsenic and benzo(a)pyrene as substances which exceeded the risk based screening levels that they had developed for the site. There are several major differences between the two assessments including:

Different Target Risk Levels — Environ (2002) used an acceptable ILCR level of 1E-5 to develop their risk-based screening levels, in comparison to the 1E-6 level used to assess potential risk in this screening-level assessment.

Consideration of Additional Media — Additional media were considered in this risk assessment as the future development plans of the park have changed between the Environ (2002) and EVS (2004). When Environ (2002) conducted their assessment, the plans for the park included an active recreational site, however current plans include restoration of wetlands and a much more passive recreational use. The restoration of the

wetland areas leads to the inclusion of surface water (only one sample was available when Environ conducted their assessment), sediment and fish in the current risk assessment.

Additional Data Sampling — As part of a site characterization study conducted by Ridolfi (2003), additional soil, sediment and surface water samples were collected. In many cases, the expanded data set led to the identification of (a) additional COPCs in soil or surface water, (b) new COPCs in sediment (c) inclusion of hypothetical fish tissue concentrations based on modeling and the expanded surface water data set, (d) increased estimates of 95% UCL and/or maximum values (for media with a limited number of samples) as the result of the additional sampling.

Table 3-1: Identification of soil COPCs based on comparison of maximum soil concentrations (0 to 2 feet) to criteria.

Exposure Point	CAS	Chemical (Qualifier)[3]	Min	Max	95% UCL or 95th Percentile (P)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	EPA Region III RBC [2] (mg/kg)	DC Tier 1 RSBLs (mg/kg)	COPC Flag
	7429-90-5	Aluminum (NC)	1920	27500	**10536.9**	mg/kg	SS-30	92/92	-	7800		**Yes**
	7440-36-0	Antimony (NC)	0.49	20.9	**9.92**	mg/kg	FD-1	18/35	7-33.43	3.1		**Yes**
	7440-38-2	Arsenic (C)	0.60	88	**17.2**	mg/kg	SS-08	126/135	4.3-7.1	0.43	0.101	**Yes**
	7440-39-3	Barium (NC)	19.1	585	**99.72**	mg/kg	SS-09	92/92	-	550		**Yes**
	7440-41-7	Beryllium (C)	0.1	1.7	**0.71**	mg/kg	SU-01	126/128	0.23-0.3	16		No
	7440-43-9	Cadmium (C)	0.12	7.3	**1.88**	mg/kg	GS-2	91/116	0.2-0.6	7.8		No
	7440-47-3	Chromium (C)	9.1	219	**40.15**	mg/kg	SS-30	92/92	-	23[6]	0.0461[6]	**Yes**
	7440-47-3	Chromium (total) (C)	6.8	47.3	**20.97**	mg/kg	SB31	36/36	-	23[6]	0.0461[6]	**Yes**
	7440-48-4	Cobalt (C)	0.59	19.8	**8.13**	mg/kg	DCMW015-02	92/92	-	160	3950	No
	7440-50-8	Copper (NC)	5.2	2840	**35.8**	mg/kg	FD-1	127/128	0.97-0.97	310	2630	**Yes**
	7439-89-6	Iron (NC)	6070	155000	**27594.8**	mg/kg	FD-1	92/92	-	2300		**Yes**
	7439-92-1	Lead (C)	5.9	371	**127.68**	mg/kg	FD-1	128/128	-	400 [1]		No
	7439-96-5	Manganese (NC)	22.4	1270J	**408.84**	mg/kg	SS-13	92/92	-	160		**Yes**
	7439-97-6	Mercury (NC)	0.04	0.97	**0.228**	mg/kg	SS-32	76/125	0.04-0.32	0.78		**Yes**
	744-2-0	Nickel (NC)	1.7	128	**23.36**	mg/kg	FD-1	128/128	-	160		No
	7782-49-2	Selenium (NC)	0.2	4	**0.84**	mg/kg	FD-1	52/91	0.2-2.79	39	329	No
	7440-22-4	Silver (NC)	0.11	8.9	**1.98 P**	mg/kg	SS-32	21/109	0.3-5.9	39	329	No
	7440-28-0	Thallium (NC)	0.1	6.2	**2.92 P**	mg/kg	FD-1	39/127	0.1-9.8	0.55		**Yes**
	7440-62-2	Vanadium (NC)	9.3	79.2	**33.2**	mg/kg	SS-30	92/92	-	2.3	461	**Yes**
	7440-66-6	Zinc (NC)	18	1830	**257.52**	mg/kg	GS-2	128/128	-	2300	19800	No
	83-32-9	Acenaphthene (NC)	0.02	0.74	**0.826 P**	mg/kg	FD-1	10/100	0.012-8.87	470	196	No
	120-12-7	Anthracene (NC)	0.037	8.96	**0.845 P**	mg/kg	SB08	36/102	0.07-5.16	2300	8.08	**Yes**
	56-55-3	Benzo(a)anthracene (C)	0.036	47.1	**3.44**	mg/kg	SB08	83/113	0.07-5.16	0.87	1.05	**Yes**
	50-32-8	Benzo(a)pyrene (C)	0.038	65.1	**4.61**	mg/kg	SB08	84/112	0.07-5.16	0.087	0.105	**Yes**
	205-99-2	Benzo(b)fluoranthene (C)	0.042	101	**6.89**	mg/kg	SB08	95/116	0.07-5.16	0.87	1.05	**Yes**
	191-24-2	Benzo(g,h,i)perylene	0.039	26.8	**2.04**	mg/kg	SB08	67/108	0.07-5.16		4.17	**Yes**
	207-08-9	Benzo(k)fluoranthene (C)	0.04	3.1	**0.4**	mg/kg	SS-22	62/82	0.07-5.16	8.7	8.16	No
	218-01-9	Chrysene (C)	0.038	45.5	**9.92**	mg/kg	SB08	88/115	0.07-5.16	87	3.92	**Yes**
	53-70-3	Dibenz(a,h)anthracene (C)	0.015	7.81	**0.826 P**	mg/kg	SB08	21/100	0.02-5.16	0.087		**Yes**
	206-44-0	Fluoranthene (NC)	0.036	133	**8.55**	mg/kg	SB08	101/122	0.07-3.14	310	101	**Yes**

Table 3-1: Cont'd.

Exposure Point	CAS	Chemical (Qualifier)[3]	Min	Max	95% UCL or 95th Percentile (P)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	EPA Region III RBC [2] (mg/kg)	DC Tier 1 RSBLs (mg/kg)	COPC Flag
	86-73-7	Fluorene (NC)	0.018	0.75	**0.826 P**	mg/kg	FD-1	13/100	0.012-8.87	310	145	No
	193-39-5	Indeno(1,2,3-cd)pyrene (C)	0.043	19.9	**1.56**	mg/kg	SB08	67/110	0.07-5.16	0.87		**Yes**
	91-20-3	Naphthalene (NC)	0.033	2.58	**0.846 P**	mg/kg	MW07	13/104	0.0058-8.87	160	706	No
	85-01-8	Phenanthrene	0.049	28.6	**2.41**	mg/kg	SB08	82/114	0.07-5.16		140	No
	129-0-0	Pyrene (NC)	0.04	62.9	**4.41**	mg/kg	SB08	99/120	0.07-3.14	230	87.2	No
	91-57-6	2-Methylnaphthalene (NC)	0.026J	**2.58**		mg/kg	MW07	18/149	-	160		No
	75-35-4	1,1-Dichloroethene (NC)	0.002	**0.002**		mg/kg	SO-11s	1/4	0.0012-0.0013	390	0.00546	No
	120-82-1	1,2,4-Trichlorobenzene (NC)	0.002	0.002	**0.201 P**	mg/kg	FD-1	1/67	0.0058-5.16	78		No
	107-06-2	1,2-Dichloroethane (C)		**0.00065**[5]		mg/kg	SS-32	0/3	0.0012-0.0013	7		No
	106-46-7	1,4-Dichlorobenzene (C)	0.005	**0.005**		mg/kg	SU-01	1/1	-	27	5.06	No
	78-93-3	2-Butanone (NC)	0.003	0.028	**0.0268 P**	mg/kg	SB06	5/25	0.0058-0.036	4700	2380	No
	591-78-6	2-Hexanone (NC)	0.002	**0.002**		mg/kg	GS-2	1/4	0.0058-0.0066	310		No
	95-48-7	2-Methylphenol (NC)	0.04	**0.04**		mg/kg	SS-20	1/99	0.07-8.87	390	8.87	No
	72-54-8	4,4'-DDD (C)	0.0013	110	**13.56**	mg/kg	SS-07	86/132	0.0035-0.25	2.7	3.2	**Yes**
	72-55-9	4,4'-DDE (C)	0.0028	8.7	**1.36**	mg/kg	SS-08	103/139	0.0035-0.11	1.9	2.26	**Yes**
	50-29-3	4,4'-DDT (C)	0.0038	130	**12.31**	mg/kg	SS-08	89/136	0.0035-0.51	1.9	0.00407	**Yes**
	106-44-5	4-Methylphenol (NC)	0.061	**0.34**		mg/kg	SS-20	3/3	-	39		No
	67-64-1	Acetone (NC)	0.001	0.117	**0.032**	mg/kg	SB06	20/30	0.0058-0.014	7000	6590	No
	12672-29-6	Aroclor 1248 (C)	0.052	2.8	**0.870 P**	mg/kg	SS-08	6/61	0.035-3	0.32		**Yes**
	11096-82-5	Aroclor 1260 (C)	0.023	3.38	**2.30 P**	mg/kg	SB40	44/112	0.035-12	0.32		**Yes**
	100-52-7	Benzaldehyde (NC)	0.053	**0.053**		mg/kg	GS-2	1/1	-	780		No
	71-43-2	Benzene (C)	-	-		mg/kg	-	0/40	0.0012-0.013	12	0.157	No
	65-85-0	Benzoic Acid (NC)	1.6	**3.5**		mg/kg	SS-16	3/63	0.7-25.8	31000		No
	100-51-6	Benzyl Alcohol (NC)	1.5	**1.5**		mg/kg	SS-19	1/63	0.35-10.2	2300	10.2	No
	319-85-7	beta-BHC (C)	0.0022J	**0.0027J**		mg/kg	FD-1	2/116	Unspecified	0.35		No
	117-81-7	bis(2-Ethylhexyl)phthalate (C)	0.043	**25**		mg/kg	SU-01	32/118	0.07-8.87	46		No
	85-68-7	Butylbenzylphthalate (NC)	0.054	**9.9**		mg/kg	SS-19	11/67	0.07-5.16	1600	370	No
	86-74-8	Carbazole (C)	0.043J	**0.83**		mg/kg	C04E2	12/28		32		No
	75-15-0	Carbon Disulfide (NC)	0.0027	**0.0027**		mg/kg	SB21	1/12	0.0012-0.0063	780	18.8	No
	108-90-7	Chlorobenzene (NC)	0.008	**0.008**		mg/kg	SU-01	1/1	-	160	61.6	No
	57-12-5	Cyanide (NC)	0.045	**8.4**		mg/kg	FD-1	25/31		160	1320	No
	333-41-5	Diazinon (NC)	0.13	**0.13**		mg/kg	GH14	1/57	0.034-0.82	7	4.57	No
	5103-71-9	alpha Chlordane (C)	0C	**0.75**		mg/kg	SS-20	8/88	1.1E-03- 5.4E-3	1.8		No

Table 3-1: Cont'd.

Exposure Point	CAS	Chemical (Qualifier)[3]	Min	Max	95% UCL or 95th Percentile (P)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	EPA Region III RBC [2] (mg/kg)	DC Tier 1 RSBLs (mg/kg)	COPC Flag
	5103-74-2	gamma Chlordane (C)	0.0014J	**1**		mg/kg	SS-08	24/90	-	1.8		No
	132-64-9	Dibenzofuran (NC)	0.014	**0.6**		mg/kg	FD-1	9/65	0.02-5.16	16	233	No
	84-66-2	Diethylphthalate (NC)	0.12	**0.12**		mg/kg	SB01	1/63	0.07-5.16	6300	1010	No
	131-11-3	Dimethylphthalate (NC)	3.7	**3.7**		mg/kg	SS-25	1/63	0.07-5.16	78000	2250	No
	84-74-2	Di-n-butylphthalate (NC)	0.05J	**4.94B**		mg/kg	MW04	45/153	-	780		No
	117-84-0	Di-n-octylphthalate (NC)	0.037J	**0.042J**		mg/kg	GS-2	2/12	-	310		No
	959-98-8	Endosulfan I (NC)	0.0072	**0.0093**		mg/kg	SS-19	3/119	0.0017-0.62	47	10.5	No
	1031-07-8	Endosulfan sulfate (NC)	0.0057J	**0.048J**		mg/kg	GS-2	2/193	-	47		No
	72-20-8	Endrin (NC)	0.011	**0.011**		mg/kg	PA-3	1/114	0.0021-1.2	2.3	19.8	No
	7421-93-4	Endrin aldehyde(NC)	0.0042J	**0.044J**		mg/kg	SO-6d	5/190	-	2.3		No
	53494-70-5	Endrin ketone		**0.065**[5]		mg/kg	SS-08	0/60	0.0035-0.13	2.3		No
	100-41-4	Ethylbenzene (NC)	-	-		mg/kg	-	0/40	0.0012-0.013	780	1160	No
	58-89-9	gamma-BHC (Lindane) (C)	0.011	**0.017**		mg/kg	SS-22	3/61	0.0017-0.065	0.49		No
	76-44-8	Heptachlor (C)	0.0085	**0.0085**		mg/kg	SS-15	1/113	0.0011-0.62	0.14	0.158	No
	1024-57-3	Heptachlor epoxide (C)	0.0033	**0.026**		mg/kg	GS-1	5/117	0.0011-0.62	0.07	0.0842	No
	72-43-5	Methoxychlor (NC)	0.026	**14.2**		mg/kg	MW02	8/121	0.007-6.2	39		No
	1634-04-4	MTBE (C)		**0.0031**		mg/kg	MW04	0/5	0.001-0.0062	160	1440	No
	75-09-2	Methylene Chloride (C)	0.0027	0.035	**0.016**	mg/kg	SO-5D	35/43	0.0023-0.0063	85	1.9	No
	99-09-2	3-Nitroaniline (NC)	0.39	**0.39**		mg/kg	GS-2	1/64	0.42-25.8	2.3		No
	87-86-5	Pentachlorophenol (C)	5.2	**5.2**		mg/kg	SS-22	1/63	0.35-25.8	5.3	25.8	No
	55722-27-5	Total TCDF (NC)	0.000036	**0.000057**		mg/kg	BP01	3/2	8.5E-07-1.5E-06	7.8		No
	108-88-3	Toluene (NC)	0.001	**0.001**		mg/kg	GS-2	1/13	0.0012-0.0063	1600	125	No
	1330-20-7	Xylenes (total) (NC)	0.0087	**0.0087**		mg/kg	MW07	1/9	0.01-0.013	1600	504	No

[1] EPA Region III RBC

[2] Criteria for non-carcinogens multiplied by 0.1

[3] NC = non-carcinogen, C = carcinogen (Soil ingestion pathway)

[4] **##** = selected concentrations for criteria screening are bold and underlined

[5] value based on ½ detection limit

[6] screening criteria for Cr(IV) used

Table 3-2: Identification of soil COPCs based on comparison of maximum soil concentrations (greater than 2 feet) to criteria.

Exposure Point	CAS	Chemical (Qualifier) [3]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	95 UCL or 95 percentile (P)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	EPA Region III RBC [2] (mg/kg)	DC TIER 1 RSBLs (mg/kg)	COPC Flag
	7429-90-5	Aluminum (NC)	2000	29400	**18700**	mg/kg	DCMW015-02	37/37	-	7800		**Yes**
	7440-36-0	Antimony (NC)	0.83	0.83	**14.3 P**	mg/kg	SO-8d	1/22	0.005-0.0154	3.1		No
	7440-38-2	Arsenic (C)	0.9	118	**26.3**	mg/kg	SB12	67/81	0.0028-0.0063	0.43	0.101	**Yes**
	7440-39-3	Barium (NC)	13.4	445	**178**	mg/kg	SO-8d	37/37	-	550		No
	7440-41-7	Beryllium (C)	0.12	2.4	**1.09**	mg/kg	SO-8d	66/72	0.0002-0.0013	16		No
	7440-43-9	Cadmium (C)	0.12	5.1	**2.27**	mg/kg	SB12	43/69	0.0002-0.0008	7.8		No
	7440-47-3	Chromium (C)	10	39.5	**26.8**	mg/kg	DCMW015-02	37/37	-	23[6]	0.0461[6]	**Yes**
	7440-47-3	Chromium (total) (C)	6.6	119	**27.2**	mg/kg	SB43	35/35	-	23[6]	0.0461[6]	**Yes**
	7440-48-4	Cobalt (C)	0.88	20	**15.2**	mg/kg	DCMW015-02	37/37	-	160	3950	No
	7440-50-8	Copper (NC)	2.5	223	**30.3**	mg/kg	SB38	72/72	-	310	2630	No
	7439-89-6	Iron (NC)	8440	43800	**26.7**	mg/kg	SB-102	37/37	-	2300		**Yes**
	7439-92-1	Lead (C)	6	440	**99.3**	mg/kg	DCMW015-02	71/72	0.0056-0.0056	400 [1]		**Yes**
	7439-96-5	Manganese (NC)	26.3	1350	**667**	mg/kg	SB-102	37/37	-	1100		**Yes**
	7439-97-6	Mercury (NC)	0.061	0.84	**0.324**	mg/kg	DCMW015-02	38/71	0.00006-0.00047	0.78		**Yes**
	7440-02-0	Nickel (NC)	2.5	250	**36.5**	mg/kg	SB43	71/72	0.0044-0.0044	160		**Yes**
	7782-49-2	Selenium (NC)	0.3	1	**1.13 P**	mg/kg	SO-6d	9/36	0.0002-0.0013	39	329	No
	7440-22-4	Silver (NC)	0.7	2.8	**2.01 P**	mg/kg	SB-2	8/67	0.0003-0.0068	39	329	No
	7440-28-0	Thallium (NC)	0.1	0.52	**2.31 P**	mg/kg	SB41	24/72	0.0001-0.0026	0.55		No
	7440-62-2	Vanadium (NC)	13.2	64.9	**38.7**	mg/kg	DCMW010-02	37/37	-	55	461	**Yes**
	7440-66-6	Zinc (NC)	7.6	421	**121**	mg/kg	DCMW010-02	72/72	-	2300	19800	No
	83-32-9	Acenaphthene (NC)	1.1	3.78	**7.86 P**	mg/kg	SB21	2/41	0.1-85.7	470	196	No
	120-12-7	Anthracene (NC)	0.15	12.3	**7.86 P**	mg/kg	SB21	5/41	0.1-8.68	2300	8.08	**Yes**
	56-55-3	Benzo(a)anthracene (C)	0.096	19	**8.23 P**	mg/kg	SB01	22/44	0.12-8.68	0.87	1.05	**Yes**
	50-32-8	Benzo(a)pyrene (C)	0.074	32	**6.37**	mg/kg	SB01	26/44	0.12-8.68	0.087	0.105	**Yes**
	205-99-2	Benzo(b)fluoranthene (C)	0.063	24.3	**6.17**	mg/kg	SB21	28/44	0.12-8.68	0.87	1.05	**Yes**
	191-24-2	Benzo(g,h,i)perylene	0.161	14	**7.86 P**	mg/kg	SB01	10/41	0.1-8.68		4.17	**Yes**
	207-08-9	Benzo(k)fluoranthene (C)	0.092	25	**7.41 P**	mg/kg	SB01	10/26	0.12-8.68	8.7	8.16	**Yes**
	218-01-9	Chrysene (C)	0.093	25	**5.63**	mg/kg	SB01	24/44	0.12-8.68	87	3.92	**Yes**
	53-70-3	Dibenz(a,h)anthracene (C)	0.465	1.29	**7.86 P**	mg/kg	SB21	3/41	0.1-85.7	0.087		**Yes**

Table 3-2: Cont'd.

Exposure Point	CAS	Chemical (Qualifier) [3]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	95 UCL or 95 percentile (P)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	EPA Region III RBC [2] (mg/kg)	DC TIER 1 RSBLs (mg/kg)	COPC Flag
	206-44-0	Fluoranthene (NC)	0.039	46.6	**8.9**	mg/kg	SB21	29/47	0.351-8.68	310	101	No
	86-73-7	Fluorene (NC)	1	7.36	**7.86 P**	mg/kg	SB21	2/41	0.1-85.7	310	145	No
	193-39-5	Indeno(1,2,3-cd)pyrene (C)	0.196	3.74	**7.86 P**	mg/kg	SB21	6/41	0.1-85.7	0.87		**Yes**
	91-20-3	Naphthalene (NC)	0.053	3.48	**6.20 P**	mg/kg	SB21	6/49	0.0046-85.7	160	706	No
	85-01-8	Phenanthrene (NC)	0.1	43.8	**8.52 P**	mg/kg	SB21	21/44	0.12-8.68		140	No
	129-00-0	Pyrene (NC)	0.049	31.9	**8.04**	mg/kg	SB21	28/46	0.351-8.68	230	87.2	No
	91-57-6	2-Methylnaphthalene (NC)	0.026J	**1.76**		mg/kg	MW07	18/149	-	160		No
						mg/kg						
	75-35-4	1,1-Dichloroethene (NC)		**0.00065**[5]		mg/kg	DCMW009-02	0/2	0.0012-0.0013	390	0.00546	No
	120-82-1	1,2,4-Trichlorobenzene (NC)		**42.85**[5]		mg/kg	SB-01	0/14	0.006-85.7	78		No
	107-06-2	1,2-Dichloroethane (C)		**0.00065**[5]		mg/kg	DCMW009-02	0/3	0.0012-0.0013	7		No
	106-46-7	1,4-Dichlorobenzene (C)		**42.85**[5]		mg/kg	SB-01	0/14	0.0012-85.7	27	5.06	No
	78-93-3	2-Butanone (NC)	0.012	0.053	**0.040 P**	mg/kg	MW01	5/31	0.006-0.017		2380	No
	591-78-6	2-Hexanone (NC)		**0.003**[5]		mg/kg	DCMW009-02	0/2	0.006-0.0064	310		No
	95-48-7	2-Methylphenol (NC)		**42.85**[5]		mg/kg	SB-01	0/41	0.077-85.7	390		No
	72-54-8	4,4'-DDD (C)	0.0033	8.16	**0.887 P**	mg/kg	BAG7	26/62	0.0038-0.048	2.7	3.2	**Yes**
	72-55-9	4,4'-DDE (C)	0.0031	7.2	**0.686 P**	mg/kg	DCMW010-02	28/62	0.0039-0.048	1.9	2.26	**Yes**
	50-29-3	4,4'-DDT (C)	0.0029	2.8	**0.429 P**	mg/kg	BAG8	15/60	0.0039-0.28	1.9	0.00407	**Yes**
	106-44-5	4-Methylphenol (NC)		**42.85**[5]		mg/kg	SB-01	0/41	0.77-85.7	39		No
	67-64-1	Acetone (NC)	0.004	0.167	**0.0396**	mg/kg	SB18	37/40	0.011-0.014	780	6590	No
	12672-29-6	Aroclor 1248 (C)		**0.0049**[5]		mg/kg	DCMW006-02	0/29	0.037-0.098	0.32		No
	11096-82-5	Aroclor 1260 (C)	0.024	1.1	**0.625 P**	mg/kg	SO-6d	10/60	0.039-2.8	0.32		**Yes**
	100-52-7	Benzaldehyde (NC)		-		mg/kg	-		-	780		No
	71-43-2	Benzene (C)	0.0025	0.081	**0.00836 P**	mg/kg	MW03	2/35	0.001-0.009	12	0.157	No
	65-85-0	Benzoic Acid (NC)		**214.5**[5]		mg/kg		0/12	0.387-169	31000		No
	100-51-6	Benzyl Alcohol (NC)		**84.5**[5]		mg/kg		0/12	0.077-85.7	2300		No
	319-85-7	beta-BHC (C)	0.0022J	**0.07J**		mg/kg	FD-1	2/116	Unspecified	0.35		No
	117-81-7	bis(2-Ethylhexyl)phthalate (C)	0.038	0.3	**7.24 P**	mg/kg	SO-1Bd	3/44	0.077-85.7	46		No
	85-68-7	Butylbenzylphthalate (NC)		**42.85**[5]		mg/kg		0/12	0.077-85.7	1600	370	No
	86-74-8	Carbazole (C)	0.043J	**1.4**		mg/kg	22-29	1/4	-	32		No
	75-15-0	Carbon Disulfide (NC)	0.003	0.011	**0.00839 P**	mg/kg	SB21	2/32	0.0012-0.0085	780	18.8	No
	108-90-7	Chlorobenzene (NC)		**0.00065**[5]		mg/kg		0/2	0.0012-0.0013	160	61.6	No

Table 3-2: Cont'd.

Exposure Point	CAS	Chemical (Qualifier) [3]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	95 UCL or 95 percentile (P)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	EPA Region III RBC [2] (mg/kg)	DC TIER 1 RSBLs (mg/kg)	COPC Flag
	57-12-5	Cyanide (NC)		**0.325**[5]		mg/kg		0/8	0.54-0.65	160	1320	No
	333-41-5	Diazinon (NC)		**0.285**[5]		mg/kg		0/30	0.14-0.5	7	4.57	No
	5103-71-9	alpha Chlordane (C)	0.06C	**0.94**		mg/kg	SS-20	8/88	1.1E-03- 5.4E-3	1.8		No
	5103-74-2	gamma Chlordane (C)	0.0029J	**0.19**		mg/kg	SS-08	24/90	-	1.8		No
	132-64-9	Dibenzofuran (NC)		**42.85**[5]		mg/kg		0/11	0.1-85.7	16	233	No
	84-66-2	Diethylphthalate (NC)		**42.85**[5]		mg/kg		0/12	0.1-85.7	6300	1010	No
	131-11-3	Dimethylphthalate (NC)		**42.85**[5]		mg/kg		0/12	0.077-85.7	78000	2250	No
	84-74-2	Di-n-butylphthalate (NC)	0.05J	**4.16B**		mg/kg	MW04	45/153	-	780		No
	117-84-0	Di-n-octylphthalate (NC)	0.037J	**42.85**[5]		mg/kg	GS-2	2/12	-	310		No
	959-98-8	Endosulfan I (NC)		**0.07**[5]		mg/kg		0/65	0.0019-0.14	47	10.5	No
	1031-07-8	Endosulfan sulfate (NC)	0.0057J	**0.057J**		mg/kg	GS-2	2/193	-	47		No
	72-20-8	Endrin (NC)		**0.14**[5]		mg/kg		0/65	0.0031-0.28	2.3	19.8	No
	7421-93-4	Endrin aldehyde(NC)	0.0042J	**0.044J**		mg/kg	SO-6d	5/190	-	2.3		No
	100-41-4	Ethylbenzene (NC)	0.012	0.138	**0.00955 P**	mg/kg	MW03	2/35	0.0012-0.0085	780	1160	No
	58-89-9	gamma-BHC (Lindane) (C)		**0.0015**[5]		mg/kg		0/29	0.0019-0.0031	0.49		No
	76-44-8	Heptachlor (C)		**0.07**[5]		mg/kg		0/65	0.0019-0.14	0.14	0.158	No
	1024-57-3	Heptachlor epoxide (C)	0.0029	**0.012**		mg/kg	SO-6d	2/59	0.0019-0.14	0.07	0.0842	No
	72-43-5	Methoxychlor (NC)	0.278	**0.278**		mg/kg	MW02	1/57	0.02-1.4	39		No
	1634-04-4	MTBE (C)	0.014	**0.098**		mg/kg	MW03	4/10	0.001-0.13	160	1440	No
	75-09-2	Methylene Chloride (C)	0.0062	0.064	**0.0177 P**	mg/kg	SO-3Bd	12/39	0.002-0.01	85	1.9	No
	99-09-2	3-Nitroaniline (NC)		**214.5**[5]		mg/kg	SB-01	0/13	0.46-429	2.3		No
	87-86-5	Pentachlorophenol (C)		**214.5**[5]		mg/kg	SB-01	0/13	0.38-429	5.3	6.4	No
	108-88-3	Toluene (NC)	0.0057	3.38	**0.00866 P**	mg/kg	MW03	3/35	0.001-0.008	1600	125	No
	1330-20-7	Xylenes (total) (NC)	0.0023	0.631	**0.017 P**	mg/kg	MW03	6/33	0.005-0.017	1600	504	No

[1] EPA Region III RBC

[2] Criteria for non-carcinogens multiplied by 0.1

[3] NC = non-carcinogen, C = carcinogen

[4] Depth Intervals - S = surface, SS = sub-surface, B = both

[5] value based on ½ detection limit

[6] screening criteria for Cr(VI) used

Table 3-3: Identification of surface water COPCs based on comparison of maximum surface water concentrations to criteria.

Point	CAS	Chemical (Qualifier) [2]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (ug/L)	EPA Region III RBC [1] (ug/L)	EPA NRWQC (ug/L)	Drinking water MCLs (ug/L)	COPC
Surface Water	7429-90-5	Aluminum (NC)	48B	1020	ug/L	SU-01	8/10	Unspecified	3700			No
	7440-36-0	Antimony (NC)	2	2	ug/L	SU-01, SW-1/1	2/5	1000-1000	1.5	640	6	**Yes**
	7440-38-2	Arsenic (C)	1J	37	ug/L	WL04	11/12	5-1000	0.045	0.14	10	**Yes**
	7440-39-3	Barium (NC)	47	98	ug/L	SU-01	11/11	1000-2000	260		2000	No
	7440-41-7	Beryllium (C)	0.41B	0.41B	ug/L	SW-1/2	1/4	Unspecified	7.3		4	No
	7440-43-9	Cadmium (C)	1B	2.2	ug/L	WL04	2/4	2-2000	1.8		5	**Yes**
	7440-47-3	Chromium (C)	1	13	ug/L	SU-01	4/6	1000-5000	11[4]		100[4]	**Yes**
	7440-48-4	Cobalt (C)	2	6	ug/L	SW-01	4/4	1000-5000	73			No
	7440-50-8	Copper (NC)	2	45	ug/L	SU-01	10/10	10-5000	150		1300	No
	7439-89-6	Iron (NC)	120	8940K	ug/L	SU-01	11/11	Unspecified	1100			**Yes**
	7439-92-1	Lead (C)	2L	177	ug/L	WL04	6/12	50-2000			15	**Yes**
	7439-96-5	Manganese (NC)	116	522	ug/L	SU-01	11/11	1000-5000	73			**Yes**
	7439-97-6	Mercury (NC)		0.5[3]	ug/L	WL04	0/12	0.0002-0.001	0.00037			**Yes**
	7440-02-0	Nickel (NC)	1	21.9	ug/L	WL04	7/9	20-1000	73	4600		No
	7440-28-0	Thallium (NC)		5[3]	ug/L	WL04	0/10	0.002-0.01	0.00026			**Yes**
	7440-62-2	Vanadium (NC)	1	5	ug/L	SU-01	5/7	1000-3000	1.1			**Yes**
	7440-66-6	Zinc (NC)	1L	475	ug/L	WL04	12/12	10-5000	1100	26000		No
	91-57-6	2-Methylnaphthalene (NC)		0.5[3]	ug/L	SW-01	0/2	0.1-1	12			No
	56-55-3	Benzo(a)anthracene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.09			**Yes**
	50-32-8	Benzo(a)pyrene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.009			**Yes**
	205-99-2	Benzo(b)fluoranthene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.09			**Yes**
	207-08-9	Benzo(k)fluoranthene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.9			**Yes**
	53-70-3	Dibenz(a,h)anthracene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.009			**Yes**
	193-39-5	Indeno(1,2,3-cd)pyrene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.09			**Yes**
	12672-29-6	Aroclor 1248 (C)		0.55[3]	ug/L	SW-01	0/1		0.033			**Yes**
	11096-82-5	Aroclor 1260 (C)		1.0[3]	ug/L	WL04	0/2	1.1-2	0.033			**Yes**
	67-64-1	Acetone (NC)	2B	4B	ug/L	SU-01, SW-1/1, SW-1/4, SW-01	8/11	Unspecified	550			No
	75-27-4	Bromodichloromethane (C)	1J	2J, L	ug/L	SW-1/1, SW-1/6, SW-1/2D	6/10	Unspecified	0.17			**Yes**
	67-66-3	Chloroform (C)	0.9J	6J, L	ug/L	SW-1/1, SW-1/2D	8/11	Unspecified	0.15	470		**Yes**

Table 3-3: Cont'd

Exposure Point	CAS	Chemical (Qualifier) [2]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (ug/L)	EPA Region III RBC [1] (ug/L)	EPA NRWQC (ug/L)	Drinking water MCLs (ug/L)	COPC
	124-48-1	Dibromochloromethane (C)	0.5L	0.6J	ug/L	SW-1/1	2/10	Unspecified	0.13			**Yes**
	84-74-2	Di-n-butylphthalate (NC)	13	13	ug/L	WL04	1/2	5-5	370	4500		No
	16984-48-8	Fluoride	520	520	ug/L	SW-01	1/1	Unspecified			4000	No
	71-43-2	Benzene (C)		2.5[3]	ug/L		0/9		0.34			**Yes**
	108-88-3	Toluene (NC)	2J	6.2	ug/L	WL04	2/11	1-1	75	200000	1000	No
	319-85-7	Beta-BHC		0.05[3]	ug/L	WL04	0/2		0.037			**Yes**
	135-98-8	sec-Butylbenzene	2	2	ug/L	MW02	1/4	Unspecified		12000		No
	57-12-5	Cyanide (NC)	1L	2L	ug/L	SU-01, SW-1/2D	5/9	Unspecified	73	220000	200	No

[1] criteria for non-carcinogens multiplied by 0.1

[2] NC = non-carcinogen, C = carcinogen (Ingestion pathway)

[3] indicates ½ maximum detection limit

[4] Screening criteria for Cr(IV) used

Table 3-4: Identification of surface water COPCs based on comparison of maximum surface water concentrations to criteria (removal of samples SU-01 and SW-01)[4].

Exposure Point	CAS	Chemical (Qualifier) [2]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (ug/L)	EPA Region III RBC [1] (ug/L)	EPA NRWQC (ug/L)	Drinking water MCLs (ug/L)	COPC
Surface Water	7429-90-5	Aluminum (NC)	48B	300	ug/L	SW-1/3	8/10	Unspecified	3700			No
	7440-36-0	Antimony (NC)	2	2	ug/L	SW-1/1	2/5	1000-1000	1.5	640	6	**Yes**
	7440-38-2	Arsenic (C)	1J	37	ug/L	WL04	11/12	5-1000	0.045	0.14	10	**Yes**
	7440-39-3	Barium (NC)	47	68	ug/L	SW-1/1	11/11	1000-2000	260		2000	No
	7440-41-7	Beryllium (C)	0.41B	0.41B	ug/L	SW-1/2	1/4	Unspecified	7.3		4	No
	7440-43-9	Cadmium (C)	1B	2.2	ug/L	WL04	2/4	2-2000	1.8		5	No
	7440-47-3	Chromium (C)	1	1.1	ug/L	SW-1/4	4/6	1000-5000	11		100	No
	7440-48-4	Cobalt (C)	2	2	ug/L	SW-1/1	4/4	1000-5000	73			No
	7440-50-8	Copper (NC)	2	34.3	ug/L	WL04	10/10	10-5000	150		1300	No
	7439-89-6	Iron (NC)	120	1060	ug/L	SW-1/1	11/11	Unspecified	1100			No
	7439-92-1	Lead (C)	2L	177	ug/L	WL04	6/12	50-2000			15	**Yes**
	7439-97-6	Mercury (NC)		0.5[3]	ug/L	WL04	0/12	0.0002-0.001	0.00037			**Yes**
	7439-96-5	Manganese (NC)	116	402	ug/L	SW-1/1	11/11	1000-5000	73			**Yes**
	7440-02-0	Nickel (NC)	1	21.9	ug/L	WL04	7/9	20-1000	73	4600		No
	7440-28-0	Thallium (NC)		5[3]	ug/L	WL04	0/10	0.002-0.01	0.00026			**Yes**
	7440-62-2	Vanadium (NC)	1	2	ug/L	SW-1/1	5/7	1000-3000	26			No
	7440-66-6	Zinc (NC)	1L	475	ug/L	WL04	12/12	10-5000	1100	26000		No
	91-57-6	2-Methylnaphthalene (NC)		-	ug/L	-	0/0					
	56-55-3	Benzo(a)anthacene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.09			**Yes**
	50-32-8	Benzo(a)pyrene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.009			**Yes**
	205-99-2	Benzo(b)fluoranthene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.09			**Yes**
	207-08-9	Benzo(k)fluoranthene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.9			**Yes**
	53-70-3	Dibenz(a,h)anthracene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.009			**Yes**
	193-39-5	Indeno(1,2,3-cd)pyrene (C)		5.0[3]	ug/L	WL04	0/3	0.1-10	0.09			**Yes**
	12672-29-6	Aroclor 1248			ug/L		0/0		0.033			No
	11096-82-5	Aroclor 1260		1.0[3]	ug/L	WL04	0/2	1.1-2	0.033			**Yes**
	67-64-1	Acetone (NC)	2B	4B	ug/L	SW-1/1, SW-1/4	8/11	Unspecified	61			No
	75-27-4	Bromodichloromethane (C)	1J	2J, J, L	ug/L	SW-1/1, SW-1/6, SW-1/2D	6/10	Unspecified	0.17			**Yes**

Table 3-4: Cont'd

Exposure Point	CAS	Chemical (Qualifier) [2]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (ug/L)	EPA Region III RBC [1] (ug/L)	EPA NRWQC (ug/L)	Drinking water MCLs (ug/L)	COPC
	67-66-3	Chloroform (C)	0.9J	6J, L	ug/L	SW-1/1, SW-1/2D	8/11	Unspecified	0.15	470		**Yes**
	124-48-1	Dibromochloromethane (C)	0.5L	0.6J	ug/L	SW-1/1	2/10	Unspecified	0.13			**Yes**
	84-74-2	Di-n-butylphthalate (NC)	13	13	ug/L	WL04	1/2	5-5	370	4500		No
	16984-48-8	Fluoride	-	-	ug/L	-	0/0	Unspecified			4000	No
	71-43-2	Benzene (C)		2.5[3]	ug/L		0/9		0.34			**Yes**
	108-88-3	Toluene (NC)	2J	6.2	ug/L	WL04	2/11	1-1	75	200000	1000	No
	319-85-7	Beta-BHC		0.5[3]	ug/L	WL04	0/2		0.037			**Yes**
	135-98-8	sec-Butylbenzene	2	2	ug/L	MW02	1/4	Unspecified		12000		No
	57-12-5	Cyanide (NC)	1L	2L	ug/L	SW-1/2D	5/9	Unspecified	73	220000	200	No

[1] criteria for non-carcinogens multiplied by 0.1

[2] NC = non-carcinogen, C = carcinogen

[3] indicates ½ maximum detection limit

[4] used for assessment of all receptors except adult trespassers and construction workers

Table 3-5: Identification of groundwater COPCs based on comparison of maximum groundwater concentrations to criteria.

Exposure Point	CAS	Chemical (Qualifier) [2]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	D.C. RBSLs (mg/L)	USEPA drinking water MCLs (mg/L)	EPA Region III RBC [3] (mg/L)	COPC Flag
Ground Water	7429-90-5	Aluminum (NC)	0.05	169	mg/L	DCMW008-02	22/48	Unspecified			3.7	**Yes**
	7440-38-2	Arsenic (C)	0.002	0.415	mg/L	MW02A	55/84	0.0001 - 5.0		0.01	0.000045	**Yes**
	7440-39-3	Barium (NC)	0.03	6.37	mg/L	DCMW008-02	48/48	0.0001 - 6.0		2	0.26	**Yes**
	7440-41-7	Beryllium (C)	0.002	0.021	mg/L	DCMW008-02	5/88	0.002 - 1.0		0.004	0.0073	**Yes**
	7440-43-9	Cadmium (C)	0.002	0.0398	mg/L	MW02	7/88	0.002 - 1.0		0.005	0.0018	**Yes**
	7440-47-3	Chromium (C)	0.005	0.43	mg/L	DCMW008-02	13/74	0.001 - 2.0		0.1[5]	0.011[5]	**Yes**
	7440-48-4	Cobalt (C)	0.003	0.175	mg/L	DCMW006-02	35/48	Unspecified			0.073	**Yes**
	7440-50-8	Copper (NC)	0.002	0.354	mg/L	DCMW008-02	32/74	0.001 - 2.1		1.3	0.15	**Yes**
	7439-89-6	Iron (NC)	0.2	379	mg/L	DCMW008-02	47/48	Unspecified			1.1	**Yes**
	7439-92-1	Lead (NC)	0.001	1.18	mg/L	WL03	35/88	0.0001 - 5.0		0.015		**Yes**
	7439-97-6	Mercury (NC)	0.0002	0.0006	mg/L	DCMW008-02	2/74	0.051 - 0.1		0.002	0.00037 [1]	**Yes**
	7439-96-5	Manganese (NC)	0.348	13.6	mg/L	DCMW007-02	48/48	Unspecified			0.073	**Yes**
	7440-02-0	Nickel (NC)	0.01	0.277	mg/L	MW02	20/74	0.02-0.04			0.073	**Yes**
	7782-49-2	Selenium(NC)	0.007	0.007	mg/L	MW11	1/74	0.005 - 5.0		0.05	0.018	No
	7440-28-0	Thallium (NC)	0.003	0.003	mg/L	MW10A	1/74	0.002 - 1.0		0.002	0.00026	**Yes**
	7440-62-2	Vanadium (NC)	0.003	0.685	mg/L	DCMW008-02	12/48	Unspecified			0.0011	**Yes**
	7440-66-6	Zinc (NC)	0.007	1.3	mg/L	WL03	48/73	0.01-0.01			1.1	**Yes**
	95-63-6	1,2,4-Trimethylbenzene (NC)	0.0034J	0.006	mg/L	DCMW009-02	2/4	0.00005 - 5.E-05	3.21		0.0012	**Yes**
	107-06-2	1,2-Dichloroethane (C)		0.002J	mg/L	MW03	1/4	Unspecified	0.385	0.005	0.00012	**Yes**
	108-67-8	1,3,5-Trimethylbenzene (NC)	0.0021	0.0021	mg/L	DCMW009-02	1/3	0.00005 - 5.E-05	2.21		0.0012	**Yes**
	105-67-9	2,4-Dimethylphenol (NC)	0.0052	0.01	mg/L	MW03	2/28	Unspecified			0.073	No
	95-48-7	2-Methylphenol (NC)	0.0073	0.0073	mg/L	MW03	1/25	Unspecified			0.18	No
	106-44-5	4-Methylphenol (NC)	0.0062	0.0062	mg/L	MW03	1/25	Unspecified			0.018	No
	12672-29-6	Aroclor 1248 (C)		0.00055[4]	mg/L	MW-04	0/21	0.001-0.0011			0.000033	**Yes**
	11096-82-5	Aroclor 1260 (C)		0.001[4]	mg/L	WL03	0/21	0.001-0.002			0.000033	**Yes**

Table 3-5: Cont'd.

Exposure Point	CAS	Chemical (Qualifier) [2]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	D.C. RBSLs (mg/L)	USEPA drinking water MCLs (mg/L)	EPA Region III RBC [3] (mg/L)	COPC Flag
	83-32-9	Acenaphthene (NC)	0.0073	0.012	mg/L	MW-05	4/28	Unspecified			0.037	No
	56-55-3	Benzo(a)anthacene (C)		5.0[4]	ug/L	WL04	0/3	0.1-10			0.09	**Yes**
	50-32-8	Benzo(a)pyrene (C)		5.0[4]	ug/L	WL04	0/3	0.1-10			0.009	**Yes**
	205-99-2	Benzo(b)fluoranthene (C)		5.0[4]	ug/L	WL04	0/3	0.1-10			0.09	**Yes**
	207-08-9	Benzo(k)fluoranthene (C)		5.0[4]	ug/L	WL04	0/3	0.1-10			0.9	**Yes**
	53-70-3	Dibenz(a,h)anthracene (C)		5.0[4]	ug/L	WL04	0/3	0.1-10			0.009	**Yes**
	193-39-5	Indeno(1,2,3-cd)pyrene (C)		5.0[4]	ug/L	WL04	0/3	0.1-10			0.09	**Yes**
	91-20-3	Naphthalene (NC)	0.007	0.032	mg/L	MW03	3/40	1E-6-5E-3	12.7		0.00065	**Yes**
	91-57-6	2-Methylnaphthalene (NC)	0.012	0.029	mg/L	MW10	2/25	Unspecified			0.012	**Yes**
	67-64-1	Acetone (NC)	0.0051	0.053	mg/L	MW03	4/31	Unspecified			0.550	No
	71-43-2	Benzene (C)	0.0072	0.254	mg/L	MW03	5/34	3E-06 - 1.E-03	0.254	0.005	0.0034	**Yes**
	117-81-7	bis(2-Ethylhexyl)phthalate (C)	0.013	0.013	mg/L	MW10	1/28	Unspecified			0.0048	**Yes**
	104-51-8	n-Butylbenzene (C)	0.0066	0.0066	mg/L	MW03	1/4	Unspecified			0.024	No
	100-41-4	Ethylbenzene (NC)	0.0012	0.181	mg/L	MW03	2/34	2E-06 - 1.E-03	169	0.7	0.13	**Yes**
	136777-61-2	m,p-Xylene (NC)	0.0072	0.068	mg/L	MW03	2/14	1.E-04 - 1.E-03	91.8		0.021	**Yes**
	1634-04-4	Methyl tert-butyl ether (C)	0.058	0.378	mg/L	MW10A	4/8	0.00005 - 1.E-03	6800		0.0026	**Yes**
	108-95-2	Phenol (NC)	0.013	0.013	mg/L	MW03	1/28	Unspecified			1.1	No
	108-88-3	Toluene (NC)	0.0032J	0.585	mg/L	MW03	3/34	1E-06 - 3.E-06	108	1	0.075	**Yes**
	75-01-4	Vinyl Chloride (C)	0.0022J	0.0022J	mg/L	MW21	1/4	Unspecified	0.0471	0.002	0.000015	**Yes**
	1330-20-7	Xylenes (total) (NC)	0.003J	0.51	mg/L	MW03	3/31	1E-07 - 1.E-03	91.8	10	0.021	**Yes**

[1] methyl mercury criteria

[2] NC = non-carcinogen, C = carcinogen (ingestion pathway)

[3] criteria for non-carcinogens multiplied by 0.1

[4] indicates ½ maximum detection limit

[5] Screening criteria for Cr(IV) used

Table 3-6: Identification of sediment COPCs based on comparison of maximum sediment concentrations to criteria.

Exposure Point	CAS	Chemical (Qualifier) [2]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	EPA Region III RBC [1] (mg/kg)	COPC Flag
Sediment	7429-90-5	Aluminum (NC)	3230	7030	mg/kg	SD-1/5d	11/11	17.45-17.45	7800	No
	7440-36-0	Antimony (NC)	1.5	2.6B	mg/kg	SD-1/2d	3/11	Unspecified	3.1	No
	7440-38-2	Arsenic (C)	3.3	54.3	mg/kg	SD-1/3s	11/11	Unspecified	0.43	**Yes**
	7440-39-3	Barium (NC)	43.5	132	mg/kg	SD-1/3d	11/11	Unspecified	550	No
	7440-41-7	Beryllium (C)	0.3	0.92B	mg/kg	SD-1/3s	11/11	17.45-17.45	16	No
	7440-43-9	Cadmium (C)	0.19	1.4	mg/kg	SD-1/1s, SD-1/2D	10/10	3.15-3.15	7.8	No
	7440-47-3	Chromium (C)	13.4	31.6	mg/kg	SD-1/2D	11/11	Unspecified	23	**Yes**
	7440-48-4	Cobalt (C)	3.9	8	mg/kg	SD-1/3s, SD-1/5s	11/11	Unspecified	160	No
	7440-50-8	Copper (NC)	10.4	56.7	mg/kg	SD-1/4s	11/11	Unspecified	310	No
	7439-89-6	Iron (NC)	7510	27700	mg/kg	SD-1/4s	11/11	Unspecified	2300	**Yes**
	7439-92-1	Lead (C)	88.1	287	mg/kg	SD-1/3d	11/11	Unspecified	400[3]	No
	7439-96-5	Manganese (NC)	155	416J	mg/kg	SD-1/2s	11/11	Unspecified	160	**Yes**
	7439-97-6	Mercury (NC)	0.1	0.3	mg/kg	SD-1/2d	10/11	Unspecified	0.78	No
	7440-02-0	Nickel (NC)	11.5	54.2K	mg/kg	SD-1/1s	11/11	Unspecified	160	No
	7782-49-2	Selenium (NC)	1.2	2K	mg/kg	SD-1/4s	6/11	Unspecified	39	No
	7440-22-4	Silver (NC)	0.24	0.97	mg/kg	SD-1/2d	6/6	4343-12643	39	No
	7440-28-0	Thallium (NC)		1.99[4]	mg/kg	SD-1/2s	0/11	2.42-3.98	0.55	**Yes**
	7440-62-2	Vanadium (NC)	19.3	26.5	mg/kg	SD-1/2D	11/11	Unspecified	2.3	**Yes**
	7440-66-6	Zinc (NC)	33.6	1210	mg/kg	SD-1/1s	11/11	Unspecified	2300	No
	83-32-9	Acenaphthene (NC)	0.89J	0.89J	mg/kg	SD-1/2d	1/1	0.00074-0.00074	470	No
	120-12-7	Anthracene (NC)	1.5	3.3J	mg/kg	SD-1/2d	2/2	0.00315-0.01745	2300	No
	56-55-3	Benzo(a)anthracene (C)	0.15	5.6	mg/kg	SD-1/2d	6/6	0.00315-0.00611	0.87	**Yes**
	50-32-8	Benzo(a)pyrene (C)	0.16	5.6	mg/kg	SD-1/2d	6/6	0.00315-0.01745	0.087	**Yes**
	205-99-2	Benzo(b)fluoranthene (C)	0.16	4.8J	mg/kg	SD-1/3d, SD-1/2d	6/6	0.00015-0.03148	0.87	**Yes**
	207-08-9	Benzo(k)fluoranthene (C)	0.17	5	mg/kg	SD-1/2d	6/6	0.00121-0.00156	8.7	No
	53-70-3	Dibenz(a,h)anthracene (C)	0.94J	0.94J	mg/kg	SD-1/2d	1/1	0.00295-0.00295	0.087	**Yes**
	206-44-0	Fluoranthene (NC)	0.25	12	mg/kg	SD-1/2d	6/6	0.00315-0.0192	310	No
	86-73-7	Fluorene (NC)	0.86J	0.86J	mg/kg	SD-1/2d	1/1	0.01745-0.01745	310	No
	193-39-5	Indeno(1,2,3-cd)pyrene (C)	0.15	2.5J	mg/kg	SD-1/2d	4/4	Unspecified	0.87	**Yes**

Table 3-6: Cont'd.

Exposure Point	CAS	Chemical (Qualifier) [2]	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	EPA Region III RBC [1] (mg/kg)	COPC Flag
	91-20-3	Naphthalene (NC)	0.12J	0.12J	mg/kg	SD-1/5d	1/1	Unspecified	160	No
	129-00-0	Pyrene (NC)	0.24	11	mg/kg	SD-1/2d	6/6	0.06111-5.077	230	No
	91-57-6	2-Methylnaphthalene (NC)	0.21	0.21J	mg/kg	SD-1/5d	1/1	Unspecified	160	No
	78-93-3	2-Butanone (NC)	0.009	0.034	mg/kg	SD-1/2D	3/4	Unspecified	4700	No
	72-54-8	4,4'-DDD (C)	0.0074	5.9J	mg/kg	SD-1/5s	11/11	0.01745-0.01745	2.7	**Yes**
	72-54-8	4,4'-DDE (C)	0.025	3.7	mg/kg	SD-1/5s	11/11	0.01745-0.01745	1.9	**Yes**
	50-29-3	4,4'-DDT (C)	0.026	76	mg/kg	SD-1/5s	11/11	0.01745-0.01745	1.9	**Yes**
	106-44-5	4-Methylphenol (NC)	0.48	3.9	mg/kg	SD-1/5s	3/3	0.0006-0.00078	39	No
	11096-82-5	Aroclor 1260 (C)	0.036	0.11	mg/kg	SD-1/2d	3/4	Unspecified	0.32	No
	12672-29-6	Aroclor-1248 (C)	0.078	0.078J	mg/kg	SD-1/4d	1/2	Unspecified	0.32	No
	67-64-1	Acetone (NC)	0.008	0.041B	mg/kg	SD-1/2S	7/7	0.01745-0.01745	7000	No
	71-43-2	Benzene (C)		0.0087[4]	mg/kg	SD-1/2S	0/1	-	12	No
	117-81-7	bis(2-Ethylhexyl)phthalate (NC)	0.12	0.3B	mg/kg	SD-1/3s	3/3	0.01319-0.01745	46	No
	85-68-7	Butylbenzylphthalate(C)	1.6	1.6	mg/kg	SD-1/5d	1/1	Unspecified	1600	No
	86-74-8	Carbazole (C)	1.3J	1.3J	mg/kg	C04D6	1/1	Unspecified	32	No
	57-12-5	Cyanide (NC)	0.074	0.44	mg/kg	SD-1/3d	6/11	Unspecified0	160	No
	132-64-9	Dibenzofuran (NC)	0.67J	0.67J	mg/kg	SD-1/2d	1/1	0.00251-0.00251	16	No
	60-57-1	Dieldrin (C)	0.0044	0.0046J	mg/kg	SD-1/2d	2/3	0.00299-0.00313	0.04	No
	72-20-8	Endrin (NC)	0.011J	0.011J	mg/kg	SD-1/3d	1/2	0.315-0.315	2.3	No
	7421-93-4	Endrin aldehyde (NC)	0.0062	0.0062J	mg/kg	SD-1/2d	1/2	Unspecified	2.3	No
	53494-70-5	Endrin ketone (NC)	0.054	0.054J	mg/kg	SD-1/3d	1/2	Unspecified	2.3	No
	5103-71-9	alpha Chlordane (C)	0.0038	0.38J	mg/kg	SD-1/5s	7/8	Unspecified	1.8	No
	5103-74-2	gamma Chlordane (C)	0.0017	0.29	mg/kg	SD-1/5s	7/8	Unspecified	1.8	No
	76-44-8	Heptachlor (C)	0.0022	0.0022	mg/kg	SD-1/3d	1/2	Unspecified	0.14	No
	75-09-2	Methylene Chloride (C)	0.009	0.042B	mg/kg	SD-1/2D	11/11	Unspecified	85	No
	108-95-2	Phenol (NC)	0.39J	0.39J	mg/kg	SD-1/5s	1/1	Unspecified	2300	No
	108-88-3	Toluene (NC)	0.14	0.14J	mg/kg	SD-1/2S	1/1	Unspecified	16000	No

[1] criteria for non-carcinogens multiplied by 0.1

[2] NC = non-carcinogen, C = carcinogen (Ingestion pathway)

[3] EPA Region III RBC

[4] indicates ½ maximum detection limit

Table 3-7: Summary of COPCs evaluatedin the HHRA by media.

Chemical	A. Surface Soil COPC Flag	B. Subsurface Soil COPC Flag	C. Surface Water COPC Flag	D. Groundwater COPC Flag	E. Sediments COPC Flag
Aluminum (NC)	**Yes**	**Yes**	No	**Yes**	No
Antimony (NC)	**Yes**	**Yes**	**Yes**	No; (b)	No
Arsenic (C)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Barium (NC)	**Yes**	No	No	**Yes**	No
Beryllium (C)	No	No	No	**Yes**	No
Cadmium (C)	No	No	**Yes**	**Yes**	No
Chromium (C)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Chromium (total) (C)	**Yes**	**Yes**	**Yes**; (b)	**Yes**	No
Cobalt (C)	No	No	No	**Yes**	No
Copper (NC)	**Yes**	No	No	**Yes**	No
Iron (NC)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Lead (C)	No	**Yes**	**Yes**	**Yes**	No
Manganese (NC)	**Yes**	**Yes**	**Yes**	**Yes**	No
Mercury (NC)	**Yes**	**Yes**	No; (b)	**Yes**	No
Nickel (NC)	No	**Yes**	No	**Yes**	No
Thallium (NC)	**Yes**	**Yes**	**Yes**; (b)	**Yes**	No; (b)
Vanadium (NC)	**Yes**	**Yes**	**Yes**; (b)	**Yes**	No
Zinc (NC)	No	No	No	**Yes**	No
Acenaphthylene (C)	**Yes**; (a)	**Yes**; (a)	**Yes**; (a)	**Yes**; (a)	not measured
Anthracene (NC)	**Yes**	**Yes**	No; (b)	No; (b)	No
Benzo(a)anthracene (C)	**Yes**	**Yes**	**Yes**; (b)	**Yes**; (b)	**Yes**
Benzo(a)pyrene (C)	**Yes**	**Yes**	**Yes**; (b)	**Yes**; (b)	**Yes**
Benzo(b)fluoranthene (C)	**Yes**	**Yes**	**Yes**; (b)	**Yes**; (b)	**Yes**
Benzo(g,h,i)perylene	**Yes**; (a)	**Yes**	**Yes**; (a)	**Yes**; (a)	**Yes**; (a)
Benzo(k)fluoranthene (C)	No	**Yes**	**Yes**; (b)	**Yes**; (b)	No
Chrysene (C)	**Yes**	**Yes**	No; (b)	No; (b)	No
Dibenz(a,h)anthracene (C)	**Yes**	**Yes**	**Yes**; (b)	**Yes**; (b)	**Yes**
Fluoranthene (NC)	**Yes**	No	No; (b)	No; (b)	No
Indeno(1,2,3-cd)pyrene (C)	**Yes**	**Yes**	**Yes**; (b)	**Yes**; (b)	**Yes**
Naphthalene (NC)	No	No	**Yes**; (b)	**Yes**	No
Phenanthrene (C)	**Yes**; (a)	No	**Yes**; (a)	**Yes**; (a)	**Yes**; (a)
2-Methylnaphthylene (NC)	No	No	No; (b)	**Yes**	No
1,2-Dichloroethane (C)	No; (b)	No; (b)	**Yes**; (b)	**Yes**	No; (b)
1,2,4-Trimethylbenzene (NC)	No; (b)	No; (b)	**Yes**; (b)	**Yes**	not measured
1,3,5-Trimethylbenzene (NC)	No; (b)	No; (b)	**Yes**; (b)	**Yes**	not measured
4,4'-DDD (C)	**Yes**	**Yes**	No; (b)	No; (b)	**Yes**
4,4'-DDE (C)	**Yes**	**Yes**	No; (b)	No; (b)	**Yes**
4,4'-DDT (C)	**Yes**	**Yes**	No; (b)	No; (b)	**Yes**
Aroclor 1248 (C)	**Yes**	No	**Yes**; (b)	**Yes**; (b)	No
Aroclor 1260 (C)	**Yes**	**Yes**	**Yes**; (b)	**Yes**; (b)	No
Benzene (C)	No; (b)	No	**Yes**; (b)	**Yes**	No; (b)
bis(2-Ethylhexyl)phthalate (C)	No	No	**Yes**; (b)	**Yes**	No
Bromodichloromethane (C)	No; (b)	No; (b)	**Yes**	**Yes**; (b)	No; (b)
Chloroform (C)	No; (b)	No; (b)	**Yes**	**Yes**; (b)	No; (b)
Dibromochloromethane (C)	No; (b)	No; (b)	**Yes**	**Yes**; (b)	No; (b)
Di-n-butylphthalate (NC)	No	No	No	No; (b)	not measured
Ethylbenzene (NC)	No; (b)	No	No; (b)	**Yes**	No; (b)
Methyl tert-butyl ether (C)	No; (b)	No	No; (b)	**Yes**	No; (b)
n-Butylbenzene (NC)	No; (b)	No; (b)	No; (b)	No	not measured
Toluene (NC)	No	No	No	**Yes**	No
Vinyl Chloride (C)	No; (b)	No; (b)	**Yes**; (b)	**Yes**	No; (b)
m,p-Xylene (NC)	No; (b)	No; (b)	No; (b)	**Yes**	not measured
ortho-xylene (NC)	No; (b)	No; (b)	No; (b)		not measured
Xylenes (total) (NC)	No; (b)	No	No; (b)	**Yes**	No; (b)
beta-BHC (C)	No	No; (b)	**Yes**; (b)	**Yes**; (b)	No; (b)
Total TCDD (C)	**Yes**	not measured	not measured	not measured	not measured

Notes:

(a) No criteria (C) Carcinogen

(b) 0.5 Detection Limit (NC) Non-carconigen

Table 3-8: Summary of COPC concentrations used in the HHRA.

Chemical	A. Surface Soil (mg/kg)			B. Subsurface Soil (mg/kg)			C. Surface Water (mg/L)		D. Groundwater (mg/L)	E. Sediments (mg/kg)	F. Fish (mg/kg)
	95 UCL	Max	Modeled[1]	95 UCL	Max	Modeled	AT and CW[2]	Max	Max	Max	Modeled
Aluminum (NC)	1.05E+04	2.75E+04	1.05E+04	1.87E+04	2.94E+04	1.87E+04	1.0E+00	3.00E-01	1.69E+02	7.03E+03	8.10E-01
Antimony (NC)	9.92E+00	2.09E+01	9.92E+00	1.43E+01	8.30E-01	1.43E+01	2.0E-03	2.00E-03	5.00E-02	2.60E+00	8.00E-02
Arsenic (C)	1.72E+01	8.80E+01	1.72E+01	2.63E+01	1.18E+02	2.63E+01	3.7E-02	3.70E-02	4.15E-01	5.43E+01	4.07E+00
Barium (NC)	9.97E+01	5.85E+02	9.97E+01	1.78E+02	4.45E+02	1.78E+02	9.8E-02	6.80E-02	6.37E+00	1.32E+02	4.28E+01
Beryllium (C)	7.10E-01	1.70E+00	7.10E-01	1.09E+00	2.40E+00	1.09E+00	4.1E-04	4.10E-04	2.10E-02	9.20E-01	2.54E-02
Cadmium (C)	1.88E+00	7.30E+00	1.88E+00	2.27E+00	5.10E+00	2.27E+00	2.2E-03	2.20E-03	3.98E-02	1.40E+00	2.00E+00
Chromium (C)	4.02E+01	2.19E+02	4.02E+01	2.68E+01	3.95E+01	2.68E+01	1.3E-02	1.10E-03	4.30E-01	3.16E+01	2.09E-02
Chromium (total) (C)	2.10E+01	4.73E+01	2.10E+01	2.72E+01	1.19E+02	2.72E+01	5.0E-03	5.00E-03	4.20E-01	0.00E+00	9.50E-02
Cobalt (C)	8.13E+00	1.98E+01	8.13E+00	1.52E+01	2.00E+01	1.52E+01	6.0E-03	2.00E-03	1.75E-01	8.00E+00	3.60E+00
Copper (NC)	3.58E+01	2.84E+03	3.58E+01	3.03E+01	2.23E+02	3.03E+01	4.5E-02	3.43E-02	3.54E-01	5.67E+01	2.44E+01
Iron (NC)	2.76E+04	1.55E+05	2.76E+04	2.67E+01	4.38E+04	2.67E+01	8.9E+00	1.06E+00	3.79E+02	2.77E+04	1.91E+03
Lead (C)	1.28E+02	3.71E+02	1.28E+02	9.93E+01	4.40E+02	9.93E+01	1.8E-01	1.77E-01	1.18E+00	2.87E+02	1.59E-02
Manganese (NC)	4.09E+02	1.27E+03	4.09E+02	6.67E+02	1.35E+03	6.67E+02	5.2E-01	4.02E-01	1.36E+01	4.16E+02	7.24E+02
Mercury (NC)	2.28E-01	9.70E-01	2.28E-01	3.21E-01	8.40E-01	3.21E-01	5.0E-04	5.00E-04	6.00E-04	3.00E-01	1.75E+00
Nickel (NC)	2.34E+01	1.28E+02	2.34E+01	3.65E+01	2.50E+02	3.65E+01	2.2E-02	2.19E-02	2.77E-01	5.42E+01	1.71E+00
Thallium (NC)	2.92E+00	6.20E+00	2.92E+00	2.31E+00	5.20E-01	2.31E+00	5.0E-03	5.00E-03	3.00E-03	1.99E+00	5.00E+01
Vanadium (NC)	3.32E+01	7.92E+01	3.32E+01	3.87E+01	6.49E+01	3.87E+01	5.0E-03	2.00E-03	6.85E-01	2.65E+01	3.60E+00
Zinc (NC)	2.58E+02	1.83E+03	2.58E+02	1.21E+02	4.21E+02	1.21E+02	4.8E-01	4.75E-01	1.30E+00	1.21E+03	9.98E+02
Acenaphthylene (C)		4.69E+00	4.69E+00		1.90E+01	1.90E+01	5.0E-03	5.00E-03	5.00E-03	0.00E+00	2.50E+00
Anthracene (NC)	8.45E-01	8.96E+00	8.45E-01	7.86E+00	1.23E+01	7.86E+00	5.0E-03	5.00E-03	5.00E-03	3.30E+00	2.50E+00
Benzo(a)anthracene (C)	3.44E+00	4.71E+01	3.44E+00	8.23E+00	1.90E+01	8.23E+00	5.0E-03	5.00E-03	5.00E-03	5.60E+00	2.50E+00
Benzo(a)pyrene (C)	4.61E+00	6.51E+01	4.61E+00	6.37E+00	3.20E+01	6.37E+00	5.0E-03	5.00E-03	5.00E-03	5.60E+00	2.50E+00
Benzo(b)fluoranthene (C)	6.89E+00	1.01E+02	6.89E+00	6.17E+00	2.43E+01	6.17E+00	5.0E-03	5.00E-03	5.00E-03	4.80E+00	2.50E+00
Benzo(g,h,i)perylene	2.04E+00	2.68E+01	2.04E+00	7.86E+00	1.40E+01	7.86E+00	5.0E-03	5.00E-03	5.00E-03	2.00E+00	2.50E+00
Benzo(k)fluoranthene (C)	4.00E-01	3.10E+00	4.00E-01	7.41E+00	2.50E+01	7.41E+00	5.0E-03	5.00E-03	5.00E-03	5.00E+00	2.50E+00
Chrysene (C)	9.92E+00	4.55E+01	9.92E+00	5.63E+00	2.50E+01	5.63E+00	5.0E-03	5.00E-03	5.00E-03	5.20E+00	2.50E+00
Dibenz(a,h)anthracene (C)	8.26E-01	7.81E+00	8.26E-01	7.86E+00	1.29E+00	7.86E+00	5.0E-03	5.00E-03	5.00E-03	9.40E-01	2.50E+00
Fluoranthene (NC)	8.55E+00	1.33E+02	8.55E+00	8.90E+00	4.66E+01	8.90E+00	5.0E-03	5.00E-03	5.00E-03	1.20E+01	2.50E+00
Indeno(1,2,3-cd)pyrene (C)	1.56E+00	1.99E+01	1.56E+00	7.86E+00	3.74E+00	7.86E+00	5.0E-03	5.00E-03	5.00E-03	2.50E+00	2.50E+00
Naphthalene (NC)	8.46E-01	2.58E+00	8.46E-01	6.20E+00	3.48E+00	6.20E+00	5.0E-03	5.00E-03	3.20E-02	1.20E-01	2.50E+00
Phenanthrene (C)	2.41E+00	2.86E+01	2.41E+00	8.52E+00	4.38E+01	8.52E+00	5.0E-03	5.00E-03	5.00E-03	1.00E+01	2.50E+00
2-Methylnaphthylene (NC)		2.58E+00	2.58E+00		1.76E+00	1.76E+00	5.0E-04	5.00E-04	2.90E-02	2.10E-01	2.50E-01

Table 3-8: Cont'd

Chemical	A. Surface Soil (mg/kg)			B. Subsurface Soil (mg/kg)			C. Surface Water (mg/L)		D. Groundwater (mg/L)	E. Sediments (mg/kg)	F. Fish (mg/kg)
	95 UCL	Max	Modeled[1]	95 UCL	Max	Modeled	AT and CW[2]	Max	Max	Max	Modeled
1,2-Dichloroethane (C)		6.50E-04	6.50E-04		6.50E-04	6.50E-04	5.0E-04	5.00E-04	2.00E-03	8.80E-03	9.27E-03
1,2,4-Trimethylbenzene (NC)		6.50E-04	6.50E-04		6.50E-04	6.50E-04	5.0E-03	5.00E-03	6.00E-03	0.00E+00	8.75E+00
1,3,5-Trimethylbenzene (NC)		6.50E-04	6.50E-04		6.50E-03	6.50E-03	5.0E-04	5.00E-04	2.10E-03	0.00E+00	5.40E-01
4,4'-DDD (C)	1.36E+01	1.10E+02	1.36E+01	8.87E-01	8.16E+00	8.87E-01	1.0E-04	1.00E-04	5.00E-05	5.90E+00	5.80E+00
4,4'-DDE (C)	1.36E+00	8.70E+00	1.36E+00	6.86E-01	7.20E+00	6.86E-01	1.0E-04	1.00E-04	5.00E-05	3.70E+00	2.64E+00
4,4'-DDT (C)	1.23E+01	1.30E+02	1.23E+01	4.29E-01	2.80E+00	4.29E-01	1.0E-04	1.00E-04	5.00E-05	7.60E+01	1.40E+01
Aroclor 1248 (C)	8.70E-01	2.80E+00	8.70E-01		4.90E-02	4.90E-02	0.0E+00	5.50E-04	5.50E-04	7.80E-02	3.25E+01
Aroclor 1260 (C)	2.30E+00	3.38E+00	2.30E+00	6.25E-01	1.10E+00	6.25E-01	1.0E-03	1.00E-03	1.00E-03	1.10E-01	3.20E+02
Benzene (C)		4.45E-03	4.45E-03	8.36E-03	8.10E-02	8.36E-03	2.5E-03	2.50E-03	2.54E-01	8.73E-03	1.81E-01
bis(2-Ethylhexyl)phthalate (C)		2.50E+01	2.50E+01	7.24E+00	3.00E-01	7.24E+00	5.0E-03	5.00E-03	1.30E-02	3.00E-01	1.86E+02
Bromodichloromethane (C)		6.50E-04	6.50E-04		6.50E-04	6.50E-04	2.0E-03	2.00E-03	5.00E-04	8.73E-03	1.36E-01
Chloroform (C)		4.45E-03	4.45E-03		4.45E-03	4.45E-03	6.0E-03	6.00E-03	1.25E-02	8.73E-03	2.15E-02
Dibromochloromethane (C)		6.50E-04	6.50E-04		6.50E-04	6.50E-04	6.0E-04	6.00E-04	5.00E-04	8.73E-03	5.47E-02
Di-n-butylphthalate (NC)		4.94E+00	4.94E+00		4.16E+00	4.16E+00	1.3E-02	1.30E-02	5.00E-03	0.00E+00	3.33E+01
Ethylbenzene (NC)		4.45E-03	4.45E-03	9.55E-03	1.38E-01	9.55E-03	2.5E-03	2.50E-03	1.81E-01	8.73E-03	1.53E+00
Methyl tert-butyl ether (C)		3.10E-03	3.10E-03		9.80E-02	9.80E-02	5.0E-04	5.00E-04	3.78E-01	8.73E-03	6.36E-03
n-Butylbenzene (NC)		1.35E-03	1.35E-03		1.30E-03	1.30E-03	5.0E-04	5.00E-04	6.60E-03	0.00E+00	3.14E+00
Toluene (NC)		1.00E-03	1.00E-03	8.66E-03	3.38E+00	8.66E-03	6.2E-03	6.20E-03	5.85E-01	1.40E-01	1.45E+00
Vinyl Chloride (C)		6.50E-04	6.50E-04		6.50E-04	6.50E-04	5.0E-04	5.00E-04	2.20E-03	8.73E-03	7.52E-03
m,p-Xylene (NC)		6.50E-04	6.50E-04		6.50E-04	6.50E-04	5.0E-04	5.00E-04	6.80E-02	0.00E+00	0.00E+00
ortho-xylene (NC)		6.50E-04	6.50E-04		6.50E-04	6.50E-04	5.0E-04	5.00E-04	3.10E-02	0.00E+00	0.00E+00
Xylenes (total) (NC)		8.70E-03	8.70E-03	1.70E-02	6.31E-01	1.70E-02	5.0E-03	5.00E-03	5.10E-01	8.73E-03	3.41E+00
beta-BHC (C)		2.70E-03	2.70E-03		7.00E-02	7.00E-02	5.0E-05	5.00E-05	5.00E-05	1.58E-03	1.15E-01
Total TCDD (C)		1.10E-05	1.10E-05		0.00E+00	0.00E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Notes

[1] Modeled values used in HHRA calculations

[2] Removal of Samples SU-01, SW-01 taken from a sump and culvert respectively. These concentratiosn were only used for the adult trespasser and construction worker who may come into contact with material from these areas.

Table 3-9: Summary of chemical properties.

Chemical	Soil Dermal absorption factor (unitless)	Water Dermal permeability coefficient (cm / hr)	D Reference	E Reference	D Rationale	E Rationale	Water to Fish BCF	Source	log Kow	Calculated BCF
Aluminum (NC)	0.01	1.00E-03	(a)	(c)	metals		2.7	(g)	NA	NA
Antimony (NC)	0.01	1.00E-03	(a)	(c)	metals		4.00E+01	(g)	NA	NA
Arsenic (C)	0.03	1.00E-03	(c)	(c)			1.10E+02	(g)	NA	NA
Barium (NC)	0.01	1.00E-03	(a)	(c)	metals		f30	(g)	NA	NA
Beryllium (C)	0.01	1.00E-03	(a)	(c)	metals		f2	(g)	NA	NA
Cadmium (C)	0.001	1.00E-03	(c)	(c)			9.10E+02	(g)	NA	NA
Chromium (C)	0.01	2.00E-03	(a)	(c)	metals		1.90E+01	(g)	NA	NA
Chromium (total) (C)	0.01	2.00E-03	(a)	(c)	metals		1.90E+01	(g)	NA	NA
Cobalt (C)	0.01	4.00E-04	(a)	(c)	metals		1.80E+03		NA	NA
Copper (NC)	0.01	1.00E-03	(a)	(c)	metals		7.10E+02	(g)	NA	NA
Iron (NC)	0.01	1.00E-03	(a)	(c)	metals		1.80E+03		NA	NA
Lead (C)	0.01	1.00E-04	(a)	(c)	metals		9.00E-02	(g)	NA	NA
Manganese (NC)	0.01	1.00E-03	(a)	(c)	metals		1.80E+03		NA	NA
Mercury (NC)	0.01	1.00E-03	(a)	(c)	metals		3.50E+03	(g)	NA	NA
Nickel (NC)	0.01	2.00E-04	(a)	(c)	metals		7.80E+01	(g)	NA	NA
Thallium (NC)	0.01	1.00E-03	(a)	(c)	metals		1.00E+04		NA	NA
Vanadium (NC)	0.01	1.00E-03	(a)	(c)	metals		1.80E+03	(g)	NA	NA
Zinc (NC)	0.01	1.00E-03	(b)	(c)			2.10E+03	(g)	NA	NA
Acenaphthylene (C)	0.13	1.41E-01	(c)	(d)	PAHs	(e)	5.00E+02		NA	NA
Anthracene (NC)	0.13	2.25E-01	(c)	(d)	PAHs	(e)	5.00E+02		NA	NA
Benzo(a)anthracene (C)	0.13	9.48E-01	(c)	(d)	PAHs	(e)	5.00E+02	(g)	NA	NA
Benzo(a)pyrene (C)	0.13	1.24E+00	(c)	(d)	PAHs	(e)	5.00E+02		NA	NA
Benzo(b)fluoranthene (C)	0.13	6.99E-01	(c)	(d)	PAHs	(e)	5.00E+02	(g)	NA	NA
Benzo(g,h,i)perylene	0.13	2.00E+00	(c)	(d)	PAHs	(e)	5.00E+02		NA	NA
Benzo(k)fluoranthene (C)	0.13	1.20E+00	(c)	(d)	PAHs	(e)	5.00E+02	(g)	NA	NA
Chrysene (C)	0.13	1.03E+00	(c)	(d)	PAHs	(e)	5.00E+02	(g)	NA	NA
Dibenz(a,h)anthracene (C)	0.13	1.68E+00	(c)	(d)	PAHs	(e)	5.00E+02	(g)	NA	NA
Fluoranthene (NC)	0.13	5.13E-01	(c)	(d)	PAHs	(e)	5.00E+02		NA	NA
Indeno(1,2,3-cd)pyrene (C)	0.13	2.23E+00	(c)	(d)	PAHs	(e)	5.00E+02	(g)	NA	NA
Naphthalene (NC)	0.13	6.94E-02	(c)	(d)	PAHs	(e)	5.00E+02		NA	NA
Phenanthrene (C)	0.13	2.29E-01	(c)	(d)	PAHs	(e)	5.00E+02		NA	NA
2-Methylnaphthylene (NC)	0.13	1.42E-01	(c)	(d)	PAHs	(e)	5.00E+02		NA	NA

Notes:

(a) EPA Region III, 1995
(b) EPA Region III, 1996
(c) EPA RAGS Part E
(d) ORNL, RAIS, 2004
(e) KOW/MW values outside of range for EPA RAGs Part E Model
(f) VOC; VP less than benzene
(g) US EPA, 1999

Table 3-9: Cont'd

Chemical	Soil Dermal absorption factor (unitless)	Water Dermal permeability coefficient (cm / hr)	D Reference	E Reference	D Rationale	E Rationale	Water to Fish BCF	Source	log Kow	Calculated BCF
1,2-Dichloroethane (C)	0.03	0.00534	(a)	(d)	(f)				1.48	1.85E+01
1,2,4-Trimethylbenzene (NC)	0.03	0.107	(a)	(d)	(f)				3.65	1.75E+03
1,3,5-Trimethylbenzene (NC)	0.03	0.107	(a)	(d)	(f)				3.42	1.08E+03
4,4'-DDD (C)	0.1	0.4	(a)	(d)	Pesticides	(e)	5.80E+04			
4,4'-DDE (C)	0.1	0.916	(a)	(d)	Pesticides	(e)	2.60E+04			
4,4'-DDT (C)	0.03	1.06	(c)	(d)	DDT	(e)	1.40E+05			
Aroclor 1248 (C)	0.14	0.992	(c)	(d)	Arochlors	(e)	5.90E+04		6.11	5.94E+04
Aroclor 1260 (C)	0.14	5.48	(c)	(d)	Arochlors	(e)	3.20E+05			8.34E-01
Benzene (C)	0.0005	3.70E-01	(a)	(c)	Benzene				2.13	7.24E+01
bis(2-Ethylhexyl)phthalate (C)	0.1	6.60E-01	(a)	(c)	SVOC				5.11	3.73E+04
Bromodichloromethane (C)	0.03	1.10E-01	(a)	(c)	SVOC				2.1	6.80E+01
Chloroform (C)	0.03	1.70E-01	(a)	(c)	SVOC					8.34E-01
Dibromochloromethane (C)	0.03	0.0039	(a)	(d)	SVOC				2.24	9.12E+01
Di-n-butylphthalate (NC)	0.1	6.10E-01	(a)	(c)	SVOC		2.60E+03		4.72	1.65E+04
Ethylbenzene (NC)	0.03	1.2	(a)	(c)	(f)				3.15	6.14E+02
Methyl tert-butyl ether (C)	0.03	0.00257	(a)	(d)	VOC				1.3	1.27E+01
n-Butylbenzene (NC)	0.03	0	(a)	(d)	VOC				4.26	6.28E+03
Toluene (NC)	0.03	7.80E-01	(a)	(c)	(f)				2.69	2.34E+02
Vinyl Chloride (C)	0.0005	1.40E-01	(a)	(c)	(f)				1.38	1.50E+01
m,p-Xylene (NC)	0.03	1.4	(a)	(c)	(f)					
ortho-xylene (NC)	0.03	1.4	(a)	(c)	(f)					
Xylenes (total) (NC)	0.03	1.4	(a)	(c)	(f)				3.2	6.81E+02
beta-BHC (C)	0.1	2.70E-01	(a)	(c)	Pesticides				3.78	2.30E+03
Total TCDD (C)	0.03	1.39E+00	(c)	(d)	dioxins	(e)			7.14	2.62E+06

Notes:

(a) EPA Region III, 1995
(b) EPA Region III, 1996
(c) EPA RAGS Part E
(d) ORNL, RAIS, 2004
(e) KOW/MW values outside of range for EPA RAGs Part E Model
(f) VOC; VP less than benzene
(g) US EPA, 1999

Table 3-10: Summary of COPC toxicity data used in HHRA

	Reference Dose Chronic - Oral		Reference Dose Chronic - Inhalation		Slope Factors - Oral and Inhalation						
Chemical (Qualifier)[1]	RfDo (mg/kg/day)	Source [2]	RFDi (mg/kg/day)	Source [2]	Oral Slope Factor (mg/kg/day)$^{-1}$	Source [2]	Inhalation Unit Risk (ug/m^3)$^{-1}$	Source [2]	Inhalation Slope Factor (mg/kg/day)$^{-1}$	Source [2]	Carcinogen Class [3]
Aluminum (NC)	1	NCEA	1.00E-03	NCEA	0	-	0	-	0	-	-
Antimony (NC)	4.00E-04	IRIS	5.71E-05	IRIS	0	-	0	-	0	-	-
Arsenic (C)	3.00E-04	IRIS	**3.00E-04**	IRIS	1.5	IRIS	4.30E-03	IRIS	1.51E+01	IRIS	A
Barium (NC)	7.00E-02	IRIS	1.40E-04	HEAST	0	-	0	-	0	-	D
Beryllium (C)	2.00E-03	IRIS	5.71E-06	IRIS	**8.4**	IRIS	2.40E-03	IRIS	8.4	IRIS	B1
Cadmium (C)	1.00E-03	IRIS	5.70E-05	NCEA	**6.3**	IRIS	1.80E-03	IRIS	6.3	IRIS	B2
Chromium (C)	3.00E-03	IRIS	2.86E-05	IRIS	**4.20E+01**	IRIS	1.20E-02	IRIS	4.20E+01	HEAST	A[4]
Chromium (total) (C)	3.00E-03	IRIS	2.86E-05	IRIS	**4.20E+01**	IRIS	1.20E-02	IRIS	4.20E+01	HEAST	A[4]
Cobalt (C)	2.00E-02	NCEA	5.70E-06	NCEA	**9.8**	NCEA	0	-	9.8	NCEA	-
Copper (NC)	4.00E-02	HEAST	**4.00E-02**	HEAST	0	.	0	-	0	-	D
Iron (NC)	3.00E-01	NCEA	**3.00E-01**	NCEA	0	-	0	-	0	-	-
Lead (C)	NA	-	NA	-	0	-	0	-	0	-	B2
Manganese (NC)	2.00E-02	IRIS	1.43E-05	IRIS	0	-	0	-	0	-	D
Mercury (NC)	**8.57E-05**	IRIS	8.57E-05	IRIS	0	-	0	-	0	-	D
Nickel (NC)	2.00E-02	IRIS	**2.00E-02**	IRIS	0	-	0	-	0	-	-
Thallium (NC)	7.00E-05	NCEA	**7.00E-05**	NCEA	0	-	0	-	0	-	-
Vanadium (NC)	3.00E-04	NCEA	**3.00E-04**	NCEA	0	-	0	-	0	-	-
Zinc (NC)				IRIS							D
Acenaphthylene (C)	NA	-	NA	-	7.30E-03	TEF B(a)P	0	-	3.10E-03	TEF B(a)P	D[5]
Anthracene (NC)	0.3	IRIS	**3.00E-01**	IRIS	0	-	0	-	0	-	D
Benzo(a)anthracene (C)	NA	-	NA	-	7.30E-01	TEF B(a)P	0	-	3.10E-01	TEF B(a)P	B2
Benzo(a)pyrene (C)	NA	-	NA	-	7.3	IRIS	0	-	3.1	NCEA	B2
Benzo(b)fluoranthene (C)	NA	-	NA	-	7.30E-01	TEF B(a)P	0	-	3.10E-01	TEF B(a)P	B2
Benzo(g,h,i)perylene	NA	-	NA	-	7.30E-02	TEF B(a)P	0	-	3.10E-02	TEF B(a)P	D
Benzo(k)fluoranthene (C)	NA	-	NA	-	7.30E-02	TEF B(a)P	0	-	3.10E-02	TEF B(a)P	B2
Chrysene (C)	NA	-	NA	-	7.30E-03	TEF B(a)P	0	-	3.10E-03	TEF B(a)P	B2
Dibenz(a,h)anthracene (C)	NA	-	NA	-	7.3	TEF B(a)P	0	-	3.1	TEF B(a)P	B2
Fluoranthene (NC)	4.00E-02	IRIS	**4.00E-02**	IRIS	0	-	0	-	0	-	D
Indeno(1,2,3-cd)pyrene (C)	NA	-	NA	-	7.30E-01	TEF B(a)P	0	-	3.10E-01	TEF B(a)P	B2
Naphthalene (NC)	2.00E-02	IRIS	8.57E-04	IRIS	0	-	0	-	0	-	C
Phenanthrene (C)	NA	-	NA	-	7.30E-03	TEF B(a)P	0	-	3.10E-03	TEF B(a)P	D[5]
2-Methylnaphthylene (NC)	4.00E-03	IRIS	**4.00E-03**	IRIS	0	-	0	-	0	-	D
1,2-Dichloroethane (C)	2.00E-02	NCEA	1.40E-03	NCEA	9.10E-02	IRIS			9.10E-02	IRIS	B2
1,2,4-Trimethylbenzene (NC)	5.00E-02	NCEA	1.70E-03	NCEA	0	-	0	-	0	-	-
1,3,5-Trimethylbenzene (NC)	5.00E-02	NCEA	1.70E-03	NCEA	0	-	0	-	0	-	-
4,4'-DDD (C)	NA	-	NA	-	2.40E-01	IRIS	0	-	**2.40E-01**	IRIS	B2
4,4'-DDE (C)	NA	-	NA	-	3.40E-01	IRIS	0	-	**3.40E-01**	IRIS	B2
4,4'-DDT (C)	5.00E-04	IRIS	**5.00E-04**	IRIS	3.40E-01	IRIS	9.70E-05	IRIS	3.40E-01	IRIS	B2
Aroclor 1248 (C)	NA	-	NA	-	2	IRIS	0	-	2	NCEA	B2
Aroclor 1260 (C)	NA	-	NA	-	2	IRIS	0	-	2	NCEA	B2
Benzene (C)	4.00E-03	IRIS	8.57E-03	IRIS	5.50E-02	IRIS	7.80E-06	IRIS	2.73E-02	IRIS	A
bis(2-Ethylhexyl)phthalate (C)	2.00E-02	IRIS	**2.00E-02**	IRIS	1.40E-02	IRIS	0	-	1.40E-02	NCEA	B2
Bromodichloromethane (C)	2.00E-02	IRIS	**2.00E-02**	IRIS	6.20E-02	IRIS	0	-	6.20E-02	IRIS	B2
Chloroform (C)	0.01	IRIS	1.40E-02	NCEA	0	-	2.30E-05		8.05E-02		B2
Dibromochloromethane (C)	2.00E-02	IRIS	**2.00E-02**	IRIS	8.40E-02	IRIS	0	-	**8.40E-02**	IRIS	C
Di-n-butylphthalate (NC)	1.00E-01	IRIS	**1.00E-01**	IRIS	0	-	0	-	0	-	D
Ethylbenzene (NC)	1.00E-01	IRIS	2.86E-01	IRIS	0	-	0	-	0	-	D
Methyl tert-butyl ether (C)	**8.57E-01**	IRIS	8.57E-01	IRIS	4.00E-03	NCEA	0	-	**4.00E-03**	NCEA	-
n-Butylbenzene (NC)	4.00E-02	NCEA	**4.00E-02**	NCEA	0	-	0	-	0	-	-
Toluene (NC)	2.00E-01	IRIS	1.14E-01	IRIS	0	-	0	-	0	-	D
Vinyl Chloride (C)	3.00E-03	IRIS	2.86E-02	IRIS	(combined)	IRIS	4.4E-06 (adult) to 8.8E-06 (combined)	IRIS	02 (combined)	IRIS	A
m,p-Xylene (NC)	0.2	IRIS	2.86E-02	IRIS	0	-	0	-	0	-	D
ortho-xylene (NC)	0.2	IRIS	2.86E-02	IRIS	0	-	0	-	0	-	D
Xylenes (total) (NC)	0.2	IRIS	2.86E-02	IRIS	0	-	0	-	0	-	D
beta-BHC (C)	NA	-	NA	-	1.8	IRIS	5.30E+04	IRIS	1.8	IRIS	C
Total TCDD (C)	NA	-	NA	-	1.50E+05	HEAST	3.30E+01	HEAST	1.16E+05	HEAST	B2

Notes:

[3] NC = non-carcinogen, C = carcinogen

[2] NCEA = US EPA NCEA, HEAST = US EPA HEAST Table, IRIS = US EPA IRIS, TEF B(a)P = value is a TEF from benzo(a)pyrene

[3] Carcinogen Class as determined by the US EPA

[4] Carcinogen classification based on the inhalation exposure pathway for Cr(VI)

[5] Carcinogen classification from the Wisconsin Department of Natural Resources (1997), as a TEF of benzo(a)pyrene

XXX Oral RFd used for RFDi - i.e., there is no RfDi value but there is an RfDo

XXX Inhalation RfDi used for RfDo - i.e., there is no RfDo value but there is an RfDi

Table 3-11: Summary of receptor characteristics

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined
A. Surface Soil												
1) Ingestion of chemicals in surface soil												
Chemical concentration in surficial soil (mg/kg)	variable	variable	variable	variable	variable	variable	NA	NA	NA	variable	variable	variable
Ingestion rate (mg soil / day)	100	200	100	114	100	480	NA	NA	NA	200	100	114
Conversion factor (10e-6) kg/mg)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	NA	NA	NA	1.00E-06	1.00E-06	1.00E-06
Fraction ingested from contaminated source (unitless)	1	0.5	0.5	0.5	1	1	NA	NA	NA	0.5	0.5	0.5
Exposure frequency (days/year)	273	117	117	117	195	180	NA	NA	NA	117	117	117
Exposure duration (years)	5	6	24	30	30	1	NA	NA	NA	6	24	30
Body weight (kg)	70	15	70	70	70	70	NA	NA	NA	15	70	70
Averaging time for non-carcinogens [1]	1825	2190	8760	10950	10950	365	NA	NA	NA	2190	8760	10950
Averaging time for carcinogens [1]	25550	NA	25550	25550	25550	25550	NA	NA	NA	NA	25550	25550
2) Dermal contact with chemicals in surface soil												
Chemical concentration in surficial soil (mg/kg)	variable	variable	variable	variable	variable	variable	NA	NA	NA	variable	variable	variable
Dermal absorption factor (unitless)	properties	properties	properties	properties	properties	properties	NA	NA	NA	properties	properties	properties
Conversion factor (10e-6) kg/mg)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	NA	NA	NA	1.00E-06	1.00E-06	1.00E-06
Skin surface area available for contact (cm^2/event)	5700	2800	5700	3074	3300	3300	NA	NA	NA	2800	5700	3074
Soil to skin adherence factor (mg/cm^2)	0.07	0.2	0.07	0.104	0.2	0.2	NA	NA	NA	0.2	0.07	0.104
Exposure frequency (events/year)	273	117	117	117	195	180	NA	NA	NA	117	117	117
Exposure duration (years)	5	6	24	30	30	1	NA	NA	NA	6	24	30
Body weight (kg)	70	15	70	70	70	70	NA	NA	NA	15	70	70
Averaging time for non-carcinogens [1]	1825	2190	8760	10950	10950	365	NA	NA	NA	2190	8760	10950
Averaging time for carcinogens [1]	25550	NA	25550	25550	25550	25550	NA	NA	NA	NA	25550	25550
3) Inhalation of chemicals in surface soil dust and particulates												
Chemical concentration in surficial soil (mg/kg)	variable	variable	variable	variable	variable	variable	variable	variable	variable	variable	variable	variable
Inhalation rate (m^3/hr)	0.83	1.2	1.6	1.0	1.5	2.5	0.5	0.83	0.48	0.5	0.83	0.48
Exposure frequency (events/year)	273	117	117	117	195	180	273	273	273	273	273	273
Event duration (hrs/event)	24	2.5	2.5	2.5	8	8	24	24	24	24	24	24
Exposure duration (years)	5	6	24	30	30	1	6	24	30	6	24	30
Portion of dry days (unitless)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Particulate emission factor (m^3/kg)	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06
Body weight (kg)	70	15	70	70	70	70	15	70	70	15	70	70
Averaging time for non-carcinogens [1]	1825	2190	8760	10950	10950	365	2190	8760	10950	2190	8760	10950
Averaging time for carcinogens [1]	25550	NA	25550	25550	25550	25550	NA	25550	25550	NA	25550	25550

[1] period over which exposure is averaged (day)

Table 3-11: Cont'd

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined
B. Subsurface Soil												
1) Ingestion of chemicals in subsurface soil												
Chemical concentration in subsurface soil (mg/kg)	NA	NA	NA	NA	NA	variable	NA	NA	NA	NA	NA	NA
Ingestion rate (mg soil / day)	NA	NA	NA	NA	NA	480	NA	NA	NA	NA	NA	NA
Conversion factor (10e-6) kg/mg)	NA	NA	NA	NA	NA	1.00E-06	NA	NA	NA	NA	NA	NA
Fraction ingested from contaminated source (unitless)	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Exposure frequency (days/year)	NA	NA	NA	NA	NA	180	NA	NA	NA	NA	NA	NA
Exposure duration (years)	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Body weight (kg)	NA	NA	NA	NA	NA	70	NA	NA	NA	NA	NA	NA
Averaging time for non-carcinogens [1]	NA	NA	NA	NA	NA	365	NA	NA	NA	NA	NA	NA
Averaging time for carcinogens [1]	NA	NA	NA	NA	NA	25550	NA	NA	NA	NA	NA	NA
2) Dermal contact with chemicals in subsurface soil												
Chemical concentration in subsurface soil (mg/kg)	NA	NA	NA	NA	NA	variable	NA	NA	NA	NA	NA	NA
Dermal absorption factor (unitless)	NA	NA	NA	NA	NA	properties	NA	NA	NA	NA	NA	NA
Conversion factor (10e-6) kg/mg)	NA	NA	NA	NA	NA	1.00E-06	NA	NA	NA	NA	NA	NA
Skin surface area available for contact (cm^2/event)	NA	NA	NA	NA	NA	3300	NA	NA	NA	NA	NA	NA
Soil to skin adherence factor (mg/cm^2)	NA	NA	NA	NA	NA	0.2	NA	NA	NA	NA	NA	NA
Exposure frequency (events/year)	NA	NA	NA	NA	NA	180	NA	NA	NA	NA	NA	NA
Exposure duration (years)	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Body weight (kg)	NA	NA	NA	NA	NA	70	NA	NA	NA	NA	NA	NA
Averaging time for non-carcinogens [1]	NA	NA	NA	NA	NA	365	NA	NA	NA	NA	NA	NA
Averaging time for carcinogens [1]	NA	NA	NA	NA	NA	25550	NA	NA	NA	NA	NA	NA
3) Inhalation of chemicals in subsurface soil dust and particulates												
Chemical concentration in subsurface soil (mg/kg)	NA	NA	NA	NA	NA	variable	variable	variable	variable	variable	variable	variable
Inhalation rate (m^3/hr)	NA	NA	NA	NA	NA	2.5	0.5	0.83	0.83	0.5	0.83	0.83
Exposure frequency (events/year)	NA	NA	NA	NA	NA	180	273	273	273	273	273	273
Hours per day	NA	NA	NA	NA	NA	8	24	24	24	24	24	24
Exposure duration (years)	NA	NA	NA	NA	NA	1	1	1	1	1	1	1
Portion of dry days (unitless)	NA	NA	NA	NA	NA	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Particulate emission factor (m^3/kg)	NA	NA	NA	NA	NA	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06	3.76E+06
Body weight (kg)	NA	NA	NA	NA	NA	70	15	70	70	15	70	70
Averaging time for non-carcinogens [1]	NA	NA	NA	NA	NA	365	2190	8760	10950	2190	8760	10950
Averaging time for carcinogens [1]	NA	NA	NA	NA	NA	25550	NA	25550	25550	NA	25550	25550

[1] period over which exposure is averaged (day)

Table 3-11: Cont'd

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined
C. Surface Water												
1) Ingestion of chemicals in surface water while swimming												
Chemical concentration in water (mg / L)	variable	variable	variable	variable	NA	NA	NA	NA	NA	variable	variable	variable
Ingestion rate (litres / hour)	0.05	0.05	0.05	0.05	NA	NA	NA	NA	NA	0.05	0.05	0.05
Exposure time (hours / event)	1	1	1	1	NA	NA	NA	NA	NA	1	1	1
Exposure frequency (events / year)	154	44	44	44	NA	NA	NA	NA	NA	44	44	44
Exposure duration (years)	5	6	24	30	NA	NA	NA	NA	NA	6	24	30
Body weight (kg)	70	15	70	70	NA	NA	NA	NA	NA	15	70	70
Averaging time for non-carcinogens [1]	1825	2190	8760	10950	NA	NA	NA	NA	NA	2190	8760	10950
Averaging time for carcinogens [1]	25550	NA	25550	25550	NA	NA	NA	NA	NA	NA	25550	25550
2) Dermal contact with surface water while swimming												
Chemical concentration in surface water (mg / L)	variable	variable	variable	variable	NA	NA	NA	NA	NA	variable	variable	variable
Chemical-specific dermal permeability constant (cm / hr)	properties	properties	properties	properties	NA	NA	NA	NA	NA	properties	properties	properties
Skin surface area available for contact (cm^2)	18000	6,600	18000	8811	NA	NA	NA	NA	NA	6,600	18000	8811
Exposure time (hours / day)	1	1	1	1	NA	NA	NA	NA	NA	1	1	1
Exposure frequency (days / year)	183	44	44	44	NA	NA	NA	NA	NA	44	44	44
Exposure duration (years)	5	6	24	30	NA	NA	NA	NA	NA	6	24	30
Volumetric conversion factor for water (1 L/1000 cm^3)	0.001	0.001	0.001	0.001	NA	NA	NA	NA	NA	0.001	0.001	0.001
Body weight (kg)	70	15	70	70	NA	NA	NA	NA	NA	15	70	70
Averaging time for non-carcinogens [1]	1825	2190	8760	10950	NA	NA	NA	NA	NA	2190	8760	10950
Averaging time for carcinogens [1]	25550	NA	25550	25550	NA	NA	NA	NA	NA	NA	25550	25550
3) Dermal contact with surface water while wading												
Chemical concentration in surface water (mg / L)	NA	variable	variable	variable	variable	variable	NA	NA	NA	variable	variable	variable
Chemical-specific dermal permeability constant (cm / hr)	NA	properties	properties	properties	properties	properties	NA	NA	NA	properties	properties	properties
Skin surface area available for contact (cm^2)	NA	2800	5700	3074	3300	3300	NA	NA	NA	2800	5700	3074
Exposure time (hours / day)	NA	1	1	1	4	8	NA	NA	NA	1	1	1
Exposure frequency (days / year)	NA	44	44	44	110	180	NA	NA	NA	44	44	44
Exposure duration (years)	NA	6	24	30	30	1	NA	NA	NA	6	24	30
Volumetric conversion factor for water (1 L/1000 cm^3)	NA	0.001	0.001	0.001	0.001	0.001	NA	NA	NA	0.001	0.001	0.001
Body weight (kg)	NA	15	70	70	70	70	NA	NA	NA	15	70	70
Averaging time for non-carcinogens [1]	NA	2190	8760	10950	10950	365	NA	NA	NA	2190	8760	10950
Averaging time for carcinogens [1]	NA	NA	25550	25550	25550	25550	NA	NA	NA	NA	25550	25550

[1] period over which exposure is averaged (day)

Table 3-11: Cont'd

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined
D. Groundwater												
1) Dermal contact with groundwater during construction activities												
Chemical concentration in water (mg / L)	NA	NA	NA	NA	NA	variable	NA	NA	NA	NA	NA	NA
Chemical-specific dermal permeability constant (cm / hr)	NA	NA	NA	NA	NA	properties	NA	NA	NA	NA	NA	NA
Skin surface area available for contact (cm^2)	NA	NA	NA	NA	NA	3300	NA	NA	NA	NA	NA	NA
Exposure time (hours / day)	NA	NA	NA	NA	NA	8	NA	NA	NA	NA	NA	NA
Exposure frequency (days / year)	NA	NA	NA	NA	NA	180	NA	NA	NA	NA	NA	NA
Exposure duration (years)	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Volumetric conversion factor for water (1 L/1000 cm^3)	NA	NA	NA	NA	NA	0.001	NA	NA	NA	NA	NA	NA
Body weight (kg)	NA	NA	NA	NA	NA	70	NA	NA	NA	NA	NA	NA
Averaging time for non-carcinogens [1]	NA	NA	NA	NA	NA	365	NA	NA	NA	NA	NA	NA
Averaging time for carcinogens [1]	NA	NA	NA	NA	NA	25550	NA	NA	NA	NA	NA	NA
E. Sediments												
1) Ingestion of chemicals in sediment												
Chemical concentration in sediment (mg/kg)	variable	variable	variable	variable	variable	variable	NA	NA	NA	variable	variable	variable
Ingestion rate (mg soil / day)	100	200	100	114	100	480	NA	NA	NA	200	100	114
Conversion factor (10e-6) kg/mg)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	NA	NA	NA	1.00E-06	1.00E-06	1.00E-06
Fraction ingested from contaminated source (unitless)	1	1	1	1	1	1	NA	NA	NA	1	1	1
Exposure frequency (days/year)	273	44	44	44	44	44	NA	NA	NA	44	44	44
Exposure duration (years)	5	6	24	30	30	1	NA	NA	NA	6	24	24
Body weight (kg)	70	15	70	70	70	70	NA	NA	NA	15	70	70
Averaging time for non-carcinogens [1]	1825	2190	8760	10950	10950	365	NA	NA	NA	2190	8760	10950
Averaging time for carcinogens [1]	25550	NA	25550	25550	25550	25550	NA	NA	NA	NA	25550	25550
2) Dermal contact with chemicals in sediment												
Chemical concentration in sediment (mg/kg)	variable	variable	variable	variable	variable	variable	NA	NA	NA	variable	variable	variable
Dermal absorption factor (unitless)	properties	properties	properties	properties	properties	properties	NA	NA	NA	properties	properties	properties
Conversion factor (10e-6) kg/mg)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	NA	NA	NA	1.00E-06	1.00E-06	1.00E-06
Skin surface area available for contact (cm^2/event)	5700	2800	5700	3074	3300	3300	NA	NA	NA	2800	5700	3074
Soil to skin adherence factor (mg/cm^2)	0.3	0.2	0.3	0.18	0.3	0.6	NA	NA	NA	0.2	0.3	0.18
Exposure frequency (events/year)	273	44	44	44	110	180	NA	NA	NA	44	44	44
Exposure duration (years)	5	6	24	30	30	1	NA	NA	NA	6	24	30
Body weight (kg)	70	15	70	70	70	70	NA	NA	NA	15	70	70
Averaging time for non-carcinogens [1]	1825	2190	8760	10950	10950	365	NA	NA	NA	2190	8760	10950
Averaging time for carcinogens [1]	25550	NA	25550	25550	25550	25550	NA	NA	NA	NA	25550	25550

[1] period over which exposure is averaged (day)

Table 3-11: Cont'd

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined
F. Fish												
1) Ingestion of fish from the site												
Chemical concentration in fish (mg/kg)	NA	variable	variable	variable	NA	NA	NA	NA	NA	variable	variable	variable
Ingestion rate (mg fish / day)	NA	24750	63000	31500	NA	NA	NA	NA	NA	24750	63000	31500
Conversion factor (10e-6) kg/mg)	NA	1.00E-06	1.00E-06	1.00E-06	NA	NA	NA	NA	NA	1.00E-06	1.00E-06	1.00E-06
Fraction of fish ingested from the site (unitless)	NA	0.5	0.5	0.5	NA	NA	NA	NA	NA	0.5	0.5	0.5
Exposure frequency (days/year)	NA	365	365	365	NA	NA	NA	NA	NA	365	365	365
Exposure duration (years)	NA	6	24	30	NA	NA	NA	NA	NA	6	24	30
Body weight (kg)	NA	15	70	70	NA	NA	NA	NA	NA	15	70	70
Averaging time for non-carcinogens [1]	NA	2190	8760	10950	NA	NA	NA	NA	NA	2190	8760	10950
Averaging time for carcinogens [1]	NA	NA	25550	25550	NA	NA	NA	NA	NA	NA	25550	25550

[1] period over which exposure is averaged (day)

Table 3-12: Summary of exposure dose and hazard quotient by media for adult trespassers.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalatior	Ingestion	Dermal	Inhalation
Aluminum (NC)	1.13E-02	4.49E-04	4.18E-04	1.13E-02	4.49E-04	4.18E-01	NA	NA	NA	NA	NA	NA
Antimony (NC)	1.06E-05	4.23E-07	3.93E-07	2.65E-02	1.06E-03	6.88E-03	NA	NA	NA	NA	NA	NA
Arsenic (C)	1.84E-05	2.20E-06	6.82E-07	6.13E-02	7.33E-03	2.27E-03	NA	NA	NA	NA	NA	NA
Barium (NC)	1.07E-04	4.25E-06	3.95E-06	1.52E-03	6.07E-05	2.82E-02	NA	NA	NA	NA	NA	NA
Beryllium (C)	7.59E-07	3.03E-08	2.81E-08	3.79E-04	1.51E-05	4.92E-03	NA	NA	NA	NA	NA	NA
Cadmium (C)	2.01E-06	8.01E-09	7.45E-08	2.01E-03	8.01E-06	1.31E-03	NA	NA	NA	NA	NA	NA
Chromium (C)	4.29E-05	1.71E-06	1.59E-06	1.43E-02	5.71E-04	5.57E-02	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	2.24E-05	8.94E-07	8.31E-07	7.47E-03	2.98E-04	2.91E-02	NA	NA	NA	NA	NA	NA
Cobalt (C)	8.69E-06	3.47E-07	3.22E-07	4.34E-04	1.73E-05	5.65E-02	NA	NA	NA	NA	NA	NA
Copper (NC)	3.83E-05	1.53E-06	1.42E-06	9.56E-04	3.82E-05	3.55E-05	NA	NA	NA	NA	NA	NA
Iron (NC)	2.95E-02	1.18E-03	1.09E-03	9.83E-02	3.92E-03	3.64E-03	NA	NA	NA	NA	NA	NA
Lead (C)	1.36E-04	5.44E-06	5.06E-06	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	4.37E-04	1.74E-05	1.62E-05	2.18E-02	8.72E-04	1.13E+00	NA	NA	NA	NA	NA	NA
Mercury (NC)	2.44E-07	9.72E-09	9.03E-09	2.84E-03	1.13E-04	1.05E-04	NA	NA	NA	NA	NA	NA
Nickel (NC)	2.50E-05	9.96E-07	9.26E-07	1.25E-03	4.98E-05	4.63E-05	NA	NA	NA	NA	NA	NA
Thallium (NC)	3.12E-06	1.24E-07	1.16E-07	4.46E-02	1.78E-03	1.65E-03	NA	NA	NA	NA	NA	NA
Vanadium (NC)	3.55E-05	1.42E-06	1.32E-06	1.18E-01	4.72E-03	4.39E-03	NA	NA	NA	NA	NA	NA
Zinc (NC)	2.75E-04	1.10E-05	1.02E-05	9.17E-04	3.66E-05	3.40E-05	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	5.01E-06	2.60E-06	1.86E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	9.03E-07	4.68E-07	3.35E-08	3.01E-06	1.56E-06	1.12E-07	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	3.68E-06	1.91E-06	1.36E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	4.93E-06	2.55E-06	1.83E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	7.36E-06	3.82E-06	2.73E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	2.18E-06	1.13E-06	8.08E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	4.27E-07	2.22E-07	1.59E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	1.06E-05	5.50E-06	3.93E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	8.83E-07	4.58E-07	3.27E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	9.14E-06	4.74E-06	3.39E-07	2.28E-04	1.18E-04	8.47E-06	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	1.67E-06	8.65E-07	6.18E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	9.04E-07	4.69E-07	3.35E-08	4.52E-05	2.34E-05	3.91E-05	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	2.58E-06	1.34E-06	9.55E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	2.76E-06	1.43E-06	1.02E-07	6.89E-04	3.57E-04	2.56E-05	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	2.76E-06	3.30E-07	1.02E-07	1.38E-04	1.65E-05	7.30E-05	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	6.95E-10	8.31E-11	2.58E-11	1.39E-08	1.66E-09	1.52E-08	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	6.95E-10	8.31E-11	2.58E-11	1.39E-08	1.66E-09	1.52E-08	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	1.45E-05	5.78E-06	5.37E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	1.45E-06	5.80E-07	5.39E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	1.32E-05	1.57E-06	4.88E-07	2.63E-02	3.15E-03	9.76E-04	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	9.30E-07	5.19E-07	3.45E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	2.46E-06	1.37E-06	9.11E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	4.75E-09	9.49E-12	1.76E-10	1.19E-06	2.37E-09	2.06E-08	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	2.67E-05	1.07E-05	9.91E-07	1.34E-03	5.33E-04	4.95E-05	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	6.95E-10	8.31E-11	2.58E-11	3.47E-08	4.16E-09	1.29E-09	NA	NA	NA	NA	NA	NA
Chloroform (C)	4.75E-09	5.69E-10	1.76E-10	4.75E-07	5.69E-08	1.26E-08	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	6.95E-10	8.31E-11	2.58E-11	3.47E-08	4.16E-09	1.29E-09	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	5.28E-06	2.11E-06	1.96E-07	5.28E-05	2.11E-05	1.96E-06	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	4.75E-09	5.69E-10	1.76E-10	4.75E-08	5.69E-09	6.17E-10	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	3.31E-09	3.96E-10	1.23E-10	3.86E-09	4.63E-10	1.43E-10	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	1.44E-09	1.73E-10	5.35E-11	3.61E-08	4.32E-09	1.34E-09	NA	NA	NA	NA	NA	NA
Toluene (NC)	1.07E-09	1.28E-10	3.96E-11	5.34E-09	6.39E-10	3.47E-10	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	6.95E-10	1.39E-12	2.58E-11	2.32E-07	4.62E-10	9.01E-10	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	6.95E-10	8.31E-11	2.58E-11	3.47E-09	4.16E-10	9.01E-10	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	6.95E-10	8.31E-11	2.58E-11	3.47E-09	4.16E-10	9.01E-10	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	9.30E-09	1.11E-09	3.45E-10	4.65E-08	5.56E-09	1.21E-08	NA	NA	NA	NA	NA	NA
beta-BHC (C)	2.88E-09	1.15E-09	1.07E-10	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	1.18E-11	1.41E-12	4.36E-13	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-12: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure/ HQ		Exposure		Hazard Quotient	
	Ingestion	Dermal	NA	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	3.07E-04	1.32E-04	NA	3.07E-04	1.32E-04	0.00E+00	NA	NA	7.51E-03	1.28E-03	7.51E-03	1.28E-03
Antimony (NC)	6.03E-07	2.58E-07	NA	1.51E-03	6.45E-04	0.00E+00	NA	NA	2.78E-06	4.75E-07	6.95E-03	1.19E-03
Arsenic (C)	1.12E-05	4.77E-06	NA	3.72E-02	1.59E-02	0.00E+00	NA	NA	5.80E-05	2.98E-05	1.93E-01	9.92E-02
Barium (NC)	2.95E-05	1.26E-05	NA	4.22E-04	1.80E-04	0.00E+00	NA	NA	1.41E-04	2.41E-05	2.01E-03	3.45E-04
Beryllium (C)	1.24E-07	5.29E-08	NA	6.18E-05	2.64E-05	0.00E+00	NA	NA	9.83E-07	1.68E-07	4.92E-04	8.40E-05
Cadmium (C)	6.63E-07	2.84E-07	NA	6.63E-04	2.84E-04	0.00E+00	NA	NA	1.50E-06	2.56E-08	1.50E-03	2.56E-05
Chromium (C)	3.92E-06	3.35E-06	NA	1.31E-03	1.12E-03	0.00E+00	NA	NA	3.38E-05	5.77E-06	1.13E-02	1.92E-03
Chromium (total) (C)	1.51E-06	1.29E-06	NA	5.02E-04	4.30E-04	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	1.81E-06	3.09E-07	NA	9.04E-05	1.55E-05	0.00E+00	NA	NA	8.55E-06	1.46E-06	4.27E-04	7.31E-05
Copper (NC)	1.36E-05	5.80E-06	NA	3.39E-04	1.45E-04	0.00E+00	NA	NA	6.06E-05	1.04E-05	1.51E-03	2.59E-04
Iron (NC)	2.69E-03	1.15E-03	NA	8.98E-03	3.84E-03	0.00E+00	NA	NA	2.96E-02	5.06E-03	9.87E-02	1.69E-02
Lead (C)	5.33E-05	2.28E-06	NA	NA	NA	NA	NA	NA	3.07E-04	5.24E-05	NA	NA
Manganese (NC)	1.57E-04	6.73E-05	NA	7.87E-03	3.36E-03	0.00E+00	NA	NA	4.44E-04	7.60E-05	2.22E-02	3.80E-03
Mercury (NC)	1.51E-07	6.45E-08	NA	1.76E-03	7.52E-04	0.00E+00	NA	NA	3.21E-07	5.48E-08	3.74E-03	6.39E-04
Nickel (NC)	6.60E-06	5.65E-07	NA	3.30E-04	2.82E-05	0.00E+00	NA	NA	5.79E-05	9.90E-06	2.90E-03	4.95E-04
Thallium (NC)	1.51E-06	6.45E-07	NA	2.15E-02	9.21E-03	0.00E+00	NA	NA	2.13E-06	3.64E-07	3.04E-02	5.19E-03
Vanadium (NC)	1.51E-06	6.45E-07	NA	5.02E-03	2.15E-03	0.00E+00	NA	NA	2.83E-05	4.84E-06	9.44E-02	1.61E-02
Zinc (NC)	1.43E-04	6.12E-05	NA	4.77E-04	2.04E-04	0.00E+00	NA	NA	1.29E-03	2.21E-04	4.31E-03	7.37E-04
Acenaphthylene (C)	1.51E-06	9.09E-05	NA	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	1.51E-06	1.45E-04	NA	5.02E-06	4.83E-04	0.00E+00	NA	NA	3.53E-06	7.84E-06	1.18E-05	2.61E-05
Benzo(a)anthracene (C)	1.51E-06	6.11E-04	NA	NA	NA	NA	NA	NA	5.98E-06	1.33E-05	NA	NA
Benzo(a)pyrene (C)	1.51E-06	7.99E-04	NA	NA	NA	NA	NA	NA	5.98E-06	1.33E-05	NA	NA
Benzo(b)fluoranthene (C)	1.51E-06	4.51E-04	NA	NA	NA	NA	NA	NA	5.13E-06	1.14E-05	NA	NA
Benzo(g,h,i)perylene	1.51E-06	1.29E-03	NA	NA	NA	NA	NA	NA	2.14E-06	4.75E-06	NA	NA
Benzo(k)fluoranthene (C)	1.51E-06	7.74E-04	NA	NA	NA	NA	NA	NA	5.34E-06	1.19E-05	NA	NA
Chrysene (C)	1.51E-06	6.64E-04	NA	NA	NA	NA	NA	NA	5.56E-06	1.24E-05	NA	NA
Dibenz(a,h)anthracene (C)		1.08E-03	NA	NA	NA	NA	NA	NA	1.00E-06	2.23E-06	NA	NA
Fluoranthene (NC)	1.51E-06	3.31E-04	NA	3.77E-05	8.27E-03	0.00E+00	NA	NA	1.28E-05	2.85E-05	3.21E-04	7.13E-04
Indeno(1,2,3-cd)pyrene (C)	1.51E-06	1.44E-03	NA	NA	NA	NA	NA	NA	2.67E-06	5.94E-06	NA	NA
Naphthalene (NC)	1.51E-06	4.47E-05	NA	7.53E-05	2.24E-03	0.00E+00	NA	NA	1.28E-07	2.85E-07	6.41E-06	1.43E-05
Phenanthrene (C)	1.51E-06	1.48E-04	NA	NA	NA	NA	NA	NA	1.07E-05	2.38E-05	NA	NA
2-Methylnaphthylene (NC)	1.51E-07	9.15E-06	NA	3.77E-05	2.29E-03	0.00E+00	NA	NA	2.24E-07	4.99E-07	5.61E-05	1.25E-04
1,2-Dichloroethane (C)	1.51E-07	3.44E-07	NA	7.53E-06	1.72E-05	0.00E+00	NA	NA	2.24E-07	1.15E-07	1.12E-05	5.76E-06
1,2,4-Trimethylbenzene (NC)	1.51E-06	6.90E-05	NA	3.01E-05	1.38E-03	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	1.51E-07	6.90E-06	NA	3.01E-06	1.38E-04	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	3.01E-08	5.16E-06	NA	NA	NA	NA	NA	NA	6.30E-06	1.08E-05	NA	NA
4,4'-DDE (C)	3.01E-08	1.18E-05	NA	NA	NA	NA	NA	NA	3.95E-06	6.76E-06	NA	NA
4,4'-DDT (C)	3.01E-08	1.37E-05	NA	6.03E-05	2.73E-02	0.00E+00	NA	NA	8.12E-05	4.17E-05	1.62E-01	8.33E-02
Aroclor 1248 (C)	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA	8.33E-08	2.00E-07	NA	NA
Aroclor 1260 (C)	3.01E-07	7.07E-04	NA	NA	NA	NA	NA	NA	1.18E-07	2.81E-07	NA	NA
Benzene (C)	7.53E-07	1.19E-04	NA	1.88E-04	2.98E-02	0.00E+00	NA	NA	9.33E-09	7.98E-11	2.33E-06	1.99E-08
bis(2-Ethylhexyl)phthalate (C)	1.51E-06	4.25E-04	NA	7.53E-05	2.13E-02	0.00E+00	NA	NA	3.21E-07	5.48E-07	1.60E-05	2.74E-05
Bromodichloromethane (C)	6.03E-07	2.84E-05	NA	3.01E-05	1.42E-03	0.00E+00	NA	NA	9.33E-09	4.79E-09	4.66E-07	2.39E-07
Chloroform (C)	1.81E-06	1.32E-04	NA	1.81E-04	1.32E-02	0.00E+00	NA	NA	9.33E-09	4.79E-09	9.33E-07	4.79E-07
Dibromochloromethane (C)	1.81E-07	3.02E-07	NA	9.04E-06	1.51E-05	0.00E+00	NA	NA	9.33E-09	4.79E-09	4.66E-07	2.39E-07
Di-n-butylphthalate (NC)	3.92E-06	1.02E-03	NA	3.92E-05	1.02E-02	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	7.53E-07	3.87E-04	NA	7.53E-06	3.87E-03	0.00E+00	NA	NA	9.33E-09	4.79E-09	9.33E-08	4.79E-08
Methyl tert-butyl ether (C)	1.51E-07	1.66E-07	NA	1.76E-07	1.93E-07	0.00E+00	NA	NA	9.33E-09	4.79E-09	1.09E-08	5.58E-09
n-Butylbenzene (NC)	1.51E-07	0.00E+00	NA	3.77E-06	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	1.87E-06	6.23E-04	NA	9.34E-06	3.12E-03	0.00E+00	NA	NA	1.50E-07	7.67E-08	7.48E-07	3.84E-07
Vinyl Chloride (C)	1.51E-07	9.02E-06	NA	5.02E-05	3.01E-03	0.00E+00	NA	NA	9.33E-09	7.98E-11	3.11E-06	2.66E-08
m,p-Xylene (NC)	1.51E-07	9.02E-05	NA	7.53E-07	4.51E-04	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	1.51E-07	9.02E-05	NA	7.53E-07	4.51E-04	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	1.51E-06	9.02E-04	NA	7.53E-06	4.51E-03	0.00E+00	NA	NA	9.33E-09	4.79E-09	4.66E-08	2.39E-08
beta-BHC (C)	1.51E-08	1.74E-06	NA	NA	NA	NA	NA	NA	1.69E-09	2.89E-09	NA	NA
Total TCDD (C)	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA

Table 3-12: Cont'd

Chemical (Qualifier)	F. Fish Exposure / HQ Ingestion	F. Fish Exposure / HQ Ingestion	Total Hazard Quotient	Total Hazard No Fish
Aluminum (NC)	NA	NA	4.38E-01	4.38E-01
Antimony (NC)	NA	NA	4.47E-02	4.47E-02
Arsenic (C)	NA	NA	4.17E-01	4.17E-01
Barium (NC)	NA	NA	3.28E-02	3.28E-02
Beryllium (C)	NA	NA	5.98E-03	5.98E-03
Cadmium (C)	NA	NA	5.79E-03	5.79E-03
Chromium (C)	NA	NA	8.62E-02	8.62E-02
Chromium (total) (C)	NA	NA	3.78E-02	3.78E-02
Cobalt (C)	NA	NA	5.76E-02	5.76E-02
Copper (NC)	NA	NA	3.29E-03	3.29E-03
Iron (NC)	NA	NA	2.34E-01	2.34E-01
Lead (C)	NA	NA	NA	NA
Manganese (NC)	NA	NA	1.19E+00	1.19E+00
Mercury (NC)	NA	NA	9.95E-03	9.95E-03
Nickel (NC)	NA	NA	5.09E-03	5.09E-03
Thallium (NC)	NA	NA	1.14E-01	1.14E-01
Vanadium (NC)	NA	NA	2.45E-01	2.45E-01
Zinc (NC)	NA	NA	6.72E-03	6.72E-03
Acenaphthylene (C)	NA	NA	NA	NA
Anthracene (NC)	NA	NA	5.31E-04	5.31E-04
Benzo(a)anthracene (C)	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	9.69E-03	9.69E-03
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	2.44E-03	2.44E-03
Phenanthrene (C)	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	3.58E-03	3.58E-03
1,2-Dichloroethane (C)	NA	NA	2.69E-04	2.69E-04
1,2,4-Trimethylbenzene (NC)	NA	NA	1.41E-03	1.41E-03
1,3,5-Trimethylbenzene (NC)	NA	NA	1.41E-04	1.41E-04
4,4'-DDD (C)	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	3.04E-01	3.04E-01
Aroclor 1248 (C)	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA
Benzene (C)	NA	NA	3.00E-02	3.00E-02
bis(2-Ethylhexyl)phthalate (C)	NA	NA	2.33E-02	2.33E-02
Bromodichloromethane (C)	NA	NA	1.45E-03	1.45E-03
Chloroform (C)	NA	NA	1.33E-02	1.33E-02
Dibromochloromethane (C)	NA	NA	2.49E-05	2.49E-05
Di-n-butylphthalate (NC)	NA	NA	1.03E-02	1.03E-02
Ethylbenzene (NC)	NA	NA	3.88E-03	3.88E-03
Methyl tert-butyl ether (C)	NA	NA	3.90E-07	3.90E-07
n-Butylbenzene (NC)	NA	NA	3.81E-06	3.81E-06
Toluene (NC)	NA	NA	3.13E-03	3.13E-03
Vinyl Chloride (C)	NA	NA	3.06E-03	3.06E-03
m,p-Xylene (NC)	NA	NA	4.52E-04	4.52E-04
ortho-xylene (NC)	NA	NA	4.52E-04	4.52E-04
Xylenes (total) (NC)	NA	NA	4.52E-03	4.52E-03
beta-BHC (C)	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA

Table 3-13: Summary of exposure dose and ILCR by media for adult trespassers.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalatior	Ingestion	Dermal	Inhalation
Arsenic (C)	1.31E-06	1.57E-07	4.87E-08	1.97E-06	2.36E-07	7.33E-07	NA	NA	NA	NA	NA	NA
Beryllium (C)	5.42E-08	2.16E-09	2.01E-09	4.55E-07	1.82E-08	1.69E-08	NA	NA	NA	NA	NA	NA
Cadmium (C)	1.43E-07	5.72E-10	5.32E-09	9.04E-07	3.61E-09	3.35E-08	NA	NA	NA	NA	NA	NA
Chromium (C)	3.06E-06	1.22E-07	1.14E-07	1.29E-04	5.14E-06	4.77E-06	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	1.60E-06	6.39E-08	5.94E-08	6.72E-05	2.68E-06	2.49E-06	NA	NA	NA	NA	NA	NA
Cobalt (C)	6.20E-07	2.48E-08	2.30E-08	6.08E-06	2.43E-07	2.26E-07	NA	NA	NA	NA	NA	NA
Lead (C)	9.74E-06	3.89E-07	3.61E-07	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	3.58E-07	1.86E-07	1.33E-08	2.61E-09	1.36E-09	4.12E-11	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	2.63E-07	1.36E-07	9.74E-09	1.92E-07	9.94E-08	3.02E-09	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	3.52E-07	1.82E-07	1.30E-08	2.57E-06	1.33E-06	4.04E-08	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	5.26E-07	2.73E-07	1.95E-08	3.84E-07	1.99E-07	6.05E-09	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.56E-07	8.08E-08	5.77E-09	1.14E-08	5.90E-09	1.79E-10	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	3.05E-08	1.58E-08	1.13E-09	2.23E-09	1.16E-09	3.51E-11	NA	NA	NA	NA	NA	NA
Chrysene (C)	7.57E-07	3.93E-07	2.81E-08	5.53E-09	2.87E-09	8.70E-11	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	6.30E-08	3.27E-08	2.34E-09	4.60E-07	2.39E-07	7.25E-09	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	1.19E-07	6.18E-08	4.42E-09	8.69E-08	4.51E-08	1.37E-09	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	1.84E-07	9.54E-08	6.82E-09	1.34E-09	6.96E-10	2.11E-11	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	1.97E-07	2.36E-08	7.30E-09	1.79E-08	2.14E-09	6.65E-10	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	1.03E-06	4.13E-07	3.84E-08	2.48E-07	9.91E-08	9.21E-09	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	1.04E-07	4.14E-08	3.85E-09	3.53E-08	1.41E-08	1.31E-09	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	9.40E-07	1.12E-07	3.48E-08	3.19E-07	3.82E-08	1.18E-08	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	6.64E-08	3.71E-08	2.46E-09	1.33E-07	7.42E-08	4.92E-09	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	1.76E-07	9.81E-08	6.51E-09	3.51E-07	1.96E-07	1.30E-08	NA	NA	NA	NA	NA	NA
Benzene (C)	3.40E-10	6.78E-13	1.26E-11	1.87E-11	3.73E-14	3.44E-13	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	1.91E-06	7.61E-07	7.08E-08	2.67E-08	1.07E-08	9.91E-10	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	4.96E-11	5.94E-12	1.84E-12	3.08E-12	3.68E-13	1.14E-13	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	4.96E-11	5.94E-12	1.84E-12	4.17E-12	4.99E-13	1.55E-13	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	2.37E-10	2.83E-11	8.77E-12	9.46E-13	1.13E-13	3.51E-14	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	4.96E-11	9.90E-14	1.84E-12	3.72E-11	7.42E-14	2.83E-14	NA	NA	NA	NA	NA	NA
beta-BHC (C)	2.06E-10	8.22E-11	7.64E-12	3.71E-10	1.48E-10	1.38E-11	NA	NA	NA	NA	NA	NA
Total TCDD (C)	8.40E-13	1.00E-13	3.11E-14	1.26E-07	1.51E-08	3.60E-09	NA	NA	NA	NA	NA	NA

Table 3-13: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	ILCR - Swimming		.CR - Wading	Exposure/ ILCR		Exposure		ILCR	
	Ingestion	Dermal	NA	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	7.96E-07	3.41E-07	NA	1.19E-06	5.11E-07	0.00E+00	NA	NA	4.14E-06	2.13E-06	6.22E-06	3.19E-06
Beryllium (C)	8.83E-09	3.78E-09	NA	7.41E-08	3.17E-08	0.00E+00	NA	NA	7.02E-08	1.20E-08	5.90E-07	1.01E-07
Cadmium (C)	4.74E-08	2.03E-08	NA	2.98E-07	1.28E-07	0.00E+00	NA	NA	1.07E-07	1.83E-09	6.73E-07	1.15E-08
Chromium (C)	2.80E-07	2.39E-07	NA	1.18E-05	1.01E-05	0.00E+00	NA	NA	2.41E-06	4.12E-07	1.01E-04	1.73E-05
Chromium (total) (C)	1.08E-07	9.21E-08	NA	4.52E-06	3.87E-06	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	1.29E-07	2.21E-08	NA	1.27E-06	2.17E-07	0.00E+00	NA	NA	6.11E-07	1.04E-07	5.98E-06	1.02E-06
Lead (C)	3.81E-06	1.63E-07	NA	0.00E+00	0.00E+00	0.00E+00	NA	NA	2.19E-05	3.75E-06	0.00E+00	0.00E+00
Acenaphthylene (C)	1.08E-07	6.49E-06	NA	7.86E-10	4.74E-08	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	1.08E-07	4.36E-05	NA	7.86E-08	3.19E-05	0.00E+00	NA	NA	4.27E-07	9.50E-07	3.12E-07	6.94E-07
Benzo(a)pyrene (C)	1.08E-07	5.71E-05	NA	7.86E-07	4.17E-04	0.00E+00	NA	NA	4.27E-07	9.50E-07	3.12E-06	6.94E-06
Benzo(b)fluoranthene (C)	1.08E-07	3.22E-05	NA	7.86E-08	2.35E-05	0.00E+00	NA	NA	3.66E-07	8.14E-07	2.67E-07	5.94E-07
Benzo(g,h,i)perylene	1.08E-07	9.21E-05	NA	7.86E-09	6.72E-06	0.00E+00	NA	NA	1.53E-07	3.39E-07	1.11E-08	2.48E-08
Benzo(k)fluoranthene (C)	1.08E-07	5.53E-05	NA	7.86E-09	4.03E-06	0.00E+00	NA	NA	3.82E-07	8.48E-07	2.79E-08	6.19E-08
Chrysene (C)	1.08E-07	4.74E-05	NA	7.86E-10	3.46E-07	0.00E+00	NA	NA	3.97E-07	8.82E-07	2.90E-09	6.44E-09
Dibenz(a,h)anthracene (C)	1.08E-07	7.74E-05	NA	7.86E-07	5.65E-04	0.00E+00	NA	NA	7.17E-08	1.59E-07	5.24E-07	1.16E-06
Indeno(1,2,3-cd)pyrene (C)	1.08E-07	1.03E-04	NA	7.86E-08	7.50E-05	0.00E+00	NA	NA	1.91E-07	4.24E-07	1.39E-07	3.10E-07
Phenanthrene (C)	1.08E-07	1.05E-05	NA	7.86E-10	7.70E-08	0.00E+00	NA	NA	7.63E-07	1.70E-06	5.57E-09	1.24E-08
1,2-Dichloroethane (C)	1.08E-08	2.46E-08	NA	9.79E-10	2.24E-09	0.00E+00	NA	NA	1.60E-08	8.22E-09	1.46E-09	7.48E-10
4,4'-DDD (C)	2.15E-09	3.68E-07	NA	5.17E-10	8.84E-08	0.00E+00	NA	NA	4.50E-07	7.70E-07	1.08E-07	1.85E-07
4,4'-DDE (C)	2.15E-09	8.44E-07	NA	7.32E-10	2.87E-07	0.00E+00	NA	NA	2.82E-07	4.83E-07	9.60E-08	1.64E-07
4,4'-DDT (C)	2.15E-09	9.76E-07	NA	7.32E-10	3.32E-07	0.00E+00	NA	NA	5.80E-06	2.98E-06	1.97E-06	1.01E-06
Aroclor 1248 (C)	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.95E-09	1.43E-08	1.19E-08	2.85E-08
Aroclor 1260 (C)	2.15E-08	5.05E-05	NA	4.31E-08	1.01E-04	0.00E+00	NA	NA	8.40E-09	2.01E-08	1.68E-08	4.02E-08
Benzene (C)	5.38E-08	8.52E-06	NA	2.96E-09	4.68E-07	0.00E+00	NA	NA	6.66E-10	5.70E-12	3.66E-11	3.13E-13
bis(2-Ethylhexyl)phthalate (C)	1.08E-07	3.04E-05	NA	1.51E-09	4.25E-07	0.00E+00	NA	NA	2.29E-08	3.92E-08	3.21E-10	5.48E-10
Bromodichloromethane (C)	4.31E-08	2.03E-06	NA	2.67E-09	1.26E-07	0.00E+00	NA	NA	6.66E-10	3.42E-10	4.13E-11	2.12E-11
Dibromochloromethane (C)	1.29E-08	2.15E-08	NA	1.08E-09	1.81E-09	0.00E+00	NA	NA	6.66E-10	3.42E-10	5.60E-11	2.87E-11
Methyl tert-butyl ether (C)	1.08E-08	1.18E-08	NA	4.31E-11	4.73E-11	0.00E+00	NA	NA	6.66E-10	3.42E-10	2.67E-12	1.37E-12
Vinyl Chloride (C)	1.08E-08	6.45E-07	NA	8.07E-09	4.83E-07	0.00E+00	NA	NA	6.66E-10	5.70E-12	5.00E-10	4.27E-12
beta-BHC (C)	1.08E-09	1.24E-07	NA	1.94E-09	2.24E-07	0.00E+00	NA	NA	1.21E-10	2.06E-10	2.17E-10	3.71E-10
Total TCDD (C)	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-13: Cont'd

Chemical (Qualifier)	F. Fish Exposure / ILCR		Total ILCR	Total ILCR No Fish
	Ingestion	Ingestion		
Arsenic (C)	NA	NA	1.40E-05	1.40E-05
Beryllium (C)	NA	NA	1.29E-06	1.29E-06
Cadmium (C)	NA	NA	2.05E-06	2.05E-06
Chromium (C)	NA	NA	2.79E-04	2.79E-04
Chromium (total) (C)	NA	NA	8.08E-05	8.08E-05
Cobalt (C)	NA	NA	1.50E-05	1.50E-05
Lead (C)	NA	NA	0.00E+00	0.00E+00
Acenaphthylene (C)	NA	NA	5.22E-08	5.22E-08
Benzo(a)anthracene (C)	NA	NA	3.32E-05	3.32E-05
Benzo(a)pyrene (C)	NA	NA	4.32E-04	4.32E-04
Benzo(b)fluoranthene (C)	NA	NA	2.50E-05	2.50E-05
Benzo(g,h,i)perylene	NA	NA	6.78E-06	6.78E-06
Benzo(k)fluoranthene (C)	NA	NA	4.13E-06	4.13E-06
Chrysene (C)	NA	NA	3.65E-07	3.65E-07
Dibenz(a,h)anthracene (C)	NA	NA	5.68E-04	5.68E-04
Indeno(1,2,3-cd)pyrene (C)	NA	NA	7.56E-05	7.56E-05
Phenanthrene (C)	NA	NA	9.78E-08	9.78E-08
1,2-Dichloroethane (C)	NA	NA	2.62E-08	2.62E-08
4,4'-DDD (C)	NA	NA	7.38E-07	7.38E-07
4,4'-DDE (C)	NA	NA	5.98E-07	5.98E-07
4,4'-DDT (C)	NA	NA	3.69E-06	3.69E-06
Aroclor 1248 (C)	NA	NA	2.52E-07	2.52E-07
Aroclor 1260 (C)	NA	NA	1.02E-04	1.02E-04
Benzene (C)	NA	NA	4.72E-07	4.72E-07
bis(2-Ethylhexyl)phthalate (C)	NA	NA	4.66E-07	4.66E-07
Bromodichloromethane (C)	NA	NA	1.28E-07	1.28E-07
Dibromochloromethane (C)	NA	NA	2.98E-09	2.98E-09
Methyl tert-butyl ether (C)	NA	NA	9.55E-11	9.55E-11
Vinyl Chloride (C)	NA	NA	4.92E-07	4.92E-07
beta-BHC (C)	NA	NA	2.27E-07	2.27E-07
Total TCDD (C)	NA	NA	1.45E-07	1.45E-07

Table 3-14: Summary of exposure dose and hazard quotient by media for child park users.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	2.25E-02	1.26E-03	1.26E-04	2.25E-02	1.26E-03	1.26E-01	NA	NA	NA	NA	NA	NA
Antimony (NC)	2.12E-05	1.19E-06	1.18E-07	5.30E-02	2.97E-03	2.07E-03	NA	NA	NA	NA	NA	NA
Arsenic (C)	3.68E-05	6.18E-06	2.05E-07	1.23E-01	2.06E-02	6.84E-04	NA	NA	NA	NA	NA	NA
Barium (NC)	2.13E-04	1.19E-05	1.19E-06	3.04E-03	1.70E-04	8.50E-03	NA	NA	NA	NA	NA	NA
Beryllium (C)	1.52E-06	8.50E-08	8.47E-09	7.59E-04	4.25E-05	1.48E-03	NA	NA	NA	NA	NA	NA
Cadmium (C)	4.02E-06	2.25E-08	2.24E-08	4.02E-03	2.25E-05	3.94E-04	NA	NA	NA	NA	NA	NA
Chromium (C)	8.58E-05	4.80E-06	4.79E-07	2.86E-02	1.60E-03	1.68E-02	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	4.48E-05	2.51E-06	2.50E-07	1.49E-02	8.37E-04	8.76E-03	NA	NA	NA	NA	NA	NA
Cobalt (C)	1.74E-05	9.73E-07	9.70E-08	8.69E-04	4.86E-05	1.70E-02	NA	NA	NA	NA	NA	NA
Copper (NC)	7.65E-05	4.28E-06	4.27E-07	1.91E-03	1.07E-04	1.07E-05	NA	NA	NA	NA	NA	NA
Iron (NC)	5.90E-02	3.30E-03	3.29E-04	1.97E-01	1.10E-02	1.10E-03	NA	NA	NA	NA	NA	NA
Lead (C)	2.73E-04	1.53E-05	1.52E-06	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	8.74E-04	4.89E-05	4.88E-06	4.37E-02	2.45E-03	3.42E-01	NA	NA	NA	NA	NA	NA
Mercury (NC)	4.87E-07	2.73E-08	2.72E-09	5.68E-03	3.18E-04	3.17E-05	NA	NA	NA	NA	NA	NA
Nickel (NC)	4.99E-05	2.80E-06	2.79E-07	2.50E-03	1.40E-04	1.39E-05	NA	NA	NA	NA	NA	NA
Thallium (NC)	6.24E-06	3.49E-07	3.49E-08	8.91E-02	4.99E-03	4.98E-04	NA	NA	NA	NA	NA	NA
Vanadium (NC)	7.09E-05	3.97E-06	3.96E-07	2.36E-01	1.32E-02	1.32E-03	NA	NA	NA	NA	NA	NA
Zinc (NC)	5.50E-04	3.08E-05	3.07E-06	1.83E-03	1.03E-04	1.02E-05	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	1.00E-05	7.30E-06	5.60E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	1.81E-06	1.31E-06	1.01E-08	6.02E-06	4.38E-06	3.36E-08	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	7.35E-06	5.35E-06	4.11E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	9.85E-06	7.17E-06	5.50E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	1.47E-05	1.07E-05	8.22E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	4.36E-06	3.17E-06	2.43E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	8.55E-07	6.22E-07	4.77E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	2.12E-05	1.54E-05	1.18E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	1.77E-06	1.29E-06	9.86E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	1.83E-05	1.33E-05	1.02E-07	4.57E-04	3.33E-04	2.55E-06	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	3.33E-06	2.43E-06	1.86E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	1.81E-06	1.32E-06	1.01E-08	9.04E-05	6.58E-05	1.18E-05	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	5.15E-06	3.75E-06	2.88E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	5.51E-06	4.01E-06	3.08E-08	1.38E-03	1.00E-03	7.70E-06	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	5.51E-06	9.26E-07	3.08E-08	2.76E-04	4.63E-05	2.20E-05	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	1.39E-09	2.33E-10	7.76E-12	2.78E-08	4.67E-09	4.56E-09	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	1.39E-09	2.33E-10	7.76E-12	2.78E-08	4.67E-09	4.56E-09	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	2.90E-05	1.62E-05	1.62E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	2.91E-06	1.63E-06	1.62E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	2.63E-05	4.42E-06	1.47E-07	5.26E-02	8.84E-03	2.94E-04	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	1.86E-06	1.46E-06	1.04E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	4.92E-06	3.85E-06	2.75E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	9.51E-09	2.66E-11	5.31E-11	2.38E-06	6.66E-09	6.20E-09	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	5.34E-05	2.99E-05	2.98E-07	2.67E-03	1.50E-03	1.49E-05	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	1.39E-09	2.33E-10	7.76E-12	6.95E-08	1.17E-08	3.88E-10	NA	NA	NA	NA	NA	NA
Chloroform (C)	9.51E-09	1.60E-09	5.31E-11	9.51E-07	1.60E-07	3.79E-09	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	1.39E-09	2.33E-10	7.76E-12	6.95E-08	1.17E-08	3.88E-10	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	1.06E-05	5.91E-06	5.90E-08	1.06E-04	5.91E-05	5.90E-07	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	9.51E-09	1.60E-09	5.31E-11	9.51E-08	1.60E-08	1.86E-10	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	6.62E-09	1.11E-09	3.70E-11	7.73E-09	1.30E-09	4.32E-11	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	2.88E-09	4.85E-10	1.61E-11	7.21E-08	1.21E-08	4.03E-10	NA	NA	NA	NA	NA	NA
Toluene (NC)	2.14E-09	3.59E-10	1.19E-11	1.07E-08	1.80E-09	1.04E-10	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	1.39E-09	3.89E-12	7.76E-12	4.63E-07	1.30E-09	2.72E-10	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	1.39E-09	2.33E-10	7.76E-12	6.95E-09	1.17E-09	2.72E-10	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	1.39E-09	2.33E-10	7.76E-12	6.95E-09	1.17E-09	2.72E-10	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	1.86E-08	3.12E-09	1.04E-10	9.30E-08	1.56E-08	3.63E-09	NA	NA	NA	NA	NA	NA
beta-BHC (C)	5.77E-09	3.23E-09	3.22E-11	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	2.35E-11	3.95E-12	1.31E-13	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-14: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater	E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure / HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	1.21E-04	1.59E-05	2.30E-05	1.21E-04	1.59E-05	2.30E-05	NA	1.13E-02	3.16E-04	1.13E-02	3.16E-04
Antimony (NC)	8.04E-07	1.06E-07	4.50E-08	2.01E-03	2.65E-04	1.13E-04	NA	4.18E-06	1.17E-07	1.04E-02	2.93E-04
Arsenic (C)	1.49E-05	1.96E-06	8.33E-07	4.96E-02	6.54E-03	2.78E-03	NA	8.73E-05	7.33E-06	2.91E-01	2.44E-02
Barium (NC)	2.73E-05	3.61E-06	2.21E-06	3.90E-04	5.15E-05	3.15E-05	NA	2.12E-04	5.94E-06	3.03E-03	8.49E-05
Beryllium (C)	1.65E-07	2.17E-08	9.23E-09	8.24E-05	1.09E-05	4.61E-06	NA	1.48E-06	4.14E-08	7.39E-04	2.07E-05
Cadmium (C)	8.84E-07	1.17E-07	4.95E-08	8.84E-04	1.17E-04	4.95E-05	NA	2.25E-06	6.30E-09	2.25E-03	6.30E-06
Chromium (C)	4.42E-07	1.17E-07	5.85E-07	1.47E-04	3.89E-05	1.95E-04	NA	5.08E-05	1.42E-06	1.69E-02	4.74E-04
Chromium (total) (C)	2.01E-06	5.30E-07	2.25E-07	6.70E-04	1.77E-04	7.50E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	8.04E-07	4.24E-08	5.40E-08	4.02E-05	2.12E-06	2.70E-06	NA	1.29E-05	3.60E-07	6.43E-04	1.80E-05
Copper (NC)	1.38E-05	1.82E-06	1.01E-07	3.45E-04	4.55E-05	2.53E-06	NA	9.11E-05	2.55E-06	2.28E-03	6.38E-05
Iron (NC)	4.26E-04	5.62E-05	2.01E-04	1.42E-03	1.87E-04	6.71E-04	NA	4.45E-02	1.25E-03	1.48E-01	4.16E-03
Lead (C)	7.11E-05	9.39E-07	3.98E-07	NA	NA	NA	NA	4.61E-04	1.29E-05	NA	NA
Manganese (NC)	1.62E-04	2.13E-05	1.17E-05	8.08E-03	1.07E-03	5.87E-04	NA	6.69E-04	1.87E-05	3.34E-02	9.36E-04
Mercury (NC)	2.01E-07	2.65E-08	1.13E-08	2.34E-03	3.09E-04	1.31E-04	NA	4.82E-07	1.35E-08	5.63E-03	1.58E-04
Nickel (NC)	8.80E-06	2.32E-07	9.86E-08	4.40E-04	1.16E-05	4.93E-06	NA	8.71E-05	2.44E-06	4.36E-03	1.22E-04
Thallium (NC)	2.01E-06	2.65E-07	1.13E-07	2.87E-02	3.79E-03	1.61E-03	NA	3.20E-06	8.96E-08	4.57E-02	1.28E-03
Vanadium (NC)	8.04E-07	1.06E-07	1.13E-07	2.68E-03	3.54E-04	3.75E-04	NA	4.26E-05	1.19E-06	1.42E-01	3.98E-03
Zinc (NC)	1.91E-04	2.52E-05	1.07E-05	6.36E-04	8.40E-05	3.56E-05	NA	1.94E-03	5.45E-05	6.48E-03	1.82E-04
Acenaphthylene (C)	2.01E-06	3.74E-05	1.59E-05	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	2.01E-06	5.97E-05	2.53E-05	6.70E-06	1.99E-04	8.44E-05	NA	5.30E-06	1.93E-06	1.77E-05	6.44E-06
Benzo(a)anthracene (C)	2.01E-06	2.51E-04	1.07E-04	NA	NA	NA	NA	9.00E-06	3.28E-06	NA	NA
Benzo(a)pyrene (C)	2.01E-06	3.29E-04	1.40E-04	NA	NA	NA	NA	9.00E-06	3.28E-06	NA	NA
Benzo(b)fluoranthene (C)	2.01E-06	1.85E-04	7.86E-05	NA	NA	NA	NA	7.72E-06	2.81E-06	NA	NA
Benzo(g,h,i)perylene	2.01E-06	5.30E-04	2.25E-04	NA	NA	NA	NA	3.21E-06	1.17E-06	NA	NA
Benzo(k)fluoranthene (C)	2.01E-06	3.18E-04	1.35E-04	NA	NA	NA	NA	8.04E-06	2.93E-06	NA	NA
Chrysene (C)	2.01E-06	2.73E-04	1.16E-04	NA	NA	NA	NA	8.36E-06	3.04E-06	NA	NA
Dibenz(a,h)anthracene (C)		4.46E-04	1.89E-04	NA	NA	NA	NA	1.51E-06	5.50E-07	NA	NA
Fluoranthene (NC)	2.01E-06	1.36E-04	5.77E-05	5.02E-05	3.40E-03	1.44E-03	NA	1.93E-05	7.02E-06	4.82E-04	1.76E-04
Indeno(1,2,3-cd)pyrene (C)	2.01E-06	5.91E-04	2.51E-04	NA	NA	NA	NA	4.02E-06	1.46E-06	NA	NA
Naphthalene (NC)	2.01E-06	1.84E-05	7.81E-06	1.00E-04	9.20E-04	3.90E-04	NA	1.93E-07	7.02E-08	9.64E-06	3.51E-06
Phenanthrene (C)	2.01E-06	6.07E-05	2.58E-05	NA	NA	NA	NA	1.61E-05	5.85E-06	NA	NA
2-Methylnaphthylene (NC)	2.01E-07	3.77E-06	1.60E-06	5.02E-05	9.41E-04	3.99E-04	NA	3.38E-07	1.23E-07	8.44E-05	3.07E-05
1,2-Dichloroethane (C)	2.01E-07	1.42E-07	6.01E-08	1.00E-05	7.08E-06	3.00E-06	NA	3.38E-07	2.84E-08	1.69E-05	1.42E-06
1,2,4-Trimethylbenzene (NC)	2.01E-06	2.84E-05	1.20E-05	4.02E-05	5.68E-04	2.41E-04	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	2.01E-07	2.84E-06	1.20E-06	4.02E-06	5.68E-05	2.41E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	4.02E-08	2.12E-06	9.00E-07	NA	NA	NA	NA	9.48E-06	2.66E-06	NA	NA
4,4'-DDE (C)	4.02E-08	4.86E-06	2.06E-06	NA	NA	NA	NA	5.95E-06	1.67E-06	NA	NA
4,4'-DDT (C)	4.02E-08	5.62E-06	2.39E-06	8.04E-05	1.12E-02	4.77E-03	NA	1.22E-04	1.03E-05	2.44E-01	2.05E-02
Aroclor 1248 (C)	2.21E-07	2.89E-05	1.23E-05	NA	NA	NA	NA	1.25E-07	4.91E-08	NA	NA
Aroclor 1260 (C)	4.02E-07	2.91E-04	1.23E-04	NA	NA	NA	NA	1.77E-07	6.93E-08	NA	NA
Benzene (C)	1.00E-06	4.91E-05	2.08E-05	2.51E-04	1.23E-02	5.20E-03	NA	1.40E-08	1.96E-11	3.51E-06	4.91E-09
bis(2-Ethylhexyl)phthalate (C)	2.01E-06	1.75E-04	7.43E-05	1.00E-04	8.75E-03	3.71E-03	NA	4.82E-07	1.35E-07	2.41E-05	6.75E-06
Bromodichloromethane (C)	8.04E-07	1.17E-05	4.95E-06	4.02E-05	5.83E-04	2.48E-04	NA	1.40E-08	1.18E-09	7.02E-07	5.89E-08
Chloroform (C)	2.41E-06	5.41E-05	2.30E-05	2.41E-04	5.41E-03	2.30E-03	NA	1.40E-08	1.18E-09	1.40E-06	1.18E-07
Dibromochloromethane (C)	2.41E-07	1.24E-07	5.27E-08	1.21E-05	6.21E-06	2.63E-06	NA	1.40E-08	1.18E-09	7.02E-07	5.89E-08
Di-n-butylphthalate (NC)	5.22E-06	4.21E-04	1.78E-04	5.22E-05	4.21E-03	1.78E-03	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	1.00E-06	1.59E-04	6.75E-05	1.00E-05	1.59E-03	6.75E-04	NA	1.40E-08	1.18E-09	1.40E-07	1.18E-08
Methyl tert-butyl ether (C)	2.01E-07	6.82E-08	2.89E-08	2.34E-07	7.95E-08	3.37E-08	NA	1.40E-08	1.18E-09	1.64E-08	1.38E-09
n-Butylbenzene (NC)	2.01E-07	0.00E+00	0.00E+00	5.02E-06	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	2.49E-06	2.57E-04	1.09E-04	1.25E-05	1.28E-03	5.44E-04	NA	2.25E-07	1.89E-08	1.13E-06	9.45E-08
Vinyl Chloride (C)	2.01E-07	3.71E-06	1.58E-06	6.70E-05	1.24E-03	5.25E-04	NA	1.40E-08	1.96E-11	4.68E-06	6.55E-09
m,p-Xylene (NC)	2.01E-07	3.71E-05	1.58E-05	1.00E-06	1.86E-04	7.88E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	2.01E-07	3.71E-05	1.58E-05	1.00E-06	1.86E-04	7.88E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	2.01E-06	3.71E-04	1.58E-04	1.00E-05	1.86E-03	7.88E-04	NA	1.40E-08	1.18E-09	7.02E-08	5.89E-09
beta-BHC (C)	2.01E-08	7.16E-07	3.04E-07	NA	NA	NA	NA	2.54E-09	7.11E-10	NA	NA
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA

Table 3-14: Cont'd

Chemical (Qualifier)	F. Fish Exposure Ingestion	F. Fish HQ Ingestion	Total Hazard Quotient	Total Hazard No Fish
Aluminum (NC)	6.68E-04	6.68E-04	1.62E-01	1.61E-01
Antimony (NC)	6.60E-05	1.65E-01	2.36E-01	7.12E-02
Arsenic (C)	3.36E-03	1.12E+01	1.17E+01	5.18E-01
Barium (NC)	3.53E-02	5.05E-01	5.20E-01	1.53E-02
Beryllium (C)	2.10E-05	1.05E-02	1.36E-02	3.14E-03
Cadmium (C)	1.65E-03	1.65E+00	1.65E+00	7.74E-03
Chromium (C)	1.72E-05	5.75E-03	7.05E-02	6.48E-02
Chromium (total) (C)	7.84E-05	2.61E-02	5.16E-02	2.55E-02
Cobalt (C)	2.97E-03	1.49E-01	1.67E-01	1.86E-02
Copper (NC)	2.01E-02	5.02E-01	5.07E-01	4.77E-03
Iron (NC)	1.57E+00	5.25E+00	5.61E+00	3.64E-01
Lead (C)	1.31E-05	NA	NA	NA
Manganese (NC)	5.97E-01	2.98E+01	3.03E+01	4.32E-01
Mercury (NC)	1.44E-03	1.68E+01	1.69E+01	1.46E-02
Nickel (NC)	1.41E-03	7.05E-02	7.80E-02	7.58E-03
Thallium (NC)	4.13E-02	5.89E+02	5.89E+02	1.76E-01
Vanadium (NC)	2.97E-03	9.90E+00	1.03E+01	4.00E-01
Zinc (NC)	8.23E-01	2.74E+00	2.75E+00	9.37E-03
Acenaphthylene (C)	2.06E-03	NA	NA	NA
Anthracene (NC)	2.06E-03	6.88E-03	7.20E-03	3.25E-04
Benzo(a)anthracene (C)	2.06E-03	NA	NA	NA
Benzo(a)pyrene (C)	2.06E-03	NA	NA	NA
Benzo(b)fluoranthene (C)	2.06E-03	NA	NA	NA
Benzo(g,h,i)perylene	2.06E-03	NA	NA	NA
Benzo(k)fluoranthene (C)	2.06E-03	NA	NA	NA
Chrysene (C)	2.06E-03	NA	NA	NA
Dibenz(a,h)anthracene (C)	2.06E-03	NA	NA	NA
Fluoranthene (NC)	2.06E-03	5.16E-02	5.79E-02	6.34E-03
Indeno(1,2,3-cd)pyrene (C)	2.06E-03	NA	NA	NA
Naphthalene (NC)	2.06E-03	1.03E-01	1.05E-01	1.59E-03
Phenanthrene (C)	2.06E-03	NA	NA	NA
2-Methylnaphthylene (NC)	2.06E-04	5.16E-02	5.55E-02	3.90E-03
1,2-Dichloroethane (C)	2.06E-04	1.03E-02	1.07E-02	3.82E-04
1,2,4-Trimethylbenzene (NC)	7.22E-03	1.44E-01	1.45E-01	8.49E-04
1,3,5-Trimethylbenzene (NC)	4.46E-04	8.91E-03	9.00E-03	8.49E-05
4,4'-DDD (C)	4.79E-03	NA	NA	NA
4,4'-DDE (C)	2.18E-03	NA	NA	NA
4,4'-DDT (C)	1.16E-02	2.31E+01	2.34E+01	3.43E-01
Aroclor 1248 (C)	2.68E-02	NA	NA	NA
Aroclor 1260 (C)	2.64E-01	NA	NA	NA
Benzene (C)	1.49E-04	3.73E-02	5.51E-02	1.77E-02
bis(2-Ethylhexyl)phthalate (C)	1.54E-01	7.69E+00	7.71E+00	1.68E-02
Bromodichloromethane (C)	1.12E-04	5.61E-03	6.48E-03	8.72E-04
Chloroform (C)	1.78E-05	1.78E-03	9.73E-03	7.95E-03
Dibromochloromethane (C)	4.51E-05	2.26E-03	2.28E-03	2.17E-05
Di-n-butylphthalate (NC)	2.75E-02	2.75E-01	2.81E-01	6.21E-03
Ethylbenzene (NC)	1.27E-03	1.27E-02	1.49E-02	2.28E-03
Methyl tert-butyl ether (C)	5.25E-06	6.12E-06	6.49E-06	3.74E-07
n-Butylbenzene (NC)	2.59E-03	6.48E-02	6.48E-02	5.11E-06
Toluene (NC)	1.20E-03	5.99E-03	7.83E-03	1.84E-03
Vinyl Chloride (C)	6.20E-06	2.07E-03	3.90E-03	1.83E-03
m,p-Xylene (NC)	0.00E+00	0.00E+00	2.65E-04	2.65E-04
ortho-xylene (NC)	0.00E+00	0.00E+00	2.65E-04	2.65E-04
Xylenes (total) (NC)	2.81E-03	1.41E-02	1.67E-02	2.65E-03
beta-BHC (C)	9.48E-05	NA	NA	NA
Total TCDD (C)	0.00E+00	NA	NA	NA

Table 3-15: Summary of exposure dose and hazard quotient by media for adult park users.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	2.41E-03	1.93E-04	3.59E-05	2.41E-03	1.93E-04	3.59E-02	NA	NA	NA	NA	NA	NA
Antimony (NC)	2.27E-06	1.81E-07	3.38E-08	5.68E-03	4.53E-04	5.92E-04	NA	NA	NA	NA	NA	NA
Arsenic (C)	3.94E-06	9.43E-07	5.87E-08	1.31E-02	3.14E-03	1.96E-04	NA	NA	NA	NA	NA	NA
Barium (NC)	2.28E-05	1.82E-06	3.40E-07	3.26E-04	2.60E-05	2.43E-03	NA	NA	NA	NA	NA	NA
Beryllium (C)	1.63E-07	1.30E-08	2.42E-09	8.13E-05	6.49E-06	4.24E-04	NA	NA	NA	NA	NA	NA
Cadmium (C)	4.30E-07	3.43E-09	6.41E-09	4.30E-04	3.43E-06	1.12E-04	NA	NA	NA	NA	NA	NA
Chromium (C)	9.19E-06	7.34E-07	1.37E-07	3.06E-03	2.45E-04	4.79E-03	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	4.80E-06	3.83E-07	7.15E-08	1.60E-03	1.28E-04	2.50E-03	NA	NA	NA	NA	NA	NA
Cobalt (C)	1.86E-06	1.49E-07	2.77E-08	9.31E-05	7.43E-06	4.86E-03	NA	NA	NA	NA	NA	NA
Copper (NC)	8.20E-06	6.54E-07	1.22E-07	2.05E-04	1.64E-05	3.05E-06	NA	NA	NA	NA	NA	NA
Iron (NC)	6.32E-03	5.04E-04	9.41E-05	2.11E-02	1.68E-03	3.14E-04	NA	NA	NA	NA	NA	NA
Lead (C)	2.92E-05	2.33E-06	4.35E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	9.36E-05	7.47E-06	1.39E-06	4.68E-03	3.74E-04	9.76E-02	NA	NA	NA	NA	NA	NA
Mercury (NC)	5.22E-08	4.17E-09	7.77E-10	6.09E-04	4.86E-05	9.07E-06	NA	NA	NA	NA	NA	NA
Nickel (NC)	5.35E-06	4.27E-07	7.97E-08	2.67E-04	2.13E-05	3.98E-06	NA	NA	NA	NA	NA	NA
Thallium (NC)	6.69E-07	5.34E-08	9.96E-09	9.55E-03	7.62E-04	1.42E-04	NA	NA	NA	NA	NA	NA
Vanadium (NC)	7.60E-06	6.07E-07	1.13E-07	2.53E-02	2.02E-03	3.77E-04	NA	NA	NA	NA	NA	NA
Zinc (NC)	5.90E-05	4.71E-06	8.78E-07	1.97E-04	1.57E-05	2.93E-06	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	1.07E-06	1.11E-06	1.60E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	1.93E-07	2.01E-07	2.88E-09	6.45E-07	6.69E-07	9.61E-09	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	7.88E-07	8.17E-07	1.17E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	1.06E-06	1.09E-06	1.57E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	1.58E-06	1.64E-06	2.35E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	4.67E-07	4.85E-07	6.96E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	9.16E-08	9.50E-08	1.36E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	2.27E-06	2.36E-06	3.38E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	1.89E-07	1.96E-07	2.82E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	1.96E-06	2.03E-06	2.92E-08	4.89E-05	5.08E-05	7.29E-07	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	3.57E-07	3.71E-07	5.32E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	1.94E-07	2.01E-07	2.88E-09	9.69E-06	1.00E-05	3.37E-06	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	5.52E-07	5.72E-07	8.22E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	5.91E-07	6.13E-07	8.80E-09	1.48E-04	1.53E-04	2.20E-06	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	5.91E-07	1.41E-07	8.80E-09	2.95E-05	7.07E-06	6.28E-06	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	1.49E-10	3.56E-11	2.22E-12	2.98E-09	7.13E-10	1.30E-09	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	1.49E-10	3.56E-11	2.22E-12	2.98E-09	7.13E-10	1.30E-09	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	3.10E-06	2.48E-06	4.62E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	3.11E-07	2.48E-07	4.64E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	2.82E-06	6.75E-07	4.20E-08	5.64E-03	1.35E-03	8.40E-05	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	1.99E-07	2.23E-07	2.97E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	5.27E-07	5.88E-07	7.84E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	1.02E-09	4.07E-12	1.52E-11	2.55E-07	1.02E-09	1.77E-09	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	5.72E-06	4.57E-06	8.53E-08	2.86E-04	2.28E-04	4.26E-06	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	1.49E-10	3.56E-11	2.22E-12	7.44E-09	1.78E-09	1.11E-10	NA	NA	NA	NA	NA	NA
Chloroform (C)	1.02E-09	2.44E-10	1.52E-11	1.02E-07	2.44E-08	1.08E-09	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	1.49E-10	3.56E-11	2.22E-12	7.44E-09	1.78E-09	1.11E-10	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	1.13E-06	9.03E-07	1.68E-08	1.13E-05	9.03E-06	1.68E-07	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	1.02E-09	2.44E-10	1.52E-11	1.02E-08	2.44E-09	5.31E-11	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	7.10E-10	1.70E-10	1.06E-11	8.28E-10	1.98E-10	1.23E-11	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	3.09E-10	7.40E-11	4.60E-12	7.73E-09	1.85E-09	1.15E-10	NA	NA	NA	NA	NA	NA
Toluene (NC)	2.29E-10	5.48E-11	3.41E-12	1.14E-09	2.74E-10	2.98E-11	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	1.49E-10	5.94E-13	2.22E-12	4.96E-08	1.98E-10	7.76E-11	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	1.49E-10	3.56E-11	2.22E-12	7.44E-10	1.78E-10	7.76E-11	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	1.49E-10	3.56E-11	2.22E-12	7.44E-10	1.78E-10	7.76E-11	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	1.99E-09	4.77E-10	2.97E-11	9.96E-09	2.38E-09	1.04E-09	NA	NA	NA	NA	NA	NA
beta-BHC (C)	6.18E-10	4.93E-10	9.21E-12	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	2.52E-12	6.03E-13	3.75E-14	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-15: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater	E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure / HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	2.58E-05	9.30E-06	2.94E-06	2.58E-05	9.30E-06	2.94E-06	NA	1.21E-03	2.07E-04	1.21E-03	2.07E-04
Antimony (NC)	1.72E-07	6.20E-08	1.96E-08	4.31E-04	1.55E-04	4.91E-05	NA	4.48E-07	7.66E-08	1.12E-03	1.91E-04
Arsenic (C)	3.19E-06	1.15E-06	3.63E-07	1.06E-02	3.82E-03	1.21E-03	NA	9.35E-06	4.80E-06	3.12E-02	1.60E-02
Barium (NC)	5.86E-06	2.11E-06	6.67E-07	8.36E-05	3.01E-05	9.54E-06	NA	2.27E-05	3.89E-06	3.25E-04	5.55E-05
Beryllium (C)	3.53E-08	1.27E-08	4.02E-09	1.77E-05	6.35E-06	2.01E-06	NA	1.58E-07	2.71E-08	7.92E-05	1.35E-05
Cadmium (C)	1.89E-07	6.82E-08	2.16E-08	1.89E-04	6.82E-05	2.16E-05	NA	2.41E-07	4.12E-09	2.41E-04	4.12E-06
Chromium (C)	9.47E-08	6.82E-08	2.16E-08	3.16E-05	2.27E-05	7.20E-06	NA	5.44E-06	9.31E-07	1.81E-03	3.10E-04
Chromium (total) (C)	4.31E-07	3.10E-07	9.82E-08	1.44E-04	1.03E-04	3.27E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	1.72E-07	2.48E-08	7.85E-09	8.61E-06	1.24E-06	3.93E-07	NA	1.38E-06	2.36E-07	6.89E-05	1.18E-05
Copper (NC)	2.95E-06	1.06E-06	3.37E-07	7.38E-05	2.66E-05	8.42E-06	NA	9.76E-06	1.67E-06	2.44E-04	4.17E-05
Iron (NC)	9.13E-05	3.29E-05	1.04E-05	3.04E-04	1.10E-04	3.47E-05	NA	4.77E-03	8.16E-04	1.59E-02	2.72E-03
Lead (C)	1.52E-05	5.49E-07	1.74E-07	NA	NA	NA	NA	4.94E-05	8.45E-06	NA	NA
Manganese (NC)	3.46E-05	1.25E-05	3.95E-06	1.73E-03	6.23E-04	1.97E-04	NA	7.16E-05	1.23E-05	3.58E-03	6.13E-04
Mercury (NC)	4.31E-08	1.55E-08	4.91E-09	5.02E-04	1.81E-04	5.73E-05	NA	5.17E-08	8.83E-09	6.03E-04	1.03E-04
Nickel (NC)	1.89E-06	1.36E-07	4.30E-08	9.43E-05	6.79E-06	2.15E-06	NA	9.33E-06	1.60E-06	4.67E-04	7.98E-05
Thallium (NC)	4.31E-07	1.55E-07	4.91E-08	6.15E-03	2.21E-03	7.01E-04	NA	3.43E-07	5.86E-08	4.90E-03	8.37E-04
Vanadium (NC)	1.72E-07	6.20E-08	1.96E-08	5.74E-04	2.07E-04	6.54E-05	NA	4.56E-06	7.80E-07	1.52E-02	2.60E-03
Zinc (NC)	4.09E-05	1.47E-05	4.66E-06	1.36E-04	4.91E-05	1.55E-05	NA	2.08E-04	3.56E-05	6.95E-04	1.19E-04
Acenaphthylene (C)	4.31E-07	2.19E-05	6.92E-06	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	4.31E-07	3.49E-05	1.10E-05	1.44E-06	1.16E-04	3.68E-05	NA	5.68E-07	1.26E-06	1.89E-06	4.21E-06
Benzo(a)anthracene (C)	4.31E-07	1.47E-04	4.65E-05	NA	NA	NA	NA	9.64E-07	2.14E-06	NA	NA
Benzo(a)pyrene (C)	4.31E-07	1.92E-04	6.09E-05	NA	NA	NA	NA	9.64E-07	2.14E-06	NA	NA
Benzo(b)fluoranthene (C)	4.31E-07	1.08E-04	3.43E-05	NA	NA	NA	NA	8.27E-07	1.84E-06	NA	NA
Benzo(g,h,i)perylene	4.31E-07	3.10E-04	9.82E-05	NA	NA	NA	NA	3.44E-07	7.66E-07	NA	NA
Benzo(k)fluoranthene (C)	4.31E-07	1.86E-04	5.89E-05	NA	NA	NA	NA	8.61E-07	1.91E-06	NA	NA
Chrysene (C)	4.31E-07	1.60E-04	5.06E-05	NA	NA	NA	NA	8.95E-07	1.99E-06	NA	NA
Dibenz(a,h)anthracene (C)		2.60E-04	8.25E-05	NA	NA	NA	NA	1.62E-07	3.60E-07	NA	NA
Fluoranthene (NC)	4.31E-07	7.95E-05	2.52E-05	1.08E-05	1.99E-03	6.29E-04	NA	2.07E-06	4.59E-06	5.17E-05	1.15E-04
Indeno(1,2,3-cd)pyrene (C)	4.31E-07	3.46E-04	1.09E-04	NA	NA	NA	NA	4.31E-07	9.57E-07	NA	NA
Naphthalene (NC)	4.31E-07	1.08E-05	3.41E-06	2.15E-05	5.38E-04	1.70E-04	NA	2.07E-08	4.59E-08	1.03E-06	2.30E-06
Phenanthrene (C)	4.31E-07	3.55E-05	1.12E-05	NA	NA	NA	NA	1.72E-06	3.83E-06	NA	NA
2-Methylnaphthylene (NC)	4.31E-08	2.20E-06	6.97E-07	1.08E-05	5.50E-04	1.74E-04	NA	3.62E-08	8.04E-08	9.04E-06	2.01E-05
1,2-Dichloroethane (C)	4.31E-08	8.28E-08	2.62E-08	2.15E-06	4.14E-06	1.31E-06	NA	3.62E-08	1.86E-08	1.81E-06	9.28E-07
1,2,4-Trimethylbenzene (NC)	4.31E-07	1.66E-05	5.25E-06	8.61E-06	3.32E-04	1.05E-04	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	4.31E-08	1.66E-06	5.25E-07	8.61E-07	3.32E-05	1.05E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	8.61E-09	1.24E-06	3.93E-07	NA	NA	NA	NA	1.02E-06	1.74E-06	NA	NA
4,4'-DDE (C)	8.61E-09	2.84E-06	8.99E-07	NA	NA	NA	NA	6.37E-07	1.09E-06	NA	NA
4,4'-DDT (C)	8.61E-09	3.29E-06	1.04E-06	1.72E-05	6.57E-03	2.08E-03	NA	1.31E-05	6.71E-06	2.62E-02	1.34E-02
Aroclor 1248 (C)	4.74E-08	1.69E-05	5.36E-06	NA	NA	NA	NA	1.34E-08	3.22E-08	NA	NA
Aroclor 1260 (C)	8.61E-08	1.70E-04	5.38E-05	NA	NA	NA	NA	1.89E-08	4.54E-08	NA	NA
Benzene (C)	2.15E-07	2.87E-05	9.08E-06	5.38E-05	7.17E-03	2.27E-03	NA	1.50E-09	1.29E-11	3.76E-07	3.21E-09
bis(2-Ethylhexyl)phthalate (C)	4.31E-07	1.02E-04	3.24E-05	2.15E-05	5.11E-03	1.62E-03	NA	5.17E-08	8.83E-08	2.58E-06	4.42E-06
Bromodichloromethane (C)	1.72E-07	6.82E-06	2.16E-06	8.61E-06	3.41E-04	1.08E-04	NA	1.50E-09	7.71E-10	7.52E-08	3.86E-08
Chloroform (C)	5.17E-07	3.16E-05	1.00E-05	5.17E-05	3.16E-03	1.00E-03	NA	1.50E-09	7.71E-10	1.50E-07	7.71E-08
Dibromochloromethane (C)	5.17E-08	7.25E-08	2.30E-08	2.58E-06	3.63E-06	1.15E-06	NA	1.50E-09	7.71E-10	7.52E-08	3.86E-08
Di-n-butylphthalate (NC)	1.12E-06	2.46E-04	7.78E-05	1.12E-05	2.46E-03	7.78E-04	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	2.15E-07	9.30E-05	2.94E-05	2.15E-06	9.30E-04	2.94E-04	NA	1.50E-09	7.71E-10	1.50E-08	7.71E-09
Methyl tert-butyl ether (C)	4.31E-08	3.98E-08	1.26E-08	5.02E-08	4.65E-08	1.47E-08	NA	1.50E-09	7.71E-10	1.75E-09	9.00E-10
n-Butylbenzene (NC)	4.31E-08	0.00E+00	0.00E+00	1.08E-06	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	5.34E-07	1.50E-04	4.75E-05	2.67E-06	7.50E-04	2.37E-04	NA	2.41E-08	1.24E-08	1.21E-07	6.18E-08
Vinyl Chloride (C)	4.31E-08	2.17E-06	6.87E-07	1.44E-05	7.23E-04	2.29E-04	NA	1.50E-09	1.29E-11	5.01E-07	4.28E-09
m,p-Xylene (NC)	4.31E-08	2.17E-05	6.87E-06	2.15E-07	1.08E-04	3.44E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	4.31E-08	2.17E-05	6.87E-06	2.15E-07	1.08E-04	3.44E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	4.31E-07	2.17E-04	6.87E-05	2.15E-06	1.08E-03	3.44E-04	NA	1.50E-09	7.71E-10	7.52E-09	3.86E-09
beta-BHC (C)	4.31E-09	4.18E-07	1.33E-07	NA	NA	NA	NA	2.72E-10	4.65E-10	NA	NA
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA

Table 3-15: Cont'd

Chemical (Qualifier)	F. Fish		Total	Total
	Exposure	HQ	Hazard	Hazard
	Ingestion	Ingestion	Quotient	No Fish
Aluminum (NC)	3.65E-04	3.65E-04	4.04E-02	4.00E-02
Antimony (NC)	3.60E-05	9.00E-02	9.87E-02	8.67E-03
Arsenic (C)	1.83E-03	6.11E+00	6.18E+00	7.93E-02
Barium (NC)	1.93E-02	2.75E-01	2.79E-01	3.28E-03
Beryllium (C)	1.14E-05	5.72E-03	6.35E-03	6.30E-04
Cadmium (C)	8.98E-04	8.98E-01	8.99E-01	1.07E-03
Chromium (C)	9.41E-06	3.14E-03	1.34E-02	1.03E-02
Chromium (total) (C)	4.28E-05	1.43E-02	1.88E-02	4.51E-03
Cobalt (C)	1.62E-03	8.10E-02	8.61E-02	5.06E-03
Copper (NC)	1.10E-02	2.74E-01	2.75E-01	6.19E-04
Iron (NC)	8.59E-01	2.86E+00	2.90E+00	4.21E-02
Lead (C)	7.17E-06	NA	NA	NA
Manganese (NC)	3.26E-01	1.63E+01	1.64E+01	1.09E-01
Mercury (NC)	7.88E-04	9.19E+00	9.19E+00	2.11E-03
Nickel (NC)	7.69E-04	3.84E-02	3.94E-02	9.42E-04
Thallium (NC)	2.25E-02	3.21E+02	3.21E+02	2.53E-02
Vanadium (NC)	1.62E-03	5.40E+00	5.45E+00	4.64E-02
Zinc (NC)	4.49E-01	1.50E+00	1.50E+00	1.23E-03
Acenaphthylene (C)	1.13E-03	NA	NA	NA
Anthracene (NC)	1.13E-03	3.75E-03	3.91E-03	1.62E-04
Benzo(a)anthracene (C)	1.13E-03	NA	NA	NA
Benzo(a)pyrene (C)	1.13E-03	NA	NA	NA
Benzo(b)fluoranthene (C)	1.13E-03	NA	NA	NA
Benzo(g,h,i)perylene	1.13E-03	NA	NA	NA
Benzo(k)fluoranthene (C)	1.13E-03	NA	NA	NA
Chrysene (C)	1.13E-03	NA	NA	NA
Dibenz(a,h)anthracene (C)	1.13E-03	NA	NA	NA
Fluoranthene (NC)	1.13E-03	2.81E-02	3.10E-02	2.89E-03
Indeno(1,2,3-cd)pyrene (C)	1.13E-03	NA	NA	NA
Naphthalene (NC)	1.13E-03	5.63E-02	5.70E-02	7.56E-04
Phenanthrene (C)	1.13E-03	NA	NA	NA
2-Methylnaphthylene (NC)	1.13E-04	2.81E-02	2.92E-02	1.07E-03
1,2-Dichloroethane (C)	1.13E-04	5.63E-03	5.68E-03	5.32E-05
1,2,4-Trimethylbenzene (NC)	3.94E-03	7.87E-02	7.92E-02	4.45E-04
1,3,5-Trimethylbenzene (NC)	2.43E-04	4.86E-03	4.91E-03	4.45E-05
4,4'-DDD (C)	2.61E-03	NA	NA	NA
4,4'-DDE (C)	1.19E-03	NA	NA	NA
4,4'-DDT (C)	6.30E-03	1.26E+01	1.27E+01	5.53E-02
Aroclor 1248 (C)	1.46E-02	NA	NA	NA
Aroclor 1260 (C)	1.44E-01	NA	NA	NA
Benzene (C)	8.14E-05	2.04E-02	2.99E-02	9.49E-03
bis(2-Ethylhexyl)phthalate (C)	8.39E-02	4.19E+00	4.20E+00	7.28E-03
Bromodichloromethane (C)	6.12E-05	3.06E-03	3.52E-03	4.58E-04
Chloroform (C)	9.69E-06	9.69E-04	5.18E-03	4.22E-03
Dibromochloromethane (C)	2.46E-05	1.23E-03	1.24E-03	7.48E-06
Di-n-butylphthalate (NC)	1.50E-02	1.50E-01	1.53E-01	3.27E-03
Ethylbenzene (NC)	6.90E-04	6.90E-03	8.13E-03	1.23E-03
Methyl tert-butyl ether (C)	2.86E-06	3.34E-06	3.45E-06	1.15E-07
n-Butylbenzene (NC)	1.41E-03	3.53E-02	3.53E-02	1.09E-06
Toluene (NC)	6.53E-04	3.26E-03	4.25E-03	9.90E-04
Vinyl Chloride (C)	3.38E-06	1.13E-03	2.10E-03	9.67E-04
m,p-Xylene (NC)	0.00E+00	0.00E+00	1.43E-04	1.43E-04
ortho-xylene (NC)	0.00E+00	0.00E+00	1.43E-04	1.43E-04
Xylenes (total) (NC)	1.53E-03	7.67E-03	9.10E-03	1.43E-03
beta-BHC (C)	5.17E-05	NA	NA	NA
Total TCDD (C)	0.00E+00	NA	NA	NA

Table 3-16: Summary of exposure dose and ILCR by media for adult park users.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Arsenic (C)	1.35E-06	3.23E-07	2.01E-08	2.03E-06	4.85E-07	3.03E-07	NA	NA	NA	NA	NA	NA
Beryllium (C)	5.57E-08	4.45E-09	8.30E-10	4.68E-07	3.74E-08	6.97E-09	NA	NA	NA	NA	NA	NA
Cadmium (C)	1.48E-07	1.18E-09	2.20E-09	9.30E-07	7.42E-09	1.38E-08	NA	NA	NA	NA	NA	NA
Chromium (C)	3.15E-06	2.52E-07	4.69E-08	1.32E-04	1.06E-05	1.97E-06	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	1.65E-06	1.31E-07	2.45E-08	6.91E-05	5.52E-06	1.03E-06	NA	NA	NA	NA	NA	NA
Cobalt (C)	6.38E-07	5.09E-08	9.51E-09	6.25E-06	4.99E-07	9.32E-08	NA	NA	NA	NA	NA	NA
Lead (C)	1.00E-05	8.00E-07	1.49E-07	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	3.68E-07	3.82E-07	5.48E-09	2.69E-09	2.79E-09	1.70E-11	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	2.70E-07	2.80E-07	4.02E-09	1.97E-07	2.05E-07	1.25E-09	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	3.62E-07	3.75E-07	5.39E-09	2.64E-06	2.74E-06	1.67E-08	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	5.41E-07	5.61E-07	8.06E-09	3.95E-07	4.10E-07	2.50E-09	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.60E-07	1.66E-07	2.39E-09	1.17E-08	1.21E-08	7.39E-11	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	3.14E-08	3.26E-08	4.68E-10	2.29E-09	2.38E-09	1.45E-11	NA	NA	NA	NA	NA	NA
Chrysene (C)	7.79E-07	8.08E-07	1.16E-08	5.68E-09	5.90E-09	3.60E-11	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	6.48E-08	6.73E-08	9.66E-10	4.73E-07	4.91E-07	2.99E-09	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	1.22E-07	1.27E-07	1.82E-09	8.94E-08	9.27E-08	5.65E-10	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	1.89E-07	1.96E-07	2.82E-09	1.38E-09	1.43E-09	8.73E-12	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	2.03E-07	4.85E-08	3.02E-09	1.84E-08	4.41E-09	2.74E-10	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	1.06E-06	8.49E-07	1.59E-08	2.55E-07	2.04E-07	3.80E-09	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	1.07E-07	8.52E-08	1.59E-09	3.63E-08	2.90E-08	5.41E-10	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	9.66E-07	2.31E-07	1.44E-08	3.29E-07	7.87E-08	4.89E-09	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	6.83E-08	7.63E-08	1.02E-09	1.37E-07	1.53E-07	2.03E-09	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	1.81E-07	2.02E-07	2.69E-09	3.61E-07	4.03E-07	5.38E-09	NA	NA	NA	NA	NA	NA
Benzene (C)	3.49E-10	1.39E-12	5.20E-12	1.92E-11	7.67E-14	1.42E-13	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	1.96E-06	1.57E-06	2.92E-08	2.75E-08	2.19E-08	4.09E-10	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	5.10E-11	1.22E-11	7.60E-13	3.16E-12	7.57E-13	4.71E-14	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	5.10E-11	1.22E-11	7.60E-13	4.29E-12	1.03E-12	6.38E-14	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	2.43E-10	5.83E-11	3.62E-12	9.73E-13	2.33E-13	1.45E-14	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	5.10E-11	2.04E-13	7.60E-13	3.83E-11	1.53E-13	1.17E-14	NA	NA	NA	NA	NA	NA
beta-BHC (C)	2.12E-10	1.69E-10	3.16E-12	3.82E-10	3.04E-10	5.68E-12	NA	NA	NA	NA	NA	NA
Total TCDD (C)	8.64E-13	2.07E-13	1.29E-14	1.30E-07	3.10E-08	1.49E-09	NA	NA	NA	NA	NA	NA

Table 3-16: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater	E. Sediments			
	Exposure - Swimming		Wading	ILCR - Swimming		ILCR - Wading	Exposure/ ILCR	Exposure		ILCR	
	Ingestion	Dermal	NA	Ingestion	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	1.09E-06	3.93E-07	1.25E-07	1.64E-06	5.90E-07	1.87E-07	NA	3.21E-06	1.64E-06	4.81E-06	2.47E-06
Beryllium (C)	1.21E-08	4.36E-09	1.38E-09	1.02E-07	3.66E-08	1.16E-08	NA	5.43E-08	9.29E-09	4.56E-07	7.80E-08
Cadmium (C)	6.49E-08	2.34E-08	7.40E-09	4.09E-07	1.47E-07	4.66E-08	NA	8.27E-08	1.41E-09	5.21E-07	8.91E-09
Chromium (C)	3.25E-08	2.34E-08	7.40E-09	1.36E-06	9.82E-07	3.11E-07	NA	1.87E-06	3.19E-07	7.84E-05	1.34E-05
Chromium (total) (C)	1.48E-07	1.06E-07	3.37E-08	6.20E-06	4.46E-06	1.41E-06	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	5.90E-08	8.50E-09	2.69E-09	5.79E-07	8.33E-08	2.64E-08	NA	4.72E-07	8.08E-08	4.63E-06	7.92E-07
Lead (C)	5.23E-06	1.88E-07	5.96E-08	0.00E+00	0.00E+00	0.00E+00	NA	1.69E-05	2.90E-06	0.00E+00	0.00E+00
Acenaphthylene (C)	1.48E-07	7.49E-06	2.37E-06	1.08E-09	5.47E-08	1.73E-08	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	1.48E-07	5.04E-05	1.60E-05	1.08E-07	3.68E-05	1.16E-05	NA	3.31E-07	7.35E-07	2.41E-07	5.37E-07
Benzo(a)pyrene (C)	1.48E-07	6.59E-05	2.09E-05	1.08E-06	4.81E-04	1.52E-04	NA	3.31E-07	7.35E-07	2.41E-06	5.37E-06
Benzo(b)fluoranthene (C)	1.48E-07	3.71E-05	1.18E-05	1.08E-07	2.71E-05	8.59E-06	NA	2.83E-07	6.30E-07	2.07E-07	4.60E-07
Benzo(g,h,i)perylene	1.48E-07	1.06E-04	3.37E-05	1.08E-08	7.76E-06	2.46E-06	NA	1.18E-07	2.63E-07	8.62E-09	1.92E-08
Benzo(k)fluoranthene (C)	1.48E-07	6.38E-05	2.02E-05	1.08E-08	4.66E-06	1.47E-06	NA	2.95E-07	6.56E-07	2.16E-08	4.79E-08
Chrysene (C)	1.48E-07	5.47E-05	1.73E-05	1.08E-09	4.00E-07	1.27E-07	NA	3.07E-07	6.83E-07	2.24E-09	4.98E-09
Dibenz(a,h)anthracene (C)	1.48E-07	8.93E-05	2.83E-05	1.08E-06	6.52E-04	2.06E-04	NA	5.55E-08	1.23E-07	4.05E-07	9.01E-07
Indeno(1,2,3-cd)pyrene (C)	1.48E-07	1.19E-04	3.75E-05	1.08E-07	8.65E-05	2.74E-05	NA	1.48E-07	3.28E-07	1.08E-07	2.40E-07
Phenanthrene (C)	1.48E-07	1.22E-05	3.85E-06	1.08E-09	8.88E-08	2.81E-08	NA	5.90E-07	1.31E-06	4.31E-09	9.58E-09
1,2-Dichloroethane (C)	1.48E-08	2.84E-08	8.99E-09	1.34E-09	2.58E-09	8.18E-10	NA	1.24E-08	6.36E-09	1.13E-09	5.79E-10
4,4'-DDD (C)	2.95E-09	4.25E-07	1.35E-07	7.09E-10	1.02E-07	3.23E-08	NA	3.48E-07	5.96E-07	8.36E-08	1.43E-07
4,4'-DDE (C)	2.95E-09	9.74E-07	3.08E-07	1.00E-09	3.31E-07	1.05E-07	NA	2.18E-07	3.74E-07	7.43E-08	1.27E-07
4,4'-DDT (C)	2.95E-09	1.13E-06	3.57E-07	1.00E-09	3.83E-07	1.21E-07	NA	4.49E-06	2.30E-06	1.53E-06	7.83E-07
Aroclor 1248 (C)	1.62E-08	5.80E-06	1.84E-06	3.25E-08	1.16E-05	3.67E-06	NA	4.61E-09	1.10E-08	9.21E-09	2.21E-08
Aroclor 1260 (C)	2.95E-08	5.82E-05	1.84E-05	5.90E-08	1.16E-04	3.69E-05	NA	6.49E-09	1.55E-08	1.30E-08	3.11E-08
Benzene (C)	7.38E-08	9.83E-06	3.11E-06	4.06E-09	5.41E-07	1.71E-07	NA	5.15E-10	4.41E-12	2.83E-11	2.42E-13
bis(2-Ethylhexyl)phthalate (C)	1.48E-07	3.51E-05	1.11E-05	2.07E-09	4.91E-07	1.55E-07	NA	1.77E-08	3.03E-08	2.48E-10	4.24E-10
Bromodichloromethane (C)	5.90E-08	2.34E-06	7.40E-07	3.66E-09	1.45E-07	4.59E-08	NA	5.15E-10	2.64E-10	3.20E-11	1.64E-11
Dibromochloromethane (C)	1.77E-08	2.49E-08	7.88E-09	1.49E-09	2.09E-09	6.62E-10	NA	5.15E-10	2.64E-10	4.33E-11	2.22E-11
Methyl tert-butyl ether (C)	1.48E-08	1.37E-08	4.32E-09	5.90E-11	5.46E-11	1.73E-11	NA	5.15E-10	2.64E-10	2.06E-12	1.06E-12
Vinyl Chloride (C)	1.48E-08	7.44E-07	2.36E-07	1.11E-08	5.58E-07	1.77E-07	NA	5.15E-10	4.41E-12	3.87E-10	3.31E-12
beta-BHC (C)	1.48E-09	1.43E-07	4.54E-08	2.66E-09	2.58E-07	8.18E-08	NA	9.33E-11	1.60E-10	1.68E-10	2.87E-10
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-16: Cont'd

Chemical (Qualifier)		F. Fish xposure / ILC Ingestion	Total ILCR	stion
Arsenic (C)	6.28E-04	9.42E-04	9.54E-04	1.25E-05
Beryllium (C)	3.92E-06	3.29E-05	3.41E-05	1.20E-06
Cadmium (C)	3.08E-04	1.94E-03	1.94E-03	2.08E-06
Chromium (C)	3.22E-06	1.35E-04	3.75E-04	2.39E-04
Chromium (total) (C)	1.47E-05	6.16E-04	7.03E-04	8.78E-05
Cobalt (C)	5.55E-04	5.44E-03	5.46E-03	1.30E-05
Lead (C)	2.46E-06	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene (C)	3.86E-04	2.82E-06	2.89E-06	7.86E-08
Benzo(a)anthracene (C)	3.86E-04	2.82E-04	3.31E-04	4.97E-05
Benzo(a)pyrene (C)	3.86E-04	2.82E-03	3.46E-03	6.48E-04
Benzo(b)fluoranthene (C)	3.86E-04	2.82E-04	3.19E-04	3.73E-05
Benzo(g,h,i)perylene	3.86E-04	2.82E-05	3.84E-05	1.03E-05
Benzo(k)fluoranthene (C)	3.86E-04	2.82E-05	3.44E-05	6.21E-06
Chrysene (C)	3.86E-04	2.82E-06	3.36E-06	5.46E-07
Dibenz(a,h)anthracene (C)	3.86E-04	2.82E-03	3.68E-03	8.61E-04
Indeno(1,2,3-cd)pyrene (C)	3.86E-04	2.82E-04	3.96E-04	1.15E-04
Phenanthrene (C)	3.86E-04	2.82E-06	2.95E-06	1.35E-07
1,2-Dichloroethane (C)	3.86E-05	3.51E-06	3.54E-06	2.96E-08
4,4'-DDD (C)	8.95E-04	2.15E-04	2.16E-04	8.25E-07
4,4'-DDE (C)	4.07E-04	1.38E-04	1.39E-04	7.04E-07
4,4'-DDT (C)	2.16E-03	7.34E-04	7.38E-04	3.23E-06
Aroclor 1248 (C)	5.01E-03	1.00E-02	1.00E-02	1.56E-05
Aroclor 1260 (C)	4.94E-02	9.87E-02	9.89E-02	1.54E-04
Benzene (C)	2.79E-05	1.54E-06	2.25E-06	7.16E-07
bis(2-Ethylhexyl)phthalate (C)	2.88E-02	4.03E-04	4.03E-04	6.99E-07
Bromodichloromethane (C)	2.10E-05	1.30E-06	1.50E-06	1.95E-07
Dibromochloromethane (C)	8.44E-06	7.09E-07	7.13E-07	4.31E-09
Methyl tert-butyl ether (C)	9.81E-07	3.92E-09	4.06E-09	1.35E-10
Vinyl Chloride (C)	1.16E-06	8.70E-07	1.62E-06	7.46E-07
beta-BHC (C)	1.77E-05	3.19E-05	3.22E-05	3.44E-07
Total TCDD (C)	0.00E+00	0.00E+00	1.62E-07	1.62E-07

Table 3-17: Summary of exposure dose and hazard quotient by media for park users (child and adult).

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	2.75E-03	1.54E-04	2.31E-05	2.75E-03	1.54E-04	2.31E-02	NA	NA	NA	NA	NA	NA
Antimony (NC)	2.59E-06	1.45E-07	2.17E-08	6.47E-03	3.63E-04	3.81E-04	NA	NA	NA	NA	NA	NA
Arsenic (C)	4.49E-06	7.55E-07	3.77E-08	1.50E-02	2.52E-03	1.26E-04	NA	NA	NA	NA	NA	NA
Barium (NC)	2.60E-05	1.46E-06	2.19E-07	3.72E-04	2.09E-05	1.56E-03	NA	NA	NA	NA	NA	NA
Beryllium (C)	1.85E-07	1.04E-08	1.56E-09	9.27E-05	5.20E-06	2.72E-04	NA	NA	NA	NA	NA	NA
Cadmium (C)	4.91E-07	2.75E-09	4.12E-09	4.91E-04	2.75E-06	7.23E-05	NA	NA	NA	NA	NA	NA
Chromium (C)	1.05E-05	5.88E-07	8.80E-08	3.49E-03	1.96E-04	3.08E-03	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	5.47E-06	3.07E-07	4.60E-08	1.82E-03	1.02E-04	1.61E-03	NA	NA	NA	NA	NA	NA
Cobalt (C)	2.12E-06	1.19E-07	1.78E-08	1.06E-04	5.95E-06	3.13E-03	NA	NA	NA	NA	NA	NA
Copper (NC)	9.34E-06	5.24E-07	7.85E-08	2.34E-04	1.31E-05	1.96E-06	NA	NA	NA	NA	NA	NA
Iron (NC)	7.20E-03	4.04E-04	6.05E-05	2.40E-02	1.35E-03	2.02E-04	NA	NA	NA	NA	NA	NA
Lead (C)	3.33E-05	1.87E-06	2.80E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	1.07E-04	5.99E-06	8.96E-07	5.34E-03	2.99E-04	6.27E-02	NA	NA	NA	NA	NA	NA
Mercury (NC)	5.95E-08	3.34E-09	5.00E-10	6.94E-04	3.89E-05	5.83E-06	NA	NA	NA	NA	NA	NA
Nickel (NC)	6.10E-06	3.42E-07	5.12E-08	3.05E-04	1.71E-05	2.56E-06	NA	NA	NA	NA	NA	NA
Thallium (NC)	7.62E-07	4.28E-08	6.40E-09	1.09E-02	6.11E-04	9.14E-05	NA	NA	NA	NA	NA	NA
Vanadium (NC)	8.67E-06	4.86E-07	7.28E-08	2.89E-02	1.62E-03	2.43E-04	NA	NA	NA	NA	NA	NA
Zinc (NC)	6.72E-05	3.77E-06	5.65E-07	2.24E-04	1.26E-05	1.88E-06	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	1.22E-06	8.93E-07	1.03E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	2.21E-07	1.61E-07	1.85E-09	7.35E-07	5.36E-07	6.17E-09	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	8.98E-07	6.55E-07	7.54E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	1.20E-06	8.77E-07	1.01E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	1.80E-06	1.31E-06	1.51E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	5.32E-07	3.88E-07	4.47E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	1.04E-07	7.61E-08	8.77E-10	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	2.59E-06	1.89E-06	2.17E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	2.16E-07	1.57E-07	1.81E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	2.23E-06	1.63E-06	1.87E-08	5.58E-05	4.07E-05	4.69E-07	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	4.07E-07	2.97E-07	3.42E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	2.21E-07	1.61E-07	1.85E-09	1.10E-05	8.05E-06	2.16E-06	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	6.29E-07	4.59E-07	5.28E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	6.73E-07	4.91E-07	5.66E-09	1.68E-04	1.23E-04	1.41E-06	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	6.73E-07	1.13E-07	5.66E-09	3.37E-05	5.67E-06	4.04E-06	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	1.70E-10	2.86E-11	1.42E-12	3.39E-09	5.71E-10	8.38E-10	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	1.70E-10	2.86E-11	1.42E-12	3.39E-09	5.71E-10	8.38E-10	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	3.54E-06	1.99E-06	2.97E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	3.55E-07	1.99E-07	2.98E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	3.21E-06	5.41E-07	2.70E-08	6.43E-03	1.08E-03	5.40E-05	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	2.27E-07	1.78E-07	1.91E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	6.00E-07	4.71E-07	5.04E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	1.16E-09	3.26E-12	9.76E-12	2.90E-07	8.14E-10	1.14E-09	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	6.53E-06	3.66E-06	5.48E-08	3.26E-04	1.83E-04	2.74E-06	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	1.70E-10	2.86E-11	1.42E-12	8.48E-09	1.43E-09	7.12E-11	NA	NA	NA	NA	NA	NA
Chloroform (C)	1.16E-09	1.95E-10	9.76E-12	1.16E-07	1.95E-08	6.97E-10	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	1.70E-10	2.86E-11	1.42E-12	8.48E-09	1.43E-09	7.12E-11	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	1.29E-06	7.23E-07	1.08E-08	1.29E-05	7.23E-06	1.08E-07	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	1.16E-09	1.95E-10	9.76E-12	1.16E-08	1.95E-09	3.41E-11	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	8.09E-10	1.36E-10	6.80E-12	9.44E-10	1.59E-10	7.93E-12	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	3.52E-10	5.93E-11	2.96E-12	8.81E-09	1.48E-09	7.40E-11	NA	NA	NA	NA	NA	NA
Toluene (NC)	2.61E-10	4.39E-11	2.19E-12	1.31E-09	2.20E-10	1.92E-11	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	1.70E-10	4.76E-13	1.42E-12	5.66E-08	1.59E-10	4.99E-11	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	1.70E-10	2.86E-11	1.42E-12	8.48E-10	1.43E-10	4.99E-11	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	1.70E-10	2.86E-11	1.42E-12	8.48E-10	1.43E-10	4.99E-11	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	2.27E-09	3.82E-10	1.91E-11	1.14E-08	1.91E-09	6.68E-10	NA	NA	NA	NA	NA	NA
beta-BHC (C)	7.05E-10	3.95E-10	5.92E-12	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	2.87E-12	4.83E-13	2.41E-14	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-17: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater	E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure / HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	2.58E-05	4.55E-06	1.59E-06	2.58E-05	4.55E-06	1.59E-06	NA	1.38E-03	6.81E-05	1.38E-03	6.81E-05
Antimony (NC)	1.72E-07	3.03E-08	1.06E-08	4.31E-04	7.59E-05	2.65E-05	NA	5.10E-07	2.52E-08	1.28E-03	6.29E-05
Arsenic (C)	3.19E-06	5.61E-07	1.96E-07	1.06E-02	1.87E-03	6.53E-04	NA	1.07E-05	1.58E-06	3.55E-02	5.26E-03
Barium (NC)	5.86E-06	1.03E-06	3.60E-07	8.36E-05	1.47E-05	5.14E-06	NA	2.59E-05	1.28E-06	3.70E-04	1.83E-05
Beryllium (C)	3.53E-08	6.22E-09	2.17E-09	1.77E-05	3.11E-06	1.09E-06	NA	1.81E-07	8.91E-09	9.03E-05	4.45E-06
Cadmium (C)	1.89E-07	3.34E-08	1.16E-08	1.89E-04	3.34E-05	1.16E-05	NA	2.75E-07	1.36E-09	2.75E-04	1.36E-06
Chromium (C)	9.47E-08	3.34E-08	1.16E-08	3.16E-05	1.11E-05	3.88E-06	NA	6.20E-06	3.06E-07	2.07E-03	1.02E-04
Chromium (total) (C)	4.31E-07	1.52E-07	5.29E-08	1.44E-04	5.06E-05	1.76E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	1.72E-07	1.21E-08	4.24E-09	8.61E-06	6.07E-07	2.12E-07	NA	1.57E-06	7.74E-08	7.85E-05	3.87E-06
Copper (NC)	2.95E-06	5.20E-07	1.82E-07	7.38E-05	1.30E-05	4.54E-06	NA	1.11E-05	5.49E-07	2.78E-04	1.37E-05
Iron (NC)	9.13E-05	1.61E-05	5.61E-06	3.04E-04	5.36E-05	1.87E-05	NA	5.44E-03	2.68E-04	1.81E-02	8.94E-04
Lead (C)	1.52E-05	2.69E-07	9.37E-08	NA	NA	NA	NA	5.63E-05	2.78E-06	NA	NA
Manganese (NC)	3.46E-05	6.10E-06	2.13E-06	1.73E-03	3.05E-04	1.06E-04	NA	8.17E-05	4.03E-06	4.08E-03	2.01E-04
Mercury (NC)	4.31E-08	7.59E-09	2.65E-09	5.02E-04	8.85E-05	3.09E-05	NA	5.89E-08	2.90E-09	6.87E-04	3.39E-05
Nickel (NC)	1.89E-06	6.65E-08	2.32E-08	9.43E-05	3.32E-06	1.16E-06	NA	1.06E-05	5.25E-07	5.32E-04	2.62E-05
Thallium (NC)	4.31E-07	7.59E-08	2.65E-08	6.15E-03	1.08E-03	3.78E-04	NA	3.91E-07	1.93E-08	5.58E-03	2.75E-04
Vanadium (NC)	1.72E-07	3.03E-08	1.06E-08	5.74E-04	1.01E-04	3.53E-05	NA	5.20E-06	2.57E-07	1.73E-02	8.55E-04
Zinc (NC)	4.09E-05	7.21E-06	2.51E-06	1.36E-04	2.40E-05	8.38E-06	NA	2.38E-04	1.17E-05	7.92E-04	3.90E-05
Acenaphthylene (C)	4.31E-07	1.07E-05	3.73E-06	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	4.31E-07	1.71E-05	5.96E-06	1.44E-06	5.69E-05	1.99E-05	NA	6.48E-07	4.15E-07	2.16E-06	1.38E-06
Benzo(a)anthracene (C)	4.31E-07	7.19E-05	2.51E-05	NA	NA	NA	NA	1.10E-06	7.05E-07	NA	NA
Benzo(a)pyrene (C)	4.31E-07	9.41E-05	3.28E-05	NA	NA	NA	NA	1.10E-06	7.05E-07	NA	NA
Benzo(b)fluoranthene (C)	4.31E-07	5.30E-05	1.85E-05	NA	NA	NA	NA	9.42E-07	6.04E-07	NA	NA
Benzo(g,h,i)perylene	4.31E-07	1.52E-04	5.29E-05	NA	NA	NA	NA	3.93E-07	2.52E-07	NA	NA
Benzo(k)fluoranthene (C)	4.31E-07	9.10E-05	3.18E-05	NA	NA	NA	NA	9.82E-07	6.29E-07	NA	NA
Chrysene (C)	4.31E-07	7.81E-05	2.73E-05	NA	NA	NA	NA	1.02E-06	6.54E-07	NA	NA
Dibenz(a,h)anthracene (C)		1.27E-04	4.45E-05	NA	NA	NA	NA	1.85E-07	1.18E-07	NA	NA
Fluoranthene (NC)	4.31E-07	3.89E-05	1.36E-05	1.08E-05	9.73E-04	3.39E-04	NA	2.36E-06	1.51E-06	5.89E-05	3.78E-05
Indeno(1,2,3-cd)pyrene (C)	4.31E-07	1.69E-04	5.90E-05	NA	NA	NA	NA	4.91E-07	3.15E-07	NA	NA
Naphthalene (NC)	4.31E-07	5.27E-06	1.84E-06	2.15E-05	2.63E-04	9.19E-05	NA	2.36E-08	1.51E-08	1.18E-06	7.55E-07
Phenanthrene (C)	4.31E-07	1.74E-05	6.06E-06	NA	NA	NA	NA	1.96E-06	1.26E-06	NA	NA
2-Methylnaphthylene (NC)	4.31E-08	1.08E-06	3.76E-07	1.08E-05	2.69E-04	9.40E-05	NA	4.12E-08	2.64E-08	1.03E-05	6.61E-06
1,2-Dichloroethane (C)	4.31E-08	4.05E-08	1.41E-08	2.15E-06	2.03E-06	7.07E-07	NA	4.12E-08	6.10E-09	2.06E-06	3.05E-07
1,2,4-Trimethylbenzene (NC)	4.31E-07	8.12E-06	2.83E-06	8.61E-06	1.62E-04	5.66E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	4.31E-08	8.12E-07	2.83E-07	8.61E-07	1.62E-05	5.66E-06	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	8.61E-09	6.07E-07	2.12E-07	NA	NA	NA	NA	1.16E-06	5.71E-07	NA	NA
4,4'-DDE (C)	8.61E-09	1.39E-06	4.85E-07	NA	NA	NA	NA	7.26E-07	3.58E-07	NA	NA
4,4'-DDT (C)	8.61E-09	1.61E-06	5.61E-07	1.72E-05	3.22E-03	1.12E-03	NA	1.49E-05	2.21E-06	2.98E-02	4.41E-03
Aroclor 1248 (C)	4.74E-08	8.28E-06	2.89E-06	NA	NA	NA	NA	1.53E-08	1.06E-08	NA	NA
Aroclor 1260 (C)	8.61E-08	8.32E-05	2.90E-05	NA	NA	NA	NA	2.16E-08	1.49E-08	NA	NA
Benzene (C)	2.15E-07	1.40E-05	4.90E-06	5.38E-05	3.51E-03	1.22E-03	NA	1.71E-09	4.23E-12	4.28E-07	1.06E-09
bis(2-Ethylhexyl)phthalate (C)	4.31E-07	5.01E-05	1.75E-05	2.15E-05	2.50E-03	8.74E-04	NA	5.89E-08	2.90E-08	2.94E-06	1.45E-06
Bromodichloromethane (C)	1.72E-07	3.34E-06	1.16E-06	8.61E-06	1.67E-04	5.82E-05	NA	1.71E-09	2.54E-10	8.57E-08	1.27E-08
Chloroform (C)	5.17E-07	1.55E-05	5.40E-06	5.17E-05	1.55E-03	5.40E-04	NA	1.71E-09	2.54E-10	1.71E-07	2.54E-08
Dibromochloromethane (C)	5.17E-08	3.55E-08	1.24E-08	2.58E-06	1.78E-06	6.19E-07	NA	1.71E-09	2.54E-10	8.57E-08	1.27E-08
Di-n-butylphthalate (NC)	1.12E-06	1.20E-04	4.20E-05	1.12E-05	1.20E-03	4.20E-04	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	2.15E-07	4.55E-05	1.59E-05	2.15E-06	4.55E-04	1.59E-04	NA	1.71E-09	2.54E-10	1.71E-08	2.54E-09
Methyl tert-butyl ether (C)	4.31E-08	1.95E-08	6.80E-09	5.02E-08	2.27E-08	7.94E-09	NA	1.71E-09	2.54E-10	2.00E-09	2.96E-10
n-Butylbenzene (NC)	4.31E-08	0.00E+00	0.00E+00	1.08E-06	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	5.34E-07	7.34E-05	2.56E-05	2.67E-06	3.67E-04	1.28E-04	NA	2.75E-08	4.07E-09	1.37E-07	2.03E-08
Vinyl Chloride (C)	4.31E-08	1.06E-06	3.71E-07	1.44E-05	3.54E-04	1.24E-04	NA	1.71E-09	4.23E-12	5.71E-07	1.41E-09
m,p-Xylene (NC)	4.31E-08	1.06E-05	3.71E-06	2.15E-07	5.31E-05	1.85E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	4.31E-08	1.06E-05	3.71E-06	2.15E-07	5.31E-05	1.85E-05	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	4.31E-07	1.06E-04	3.71E-05	2.15E-06	5.31E-04	1.85E-04	NA	1.71E-09	2.54E-10	8.57E-09	1.27E-09
beta-BHC (C)	4.31E-09	2.05E-07	7.15E-08	NA	NA	NA	NA	3.10E-10	1.53E-10	NA	NA
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA

Table 3-17: Cont'd

Chemical (Qualifier)	F. Fish		Total	Total
	Exposure	HQ	Hazard	Hazard
	Ingestion	Ingestion	Quotient	No Fish
Aluminum (NC)	1.82E-04	1.82E-04	2.77E-02	2.75E-02
Antimony (NC)	1.80E-05	4.50E-02	5.41E-02	9.09E-03
Arsenic (C)	9.16E-04	3.05E+00	3.12E+00	7.15E-02
Barium (NC)	9.64E-03	1.38E-01	1.40E-01	2.45E-03
Beryllium (C)	5.72E-06	2.86E-03	3.35E-03	4.87E-04
Cadmium (C)	4.49E-04	4.49E-01	4.50E-01	1.08E-03
Chromium (C)	4.70E-06	1.57E-03	1.06E-02	8.99E-03
Chromium (total) (C)	2.14E-05	7.13E-03	1.09E-02	3.75E-03
Cobalt (C)	8.10E-04	4.05E-02	4.38E-02	3.33E-03
Copper (NC)	5.48E-03	1.37E-01	1.38E-01	6.32E-04
Iron (NC)	4.29E-01	1.43E+00	1.48E+00	4.50E-02
Lead (C)	3.58E-06	NA	NA	NA
Manganese (NC)	1.63E-01	8.14E+00	8.22E+00	7.48E-02
Mercury (NC)	3.94E-04	4.59E+00	4.60E+00	2.08E-03
Nickel (NC)	3.84E-04	1.92E-02	2.02E-02	9.82E-04
Thallium (NC)	1.13E-02	1.61E+02	1.61E+02	2.51E-02
Vanadium (NC)	8.10E-04	2.70E+00	2.75E+00	4.97E-02
Zinc (NC)	2.24E-01	7.48E-01	7.49E-01	1.24E-03
Acenaphthylene (C)	5.63E-04	NA	NA	NA
Anthracene (NC)	5.63E-04	1.88E-03	1.96E-03	8.30E-05
Benzo(a)anthracene (C)	5.63E-04	NA	NA	NA
Benzo(a)pyrene (C)	5.63E-04	NA	NA	NA
Benzo(b)fluoranthene (C)	5.63E-04	NA	NA	NA
Benzo(g,h,i)perylene	5.63E-04	NA	NA	NA
Benzo(k)fluoranthene (C)	5.63E-04	NA	NA	NA
Chrysene (C)	5.63E-04	NA	NA	NA
Dibenz(a,h)anthracene (C)	5.63E-04	NA	NA	NA
Fluoranthene (NC)	5.63E-04	1.41E-02	1.56E-02	1.52E-03
Indeno(1,2,3-cd)pyrene (C)	5.63E-04	NA	NA	NA
Naphthalene (NC)	5.63E-04	2.81E-02	2.85E-02	4.00E-04
Phenanthrene (C)	5.63E-04	NA	NA	NA
2-Methylnaphthylene (NC)	5.63E-05	1.41E-02	1.47E-02	6.84E-04
1,2-Dichloroethane (C)	5.63E-05	2.81E-03	2.86E-03	5.06E-05
1,2,4-Trimethylbenzene (NC)	1.97E-03	3.94E-02	3.96E-02	2.28E-04
1,3,5-Trimethylbenzene (NC)	1.22E-04	2.43E-03	2.45E-03	2.28E-05
4,4'-DDD (C)	1.31E-03	NA	NA	NA
4,4'-DDE (C)	5.94E-04	NA	NA	NA
4,4'-DDT (C)	3.15E-03	6.30E+00	6.35E+00	4.62E-02
Aroclor 1248 (C)	7.30E-03	NA	NA	NA
Aroclor 1260 (C)	7.20E-02	NA	NA	NA
Benzene (C)	4.07E-05	1.02E-02	1.50E-02	4.79E-03
bis(2-Ethylhexyl)phthalate (C)	4.19E-02	2.10E+00	2.10E+00	3.92E-03
Bromodichloromethane (C)	3.06E-05	1.53E-03	1.76E-03	2.34E-04
Chloroform (C)	4.85E-06	4.85E-04	2.62E-03	2.14E-03
Dibromochloromethane (C)	1.23E-05	6.15E-04	6.20E-04	5.09E-06
Di-n-butylphthalate (NC)	7.50E-03	7.50E-02	7.67E-02	1.65E-03
Ethylbenzene (NC)	3.45E-04	3.45E-03	4.07E-03	6.16E-04
Methyl tert-butyl ether (C)	1.43E-06	1.67E-06	1.75E-06	8.43E-08
n-Butylbenzene (NC)	7.07E-04	1.77E-02	1.77E-02	1.09E-06
Toluene (NC)	3.26E-04	1.63E-03	2.13E-03	4.98E-04
Vinyl Chloride (C)	1.69E-06	5.64E-04	1.06E-03	4.93E-04
m,p-Xylene (NC)	0.00E+00	0.00E+00	7.19E-05	7.19E-05
ortho-xylene (NC)	0.00E+00	0.00E+00	7.19E-05	7.19E-05
Xylenes (total) (NC)	7.67E-04	3.83E-03	4.55E-03	7.19E-04
beta-BHC (C)	2.58E-05	NA	NA	NA
Total TCDD (C)	0.00E+00	NA	NA	NA

Table 3-18: Summary of exposure dose and ILCR by media for park users (child and adult).

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Arsenic (C)	1.92E-06	3.24E-07	1.62E-08	2.89E-06	4.86E-07	2.43E-07	NA	NA	NA	NA	NA	NA
Beryllium (C)	7.94E-08	4.46E-09	6.67E-10	6.67E-07	3.74E-08	5.60E-09	NA	NA	NA	NA	NA	NA
Cadmium (C)	2.10E-07	1.18E-09	1.77E-09	1.32E-06	7.43E-09	1.11E-08	NA	NA	NA	NA	NA	NA
Chromium (C)	4.49E-06	2.52E-07	3.77E-08	1.89E-04	1.06E-05	1.58E-06	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	2.35E-06	1.32E-07	1.97E-08	9.85E-05	5.53E-06	8.27E-07	NA	NA	NA	NA	NA	NA
Cobalt (C)	9.09E-07	5.10E-08	7.64E-09	8.91E-06	5.00E-07	7.49E-08	NA	NA	NA	NA	NA	NA
Lead (C)	1.43E-05	8.01E-07	1.20E-07	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	5.25E-07	3.83E-07	4.41E-09	3.83E-09	2.79E-09	1.37E-11	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	3.85E-07	2.81E-07	3.23E-09	2.81E-07	2.05E-07	1.00E-09	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	5.16E-07	3.76E-07	4.33E-09	3.76E-06	2.75E-06	1.34E-08	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	7.71E-07	5.62E-07	6.47E-09	5.63E-07	4.10E-07	2.01E-09	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	2.28E-07	1.66E-07	1.92E-09	1.67E-08	1.21E-08	5.94E-11	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	4.47E-08	3.26E-08	3.76E-10	3.27E-09	2.38E-09	1.16E-11	NA	NA	NA	NA	NA	NA
Chrysene (C)	1.11E-06	8.09E-07	9.32E-09	8.10E-09	5.91E-09	2.89E-11	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	9.24E-08	6.74E-08	7.76E-10	6.75E-07	4.92E-07	2.41E-09	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	1.75E-07	1.27E-07	1.47E-09	1.27E-07	9.29E-08	4.54E-10	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	2.70E-07	1.97E-07	2.26E-09	1.97E-09	1.44E-09	7.02E-12	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	2.89E-07	4.86E-08	2.42E-09	2.63E-08	4.42E-09	2.21E-10	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	7.27E-11	1.22E-11	6.11E-13	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	7.27E-11	1.22E-11	6.11E-13	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	1.52E-06	8.51E-07	1.27E-08	3.64E-07	2.04E-07	3.06E-09	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	1.52E-07	8.53E-08	1.28E-09	5.17E-08	2.90E-08	4.34E-10	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	1.38E-06	2.32E-07	1.16E-08	4.68E-07	7.88E-08	3.93E-09	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	9.73E-08	7.64E-08	8.17E-10	1.95E-07	1.53E-07	1.63E-09	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	2.57E-07	2.02E-07	2.16E-09	5.15E-07	4.04E-07	4.32E-09	NA	NA	NA	NA	NA	NA
Benzene (C)	4.98E-10	1.40E-12	4.18E-12	2.74E-11	7.68E-14	1.14E-13	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	2.80E-06	1.57E-06	2.35E-08	3.92E-08	2.20E-08	3.29E-10	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	7.27E-11	1.22E-11	6.11E-13	4.51E-12	7.59E-13	3.79E-14	NA	NA	NA	NA	NA	NA
Chloroform (C)	4.98E-10	8.38E-11	4.18E-12	0.00E+00	0.00E+00	3.37E-13	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	7.27E-11	1.22E-11	6.11E-13	6.11E-12	1.03E-12	5.13E-14	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	5.53E-07	3.10E-07	4.64E-09	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	4.98E-10	8.38E-11	4.18E-12	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	3.47E-10	5.84E-11	2.91E-12	1.39E-12	2.33E-13	1.16E-14	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	1.51E-10	2.54E-11	1.27E-12	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
Toluene (NC)	1.12E-10	1.88E-11	9.40E-13	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	7.27E-11	2.04E-13	6.11E-13	1.09E-10	3.06E-13	1.88E-14	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	7.27E-11	1.22E-11	6.11E-13	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	7.27E-11	1.22E-11	6.11E-13	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	9.73E-10	1.64E-10	8.17E-12	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
beta-BHC (C)	3.02E-10	1.69E-10	2.54E-12	5.44E-10	3.05E-10	4.57E-12	NA	NA	NA	NA	NA	NA
Total TCDD (C)	1.23E-12	2.07E-13	1.03E-14	1.85E-07	3.11E-08	1.19E-09	NA	NA	NA	NA	NA	NA

Table 3-18: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater	E. Sediments			
	Exposure - Swimming		Wading	ILCR - Swimming		ILCR - Wading	Exposure/ ILCR	Exposure		ILC	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	1.37E-06	2.41E-07	8.40E-08	2.05E-06	3.61E-07	1.26E-07	NA	4.57E-06	6.76E-07	6.85E-06	1.01E-06
Beryllium (C)	1.51E-08	2.67E-09	9.30E-10	1.27E-07	2.24E-08	7.81E-09	NA	7.74E-08	3.82E-09	6.50E-07	3.21E-08
Cadmium (C)	8.12E-08	1.43E-08	4.99E-09	5.11E-07	9.01E-08	3.14E-08	NA	1.18E-07	5.81E-10	7.42E-07	3.66E-09
Chromium (C)	4.06E-08	1.43E-08	4.99E-09	1.70E-06	6.01E-07	2.10E-07	NA	2.66E-06	1.31E-07	1.12E-04	5.51E-06
Chromium (total) (C)	1.85E-07	6.50E-08	2.27E-08	7.75E-06	2.73E-06	9.53E-07	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	7.38E-08	5.20E-09	1.82E-09	7.23E-07	5.10E-08	1.78E-08	NA	6.73E-07	3.32E-08	6.60E-06	3.25E-07
Lead (C)	6.53E-06	1.15E-07	4.02E-08	0.00E+00	0.00E+00	0.00E+00	NA	2.41E-05	1.19E-06	0.00E+00	0.00E+00
Acenaphthylene (C)	1.85E-07	4.58E-06	1.60E-06	1.35E-09	3.35E-08	1.17E-08	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	1.85E-07	3.08E-05	1.08E-05	1.35E-07	2.25E-05	7.85E-06	NA	4.71E-07	3.02E-07	3.44E-07	2.20E-07
Benzo(a)pyrene (C)	1.85E-07	4.03E-05	1.41E-05	1.35E-06	2.94E-04	1.03E-04	NA	4.71E-07	3.02E-07	3.44E-06	2.20E-06
Benzo(b)fluoranthene (C)	1.85E-07	2.27E-05	7.93E-06	1.35E-07	1.66E-05	5.79E-06	NA	4.04E-07	2.59E-07	2.95E-07	1.89E-07
Benzo(g,h,i)perylene	1.85E-07	6.50E-05	2.27E-05	1.35E-08	4.75E-06	1.66E-06	NA	1.68E-07	1.08E-07	1.23E-08	7.87E-09
Benzo(k)fluoranthene (C)	1.85E-07	3.90E-05	1.36E-05	1.35E-08	2.85E-06	9.94E-07	NA	4.21E-07	2.70E-07	3.07E-08	1.97E-08
Chrysene (C)	1.85E-07	3.35E-05	1.17E-05	1.35E-09	2.44E-07	8.53E-08	NA	4.38E-07	2.80E-07	3.19E-09	2.05E-09
Dibenz(a,h)anthracene (C)	1.85E-07	5.46E-05	1.91E-05	1.35E-06	3.99E-04	1.39E-04	NA	7.91E-08	5.07E-08	5.77E-07	3.70E-07
Indeno(1,2,3-cd)pyrene (C)	1.85E-07	7.25E-05	2.53E-05	1.35E-07	5.29E-05	1.85E-05	NA	2.10E-07	1.35E-07	1.54E-07	9.84E-08
Phenanthrene (C)	1.85E-07	7.45E-06	2.60E-06	1.35E-09	5.44E-08	1.90E-08	NA	8.41E-07	5.39E-07	6.14E-09	3.94E-09
1,2-Dichloroethane (C)	1.85E-08	1.74E-08	6.06E-09	1.68E-09	1.58E-09	5.51E-10	NA	1.77E-08	2.61E-09	1.61E-09	2.38E-10
1,2,4-Trimethylbenzene (NC)	1.85E-07	3.48E-06	1.21E-06	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	1.85E-08	3.48E-07	1.21E-07	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	3.69E-09	2.60E-07	9.08E-08	8.86E-10	6.24E-08	2.18E-08	NA	4.96E-07	2.45E-07	1.19E-07	5.87E-08
4,4'-DDE (C)	3.69E-09	5.96E-07	2.08E-07	1.25E-09	2.03E-07	7.07E-08	NA	3.11E-07	1.54E-07	1.06E-07	5.22E-08
4,4'-DDT (C)	3.69E-09	6.89E-07	2.41E-07	1.25E-09	2.34E-07	8.18E-08	NA	6.39E-06	9.46E-07	2.17E-06	3.22E-07
Aroclor 1248 (C)	2.03E-08	3.55E-06	1.24E-06	4.06E-08	7.10E-06	2.48E-06	NA	6.56E-09	4.53E-09	1.31E-08	9.06E-09
Aroclor 1260 (C)	3.69E-08	3.56E-05	1.24E-05	7.38E-08	7.13E-05	2.49E-05	NA	9.26E-09	6.39E-09	1.85E-08	1.28E-08
Benzene (C)	9.23E-08	6.02E-06	2.10E-06	5.07E-09	3.31E-07	1.15E-07	NA	7.35E-10	1.81E-12	4.04E-11	9.96E-14
bis(2-Ethylhexyl)phthalate (C)	1.85E-07	2.15E-05	7.49E-06	2.58E-09	3.00E-07	1.05E-07	NA	2.52E-08	1.24E-08	3.53E-10	1.74E-10
Bromodichloromethane (C)	7.38E-08	1.43E-06	4.99E-07	4.58E-09	8.87E-08	3.09E-08	NA	7.35E-10	1.09E-10	4.55E-11	6.74E-12
Chloroform (C)	2.21E-07	6.63E-06	2.31E-06	0.00E+00	0.00E+00	0.00E+00	NA	7.35E-10	1.09E-10	0.00E+00	0.00E+00
Dibromochloromethane (C)	2.21E-08	1.52E-08	5.31E-09	1.86E-09	1.28E-09	4.46E-10	NA	7.35E-10	1.09E-10	6.17E-11	9.13E-12
Di-n-butylphthalate (NC)	4.80E-07	5.16E-05	1.80E-05	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	9.23E-08	1.95E-05	6.81E-06	0.00E+00	0.00E+00	0.00E+00	NA	7.35E-10	1.09E-10	0.00E+00	0.00E+00
Methyl tert-butyl ether (C)	1.85E-08	8.36E-09	2.92E-09	7.38E-11	3.34E-11	1.17E-11	NA	7.35E-10	1.09E-10	2.94E-12	4.35E-13
n-Butylbenzene (NC)	1.85E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	2.29E-07	3.14E-05	1.10E-05	0.00E+00	0.00E+00	0.00E+00	NA	1.18E-08	1.74E-09	0.00E+00	0.00E+00
Vinyl Chloride (C)	1.85E-08	4.55E-07	1.59E-07	2.77E-08	6.83E-07	2.38E-07	NA	7.35E-10	1.81E-12	1.10E-09	2.72E-12
m,p-Xylene (NC)	1.85E-08	4.55E-06	1.59E-06	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	1.85E-08	4.55E-06	1.59E-06	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	1.85E-07	4.55E-05	1.59E-05	0.00E+00	0.00E+00	0.00E+00	NA	7.35E-10	1.09E-10	0.00E+00	0.00E+00
beta-BHC (C)	1.85E-09	8.78E-08	3.06E-08	3.32E-09	1.58E-07	5.51E-08	NA	1.33E-10	6.56E-11	2.39E-10	1.18E-10
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-18: Cont'd

Chemical (Qualifier)	F. Fish Exposure / ILCR		Total ILCR	Total ILCR No Fish
	Ingestion	Ingestion		
Arsenic (C)	3.92E-04	5.89E-04	6.03E-04	1.40E-05
Beryllium (C)	2.45E-06	2.06E-05	2.21E-05	1.55E-06
Cadmium (C)	1.92E-04	1.21E-03	1.21E-03	2.72E-06
Chromium (C)	2.02E-06	8.46E-05	4.05E-04	3.20E-04
Chromium (total) (C)	9.16E-06	3.85E-04	5.01E-04	1.16E-04
Cobalt (C)	3.47E-04	3.40E-03	3.42E-03	1.72E-05
Lead (C)	1.54E-06	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene (C)	2.41E-04	1.76E-06	1.81E-06	5.31E-08
Benzo(a)anthracene (C)	2.41E-04	1.76E-04	2.08E-04	3.15E-05
Benzo(a)pyrene (C)	2.41E-04	1.76E-03	2.17E-03	4.11E-04
Benzo(b)fluoranthene (C)	2.41E-04	1.76E-04	2.00E-04	2.40E-05
Benzo(g,h,i)perylene	2.41E-04	1.76E-05	2.41E-05	6.47E-06
Benzo(k)fluoranthene (C)	2.41E-04	1.76E-05	2.15E-05	3.91E-06
Chrysene (C)	2.41E-04	1.76E-06	2.11E-06	3.50E-07
Dibenz(a,h)anthracene (C)	2.41E-04	1.76E-03	2.30E-03	5.41E-04
Indeno(1,2,3-cd)pyrene (C)	2.41E-04	1.76E-04	2.48E-04	7.20E-05
Phenanthrene (C)	2.41E-04	1.76E-06	1.85E-06	8.82E-08
1,2-Dichloroethane (C)	2.41E-05	2.19E-06	2.23E-06	3.66E-08
1,2,4-Trimethylbenzene (NC)	8.43E-04	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	5.21E-05	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	5.59E-04	1.34E-04	1.35E-04	8.34E-07
4,4'-DDE (C)	2.55E-04	8.66E-05	8.71E-05	5.14E-07
4,4'-DDT (C)	1.35E-03	4.59E-04	4.62E-04	3.36E-06
Aroclor 1248 (C)	3.13E-03	6.26E-03	6.27E-03	9.98E-06
Aroclor 1260 (C)	3.09E-02	6.17E-02	6.18E-02	9.72E-05
Benzene (C)	1.75E-05	9.60E-07	1.41E-06	4.51E-07
bis(2-Ethylhexyl)phthalate (C)	1.80E-02	2.52E-04	2.52E-04	4.70E-07
Bromodichloromethane (C)	1.31E-05	8.13E-07	9.37E-07	1.24E-07
Chloroform (C)	2.08E-06	0.00E+00	3.37E-13	3.37E-13
Dibromochloromethane (C)	5.27E-06	4.43E-07	4.47E-07	3.66E-09
Di-n-butylphthalate (NC)	3.21E-03	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	1.48E-04	0.00E+00	0.00E+00	0.00E+00
Methyl tert-butyl ether (C)	6.13E-07	2.45E-09	2.58E-09	1.24E-10
n-Butylbenzene (NC)	3.03E-04	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	1.40E-04	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride (C)	7.25E-07	1.09E-06	2.04E-06	9.50E-07
m,p-Xylene (NC)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	3.29E-04	0.00E+00	0.00E+00	0.00E+00
beta-BHC (C)	1.11E-05	1.99E-05	2.02E-05	2.18E-07
Total TCDD (C)	0.00E+00	0.00E+00	2.17E-07	2.17E-07

Table 3-19: Summary of exposure dose and hazard quotient by media for park workers.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	8.04E-03	5.31E-04	1.80E-04	8.04E-03	5.31E-04	1.80E-01	NA	NA	NA	NA	NA	NA
Antimony (NC)	7.57E-06	5.00E-07	1.69E-07	1.89E-02	1.25E-03	2.96E-03	NA	NA	NA	NA	NA	NA
Arsenic (C)	1.31E-05	2.60E-06	2.93E-07	4.38E-02	8.66E-03	9.78E-04	NA	NA	NA	NA	NA	NA
Barium (NC)	7.61E-05	5.02E-06	1.70E-06	1.09E-03	7.18E-05	1.21E-02	NA	NA	NA	NA	NA	NA
Beryllium (C)	5.42E-07	3.58E-08	1.21E-08	2.71E-04	1.79E-05	2.12E-03	NA	NA	NA	NA	NA	NA
Cadmium (C)	1.43E-06	9.47E-09	3.21E-08	1.43E-03	9.47E-06	5.62E-04	NA	NA	NA	NA	NA	NA
Chromium (C)	3.06E-05	2.02E-06	6.85E-07	1.02E-02	6.74E-04	2.40E-02	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	1.60E-05	1.06E-06	3.58E-07	5.33E-03	3.52E-04	1.25E-02	NA	NA	NA	NA	NA	NA
Cobalt (C)	6.20E-06	4.10E-07	1.39E-07	3.10E-04	2.05E-05	2.43E-02	NA	NA	NA	NA	NA	NA
Copper (NC)	2.73E-05	1.80E-06	6.10E-07	6.83E-04	4.51E-05	1.53E-05	NA	NA	NA	NA	NA	NA
Iron (NC)	2.11E-02	1.39E-03	4.71E-04	7.02E-02	4.63E-03	1.57E-03	NA	NA	NA	NA	NA	NA
Lead (C)	9.74E-05	6.43E-06	2.18E-06	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	3.12E-04	2.06E-05	6.97E-06	1.56E-02	1.03E-03	4.88E-01	NA	NA	NA	NA	NA	NA
Mercury (NC)	1.74E-07	1.15E-08	3.89E-09	2.03E-03	1.34E-04	4.54E-05	NA	NA	NA	NA	NA	NA
Nickel (NC)	1.78E-05	1.18E-06	3.98E-07	8.91E-04	5.88E-05	1.99E-05	NA	NA	NA	NA	NA	NA
Thallium (NC)	2.23E-06	1.47E-07	4.98E-08	3.18E-02	2.10E-03	7.11E-04	NA	NA	NA	NA	NA	NA
Vanadium (NC)	2.53E-05	1.67E-06	5.66E-07	8.45E-02	5.57E-03	1.89E-03	NA	NA	NA	NA	NA	NA
Zinc (NC)	1.97E-04	1.30E-05	4.39E-06	6.55E-04	4.32E-05	1.46E-05	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	3.58E-06	3.07E-06	8.00E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	6.45E-07	5.53E-07	1.44E-08	2.15E-06	1.84E-06	4.80E-08	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	2.63E-06	2.25E-06	5.87E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	3.52E-06	3.02E-06	7.86E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	5.26E-06	4.51E-06	1.17E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.56E-06	1.34E-06	3.48E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	3.05E-07	2.62E-07	6.82E-09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	7.57E-06	6.50E-06	1.69E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	6.30E-07	5.41E-07	1.41E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	6.53E-06	5.60E-06	1.46E-07	1.63E-04	1.40E-04	3.64E-06	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	1.19E-06	1.02E-06	2.66E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	6.46E-07	5.54E-07	1.44E-08	3.23E-05	2.77E-05	1.68E-05	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	1.84E-06	1.58E-06	4.11E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	1.97E-06	1.69E-06	4.40E-08	4.92E-04	4.22E-04	1.10E-05	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	1.97E-06	3.90E-07	4.40E-08	9.85E-05	1.95E-05	3.14E-05	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	4.96E-10	9.82E-11	1.11E-11	9.92E-09	1.96E-09	6.52E-09	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	4.96E-10	9.82E-11	1.11E-11	9.92E-09	1.96E-09	6.52E-09	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	1.03E-05	6.83E-06	2.31E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	1.04E-06	6.85E-07	2.32E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	9.40E-06	1.86E-06	2.10E-07	1.88E-02	3.72E-03	4.20E-04	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	6.64E-07	6.14E-07	1.48E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	1.76E-06	1.62E-06	3.92E-08	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	3.40E-09	1.12E-11	7.59E-11	8.49E-07	2.80E-09	8.85E-09	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	1.91E-05	1.26E-05	4.26E-07	9.54E-04	6.30E-04	2.13E-05	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	4.96E-10	9.82E-11	1.11E-11	2.48E-08	4.91E-09	5.54E-10	NA	NA	NA	NA	NA	NA
Chloroform (C)	3.40E-09	6.72E-10	7.59E-11	3.40E-07	6.72E-08	5.42E-09	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	4.96E-10	9.82E-11	1.11E-11	2.48E-08	4.91E-09	5.54E-10	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	3.77E-06	2.49E-06	8.42E-08	3.77E-05	2.49E-05	8.42E-07	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	3.40E-09	6.72E-10	7.59E-11	3.40E-08	6.72E-09	2.66E-10	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	2.37E-09	4.68E-10	5.29E-11	2.76E-09	5.47E-10	6.17E-11	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	1.03E-09	2.04E-10	2.30E-11	2.58E-08	5.10E-09	5.75E-10	NA	NA	NA	NA	NA	NA
Toluene (NC)	7.63E-10	1.51E-10	1.71E-11	3.82E-09	7.56E-10	1.49E-10	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	4.96E-10	1.64E-12	1.11E-11	1.65E-07	5.46E-10	3.88E-10	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	4.96E-10	9.82E-11	1.11E-11	2.48E-09	4.91E-10	3.88E-10	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	4.96E-10	9.82E-11	1.11E-11	2.48E-09	4.91E-10	3.88E-10	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	6.64E-09	1.31E-09	1.48E-10	3.32E-08	6.57E-09	5.19E-09	NA	NA	NA	NA	NA	NA
beta-BHC (C)	2.06E-09	1.36E-09	4.60E-11	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	8.40E-12	1.66E-12	1.88E-13	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-19: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure	HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	NA	NA	1.70E-05	NA	NA	1.70E-05	NA	NA	1.21E-03	3.00E-04	1.21E-03	3.00E-04
Antimony (NC)	NA	NA	1.14E-07	NA	NA	2.84E-04	NA	NA	4.48E-07	1.11E-07	1.12E-03	2.77E-04
Arsenic (C)	NA	NA	2.10E-06	NA	NA	7.01E-03	NA	NA	9.35E-06	6.94E-06	3.12E-02	2.31E-02
Barium (NC)	NA	NA	3.86E-06	NA	NA	5.52E-05	NA	NA	2.27E-05	5.63E-06	3.25E-04	8.04E-05
Beryllium (C)	NA	NA	2.33E-08	NA	NA	1.17E-05	NA	NA	1.58E-07	3.92E-08	7.92E-05	1.96E-05
Cadmium (C)	NA	NA	1.25E-07	NA	NA	1.25E-04	NA	NA	2.41E-07	5.97E-09	2.41E-04	5.97E-06
Chromium (C)	NA	NA	1.25E-07	NA	NA	4.17E-05	NA	NA	5.44E-06	1.35E-06	1.81E-03	4.49E-04
Chromium (total) (C)	NA	NA	5.68E-07	NA	NA	1.89E-04	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	NA	NA	4.55E-08	NA	NA	2.27E-06	NA	NA	1.38E-06	3.41E-07	6.89E-05	1.70E-05
Copper (NC)	NA	NA	1.95E-06	NA	NA	4.87E-05	NA	NA	9.76E-06	2.42E-06	2.44E-04	6.04E-05
Iron (NC)	NA	NA	6.02E-05	NA	NA	2.01E-04	NA	NA	4.77E-03	1.18E-03	1.59E-02	3.94E-03
Lead (C)	NA	NA	1.01E-06	NA	NA	NA	NA	NA	4.94E-05	1.22E-05	NA	NA
Manganese (NC)	NA	NA	2.28E-05	NA	NA	1.14E-03	NA	NA	7.16E-05	1.77E-05	3.58E-03	8.87E-04
Mercury (NC)	NA	NA	2.84E-08	NA	NA	3.32E-04	NA	NA	5.17E-08	1.28E-08	6.03E-04	1.49E-04
Nickel (NC)	NA	NA	2.49E-07	NA	NA	1.24E-05	NA	NA	9.33E-06	2.31E-06	4.67E-04	1.16E-04
Thallium (NC)	NA	NA	2.84E-07	NA	NA	4.06E-03	NA	NA	3.43E-07	8.48E-08	4.90E-03	1.21E-03
Vanadium (NC)	NA	NA	1.14E-07	NA	NA	3.79E-04	NA	NA	4.56E-06	1.13E-06	1.52E-02	3.76E-03
Zinc (NC)	NA	NA	2.70E-05	NA	NA	9.00E-05	NA	NA	2.08E-04	5.16E-05	6.95E-04	1.72E-04
Acenaphthylene (C)	NA	NA	4.01E-05	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	NA	NA	6.39E-05	NA	NA	2.13E-04	NA	NA	5.68E-07	1.83E-06	1.89E-06	6.09E-06
Benzo(a)anthracene (C)	NA	NA	2.69E-04	NA	NA	NA	NA	NA	9.64E-07	3.10E-06	NA	NA
Benzo(a)pyrene (C)	NA	NA	3.52E-04	NA	NA	NA	NA	NA	9.64E-07	3.10E-06	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	1.99E-04	NA	NA	NA	NA	NA	8.27E-07	2.66E-06	NA	NA
Benzo(g,h,i)perylene	NA	NA	5.68E-04	NA	NA	NA	NA	NA	3.44E-07	1.11E-06	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	3.41E-04	NA	NA	NA	NA	NA	8.61E-07	2.77E-06	NA	NA
Chrysene (C)	NA	NA	2.93E-04	NA	NA	NA	NA	NA	8.95E-07	2.88E-06	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	4.77E-04	NA	NA	NA	NA	NA	1.62E-07	5.21E-07	NA	NA
Fluoranthene (NC)	NA	NA	1.46E-04	NA	NA	3.64E-03	NA	NA	2.07E-06	6.65E-06	5.17E-05	1.66E-04
Indeno(1,2,3-cd)pyrene (C)	NA	NA	6.34E-04	NA	NA	NA	NA	NA	4.31E-07	1.39E-06	NA	NA
Naphthalene (NC)	NA	NA	1.97E-05	NA	NA	9.86E-04	NA	NA	2.07E-08	6.65E-08	1.03E-06	3.32E-06
Phenanthrene (C)	NA	NA	6.51E-05	NA	NA	NA	NA	NA	1.72E-06	5.54E-06	NA	NA
2-Methylnaphthylene (NC)	NA	NA	4.03E-06	NA	NA	1.01E-03	NA	NA	3.62E-08	1.16E-07	9.04E-06	2.91E-05
1,2-Dichloroethane (C)	NA	NA	1.52E-07	NA	NA	7.59E-06	NA	NA	3.62E-08	2.69E-08	1.81E-06	1.34E-06
1,2,4-Trimethylbenzene (NC)	NA	NA	3.04E-05	NA	NA	6.08E-04	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	NA	NA	3.04E-06	NA	NA	6.08E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	NA	NA	2.27E-06	NA	NA	NA	NA	NA	1.02E-06	2.51E-06	NA	NA
4,4'-DDE (C)	NA	NA	5.21E-06	NA	NA	NA	NA	NA	6.37E-07	1.58E-06	NA	NA
4,4'-DDT (C)	NA	NA	6.02E-06	NA	NA	1.20E-02	NA	NA	1.31E-05	9.72E-06	2.62E-02	1.94E-02
Aroclor 1248 (C)	NA	NA	3.10E-05	NA	NA	NA	NA	NA	1.34E-08	4.65E-08	NA	NA
Aroclor 1260 (C)	NA	NA	3.11E-04	NA	NA	NA	NA	NA	1.89E-08	6.56E-08	NA	NA
Benzene (C)	NA	NA	5.26E-05	NA	NA	1.31E-02	NA	NA	1.50E-09	1.86E-11	3.76E-07	4.65E-09
bis(2-Ethylhexyl)phthalate (C)	NA	NA	1.88E-04	NA	NA	9.38E-03	NA	NA	5.17E-08	1.28E-07	2.58E-06	6.39E-06
Bromodichloromethane (C)	NA	NA	1.25E-05	NA	NA	6.25E-04	NA	NA	1.50E-09	1.12E-09	7.52E-08	5.58E-08
Chloroform (C)	NA	NA	5.80E-05	NA	NA	5.80E-03	NA	NA	1.50E-09	1.12E-09	1.50E-07	1.12E-07
Dibromochloromethane (C)	NA	NA	1.33E-07	NA	NA	6.65E-06	NA	NA	1.50E-09	1.12E-09	7.52E-08	5.58E-08
Di-n-butylphthalate (NC)	NA	NA	4.51E-04	NA	NA	4.51E-03	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	NA	NA	1.70E-04	NA	NA	1.70E-03	NA	NA	1.50E-09	1.12E-09	1.50E-08	1.12E-08
Methyl tert-butyl ether (C)	NA	NA	7.30E-08	NA	NA	8.52E-08	NA	NA	1.50E-09	1.12E-09	1.75E-09	1.30E-09
n-Butylbenzene (NC)	NA	NA	0.00E+00	NA	NA	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	NA	NA	2.75E-04	NA	NA	1.37E-03	NA	NA	2.41E-08	1.79E-08	1.21E-07	8.95E-08
Vinyl Chloride (C)	NA	NA	3.98E-06	NA	NA	1.33E-03	NA	NA	1.50E-09	1.86E-11	5.01E-07	6.20E-09
m,p-Xylene (NC)	NA	NA	3.98E-05	NA	NA	1.99E-04	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	NA	NA	3.98E-05	NA	NA	1.99E-04	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	NA	NA	3.98E-04	NA	NA	1.99E-03	NA	NA	1.50E-09	1.12E-09	7.52E-09	5.58E-09
beta-BHC (C)	NA	NA	7.67E-07	NA	NA	NA	NA	NA	2.72E-10	6.73E-10	NA	NA
Total TCDD (C)	NA	NA	0.00E+00	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA

Table 3-19: Cont'd

Chemical (Qualifier)	F. Fish		Total	Total
	Exposure	HQ	Hazard	Hazard
	Ingestion	Ingestion	Quotient	No Fish
Aluminum (NC)	NA	NA	1.90E-01	1.90E-01
Antimony (NC)	NA	NA	2.48E-02	2.48E-02
Arsenic (C)	NA	NA	1.15E-01	1.15E-01
Barium (NC)	NA	NA	1.38E-02	1.38E-02
Beryllium (C)	NA	NA	2.52E-03	2.52E-03
Cadmium (C)	NA	NA	2.38E-03	2.38E-03
Chromium (C)	NA	NA	3.72E-02	3.72E-02
Chromium (total) (C)	NA	NA	1.84E-02	1.84E-02
Cobalt (C)	NA	NA	2.47E-02	2.47E-02
Copper (NC)	NA	NA	1.10E-03	1.10E-03
Iron (NC)	NA	NA	9.64E-02	9.64E-02
Lead (C)	NA	NA	NA	NA
Manganese (NC)	NA	NA	5.10E-01	5.10E-01
Mercury (NC)	NA	NA	3.29E-03	3.29E-03
Nickel (NC)	NA	NA	1.56E-03	1.56E-03
Thallium (NC)	NA	NA	4.48E-02	4.48E-02
Vanadium (NC)	NA	NA	1.11E-01	1.11E-01
Zinc (NC)	NA	NA	1.67E-03	1.67E-03
Acenaphthylene (C)	NA	NA	NA	NA
Anthracene (NC)	NA	NA	2.25E-04	2.25E-04
Benzo(a)anthracene (C)	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	4.17E-03	4.17E-03
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	1.07E-03	1.07E-03
Phenanthrene (C)	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	1.97E-03	1.97E-03
1,2-Dichloroethane (C)	NA	NA	1.60E-04	1.60E-04
1,2,4-Trimethylbenzene (NC)	NA	NA	6.08E-04	6.08E-04
1,3,5-Trimethylbenzene (NC)	NA	NA	6.08E-05	6.08E-05
4,4'-DDD (C)	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	8.06E-02	8.06E-02
Aroclor 1248 (C)	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA
Benzene (C)	NA	NA	1.31E-02	1.31E-02
bis(2-Ethylhexyl)phthalate (C)	NA	NA	1.10E-02	1.10E-02
Bromodichloromethane (C)	NA	NA	6.25E-04	6.25E-04
Chloroform (C)	NA	NA	5.80E-03	5.80E-03
Dibromochloromethane (C)	NA	NA	6.81E-06	6.81E-06
Di-n-butylphthalate (NC)	NA	NA	4.57E-03	4.57E-03
Ethylbenzene (NC)	NA	NA	1.70E-03	1.70E-03
Methyl tert-butyl ether (C)	NA	NA	9.16E-08	9.16E-08
n-Butylbenzene (NC)	NA	NA	3.14E-08	3.14E-08
Toluene (NC)	NA	NA	1.37E-03	1.37E-03
Vinyl Chloride (C)	NA	NA	1.33E-03	1.33E-03
m,p-Xylene (NC)	NA	NA	1.99E-04	1.99E-04
ortho-xylene (NC)	NA	NA	1.99E-04	1.99E-04
Xylenes (total) (NC)	NA	NA	1.99E-03	1.99E-03
beta-BHC (C)	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA

Table 3-20: Summary of exposure dose and ILCR by media for park workers.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Arsenic (C)	5.63E-06	1.11E-06	1.26E-07	8.44E-06	1.67E-06	1.89E-06	NA	NA	NA	NA	NA	NA
Beryllium (C)	2.32E-07	1.53E-08	5.19E-09	1.95E-06	1.29E-07	4.36E-08	NA	NA	NA	NA	NA	NA
Cadmium (C)	6.15E-07	4.06E-09	1.37E-08	3.87E-06	2.56E-08	8.65E-08	NA	NA	NA	NA	NA	NA
Chromium (C)	1.31E-05	8.67E-07	2.93E-07	5.52E-04	3.64E-05	1.23E-05	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	6.86E-06	4.53E-07	1.53E-07	2.88E-04	1.90E-05	6.44E-06	NA	NA	NA	NA	NA	NA
Cobalt (C)	2.66E-06	1.76E-07	5.94E-08	2.61E-05	1.72E-06	5.82E-07	NA	NA	NA	NA	NA	NA
Lead (C)	4.18E-05	2.76E-06	9.33E-07	0.00E+00	0.00E+00	0.00E+00						
Acenaphthylene (C)	1.53E-06	1.32E-06	3.43E-08	1.12E-08	9.61E-09	1.06E-10	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	1.13E-06	9.65E-07	2.51E-08	8.21E-07	7.05E-07	7.79E-09	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	1.51E-06	1.29E-06	3.37E-08	1.10E-05	9.44E-06	1.04E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	2.25E-06	1.93E-06	5.03E-08	1.65E-06	1.41E-06	1.56E-08	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	6.67E-07	5.73E-07	1.49E-08	4.87E-08	4.18E-08	4.62E-10	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	1.31E-07	1.12E-07	2.92E-09	9.55E-09	8.19E-09	9.06E-11	NA	NA	NA	NA	NA	NA
Chrysene (C)	3.24E-06	2.78E-06	7.25E-08	2.37E-08	2.03E-08	2.25E-10	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	2.70E-07	2.32E-07	6.04E-09	1.97E-06	1.69E-06	1.87E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	5.10E-07	4.38E-07	1.14E-08	3.72E-07	3.20E-07	3.53E-09	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	7.88E-07	6.76E-07	1.76E-08	5.75E-09	4.94E-09	5.46E-11	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	8.44E-07	1.67E-07	1.89E-08	7.68E-08	1.52E-08	1.72E-09	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	4.44E-06	2.93E-06	9.91E-08	1.06E-06	7.03E-07	2.38E-08	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	4.45E-07	2.94E-07	9.94E-09	1.51E-07	9.98E-08	3.38E-09	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	4.03E-06	7.97E-07	9.00E-08	1.37E-06	2.71E-07	3.05E-08	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	2.85E-07	2.63E-07	6.36E-09	5.69E-07	5.26E-07	1.27E-08	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	7.52E-07	6.95E-07	1.68E-08	1.50E-06	1.39E-06	3.36E-08	NA	NA	NA	NA	NA	NA
Benzene (C)	1.46E-09	4.80E-12	3.25E-11	8.01E-11	2.64E-13	8.88E-13	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	8.18E-06	5.40E-06	1.83E-07	1.14E-07	7.56E-08	2.56E-09	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	2.13E-10	4.21E-11	4.75E-12	1.32E-11	2.61E-12	2.94E-13	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	2.13E-10	4.21E-11	4.75E-12	1.79E-11	3.54E-12	3.99E-13	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	1.01E-09	2.01E-10	2.27E-11	4.06E-12	8.03E-13	9.06E-14	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	2.13E-10	7.02E-13	4.75E-12	1.59E-10	5.26E-13	7.31E-14	NA	NA	NA	NA	NA	NA
beta-BHC (C)	8.83E-10	5.83E-10	1.97E-11	1.59E-09	1.05E-09	3.55E-11	NA	NA	NA	NA	NA	NA
Total TCDD (C)	3.60E-12	7.12E-13	8.04E-14	5.40E-07	1.07E-07	9.28E-09	NA	NA	NA	NA	NA	NA

Table 3-20: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	ILCR - Swimming		ILCR- Wading	Exposure	ILCR	Exposure		ILCR	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	NA	NA	9.01E-07	NA	NA	1.35E-06	NA	NA	4.01E-06	2.98E-06	6.01E-06	4.46E-06
Beryllium (C)	NA	NA	9.99E-09	NA	NA	8.39E-08	NA	NA	6.79E-08	1.68E-08	5.70E-07	1.41E-07
Cadmium (C)	NA	NA	5.36E-08	NA	NA	3.38E-07	NA	NA	1.03E-07	2.56E-09	6.51E-07	1.61E-08
Chromium (C)	NA	NA	5.36E-08	NA	NA	2.25E-06	NA	NA	2.33E-06	5.77E-07	9.80E-05	2.42E-05
Chromium (total) (C)	NA	NA	2.44E-07	NA	NA	1.02E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	NA	NA	1.95E-08	NA	NA	1.91E-07	NA	NA	5.90E-07	1.46E-07	5.79E-06	1.43E-06
Lead (C)			4.31E-07			0.00E+00			2.12E-05	5.24E-06	0.00E+00	0.00E+00
Acenaphthylene (C)	NA	NA	1.72E-05	NA	NA	1.25E-07	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	NA	NA	1.15E-04	NA	NA	8.43E-05	NA	NA	4.13E-07	1.33E-06	3.02E-07	9.71E-07
Benzo(a)pyrene (C)	NA	NA	1.51E-04	NA	NA	1.10E-03	NA	NA	4.13E-07	1.33E-06	3.02E-06	9.71E-06
Benzo(b)fluoranthene (C)	NA	NA	8.51E-05	NA	NA	6.21E-05	NA	NA	3.54E-07	1.14E-06	2.59E-07	8.32E-07
Benzo(g,h,i)perylene	NA	NA	2.44E-04	NA	NA	1.78E-05	NA	NA	1.48E-07	4.75E-07	1.08E-08	3.47E-08
Benzo(k)fluoranthene (C)	NA	NA	1.46E-04	NA	NA	1.07E-05	NA	NA	3.69E-07	1.19E-06	2.69E-08	8.67E-08
Chrysene (C)	NA	NA	1.25E-04	NA	NA	9.16E-07	NA	NA	3.84E-07	1.23E-06	2.80E-09	9.01E-09
Dibenz(a,h)anthracene (C)	NA	NA	2.05E-04	NA	NA	1.49E-03	NA	NA	6.94E-08	2.23E-07	5.06E-07	1.63E-06
Indeno(1,2,3-cd)pyrene (C)	NA	NA	2.72E-04	NA	NA	1.98E-04	NA	NA	1.85E-07	5.94E-07	1.35E-07	4.33E-07
Phenanthrene (C)	NA	NA	2.79E-05	NA	NA	2.04E-07	NA	NA	7.38E-07	2.37E-06	5.39E-09	1.73E-08
1,2-Dichloroethane (C)	NA	NA	6.50E-08	NA	NA	5.92E-09	NA	NA	1.55E-08	1.15E-08	1.41E-09	1.05E-09
4,4'-DDD (C)	NA	NA	9.74E-07	NA	NA	2.34E-07	NA	NA	4.35E-07	1.08E-06	1.05E-07	2.59E-07
4,4'-DDE (C)	NA	NA	2.23E-06	NA	NA	7.59E-07	NA	NA	2.73E-07	6.76E-07	9.28E-08	2.30E-07
4,4'-DDT (C)	NA	NA	2.58E-06	NA	NA	8.78E-07	NA	NA	5.61E-06	4.16E-06	1.91E-06	1.42E-06
Aroclor 1248 (C)	NA	NA	1.33E-05	NA	NA	2.66E-05	NA	NA	5.76E-09	1.99E-08	1.15E-08	3.99E-08
Aroclor 1260 (C)	NA	NA	1.33E-04	NA	NA	2.67E-04	NA	NA	8.12E-09	2.81E-08	1.62E-08	5.63E-08
Benzene (C)	NA	NA	2.25E-05	NA	NA	1.24E-06	NA	NA	6.44E-10	7.97E-12	3.54E-11	4.39E-13
bis(2-Ethylhexyl)phthalate (C)	NA	NA	8.04E-05	NA	NA	1.13E-06	NA	NA	2.21E-08	5.48E-08	3.10E-10	7.67E-10
Bromodichloromethane (C)	NA	NA	5.36E-06	NA	NA	3.32E-07	NA	NA	6.44E-10	4.78E-10	3.99E-11	2.97E-11
Dibromochloromethane (C)	NA	NA	5.70E-08	NA	NA	4.79E-09	NA	NA	6.44E-10	4.78E-10	5.41E-11	4.02E-11
Methyl tert-butyl ether (C)	NA	NA	3.13E-08	NA	NA	1.25E-10	NA	NA	6.44E-10	4.78E-10	2.58E-12	1.91E-12
Vinyl Chloride (C)	NA	NA	1.70E-06	NA	NA	1.28E-06	NA	NA	6.44E-10	7.97E-12	4.83E-10	5.98E-12
beta-BHC (C)	NA	NA	3.29E-07	NA	NA	5.92E-07	NA	NA	1.17E-10	2.89E-10	2.10E-10	5.20E-10
Total TCDD (C)	NA	NA	0.00E+00	NA	NA	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-20: Cont'd

Chemical (Qualifier)	F. Fish		Total ILCR	Total ILCR
	Exposure Ingestion	ILCR Ingestion		
Arsenic (C)	NA	NA	2.38E-05	2.38E-05
Beryllium (C)	NA	NA	2.92E-06	2.92E-06
Cadmium (C)	NA	NA	4.99E-06	4.99E-06
Chromium (C)	NA	NA	7.25E-04	7.25E-04
Chromium (total) (C)	NA	NA	3.24E-04	3.24E-04
Cobalt (C)	NA	NA	3.58E-05	3.58E-05
Lead (C)			0.00E+00	0.00E+00
Acenaphthylene (C)	NA	NA	1.46E-07	1.46E-07
Benzo(a)anthracene (C)	NA	NA	8.71E-05	8.71E-05
Benzo(a)pyrene (C)	NA	NA	1.14E-03	1.14E-03
Benzo(b)fluoranthene (C)	NA	NA	6.63E-05	6.63E-05
Benzo(g,h,i)perylene	NA	NA	1.79E-05	1.79E-05
Benzo(k)fluoranthene (C)	NA	NA	1.08E-05	1.08E-05
Chrysene (C)	NA	NA	9.72E-07	9.72E-07
Dibenz(a,h)anthracene (C)	NA	NA	1.50E-03	1.50E-03
Indeno(1,2,3-cd)pyrene (C)	NA	NA	2.00E-04	2.00E-04
Phenanthrene (C)	NA	NA	2.37E-07	2.37E-07
1,2-Dichloroethane (C)	NA	NA	1.02E-07	1.02E-07
4,4'-DDD (C)	NA	NA	2.39E-06	2.39E-06
4,4'-DDE (C)	NA	NA	1.34E-06	1.34E-06
4,4'-DDT (C)	NA	NA	5.87E-06	5.87E-06
Aroclor 1248 (C)	NA	NA	2.77E-05	2.77E-05
Aroclor 1260 (C)	NA	NA	2.70E-04	2.70E-04
Benzene (C)	NA	NA	1.24E-06	1.24E-06
bis(2-Ethylhexyl)phthalate (C)	NA	NA	1.32E-06	1.32E-06
Bromodichloromethane (C)	NA	NA	3.32E-07	3.32E-07
Dibromochloromethane (C)	NA	NA	4.90E-09	4.90E-09
Methyl tert-butyl ether (C)	NA	NA	1.35E-10	1.35E-10
Vinyl Chloride (C)	NA	NA	1.28E-06	1.28E-06
beta-BHC (C)	NA	NA	5.95E-07	5.95E-07
Total TCDD (C)	NA	NA	6.56E-07	6.56E-07

Table 3-21: Summary of exposure dose and hazard quotient by media for construction workers.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	3.56E-02	4.90E-04	2.76E-04	3.56E-02	4.90E-04	2.76E-01	6.32E-02	8.69E-04	4.91E-04	6.32E-02	8.69E-04	4.91E-01
Antimony (NC)	3.35E-05	4.61E-07	2.60E-07	8.39E-02	1.15E-03	4.55E-03	4.84E-05	6.65E-07	3.75E-07	1.21E-01	1.66E-03	6.56E-03
Arsenic (C)	5.82E-05	2.40E-06	4.51E-07	1.94E-01	8.00E-03	1.50E-03	8.89E-05	3.67E-06	6.90E-07	2.96E-01	1.22E-02	2.30E-03
Barium (NC)	3.37E-04	4.64E-06	2.62E-06	4.82E-03	6.62E-05	1.87E-02	6.02E-04	8.28E-06	4.67E-06	8.60E-03	1.18E-04	3.34E-02
Beryllium (C)	2.40E-06	3.30E-08	1.86E-08	1.20E-03	1.65E-05	3.26E-03	3.69E-06	5.07E-08	2.86E-08	1.84E-03	2.53E-05	5.00E-03
Cadmium (C)	6.36E-06	8.74E-09	4.93E-08	6.36E-03	8.74E-06	8.65E-04	7.68E-06	1.06E-08	5.95E-08	7.68E-03	1.06E-05	1.04E-03
Chromium (C)	1.36E-04	1.87E-06	1.05E-06	4.53E-02	6.22E-04	3.69E-02	9.06E-05	1.25E-06	7.03E-07	3.02E-02	4.15E-04	2.46E-02
Chromium (total) (C)	7.09E-05	9.75E-07	5.50E-07	2.36E-02	3.25E-04	1.93E-02	9.20E-05	1.26E-06	7.13E-07	3.07E-02	4.22E-04	2.50E-02
Cobalt (C)	2.75E-05	3.78E-07	2.13E-07	1.37E-03	1.89E-05	3.74E-02	5.14E-05	7.07E-07	3.99E-07	2.57E-03	3.53E-05	7.00E-02
Copper (NC)	1.21E-04	1.66E-06	9.39E-07	3.03E-03	4.16E-05	2.35E-05	1.02E-04	1.41E-06	7.95E-07	2.56E-03	3.52E-05	1.99E-05
Iron (NC)	9.33E-02	1.28E-03	7.24E-04	3.11E-01	4.28E-03	2.41E-03	9.03E-05	1.24E-06	7.00E-07	3.01E-04	4.14E-06	2.33E-06
Lead (C)	4.32E-04	5.94E-06	3.35E-06	NA	NA	NA	3.36E-04	4.62E-06	2.60E-06	NA	NA	NA
Manganese (NC)	1.38E-03	1.90E-05	1.07E-05	6.91E-02	9.50E-04	7.51E-01	2.26E-03	3.10E-05	1.75E-05	1.13E-01	1.55E-03	1.22E+00
Mercury (NC)	7.71E-07	1.06E-08	5.98E-09	9.00E-03	1.24E-04	6.98E-05	1.09E-06	1.49E-08	8.42E-09	1.27E-02	1.74E-04	9.82E-05
Nickel (NC)	7.90E-05	1.09E-06	6.13E-07	3.95E-03	5.43E-05	3.06E-05	1.23E-04	1.70E-06	9.57E-07	6.17E-03	8.49E-05	4.79E-05
Thallium (NC)	9.87E-06	1.36E-07	7.66E-08	1.41E-01	1.94E-03	1.09E-03	7.81E-06	1.07E-07	6.06E-08	1.12E-01	1.53E-03	8.66E-04
Vanadium (NC)	1.12E-04	1.54E-06	8.71E-07	3.74E-01	5.15E-03	2.90E-03	1.31E-04	1.80E-06	1.02E-06	4.36E-01	6.00E-03	3.38E-03
Zinc (NC)	8.71E-04	1.20E-05	6.76E-06	2.90E-03	3.99E-05	2.25E-05	4.09E-04	5.63E-06	3.17E-06	1.36E-03	1.88E-05	1.06E-05
Acenaphthylene (C)	1.59E-05	2.83E-06	1.23E-07	NA	NA	NA	6.43E-05	1.15E-05	4.98E-07	NA	NA	NA
Anthracene (NC)	2.86E-06	5.11E-07	2.22E-08	9.52E-06	1.70E-06	7.39E-08	2.66E-05	4.75E-06	2.06E-07	8.86E-05	1.58E-05	6.87E-07
Benzo(a)anthracene (C)	1.16E-05	2.08E-06	9.02E-08	NA	NA	NA	2.78E-05	4.97E-06	2.16E-07	NA	NA	NA
Benzo(a)pyrene (C)	1.56E-05	2.79E-06	1.21E-07	NA	NA	NA	2.15E-05	3.85E-06	1.67E-07	NA	NA	NA
Benzo(b)fluoranthene (C)	2.33E-05	4.16E-06	1.81E-07	NA	NA	NA	2.09E-05	3.73E-06	1.62E-07	NA	NA	NA
Benzo(g,h,i)perylene	6.90E-06	1.23E-06	5.35E-08	NA	NA	NA	2.66E-05	4.75E-06	2.06E-07	NA	NA	NA
Benzo(k)fluoranthene (C)	1.35E-06	2.42E-07	1.05E-08	NA	NA	NA	2.51E-05	4.48E-06	1.94E-07	NA	NA	NA
Chrysene (C)	3.35E-05	6.00E-06	2.60E-07	NA	NA	NA	1.90E-05	3.40E-06	1.48E-07	NA	NA	NA
Dibenz(a,h)anthracene (C)	2.79E-06	4.99E-07	2.17E-08	NA	NA	NA	2.66E-05	4.75E-06	2.06E-07	NA	NA	NA
Fluoranthene (NC)	2.89E-05	5.17E-06	2.24E-07	7.23E-04	1.29E-04	5.61E-06	3.01E-05	5.38E-06	2.33E-07	7.52E-04	1.34E-04	5.84E-06
Indeno(1,2,3-cd)pyrene (C)	5.28E-06	9.43E-07	4.09E-08	NA	NA	NA	2.66E-05	4.75E-06	2.06E-07	NA	NA	NA
Naphthalene (NC)	2.86E-06	5.11E-07	2.22E-08	1.43E-04	2.56E-05	2.59E-05	2.10E-05	3.75E-06	1.63E-07	1.05E-03	1.87E-04	1.90E-04
Phenanthrene (C)	8.15E-06	1.46E-06	6.32E-08	NA	NA	NA	2.88E-05	5.15E-06	2.23E-07	NA	NA	NA
2-Methylnaphthylene (NC)	8.72E-06	1.56E-06	6.77E-08	2.18E-03	3.90E-04	1.69E-05	5.95E-06	1.06E-06	4.62E-08	1.49E-03	2.66E-04	1.15E-05
1,2-Dichloroethane (C)	8.72E-06	3.60E-07	6.77E-08	4.36E-04	1.80E-05	4.83E-05	5.95E-06	2.46E-07	4.62E-08	2.98E-04	1.23E-05	3.30E-05
1,2,4-Trimethylbenzene (NC)	2.20E-09	9.07E-11	1.71E-11	4.40E-08	1.81E-09	1.00E-08	2.20E-09	9.07E-11	1.71E-11	4.40E-08	1.81E-09	1.00E-08
1,3,5-Trimethylbenzene (NC)	2.20E-09	9.07E-11	1.71E-11	4.40E-08	1.81E-09	1.00E-08	2.20E-08	9.07E-10	1.71E-10	4.40E-07	1.81E-08	1.00E-07
4,4'-DDD (C)	4.59E-05	6.31E-06	3.56E-07	NA	NA	NA	3.00E-06	4.12E-07	2.33E-08	NA	NA	NA
4,4'-DDE (C)	4.60E-06	6.32E-07	3.57E-08	NA	NA	NA	2.32E-06	3.19E-07	1.80E-08	NA	NA	NA
4,4'-DDT (C)	4.16E-05	1.72E-06	3.23E-07	8.33E-02	3.43E-03	6.46E-04	1.45E-06	5.98E-08	1.13E-08	2.90E-03	1.20E-04	2.25E-05
Aroclor 1248 (C)	2.94E-06	5.66E-07	2.28E-08	NA	NA	NA	1.66E-07	3.19E-08	1.29E-09	NA	NA	NA
Aroclor 1260 (C)	7.78E-06	1.50E-06	6.03E-08	NA	NA	NA	2.11E-06	4.07E-07	1.64E-08	NA	NA	NA
Benzene (C)	1.50E-08	1.03E-11	1.17E-10	3.76E-06	2.59E-09	1.36E-08	2.83E-08	1.94E-11	2.19E-10	7.07E-06	4.86E-09	2.56E-08
bis(2-Ethylhexyl)phthalate (C)	8.45E-05	1.16E-05	6.56E-07	4.23E-03	5.81E-04	3.28E-05	2.45E-05	3.37E-06	1.90E-07	1.22E-03	1.68E-04	9.50E-06
Bromodichloromethane (C)	2.20E-09	9.07E-11	1.71E-11	1.10E-07	4.53E-09	8.53E-10	2.20E-09	9.07E-11	1.71E-11	1.10E-07	4.53E-09	8.53E-10
Chloroform (C)	1.50E-08	6.21E-10	1.17E-10	1.50E-06	6.21E-08	8.34E-09	1.50E-08	6.21E-10	1.17E-10	1.50E-06	6.21E-08	8.34E-09
Dibromochloromethane (C)	2.20E-09	9.07E-11	1.71E-11	1.10E-07	4.53E-09	8.53E-10	2.20E-09	9.07E-11	1.71E-11	1.10E-07	4.53E-09	8.53E-10
Di-n-butylphthalate (NC)	1.67E-05	2.30E-06	1.30E-07	1.67E-04	2.30E-05	1.30E-06	1.41E-05	1.93E-06	1.09E-07	1.41E-04	1.93E-05	1.09E-06
Ethylbenzene (NC)	1.50E-08	6.21E-10	1.17E-10	1.50E-07	6.21E-09	4.09E-10	3.23E-08	1.33E-09	2.51E-10	3.23E-07	1.33E-08	8.77E-10
Methyl tert-butyl ether (C)	1.05E-08	4.32E-10	8.13E-11	1.22E-08	5.04E-10	9.49E-11	3.31E-07	1.37E-08	2.57E-09	3.87E-07	1.59E-08	3.00E-09
n-Butylbenzene (NC)	4.57E-09	1.88E-10	3.54E-11	1.14E-07	4.71E-09	8.85E-10	4.40E-09	1.81E-10	3.41E-11	1.10E-07	4.53E-09	8.53E-10
Toluene (NC)	3.38E-09	1.39E-10	2.62E-11	1.69E-08	6.97E-10	2.30E-10	2.93E-08	1.21E-09	2.27E-10	1.46E-07	6.04E-09	1.99E-09
Vinyl Chloride (C)	2.20E-09	1.51E-12	1.71E-11	7.33E-07	5.04E-10	5.97E-10	2.20E-09	1.51E-12	1.71E-11	7.33E-07	5.04E-10	5.97E-10
m,p-Xylene (NC)	2.20E-09	9.07E-11	1.71E-11	1.10E-08	4.53E-10	5.97E-10	2.20E-09	9.07E-11	1.71E-11	1.10E-08	4.53E-10	5.97E-10
ortho-xylene (NC)	2.20E-09	9.07E-11	1.71E-11	1.10E-08	4.53E-10	5.97E-10	2.20E-09	9.07E-11	1.71E-11	1.10E-08	4.53E-10	5.97E-10
Xylenes (total) (NC)	2.94E-08	1.21E-09	2.28E-10	1.47E-07	6.07E-09	7.99E-09	5.75E-08	2.37E-09	4.46E-10	2.87E-07	1.19E-08	1.56E-08
beta-BHC (C)	9.13E-09	1.26E-09	7.08E-11	NA	NA	NA	2.37E-07	3.25E-08	1.84E-09	NA	NA	NA
Total TCDD (C)	3.72E-11	1.53E-12	2.89E-13	NA	NA	NA	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA

Table 3-21: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure	HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	NA	NA	1.90E-04	NA	NA	1.90E-04	3.14E-02	3.14E-02	5.81E-03	9.81E-04	5.81E-03	9.81E-04
Antimony (NC)	NA	NA	3.72E-07	NA	NA	9.30E-04	9.30E-06	2.32E-02	2.15E-06	3.63E-07	5.37E-03	9.07E-04
Arsenic (C)	NA	NA	6.88E-06	NA	NA	2.29E-02	7.72E-05	2.57E-01	4.49E-05	2.27E-05	1.50E-01	7.57E-02
Barium (NC)	NA	NA	1.82E-05	NA	NA	2.60E-04	1.18E-03	1.69E-02	1.09E-04	1.84E-05	1.56E-03	2.63E-04
Beryllium (C)	NA	NA	7.63E-08	NA	NA	3.81E-05	3.91E-06	1.95E-03	7.60E-07	1.28E-07	3.80E-04	6.42E-05
Cadmium (C)	NA	NA	4.09E-07	NA	NA	4.09E-04	7.40E-06	7.40E-03	1.16E-06	1.95E-08	1.16E-03	1.95E-05
Chromium (C)	NA	NA	4.84E-06	NA	NA	1.61E-03	1.60E-04	5.33E-02	2.61E-05	4.41E-06	8.71E-03	1.47E-03
Chromium (total) (C)	NA	NA	1.86E-06	NA	NA	6.20E-04	1.56E-04	5.21E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	NA	NA	4.46E-07	NA	NA	2.23E-05	1.30E-05	6.51E-04	6.61E-06	1.12E-06	3.31E-04	5.58E-05
Copper (NC)	NA	NA	8.37E-06	NA	NA	2.09E-04	6.58E-06	1.65E-04	4.69E-05	7.91E-06	1.17E-03	1.98E-04
Iron (NC)	NA	NA	1.66E-03	NA	NA	5.54E-03	7.05E-02	2.35E-01	2.29E-02	3.86E-03	7.63E-02	1.29E-02
Lead (C)	NA	NA	3.29E-06	NA	NA	NA	2.19E-05	NA	2.37E-04	4.00E-05	NA	NA
Manganese (NC)	NA	NA	9.71E-05	NA	NA	4.85E-03	2.53E-03	1.26E-01	3.44E-04	5.80E-05	1.72E-02	2.90E-03
Mercury (NC)	NA	NA	9.30E-08	NA	NA	1.08E-03	1.12E-07	1.30E-03	2.48E-07	4.18E-08	2.89E-03	4.88E-04
Nickel (NC)	NA	NA	8.15E-07	NA	NA	4.07E-05	1.03E-05	5.15E-04	4.48E-05	7.56E-06	2.24E-03	3.78E-04
Thallium (NC)	NA	NA	9.30E-07	NA	NA	1.33E-02	5.58E-07	7.97E-03	1.64E-06	2.78E-07	2.35E-02	3.97E-03
Vanadium (NC)	NA	NA	9.30E-07	NA	NA	3.10E-03	1.27E-04	4.25E-01	2.19E-05	3.70E-06	7.30E-02	1.23E-02
Zinc (NC)	NA	NA	8.83E-05	NA	NA	2.94E-04	2.42E-04	8.06E-04	1.00E-03	1.69E-04	3.33E-03	5.63E-04
Acenaphthylene (C)	NA	NA	1.31E-04	NA	NA	NA	1.31E-04	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	NA	NA	2.09E-04	NA	NA	6.97E-04	2.09E-04	6.97E-04	2.73E-06	5.98E-06	9.09E-06	1.99E-05
Benzo(a)anthracene (C)	NA	NA	8.82E-04	NA	NA	NA	8.82E-04	NA	4.63E-06	1.02E-05	NA	NA
Benzo(a)pyrene (C)	NA	NA	1.15E-03	NA	NA	NA	1.15E-03	NA	4.63E-06	1.02E-05	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	6.50E-04	NA	NA	NA	6.50E-04	NA	3.97E-06	8.70E-06	NA	NA
Benzo(g,h,i)perylene	NA	NA	1.86E-03	NA	NA	NA	1.86E-03	NA	1.65E-06	3.63E-06	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	1.12E-03	NA	NA	NA	1.12E-03	NA	4.13E-06	9.07E-06	NA	NA
Chrysene (C)	NA	NA	9.58E-04	NA	NA	NA	9.58E-04	NA	4.30E-06	9.43E-06	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	1.56E-03	NA	NA	NA	1.56E-03	NA	7.77E-07	1.70E-06	NA	NA
Fluoranthene (NC)	NA	NA	4.77E-04	NA	NA	1.19E-02	4.77E-04	1.19E-02	9.92E-06	2.18E-05	2.48E-04	5.44E-04
Indeno(1,2,3-cd)pyrene (C)	NA	NA	2.07E-03	NA	NA	NA	2.07E-03	NA	2.07E-06	4.53E-06	NA	NA
Naphthalene (NC)	NA	NA	6.45E-05	NA	NA	3.23E-03	4.13E-04	2.07E-02	9.92E-08	2.18E-07	4.96E-06	1.09E-05
Phenanthrene (C)	NA	NA	2.13E-04	NA	NA	NA	2.13E-04	NA	8.27E-06	1.81E-05	NA	NA
2-Methylnaphthylene (NC)	NA	NA	1.32E-05	NA	NA	3.30E-03	7.66E-04	1.91E-01	1.74E-07	3.81E-07	4.34E-05	9.52E-05
1,2-Dichloroethane (C)	NA	NA	4.97E-07	NA	NA	2.48E-05	2.88E-05	1.44E-03	1.74E-07	8.79E-08	8.68E-06	4.39E-06
1,2,4-Trimethylbenzene (NC)	NA	NA	9.95E-05	NA	NA	1.99E-03	1.19E-04	2.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	NA	NA	9.95E-06	NA	NA	1.99E-04	4.18E-05	8.36E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	NA	NA	7.44E-06	NA	NA	NA	3.72E-06	NA	4.88E-06	8.23E-06	NA	NA
4,4'-DDE (C)	NA	NA	1.70E-05	NA	NA	NA	8.52E-06	NA	3.06E-06	5.16E-06	NA	NA
4,4'-DDT (C)	NA	NA	1.97E-05	NA	NA	3.94E-02	9.86E-06	1.97E-02	6.28E-05	3.18E-05	1.26E-01	6.36E-02
Aroclor 1248 (C)	NA	NA	0.00E+00	NA	NA	NA	1.01E-04	NA	6.45E-08	1.52E-07	NA	NA
Aroclor 1260 (C)	NA	NA	1.02E-03	NA	NA	NA	1.02E-03	NA	9.09E-08	2.15E-07	NA	NA
Benzene (C)	NA	NA	1.72E-04	NA	NA	4.30E-02	1.75E-02	4.37E+00	7.22E-09	6.09E-11	1.80E-06	1.52E-08
bis(2-Ethylhexyl)phthalate (C)	NA	NA	6.14E-04	NA	NA	3.07E-02	1.60E-03	7.98E-02	2.48E-07	4.18E-07	1.24E-05	2.09E-05
Bromodichloromethane (C)	NA	NA	4.09E-05	NA	NA	2.05E-03	1.02E-05	5.11E-04	7.22E-09	3.65E-09	3.61E-07	1.83E-07
Chloroform (C)	NA	NA	1.90E-04	NA	NA	1.90E-02	3.95E-04	3.95E-02	7.22E-09	3.65E-09	7.22E-07	3.65E-07
Dibromochloromethane (C)	NA	NA	4.35E-07	NA	NA	2.18E-05	3.63E-07	1.81E-05	7.22E-09	3.65E-09	3.61E-07	1.83E-07
Di-n-butylphthalate (NC)	NA	NA	1.47E-03	NA	NA	1.47E-02	5.67E-04	5.67E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	NA	NA	5.58E-04	NA	NA	5.58E-03	4.04E-02	4.04E-01	7.22E-09	3.65E-09	7.22E-08	3.65E-08
Methyl tert-butyl ether (C)	NA	NA	2.39E-07	NA	NA	2.79E-07	1.81E-04	2.11E-04	7.22E-09	3.65E-09	8.42E-09	4.26E-09
n-Butylbenzene (NC)	NA	NA	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	NA	NA	8.99E-04	NA	NA	4.50E-03	8.49E-02	4.24E-01	1.16E-07	5.86E-08	5.79E-07	2.93E-07
Vinyl Chloride (C)	NA	NA	1.30E-05	NA	NA	4.34E-03	5.73E-05	1.91E-02	7.22E-09	6.09E-11	2.41E-06	2.03E-08
m,p-Xylene (NC)	NA	NA	1.30E-04	NA	NA	6.51E-04	1.77E-02	8.85E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	NA	NA	1.30E-04	NA	NA	6.51E-04	8.07E-03	4.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	NA	NA	1.30E-03	NA	NA	6.51E-03	1.33E-01	6.64E-01	7.22E-09	3.65E-09	3.61E-08	1.83E-08
beta-BHC (C)	NA	NA	2.51E-06	NA	NA	NA	2.51E-06	NA	1.31E-09	2.20E-09	NA	NA
Total TCDD (C)	NA	NA	0.00E+00	NA	NA	NA	0.00E+00	NA	0.00E+00	0.00E+00	NA	NA

Table 3-21: Cont'd

Chemical (Qualifier)	F. Fish		Total Hazard Quotient	Total Hazard No Fish
	Exposure Ingestion	HQ Ingestion		
Aluminum (NC)	NA	NA	9.06E-01	9.06E-01
Antimony (NC)	NA	NA	2.49E-01	2.49E-01
Arsenic (C)	NA	NA	1.02E+00	1.02E+00
Barium (NC)	NA	NA	8.46E-02	8.46E-02
Beryllium (C)	NA	NA	1.38E-02	1.38E-02
Cadmium (C)	NA	NA	2.50E-02	2.50E-02
Chromium (C)	NA	NA	2.03E-01	2.03E-01
Chromium (total) (C)	NA	NA	1.52E-01	1.52E-01
Cobalt (C)	NA	NA	1.12E-01	1.12E-01
Copper (NC)	NA	NA	7.45E-03	7.45E-03
Iron (NC)	NA	NA	6.48E-01	6.48E-01
Lead (C)	NA	NA	NA	NA
Manganese (NC)	NA	NA	2.31E+00	2.31E+00
Mercury (NC)	NA	NA	2.79E-02	2.79E-02
Nickel (NC)	NA	NA	1.35E-02	1.35E-02
Thallium (NC)	NA	NA	3.07E-01	3.07E-01
Vanadium (NC)	NA	NA	1.34E+00	1.34E+00
Zinc (NC)	NA	NA	9.36E-03	9.36E-03
Acenaphthylene (C)	NA	NA	NA	NA
Anthracene (NC)	NA	NA	1.54E-03	1.54E-03
Benzo(a)anthracene (C)	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	2.64E-02	2.64E-02
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	2.55E-02	2.55E-02
Phenanthrene (C)	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	1.99E-01	1.99E-01
1,2-Dichloroethane (C)	NA	NA	2.32E-03	2.32E-03
1,2,4-Trimethylbenzene (NC)	NA	NA	4.38E-03	4.38E-03
1,3,5-Trimethylbenzene (NC)	NA	NA	1.04E-03	1.04E-03
4,4'-DDD (C)	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	3.39E-01	3.39E-01
Aroclor 1248 (C)	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA
Benzene (C)	NA	NA	4.41E+00	4.41E+00
bis(2-Ethylhexyl)phthalate (C)	NA	NA	1.17E-01	1.17E-01
Bromodichloromethane (C)	NA	NA	2.56E-03	2.56E-03
Chloroform (C)	NA	NA	5.85E-02	5.85E-02
Dibromochloromethane (C)	NA	NA	4.07E-05	4.07E-05
Di-n-butylphthalate (NC)	NA	NA	2.08E-02	2.08E-02
Ethylbenzene (NC)	NA	NA	4.10E-01	4.10E-01
Methyl tert-butyl ether (C)	NA	NA	2.12E-04	2.12E-04
n-Butylbenzene (NC)	NA	NA	2.35E-07	2.35E-07
Toluene (NC)	NA	NA	4.29E-01	4.29E-01
Vinyl Chloride (C)	NA	NA	2.34E-02	2.34E-02
m,p-Xylene (NC)	NA	NA	8.92E-02	8.92E-02
ortho-xylene (NC)	NA	NA	4.10E-02	4.10E-02
Xylenes (total) (NC)	NA	NA	6.70E-01	6.70E-01
beta-BHC (C)	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA

Table 3-22: Summary of exposure dose and ILCR by media for construction workers.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Arsenic (C)	8.31E-07	3.43E-08	6.45E-09	1.25E-06	5.14E-08	9.70E-08	1.27E-06	5.24E-08	9.86E-09	1.91E-06	7.86E-08	1.48E-07
Beryllium (C)	3.43E-08	4.72E-10	2.66E-10	2.88E-07	3.96E-09	2.23E-09	5.27E-08	7.24E-10	4.08E-10	4.42E-07	6.08E-09	3.43E-09
Cadmium (C)	9.08E-08	1.25E-10	7.05E-10	5.72E-07	7.87E-10	4.44E-09	1.10E-07	1.51E-10	8.51E-10	6.91E-07	9.50E-10	5.36E-09
Chromium (C)	1.94E-06	2.67E-08	1.50E-08	8.15E-05	1.12E-06	6.32E-07	1.29E-06	1.78E-08	1.00E-08	5.44E-05	7.48E-07	4.22E-07
Chromium (total) (C)	1.01E-06	1.39E-08	7.86E-09	4.25E-05	5.85E-07	3.30E-07	1.31E-06	1.81E-08	1.02E-08	5.52E-05	7.59E-07	4.28E-07
Cobalt (C)	3.93E-07	5.40E-09	3.05E-09	3.85E-06	5.29E-08	2.99E-08	7.34E-07	1.01E-08	5.70E-09	7.20E-06	9.89E-08	5.58E-08
Lead (C)	6.17E-06	8.48E-08	4.78E-08	0.00E+00	0.00E+00	0.00E+00	4.80E-06	6.60E-08	3.72E-08	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene (C)	2.27E-07	4.05E-08	1.76E-09	1.65E-09	2.96E-10	5.45E-12	9.18E-07	1.64E-07	7.12E-09	6.70E-09	1.20E-09	2.21E-11
Benzo(a)anthracene (C)	1.66E-07	2.97E-08	1.29E-09	1.21E-07	2.17E-08	4.00E-10	3.98E-07	7.11E-08	3.08E-09	2.90E-07	5.19E-08	9.56E-10
Benzo(a)pyrene (C)	2.23E-07	3.98E-08	1.73E-09	1.63E-06	2.91E-07	5.36E-09	3.08E-07	5.50E-08	2.39E-09	2.25E-06	4.02E-07	7.40E-09
Benzo(b)fluoranthene (C)	3.33E-07	5.95E-08	2.58E-09	2.43E-07	4.34E-08	8.00E-10	2.98E-07	5.33E-08	2.31E-09	2.18E-07	3.89E-08	7.17E-10
Benzo(g,h,i)perylene	9.85E-08	1.76E-08	7.64E-10	7.19E-09	1.29E-09	2.37E-11	3.80E-07	6.79E-08	2.95E-09	2.77E-08	4.95E-09	9.13E-11
Benzo(k)fluoranthene (C)	1.93E-08	3.45E-09	1.50E-10	1.41E-09	2.52E-10	4.65E-12	3.58E-07	6.40E-08	2.78E-09	2.61E-08	4.67E-09	8.61E-11
Chrysene (C)	4.79E-07	8.57E-08	3.72E-09	3.50E-09	6.25E-10	1.15E-11	2.72E-07	4.86E-08	2.11E-09	1.99E-09	3.55E-10	6.54E-12
Dibenz(a,h)anthracene (C)	3.99E-08	7.13E-09	3.10E-10	2.91E-07	5.21E-08	9.60E-10	3.80E-07	6.79E-08	2.95E-09	2.77E-06	4.95E-07	9.13E-09
Indeno(1,2,3-cd)pyrene (C)	7.54E-08	1.35E-08	5.85E-10	5.50E-08	9.83E-09	1.81E-10	3.80E-07	6.79E-08	2.95E-09	2.77E-07	4.95E-08	9.13E-10
Phenanthrene (C)	1.16E-07	2.08E-08	9.03E-10	8.50E-10	1.52E-10	2.80E-12	4.12E-07	7.36E-08	3.19E-09	3.00E-09	5.37E-10	9.90E-12
1,2-Dichloroethane (C)	1.25E-07	5.14E-09	9.67E-10	1.13E-08	4.68E-10	8.80E-11	8.50E-08	3.51E-09	6.60E-10	7.74E-09	3.19E-10	6.00E-11
4,4'-DDD (C)	6.55E-07	9.01E-08	5.08E-09	1.57E-07	2.16E-08	1.22E-09	4.28E-08	5.89E-09	3.32E-10	1.03E-08	1.41E-09	7.98E-11
4,4'-DDE (C)	6.57E-08	9.03E-09	5.10E-10	2.23E-08	3.07E-09	1.73E-10	3.31E-08	4.56E-09	2.57E-10	1.13E-08	1.55E-09	8.74E-11
4,4'-DDT (C)	5.95E-07	2.45E-08	4.61E-09	2.02E-07	8.34E-09	1.57E-09	2.07E-08	8.55E-10	1.61E-10	7.05E-09	2.91E-10	5.46E-11
Aroclor 1248 (C)	4.20E-08	8.09E-09	3.26E-10	8.41E-08	1.62E-08	6.52E-10	2.37E-09	4.56E-10	1.84E-11	4.73E-09	9.11E-10	3.67E-11
Aroclor 1260 (C)	1.11E-07	2.14E-08	8.62E-10	2.22E-07	4.28E-08	1.72E-09	3.02E-08	5.81E-09	2.34E-10	6.04E-08	1.16E-08	4.68E-10
Benzene (C)	2.15E-10	1.48E-13	1.67E-12	1.18E-11	8.13E-15	4.55E-14	4.04E-10	2.78E-13	3.13E-12	2.22E-11	1.53E-14	8.55E-14
bis(2-Ethylhexyl)phthalate (C)	1.21E-06	1.66E-07	9.37E-09	1.69E-08	2.32E-09	1.31E-10	3.50E-07	4.81E-08	2.71E-09	4.90E-09	6.73E-10	3.80E-11
Bromodichloromethane (C)	3.14E-11	1.30E-12	2.44E-13	1.95E-12	8.03E-14	1.51E-14	3.14E-11	1.30E-12	2.44E-13	1.95E-12	8.03E-14	1.51E-14
Chloroform (C)	2.15E-10	8.87E-12	1.67E-12	0.00E+00	0.00E+00	1.34E-13	2.15E-10	8.87E-12	1.67E-12	0.00E+00	0.00E+00	1.34E-13
Dibromochloromethane (C)	3.14E-11	1.30E-12	2.44E-13	2.64E-12	1.09E-13	2.05E-14	3.14E-11	1.30E-12	2.44E-13	2.64E-12	1.09E-13	2.05E-14
Methyl tert-butyl ether (C)	1.50E-10	6.18E-12	1.16E-12	5.99E-13	2.47E-14	4.65E-15	4.73E-09	1.95E-10	3.67E-11	1.89E-11	7.81E-13	1.47E-13
Vinyl Chloride (C)	3.14E-11	2.16E-14	2.44E-13	2.36E-11	1.62E-14	3.75E-15	3.14E-11	2.16E-14	2.44E-13	2.36E-11	1.62E-14	3.75E-15
beta-BHC (C)	1.30E-10	1.79E-11	1.01E-12	2.35E-10	3.23E-11	1.82E-12	3.38E-09	4.65E-10	2.62E-11	6.09E-09	8.37E-10	4.72E-11
Total TCDD (C)	5.31E-13	2.19E-14	4.12E-15	7.97E-08	3.29E-09	4.76E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-22: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	ILCR - Swimming		ILCR - Wading	Exposure	ILCR	Exposure		ILCR	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	NA	NA	9.83E-08	NA	NA	1.47E-07	1.10E-06	1.65E-06	6.41E-07	3.25E-07	9.62E-07	4.87E-07
Beryllium (C)	NA	NA	1.09E-09	NA	NA	9.15E-09	5.58E-08	4.69E-07	1.09E-08	1.83E-09	9.13E-08	1.54E-08
Cadmium (C)	NA	NA	5.85E-09	NA	NA	3.68E-08	1.06E-07	6.66E-07	1.65E-08	2.79E-10	1.04E-07	1.76E-09
Chromium (C)	NA	NA	6.91E-08	NA	NA	2.90E-06	2.28E-06	9.60E-05	3.73E-07	6.30E-08	1.57E-05	2.64E-06
Chromium (total) (C)	NA	NA	2.66E-08	NA	NA	1.12E-06	2.23E-06	9.37E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	NA	NA	6.38E-09	NA	NA	6.25E-08	1.86E-07	1.82E-06	9.45E-08	1.59E-08	9.26E-07	1.56E-07
Lead (C)			4.70E-08			0.00E+00	3.14E-07	0.00E+00	3.39E-06	5.72E-07	0.00E+00	0.00E+00
Acenaphthylene (C)	NA	NA	1.87E-06	NA	NA	1.37E-08	1.87E-06	1.37E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	NA	NA	1.26E-05	NA	NA	9.19E-06	1.26E-05	9.19E-06	6.61E-08	1.45E-07	4.83E-08	1.06E-07
Benzo(a)pyrene (C)	NA	NA	1.65E-05	NA	NA	1.20E-04	1.65E-05	1.20E-04	6.61E-08	1.45E-07	4.83E-07	1.06E-06
Benzo(b)fluoranthene (C)	NA	NA	9.29E-06	NA	NA	6.78E-06	9.29E-06	6.78E-06	5.67E-08	1.24E-07	4.14E-08	9.08E-08
Benzo(g,h,i)perylene	NA	NA	2.66E-05	NA	NA	1.94E-06	2.66E-05	1.94E-06	2.36E-08	5.18E-08	1.72E-09	3.78E-09
Benzo(k)fluoranthene (C)	NA	NA	1.59E-05	NA	NA	1.16E-06	1.59E-05	1.16E-06	5.90E-08	1.30E-07	4.31E-09	9.46E-09
Chrysene (C)	NA	NA	1.37E-05	NA	NA	9.99E-08	1.37E-05	9.99E-08	6.14E-08	1.35E-07	4.48E-10	9.83E-10
Dibenz(a,h)anthracene (C)	NA	NA	2.23E-05	NA	NA	1.63E-04	2.23E-05	1.63E-04	1.11E-08	2.44E-08	8.10E-08	1.78E-07
Indeno(1,2,3-cd)pyrene (C)	NA	NA	2.96E-05	NA	NA	2.16E-05	2.96E-05	2.16E-05	2.95E-08	6.48E-08	2.16E-08	4.73E-08
Phenanthrene (C)	NA	NA	3.04E-06	NA	NA	2.22E-08	3.04E-06	2.22E-08	1.18E-07	2.59E-07	8.62E-10	1.89E-09
1,2-Dichloroethane (C)	NA	NA	7.09E-09	NA	NA	6.46E-10	4.11E-07	3.74E-08	2.48E-09	1.26E-09	2.26E-10	1.14E-10
4,4'-DDD (C)	NA	NA	1.06E-07	NA	NA	2.55E-08	5.31E-08	1.28E-08	6.97E-08	1.18E-07	1.67E-08	2.82E-08
4,4'-DDE (C)	NA	NA	2.43E-07	NA	NA	8.27E-08	1.22E-07	4.14E-08	4.37E-08	7.37E-08	1.49E-08	2.51E-08
4,4'-DDT (C)	NA	NA	2.82E-07	NA	NA	9.58E-08	1.41E-07	4.79E-08	8.97E-07	4.54E-07	3.05E-07	1.54E-07
Aroclor 1248 (C)	NA	NA	0.00E+00	NA	NA	0.00E+00	1.45E-06	2.90E-06	9.21E-10	2.18E-09	1.84E-09	4.35E-09
Aroclor 1260 (C)	NA	NA	1.46E-05	NA	NA	2.91E-05	1.46E-05	2.91E-05	1.30E-09	3.07E-09	2.60E-09	6.14E-09
Benzene (C)	NA	NA	2.46E-06	NA	NA	1.35E-07	2.50E-04	1.37E-05	1.03E-10	8.70E-13	5.67E-12	4.78E-14
bis(2-Ethylhexyl)phthalate (C)	NA	NA	8.77E-06	NA	NA	1.23E-07	2.28E-05	3.19E-07	3.54E-09	5.98E-09	4.96E-11	8.37E-11
Bromodichloromethane (C)	NA	NA	5.85E-07	NA	NA	3.62E-08	1.46E-07	9.06E-09	1.03E-10	5.22E-11	6.39E-12	3.24E-12
Chloroform (C)	NA	NA	2.71E-06	NA	NA	0.00E+00	5.65E-06	0.00E+00	1.03E-10	5.22E-11	0.00E+00	0.00E+00
Dibromochloromethane (C)	NA	NA	6.22E-09	NA	NA	5.22E-10	5.18E-09	4.35E-10	1.03E-10	5.22E-11	8.66E-12	4.38E-12
Methyl tert-butyl ether (C)	NA	NA	3.41E-09	NA	NA	1.37E-11	2.58E-06	1.03E-08	1.03E-10	5.22E-11	4.12E-13	2.09E-13
Vinyl Chloride (C)	NA	NA	1.86E-07	NA	NA	1.39E-07	8.18E-07	6.14E-07	1.03E-10	8.70E-13	7.73E-11	6.52E-13
beta-BHC (C)	NA	NA	3.59E-08	NA	NA	6.46E-08	3.59E-08	6.46E-08	1.87E-11	3.15E-11	3.36E-11	5.67E-11
Total TCDD (C)	NA	NA	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-22: Cont'd

Chemical (Qualifier)	F. Fish		Total ILCR	Total ILCR
	Exposure Ingestion	ILCR Ingestion		
Arsenic (C)	NA	NA	6.78E-06	6.78E-06
Beryllium (C)	NA	NA	1.33E-06	1.33E-06
Cadmium (C)	NA	NA	2.08E-06	2.08E-06
Chromium (C)	NA	NA	2.56E-04	2.56E-04
Chromium (total) (C)	NA	NA	1.95E-04	1.95E-04
Cobalt (C)	NA	NA	1.42E-05	1.42E-05
Lead (C)			0.00E+00	0.00E+00
Acenaphthylene (C)	NA	NA	3.72E-08	3.72E-08
Benzo(a)anthracene (C)	NA	NA	1.90E-05	1.90E-05
Benzo(a)pyrene (C)	NA	NA	2.47E-04	2.47E-04
Benzo(b)fluoranthene (C)	NA	NA	1.42E-05	1.42E-05
Benzo(g,h,i)perylene	NA	NA	3.93E-06	3.93E-06
Benzo(k)fluoranthene (C)	NA	NA	2.37E-06	2.37E-06
Chrysene (C)	NA	NA	2.08E-07	2.08E-07
Dibenz(a,h)anthracene (C)	NA	NA	3.30E-04	3.30E-04
Indeno(1,2,3-cd)pyrene (C)	NA	NA	4.37E-05	4.37E-05
Phenanthrene (C)	NA	NA	5.17E-08	5.17E-08
1,2-Dichloroethane (C)	NA	NA	5.84E-08	5.84E-08
4,4'-DDD (C)	NA	NA	2.75E-07	2.75E-07
4,4'-DDE (C)	NA	NA	2.03E-07	2.03E-07
4,4'-DDT (C)	NA	NA	8.23E-07	8.23E-07
Aroclor 1248 (C)	NA	NA	3.01E-06	3.01E-06
Aroclor 1260 (C)	NA	NA	5.86E-05	5.86E-05
Benzene (C)	NA	NA	1.39E-05	1.39E-05
bis(2-Ethylhexyl)phthalate (C)	NA	NA	4.67E-07	4.67E-07
Bromodichloromethane (C)	NA	NA	4.53E-08	4.53E-08
Chloroform (C)	NA	NA	2.68E-13	2.68E-13
Dibromochloromethane (C)	NA	NA	9.76E-10	9.76E-10
Methyl tert-butyl ether (C)	NA	NA	1.04E-08	1.04E-08
Vinyl Chloride (C)	NA	NA	7.53E-07	7.53E-07
beta-BHC (C)	NA	NA	1.36E-07	1.36E-07
Total TCDD (C)	NA	NA	8.35E-08	8.35E-08

Table 3-23: Summary of exposure dose and hazard quotient by media for off-site child receptors.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	NA	NA	1.17E-03	NA	NA	1.17E+00	NA	NA	3.47E-04	NA	NA	3.47E-01
Antimony (NC)	NA	NA	1.11E-06	NA	NA	1.93E-02	NA	NA	2.65E-07	NA	NA	4.65E-03
Arsenic (C)	NA	NA	1.92E-06	NA	NA	6.39E-03	NA	NA	4.88E-07	NA	NA	1.63E-03
Barium (NC)	NA	NA	1.11E-05	NA	NA	7.93E-02	NA	NA	3.30E-06	NA	NA	2.36E-02
Beryllium (C)	NA	NA	7.91E-08	NA	NA	1.38E-02	NA	NA	2.02E-08	NA	NA	3.54E-03
Cadmium (C)	NA	NA	2.09E-07	NA	NA	3.67E-03	NA	NA	4.21E-08	NA	NA	7.39E-04
Chromium (C)	NA	NA	4.47E-06	NA	NA	1.57E-01	NA	NA	4.98E-07	NA	NA	1.74E-02
Chromium (total) (C)	NA	NA	2.34E-06	NA	NA	8.18E-02	NA	NA	5.05E-07	NA	NA	1.77E-02
Cobalt (C)	NA	NA	9.06E-07	NA	NA	1.59E-01	NA	NA	2.82E-07	NA	NA	4.95E-02
Copper (NC)	NA	NA	3.99E-06	NA	NA	9.97E-05	NA	NA	5.63E-07	NA	NA	1.41E-05
Iron (NC)	NA	NA	3.07E-03	NA	NA	1.02E-02	NA	NA	4.96E-07	NA	NA	1.65E-06
Lead (C)	NA	NA	1.42E-05	NA	NA	NA	NA	NA	1.84E-06	NA	NA	NA
Manganese (NC)	NA	NA	4.55E-05	NA	NA	3.19E+00	NA	NA	1.24E-05	NA	NA	8.67E-01
Mercury (NC)	NA	NA	2.54E-08	NA	NA	2.96E-04	NA	NA	5.96E-09	NA	NA	6.95E-05
Nickel (NC)	NA	NA	2.60E-06	NA	NA	1.30E-04	NA	NA	6.78E-07	NA	NA	3.39E-05
Thallium (NC)	NA	NA	3.25E-07	NA	NA	4.65E-03	NA	NA	4.29E-08	NA	NA	6.13E-04
Vanadium (NC)	NA	NA	3.70E-06	NA	NA	1.23E-02	NA	NA	7.19E-07	NA	NA	2.40E-03
Zinc (NC)	NA	NA	2.87E-05	NA	NA	9.56E-05	NA	NA	2.25E-06	NA	NA	7.49E-06
Acenaphthylene (C)	NA	NA	5.22E-07	NA	NA	NA	NA	NA	3.53E-07	NA	NA	NA
Anthracene (NC)	NA	NA	9.41E-08	NA	NA	3.14E-07	NA	NA	1.46E-07	NA	NA	4.86E-07
Benzo(a)anthracene (C)	NA	NA	3.83E-07	NA	NA	NA	NA	NA	1.53E-07	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	5.14E-07	NA	NA	NA	NA	NA	1.18E-07	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	7.68E-07	NA	NA	NA	NA	NA	1.15E-07	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	2.27E-07	NA	NA	NA	NA	NA	1.46E-07	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	4.46E-08	NA	NA	NA	NA	NA	1.38E-07	NA	NA	NA
Chrysene (C)	NA	NA	1.11E-06	NA	NA	NA	NA	NA	1.05E-07	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	9.20E-08	NA	NA	NA	NA	NA	1.46E-07	NA	NA	NA
Fluoranthene (NC)	NA	NA	9.52E-07	NA	NA	2.38E-05	NA	NA	1.65E-07	NA	NA	4.13E-06
Indeno(1,2,3-cd)pyrene (C)	NA	NA	1.74E-07	NA	NA	NA	NA	NA	1.46E-07	NA	NA	NA
Naphthalene (NC)	NA	NA	9.42E-08	NA	NA	1.10E-04	NA	NA	1.15E-07	NA	NA	1.34E-04
Phenanthrene (C)	NA	NA	2.68E-07	NA	NA	NA	NA	NA	1.58E-07	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	2.87E-07	NA	NA	7.19E-05	NA	NA	3.27E-08	NA	NA	8.17E-06
1,2-Dichloroethane (C)	NA	NA	2.87E-07	NA	NA	2.05E-04	NA	NA	3.27E-08	NA	NA	2.33E-05
1,2,4-Trimethylbenzene (NC)	NA	NA	7.24E-11	NA	NA	4.26E-08	NA	NA	1.21E-11	NA	NA	7.10E-09
1,3,5-Trimethylbenzene (NC)	NA	NA	7.24E-11	NA	NA	4.26E-08	NA	NA	1.21E-10	NA	NA	7.10E-08
4,4'-DDD (C)	NA	NA	1.51E-06	NA	NA	NA	NA	NA	1.65E-08	NA	NA	NA
4,4'-DDE (C)	NA	NA	1.51E-07	NA	NA	NA	NA	NA	1.27E-08	NA	NA	NA
4,4'-DDT (C)	NA	NA	1.37E-06	NA	NA	2.74E-03	NA	NA	7.96E-09	NA	NA	1.59E-05
Aroclor 1248 (C)	NA	NA	9.69E-08	NA	NA	NA	NA	NA	9.10E-10	NA	NA	NA
Aroclor 1260 (C)	NA	NA	2.56E-07	NA	NA	NA	NA	NA	1.16E-08	NA	NA	NA
Benzene (C)	NA	NA	4.96E-10	NA	NA	5.78E-08	NA	NA	1.55E-10	NA	NA	1.81E-08
bis(2-Ethylhexyl)phthalate (C)	NA	NA	2.78E-06	NA	NA	1.39E-04	NA	NA	1.34E-07	NA	NA	6.72E-06
Bromodichloromethane (C)	NA	NA	7.24E-11	NA	NA	3.62E-09	NA	NA	1.21E-11	NA	NA	6.03E-10
Chloroform (C)	NA	NA	4.96E-10	NA	NA	3.54E-08	NA	NA	8.26E-11	NA	NA	5.90E-09
Dibromochloromethane (C)	NA	NA	7.24E-11	NA	NA	3.62E-09	NA	NA	1.21E-11	NA	NA	6.03E-10
Di-n-butylphthalate (NC)	NA	NA	5.50E-07	NA	NA	5.50E-06	NA	NA	7.72E-08	NA	NA	7.72E-07
Ethylbenzene (NC)	NA	NA	4.96E-10	NA	NA	1.73E-09	NA	NA	1.77E-10	NA	NA	6.21E-10
Methyl tert-butyl ether (C)	NA	NA	3.45E-10	NA	NA	4.03E-10	NA	NA	1.82E-09	NA	NA	2.12E-09
n-Butylbenzene (NC)	NA	NA	1.50E-10	NA	NA	3.76E-09	NA	NA	2.41E-11	NA	NA	6.03E-10
Toluene (NC)	NA	NA	1.11E-10	NA	NA	9.75E-10	NA	NA	1.61E-10	NA	NA	1.41E-09
Vinyl Chloride (C)	NA	NA	7.24E-11	NA	NA	2.53E-09	NA	NA	1.21E-11	NA	NA	4.22E-10
m,p-Xylene (NC)	NA	NA	7.24E-11	NA	NA	2.53E-09	NA	NA	1.21E-11	NA	NA	4.22E-10
ortho-xylene (NC)	NA	NA	7.24E-11	NA	NA	2.53E-09	NA	NA	1.21E-11	NA	NA	4.22E-10
Xylenes (total) (NC)	NA	NA	9.69E-10	NA	NA	3.39E-08	NA	NA	3.16E-10	NA	NA	1.10E-08
beta-BHC (C)	NA	NA	3.01E-10	NA	NA	NA	NA	NA	1.30E-09	NA	NA	NA
Total TCDD (C)	NA	NA	1.23E-12	NA	NA	NA	NA	NA	0.00E+00	NA	NA	NA

Table 3-23: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure	HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-23: Cont'd

Chemical (Qualifier)	F. Fish		Total Hazard Quotient	Total Hazard No Fish
	Exposure Ingestion	HQ Ingestion		
Aluminum (NC)	NA	NA	1.52E+00	1.52E+00
Antimony (NC)	NA	NA	2.40E-02	2.40E-02
Arsenic (C)	NA	NA	8.01E-03	8.01E-03
Barium (NC)	NA	NA	1.03E-01	1.03E-01
Beryllium (C)	NA	NA	1.74E-02	1.74E-02
Cadmium (C)	NA	NA	4.41E-03	4.41E-03
Chromium (C)	NA	NA	1.74E-01	1.74E-01
Chromium (total) (C)	NA	NA	9.94E-02	9.94E-02
Cobalt (C)	NA	NA	2.08E-01	2.08E-01
Copper (NC)	NA	NA	1.14E-04	1.14E-04
Iron (NC)	NA	NA	1.02E-02	1.02E-02
Lead (C)	NA	NA	NA	NA
Manganese (NC)	NA	NA	4.05E+00	4.05E+00
Mercury (NC)	NA	NA	3.66E-04	3.66E-04
Nickel (NC)	NA	NA	1.64E-04	1.64E-04
Thallium (NC)	NA	NA	5.26E-03	5.26E-03
Vanadium (NC)	NA	NA	1.47E-02	1.47E-02
Zinc (NC)	NA	NA	1.03E-04	1.03E-04
Acenaphthylene (C)	NA	NA	NA	NA
Anthracene (NC)	NA	NA	8.00E-07	8.00E-07
Benzo(a)anthracene (C)	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	2.79E-05	2.79E-05
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	2.44E-04	2.44E-04
Phenanthrene (C)	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	8.00E-05	8.00E-05
1,2-Dichloroethane (C)	NA	NA	2.29E-04	2.29E-04
1,2,4-Trimethylbenzene (NC)	NA	NA	4.97E-08	4.97E-08
1,3,5-Trimethylbenzene (NC)	NA	NA	1.14E-07	1.14E-07
4,4'-DDD (C)	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	2.76E-03	2.76E-03
Aroclor 1248 (C)	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA
Benzene (C)	NA	NA	7.59E-08	7.59E-08
bis(2-Ethylhexyl)phthalate (C)	NA	NA	1.46E-04	1.46E-04
Bromodichloromethane (C)	NA	NA	4.22E-09	4.22E-09
Chloroform (C)	NA	NA	4.13E-08	4.13E-08
Dibromochloromethane (C)	NA	NA	4.22E-09	4.22E-09
Di-n-butylphthalate (NC)	NA	NA	6.28E-06	6.28E-06
Ethylbenzene (NC)	NA	NA	2.36E-09	2.36E-09
Methyl tert-butyl ether (C)	NA	NA	2.53E-09	2.53E-09
n-Butylbenzene (NC)	NA	NA	4.36E-09	4.36E-09
Toluene (NC)	NA	NA	2.38E-09	2.38E-09
Vinyl Chloride (C)	NA	NA	2.96E-09	2.96E-09
m,p-Xylene (NC)	NA	NA	2.96E-09	2.96E-09
ortho-xylene (NC)	NA	NA	2.96E-09	2.96E-09
Xylenes (total) (NC)	NA	NA	4.50E-08	4.50E-08
beta-BHC (C)	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA

Table 3-24: Summary of exposure dose and hazard quotient by media for off-site adult receptors.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	NA	NA	4.18E-04	NA	NA	4.18E-01	NA	NA	3.09E-05	NA	NA	3.09E-02
Antimony (NC)	NA	NA	3.93E-07	NA	NA	6.88E-03	NA	NA	2.36E-08	NA	NA	4.13E-04
Arsenic (C)	NA	NA	6.82E-07	NA	NA	2.27E-03	NA	NA	4.34E-08	NA	NA	1.45E-04
Barium (NC)	NA	NA	3.95E-06	NA	NA	2.82E-02	NA	NA	2.94E-07	NA	NA	2.10E-03
Beryllium (C)	NA	NA	2.81E-08	NA	NA	4.92E-03	NA	NA	1.80E-09	NA	NA	3.15E-04
Cadmium (C)	NA	NA	7.45E-08	NA	NA	1.31E-03	NA	NA	3.75E-09	NA	NA	6.58E-05
Chromium (C)	NA	NA	1.59E-06	NA	NA	5.57E-02	NA	NA	4.42E-08	NA	NA	1.55E-03
Chromium (total) (C)	NA	NA	8.31E-07	NA	NA	2.91E-02	NA	NA	4.49E-08	NA	NA	1.57E-03
Cobalt (C)	NA	NA	3.22E-07	NA	NA	5.65E-02	NA	NA	2.51E-08	NA	NA	4.40E-03
Copper (NC)	NA	NA	1.42E-06	NA	NA	3.55E-05	NA	NA	5.00E-08	NA	NA	1.25E-06
Iron (NC)	NA	NA	1.09E-03	NA	NA	3.64E-03	NA	NA	4.41E-08	NA	NA	1.47E-07
Lead (C)	NA	NA	5.06E-06	NA	NA	NA	NA	NA	1.64E-07	NA	NA	NA
Manganese (NC)	NA	NA	1.62E-05	NA	NA	1.13E+00	NA	NA	1.10E-06	NA	NA	7.71E-02
Mercury (NC)	NA	NA	9.03E-09	NA	NA	1.05E-04	NA	NA	5.30E-10	NA	NA	6.18E-06
Nickel (NC)	NA	NA	9.26E-07	NA	NA	4.63E-05	NA	NA	6.03E-08	NA	NA	3.01E-06
Thallium (NC)	NA	NA	1.16E-07	NA	NA	1.65E-03	NA	NA	3.81E-09	NA	NA	5.45E-05
Vanadium (NC)	NA	NA	1.32E-06	NA	NA	4.39E-03	NA	NA	6.39E-08	NA	NA	2.13E-04
Zinc (NC)	NA	NA	1.02E-05	NA	NA	3.40E-05	NA	NA	2.00E-07	NA	NA	6.66E-07
Acenaphthylene (C)	NA	NA	1.86E-07	NA	NA	NA	NA	NA	3.14E-08	NA	NA	NA
Anthracene (NC)	NA	NA	3.35E-08	NA	NA	1.12E-07	NA	NA	1.30E-08	NA	NA	4.33E-08
Benzo(a)anthracene (C)	NA	NA	1.36E-07	NA	NA	NA	NA	NA	1.36E-08	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	1.83E-07	NA	NA	NA	NA	NA	1.05E-08	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	2.73E-07	NA	NA	NA	NA	NA	1.02E-08	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	8.08E-08	NA	NA	NA	NA	NA	1.30E-08	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	1.59E-08	NA	NA	NA	NA	NA	1.22E-08	NA	NA	NA
Chrysene (C)	NA	NA	3.93E-07	NA	NA	NA	NA	NA	9.30E-09	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	3.27E-08	NA	NA	NA	NA	NA	1.30E-08	NA	NA	NA
Fluoranthene (NC)	NA	NA	3.39E-07	NA	NA	8.47E-06	NA	NA	1.47E-08	NA	NA	3.67E-07
Indeno(1,2,3-cd)pyrene (C)	NA	NA	6.18E-08	NA	NA	NA	NA	NA	1.30E-08	NA	NA	NA
Naphthalene (NC)	NA	NA	3.35E-08	NA	NA	3.91E-05	NA	NA	1.02E-08	NA	NA	1.19E-05
Phenanthrene (C)	NA	NA	9.55E-08	NA	NA	NA	NA	NA	1.41E-08	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	1.02E-07	NA	NA	2.56E-05	NA	NA	2.91E-09	NA	NA	7.26E-07
1,2-Dichloroethane (C)	NA	NA	1.02E-07	NA	NA	7.30E-05	NA	NA	2.91E-09	NA	NA	2.08E-06
1,2,4-Trimethylbenzene (NC)	NA	NA	2.58E-11	NA	NA	1.52E-08	NA	NA	1.07E-12	NA	NA	6.31E-10
1,3,5-Trimethylbenzene (NC)	NA	NA	2.58E-11	NA	NA	1.52E-08	NA	NA	1.07E-11	NA	NA	6.31E-09
4,4'-DDD (C)	NA	NA	5.37E-07	NA	NA	NA	NA	NA	1.46E-09	NA	NA	NA
4,4'-DDE (C)	NA	NA	5.39E-08	NA	NA	NA	NA	NA	1.13E-09	NA	NA	NA
4,4'-DDT (C)	NA	NA	4.88E-07	NA	NA	9.76E-04	NA	NA	7.08E-10	NA	NA	1.42E-06
Aroclor 1248 (C)	NA	NA	3.45E-08	NA	NA	NA	NA	NA	8.09E-11	NA	NA	NA
Aroclor 1260 (C)	NA	NA	9.11E-08	NA	NA	NA	NA	NA	1.03E-09	NA	NA	NA
Benzene (C)	NA	NA	1.76E-10	NA	NA	2.06E-08	NA	NA	1.38E-11	NA	NA	1.61E-09
bis(2-Ethylhexyl)phthalate (C)	NA	NA	9.91E-07	NA	NA	4.95E-05	NA	NA	1.20E-08	NA	NA	5.98E-07
Bromodichloromethane (C)	NA	NA	2.58E-11	NA	NA	1.29E-09	NA	NA	1.07E-12	NA	NA	5.37E-11
Chloroform (C)	NA	NA	1.76E-10	NA	NA	1.26E-08	NA	NA	7.35E-12	NA	NA	5.25E-10
Dibromochloromethane (C)	NA	NA	2.58E-11	NA	NA	1.29E-09	NA	NA	1.07E-12	NA	NA	5.37E-11
Di-n-butylphthalate (NC)	NA	NA	1.96E-07	NA	NA	1.96E-06	NA	NA	6.87E-09	NA	NA	6.87E-08
Ethylbenzene (NC)	NA	NA	1.76E-10	NA	NA	6.17E-10	NA	NA	1.58E-11	NA	NA	5.52E-11
Methyl tert-butyl ether (C)	NA	NA	1.23E-10	NA	NA	1.43E-10	NA	NA	1.62E-10	NA	NA	1.89E-10
n-Butylbenzene (NC)	NA	NA	5.35E-11	NA	NA	1.34E-09	NA	NA	2.15E-12	NA	NA	5.37E-11
Toluene (NC)	NA	NA	3.96E-11	NA	NA	3.47E-10	NA	NA	1.43E-11	NA	NA	1.25E-10
Vinyl Chloride (C)	NA	NA	2.58E-11	NA	NA	9.01E-10	NA	NA	1.07E-12	NA	NA	3.76E-11
m,p-Xylene (NC)	NA	NA	2.58E-11	NA	NA	9.01E-10	NA	NA	1.07E-12	NA	NA	3.76E-11
ortho-xylene (NC)	NA	NA	2.58E-11	NA	NA	9.01E-10	NA	NA	1.07E-12	NA	NA	3.76E-11
Xylenes (total) (NC)	NA	NA	3.45E-10	NA	NA	1.21E-08	NA	NA	2.81E-11	NA	NA	9.82E-10
beta-BHC (C)	NA	NA	1.07E-10	NA	NA	NA	NA	NA	1.16E-10	NA	NA	NA
Total TCDD (C)	NA	NA	4.36E-13	NA	NA	NA	NA	NA	0.00E+00	NA	NA	NA

Table 3-24: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure	HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-24: Cont'd

Chemical (Qualifier)	F. Fish		Total Hazard Quotient	Total Hazard No Fish
	Exposure Ingestion	HQ Ingestion		
Aluminum (NC)	NA	NA	4.48E-01	4.48E-01
Antimony (NC)	NA	NA	7.29E-03	7.29E-03
Arsenic (C)	NA	NA	2.42E-03	2.42E-03
Barium (NC)	NA	NA	3.03E-02	3.03E-02
Beryllium (C)	NA	NA	5.24E-03	5.24E-03
Cadmium (C)	NA	NA	1.37E-03	1.37E-03
Chromium (C)	NA	NA	5.72E-02	5.72E-02
Chromium (total) (C)	NA	NA	3.07E-02	3.07E-02
Cobalt (C)	NA	NA	6.09E-02	6.09E-02
Copper (NC)	NA	NA	3.67E-05	3.67E-05
Iron (NC)	NA	NA	3.64E-03	3.64E-03
Lead (C)	NA	NA	NA	NA
Manganese (NC)	NA	NA	1.21E+00	1.21E+00
Mercury (NC)	NA	NA	1.12E-04	1.12E-04
Nickel (NC)	NA	NA	4.93E-05	4.93E-05
Thallium (NC)	NA	NA	1.71E-03	1.71E-03
Vanadium (NC)	NA	NA	4.60E-03	4.60E-03
Zinc (NC)	NA	NA	3.47E-05	3.47E-05
Acenaphthylene (C)	NA	NA	NA	NA
Anthracene (NC)	NA	NA	1.55E-07	1.55E-07
Benzo(a)anthracene (C)	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	8.84E-06	8.84E-06
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	5.11E-05	5.11E-05
Phenanthrene (C)	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	2.63E-05	2.63E-05
1,2-Dichloroethane (C)	NA	NA	7.51E-05	7.51E-05
1,2,4-Trimethylbenzene (NC)	NA	NA	1.58E-08	1.58E-08
1,3,5-Trimethylbenzene (NC)	NA	NA	2.15E-08	2.15E-08
4,4'-DDD (C)	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	9.77E-04	9.77E-04
Aroclor 1248 (C)	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA
Benzene (C)	NA	NA	2.22E-08	2.22E-08
bis(2-Ethylhexyl)phthalate (C)	NA	NA	5.01E-05	5.01E-05
Bromodichloromethane (C)	NA	NA	1.34E-09	1.34E-09
Chloroform (C)	NA	NA	1.31E-08	1.31E-08
Dibromochloromethane (C)	NA	NA	1.34E-09	1.34E-09
Di-n-butylphthalate (NC)	NA	NA	2.03E-06	2.03E-06
Ethylbenzene (NC)	NA	NA	6.72E-10	6.72E-10
Methyl tert-butyl ether (C)	NA	NA	3.32E-10	3.32E-10
n-Butylbenzene (NC)	NA	NA	1.39E-09	1.39E-09
Toluene (NC)	NA	NA	4.72E-10	4.72E-10
Vinyl Chloride (C)	NA	NA	9.39E-10	9.39E-10
m,p-Xylene (NC)	NA	NA	9.39E-10	9.39E-10
ortho-xylene (NC)	NA	NA	9.39E-10	9.39E-10
Xylenes (total) (NC)	NA	NA	1.30E-08	1.30E-08
beta-BHC (C)	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA

Table 3-25: Summary of exposure dose and ILCR by media for off-site adult receptors.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Arsenic (C)	NA	NA	2.34E-07	NA	NA	3.52E-06	NA	NA	1.49E-08	NA	NA	2.24E-07
Beryllium (C)	NA	NA	9.65E-09	NA	NA	8.10E-08	NA	NA	6.17E-10	NA	NA	5.18E-09
Cadmium (C)	NA	NA	2.55E-08	NA	NA	1.61E-07	NA	NA	1.28E-09	NA	NA	8.10E-09
Chromium (C)	NA	NA	5.45E-07	NA	NA	2.29E-05	NA	NA	1.52E-08	NA	NA	6.37E-07
Chromium (total) (C)	NA	NA	2.85E-07	NA	NA	1.20E-05	NA	NA	1.54E-08	NA	NA	6.47E-07
Cobalt (C)	NA	NA	1.10E-07	NA	NA	1.08E-06	NA	NA	8.60E-09	NA	NA	8.43E-08
Lead (C)			1.73E-06			0.00E+00			5.62E-08			0.00E+00
Acenaphthylene (C)	NA	NA	6.37E-08	NA	NA	1.98E-10	NA	NA	1.08E-08	NA	NA	3.33E-11
Benzo(a)anthracene (C)	NA	NA	4.67E-08	NA	NA	1.45E-08	NA	NA	4.66E-09	NA	NA	1.44E-09
Benzo(a)pyrene (C)	NA	NA	6.26E-08	NA	NA	1.94E-07	NA	NA	3.61E-09	NA	NA	1.12E-08
Benzo(b)fluoranthene (C)	NA	NA	9.36E-08	NA	NA	2.90E-08	NA	NA	3.49E-09	NA	NA	1.08E-09
Benzo(g,h,i)perylene	NA	NA	2.77E-08	NA	NA	8.59E-10	NA	NA	4.45E-09	NA	NA	1.38E-10
Benzo(k)fluoranthene (C)	NA	NA	5.43E-09	NA	NA	1.68E-10	NA	NA	4.19E-09	NA	NA	1.30E-10
Chrysene (C)	NA	NA	1.35E-07	NA	NA	4.18E-10	NA	NA	3.19E-09	NA	NA	9.88E-12
Dibenz(a,h)anthracene (C)	NA	NA	1.12E-08	NA	NA	3.48E-08	NA	NA	4.45E-09	NA	NA	1.38E-08
Indeno(1,2,3-cd)pyrene (C)	NA	NA	2.12E-08	NA	NA	6.57E-09	NA	NA	4.45E-09	NA	NA	1.38E-09
Phenanthrene (C)	NA	NA	3.27E-08	NA	NA	1.01E-10	NA	NA	4.82E-09	NA	NA	1.50E-11
1,2-Dichloroethane (C)	NA	NA	3.51E-08	NA	NA	3.19E-09	NA	NA	9.96E-10	NA	NA	9.07E-11
4,4'-DDD (C)	NA	NA	1.84E-07	NA	NA	4.42E-08	NA	NA	5.02E-10	NA	NA	1.21E-10
4,4'-DDE (C)	NA	NA	1.85E-08	NA	NA	6.28E-09	NA	NA	3.88E-10	NA	NA	1.32E-10
4,4'-DDT (C)	NA	NA	1.67E-07	NA	NA	5.68E-08	NA	NA	2.43E-10	NA	NA	8.24E-11
Aroclor 1248 (C)	NA	NA	1.18E-08	NA	NA	2.36E-08	NA	NA	2.77E-11	NA	NA	5.55E-11
Aroclor 1260 (C)	NA	NA	3.12E-08	NA	NA	6.25E-08	NA	NA	3.54E-10	NA	NA	7.08E-10
Benzene (C)	NA	NA	6.05E-11	NA	NA	1.65E-12	NA	NA	4.73E-12	NA	NA	1.29E-13
bis(2-Ethylhexyl)phthalate (C)	NA	NA	3.40E-07	NA	NA	4.76E-09	NA	NA	4.10E-09	NA	NA	5.74E-11
Bromodichloromethane (C)	NA	NA	8.83E-12	NA	NA	5.48E-13	NA	NA	3.68E-13	NA	NA	2.28E-14
Chloroform (C)	NA	NA	6.05E-11	NA	NA	4.87E-12	NA	NA	2.52E-12	NA	NA	2.03E-13
Dibromochloromethane (C)	NA	NA	8.83E-12	NA	NA	7.42E-13	NA	NA	3.68E-13	NA	NA	3.09E-14
Methyl tert-butyl ether (C)	NA	NA	4.21E-11	NA	NA	1.68E-13	NA	NA	5.55E-11	NA	NA	2.22E-13
Vinyl Chloride (C)	NA	NA	8.83E-12	NA	NA	1.36E-13	NA	NA	3.68E-13	NA	NA	5.67E-15
beta-BHC (C)	NA	NA	3.67E-11	NA	NA	6.60E-11	NA	NA	3.96E-11	NA	NA	7.13E-11
Total TCDD (C)	NA	NA	1.49E-13	NA	NA	1.73E-08	NA	NA	0.00E+00	NA	NA	0.00E+00

Table 3-25: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	ILCR - Swimming		LCR - Wading	Exposure	ILCR	Exposure		ILCR	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (C)												
Acenaphthylene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-25: Cont'd

Chemical (Qualifier)	F. Fish		Total ILCR	Total ILCR
	Exposure Ingestion	ILCR Ingestion		No Fish
Arsenic (C)	NA	NA	3.74E-06	3.74E-06
Beryllium (C)	NA	NA	8.62E-08	8.62E-08
Cadmium (C)	NA	NA	1.69E-07	1.69E-07
Chromium (C)	NA	NA	2.35E-05	2.35E-05
Chromium (total) (C)	NA	NA	1.26E-05	1.26E-05
Cobalt (C)	NA	NA	1.17E-06	1.17E-06
Lead (C)			0.00E+00	0.00E+00
Acenaphthylene (C)	NA	NA	2.31E-10	2.31E-10
Benzo(a)anthracene (C)	NA	NA	1.59E-08	1.59E-08
Benzo(a)pyrene (C)	NA	NA	2.05E-07	2.05E-07
Benzo(b)fluoranthene (C)	NA	NA	3.01E-08	3.01E-08
Benzo(g,h,i)perylene	NA	NA	9.97E-10	9.97E-10
Benzo(k)fluoranthene (C)	NA	NA	2.98E-10	2.98E-10
Chrysene (C)	NA	NA	4.28E-10	4.28E-10
Dibenz(a,h)anthracene (C)	NA	NA	4.86E-08	4.86E-08
Indeno(1,2,3-cd)pyrene (C)	NA	NA	7.95E-09	7.95E-09
Phenanthrene (C)	NA	NA	1.16E-10	1.16E-10
1,2-Dichloroethane (C)	NA	NA	3.28E-09	3.28E-09
4,4'-DDD (C)	NA	NA	4.43E-08	4.43E-08
4,4'-DDE (C)	NA	NA	6.41E-09	6.41E-09
4,4'-DDT (C)	NA	NA	5.69E-08	5.69E-08
Aroclor 1248 (C)	NA	NA	2.37E-08	2.37E-08
Aroclor 1260 (C)	NA	NA	6.32E-08	6.32E-08
Benzene (C)	NA	NA	1.78E-12	1.78E-12
bis(2-Ethylhexyl)phthalate (C)	NA	NA	4.81E-09	4.81E-09
Bromodichloromethane (C)	NA	NA	5.70E-13	5.70E-13
Chloroform (C)	NA	NA	5.07E-12	5.07E-12
Dibromochloromethane (C)	NA	NA	7.73E-13	7.73E-13
Methyl tert-butyl ether (C)	NA	NA	3.90E-13	3.90E-13
Vinyl Chloride (C)	NA	NA	1.42E-13	1.42E-13
beta-BHC (C)	NA	NA	1.37E-10	1.37E-10
Total TCDD (C)	NA	NA	1.73E-08	1.73E-08

Table 3-26: Summary of exposure dose and hazard quotient by media for off-site receptors (child and adult).

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	2.25E-02	1.26E-03	1.17E-03	2.25E-02	1.26E-03	1.17E+00	NA	NA	3.47E-04	NA	NA	3.47E-01
Antimony (NC)	2.12E-05	1.19E-06	1.11E-06	5.30E-02	2.97E-03	1.93E-02	NA	NA	2.65E-07	NA	NA	4.65E-03
Arsenic (C)	3.68E-05	6.18E-06	1.92E-06	1.23E-01	2.06E-02	6.39E-03	NA	NA	4.88E-07	NA	NA	1.63E-03
Barium (NC)	2.13E-04	1.19E-05	1.11E-05	3.04E-03	1.70E-04	7.93E-02	NA	NA	3.30E-06	NA	NA	2.36E-02
Beryllium (C)	1.52E-06	8.50E-08	7.91E-08	7.59E-04	4.25E-05	1.38E-02	NA	NA	2.02E-08	NA	NA	3.54E-03
Cadmium (C)	4.02E-06	2.25E-08	2.09E-07	4.02E-03	2.25E-05	3.67E-03	NA	NA	4.21E-08	NA	NA	7.39E-04
Chromium (C)	8.58E-05	4.80E-06	4.47E-06	2.86E-02	1.60E-03	1.57E-01	NA	NA	4.98E-07	NA	NA	1.74E-02
Chromium (total) (C)	4.48E-05	2.51E-06	2.34E-06	1.49E-02	8.37E-04	8.18E-02	NA	NA	5.05E-07	NA	NA	1.77E-02
Cobalt (C)	1.74E-05	9.73E-07	9.06E-07	8.69E-04	4.86E-05	1.59E-01	NA	NA	2.82E-07	NA	NA	4.95E-02
Copper (NC)	7.65E-05	4.28E-06	3.99E-06	1.91E-03	1.07E-04	9.97E-05	NA	NA	5.63E-07	NA	NA	1.41E-05
Iron (NC)	5.90E-02	3.30E-03	3.07E-03	1.97E-01	1.10E-02	1.02E-02	NA	NA	4.96E-07	NA	NA	1.65E-06
Lead (C)	2.73E-04	1.53E-05	1.42E-05	NA	NA	NA	NA	NA	1.84E-06	NA	NA	NA
Manganese (NC)	8.74E-04	4.89E-05	4.55E-05	4.37E-02	2.45E-03	3.19E+00	NA	NA	1.24E-05	NA	NA	8.67E-01
Mercury (NC)	4.87E-07	2.73E-08	2.54E-08	5.68E-03	3.18E-04	2.96E-04	NA	NA	5.96E-09	NA	NA	6.95E-05
Nickel (NC)	4.99E-05	2.80E-06	2.60E-06	2.50E-03	1.40E-04	1.30E-04	NA	NA	6.78E-07	NA	NA	3.39E-05
Thallium (NC)	6.24E-06	3.49E-07	3.25E-07	8.91E-02	4.99E-03	4.65E-03	NA	NA	4.29E-08	NA	NA	6.13E-04
Vanadium (NC)	7.09E-05	3.97E-06	3.70E-06	2.36E-01	1.32E-02	1.23E-02	NA	NA	7.19E-07	NA	NA	2.40E-03
Zinc (NC)	5.50E-04	3.08E-05	2.87E-05	1.83E-03	1.03E-04	9.56E-05	NA	NA	2.25E-06	NA	NA	7.49E-06
Acenaphthylene (C)	1.00E-05	7.30E-06	5.22E-07	NA	NA	NA	NA	NA	3.53E-07	NA	NA	NA
Anthracene (NC)	1.81E-06	1.31E-06	9.41E-08	6.02E-06	4.38E-06	3.14E-07	NA	NA	1.46E-07	NA	NA	4.86E-07
Benzo(a)anthracene (C)	7.35E-06	5.35E-06	3.83E-07	NA	NA	NA	NA	NA	1.53E-07	NA	NA	NA
Benzo(a)pyrene (C)	9.85E-06	7.17E-06	5.14E-07	NA	NA	NA	NA	NA	1.18E-07	NA	NA	NA
Benzo(b)fluoranthene (C)	1.47E-05	1.07E-05	7.68E-07	NA	NA	NA	NA	NA	1.15E-07	NA	NA	NA
Benzo(g,h,i)perylene	4.36E-06	3.17E-06	2.27E-07	NA	NA	NA	NA	NA	1.46E-07	NA	NA	NA
Benzo(k)fluoranthene (C)	8.55E-07	6.22E-07	4.46E-08	NA	NA	NA	NA	NA	1.38E-07	NA	NA	NA
Chrysene (C)	2.12E-05	1.54E-05	1.11E-06	NA	NA	NA	NA	NA	1.05E-07	NA	NA	NA
Dibenz(a,h)anthracene (C)	1.77E-06	1.29E-06	9.20E-08	NA	NA	NA	NA	NA	1.46E-07	NA	NA	NA
Fluoranthene (NC)	1.83E-05	1.33E-05	9.52E-07	4.57E-04	3.33E-04	2.38E-05	NA	NA	1.65E-07	NA	NA	4.13E-06
Indeno(1,2,3-cd)pyrene (C)	3.33E-06	2.43E-06	1.74E-07	NA	NA	NA	NA	NA	1.46E-07	NA	NA	NA
Naphthalene (NC)	1.81E-06	1.32E-06	9.42E-08	9.04E-05	6.58E-05	1.10E-04	NA	NA	1.15E-07	NA	NA	1.34E-04
Phenanthrene (C)	5.15E-06	3.75E-06	2.68E-07	NA	NA	NA	NA	NA	1.58E-07	NA	NA	NA
2-Methylnaphthylene (NC)	5.51E-06	4.01E-06	2.87E-07	1.38E-03	1.00E-03	7.19E-05	NA	NA	3.27E-08	NA	NA	8.17E-06
1,2-Dichloroethane (C)	5.51E-06	9.26E-07	2.87E-07	2.76E-04	4.63E-05	2.05E-04	NA	NA	3.27E-08	NA	NA	2.33E-05
1,2,4-Trimethylbenzene (NC)	1.39E-09	2.33E-10	7.24E-11	2.78E-08	4.67E-09	4.26E-08	NA	NA	1.21E-11	NA	NA	7.10E-09
1,3,5-Trimethylbenzene (NC)	1.39E-09	2.33E-10	7.24E-11	2.78E-08	4.67E-09	4.26E-08	NA	NA	1.21E-10	NA	NA	7.10E-08
4,4'-DDD (C)	2.90E-05	1.62E-05	1.51E-06	NA	NA	NA	NA	NA	1.65E-08	NA	NA	NA
4,4'-DDE (C)	2.91E-06	1.63E-06	1.51E-07	NA	NA	NA	NA	NA	1.27E-08	NA	NA	NA
4,4'-DDT (C)	2.63E-05	4.42E-06	1.37E-06	5.26E-02	8.84E-03	2.74E-03	NA	NA	7.96E-09	NA	NA	1.59E-05
Aroclor 1248 (C)	1.86E-06	1.46E-06	9.69E-08	NA	NA	NA	NA	NA	9.10E-10	NA	NA	NA
Aroclor 1260 (C)	4.92E-06	3.85E-06	2.56E-07	NA	NA	NA	NA	NA	1.16E-08	NA	NA	NA
Benzene (C)	9.51E-09	2.66E-11	4.96E-10	2.38E-06	6.66E-09	5.78E-08	NA	NA	1.55E-10	NA	NA	1.81E-08
bis(2-Ethylhexyl)phthalate (C)	5.34E-05	2.99E-05	2.78E-06	2.67E-03	1.50E-03	1.39E-04	NA	NA	1.34E-07	NA	NA	6.72E-06
Bromodichloromethane (C)	1.39E-09	2.33E-10	7.24E-11	6.95E-08	1.17E-08	3.62E-09	NA	NA	1.21E-11	NA	NA	6.03E-10
Chloroform (C)	9.51E-09	1.60E-09	4.96E-10	9.51E-07	1.60E-07	3.54E-08	NA	NA	8.26E-11	NA	NA	5.90E-09
Dibromochloromethane (C)	1.39E-09	2.33E-10	7.24E-11	6.95E-08	1.17E-08	3.62E-09	NA	NA	1.21E-11	NA	NA	6.03E-10
Di-n-butylphthalate (NC)	1.06E-05	5.91E-06	5.50E-07	1.06E-04	5.91E-05	5.50E-06	NA	NA	7.72E-08	NA	NA	7.72E-07
Ethylbenzene (NC)	9.51E-09	1.60E-09	4.96E-10	9.51E-08	1.60E-08	1.73E-09	NA	NA	1.77E-10	NA	NA	6.21E-10
Methyl tert-butyl ether (C)	6.62E-09	1.11E-09	3.45E-10	7.73E-09	1.30E-09	4.03E-10	NA	NA	1.82E-09	NA	NA	2.12E-09
n-Butylbenzene (NC)	2.88E-09	4.85E-10	1.50E-10	7.21E-08	1.21E-08	3.76E-09	NA	NA	2.41E-11	NA	NA	6.03E-10
Toluene (NC)	2.14E-09	3.59E-10	1.11E-10	1.07E-08	1.80E-09	9.75E-10	NA	NA	1.61E-10	NA	NA	1.41E-09
Vinyl Chloride (C)	1.39E-09	3.89E-12	7.24E-11	4.63E-07	1.30E-09	2.53E-09	NA	NA	1.21E-11	NA	NA	4.22E-10
m,p-Xylene (NC)	1.39E-09	2.33E-10	7.24E-11	6.95E-09	1.17E-09	2.53E-09	NA	NA	1.21E-11	NA	NA	4.22E-10
ortho-xylene (NC)	1.39E-09	2.33E-10	7.24E-11	6.95E-09	1.17E-09	2.53E-09	NA	NA	1.21E-11	NA	NA	4.22E-10
Xylenes (total) (NC)	1.86E-08	3.12E-09	9.69E-10	9.30E-08	1.56E-08	3.39E-08	NA	NA	3.16E-10	NA	NA	1.10E-08
beta-BHC (C)	5.77E-09	3.23E-09	3.01E-10	NA	NA	NA	NA	NA	1.30E-09	NA	NA	NA
Total TCDD (C)	2.35E-11	3.95E-12	1.23E-12	NA	NA	NA	NA	NA	0.00E+00	NA	NA	NA

Table 3-26: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure	HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	1.00E-04	1.59E-05	6.75E-06	1.21E-04	1.59E-05	6.75E-06	NA	NA	1.13E-02	3.16E-04	1.13E-02	3.16E-04
Antimony (NC)	6.70E-07	1.06E-07	4.50E-08	2.01E-03	2.65E-04	1.13E-04	NA	NA	4.18E-06	1.17E-07	1.04E-02	2.93E-04
Arsenic (C)	1.24E-05	1.96E-06	8.33E-07	4.96E-02	6.54E-03	2.78E-03	NA	NA	8.73E-05	7.33E-06	2.91E-01	2.44E-02
Barium (NC)	2.28E-05	3.61E-06	1.53E-06	3.90E-04	5.15E-05	2.19E-05	NA	NA	2.12E-04	5.94E-06	3.03E-03	8.49E-05
Beryllium (C)	1.37E-07	2.17E-08	9.23E-09	8.24E-05	1.09E-05	4.61E-06	NA	NA	1.48E-06	4.14E-08	7.39E-04	2.07E-05
Cadmium (C)	7.37E-07	1.17E-07	4.95E-08	8.84E-04	1.17E-04	4.95E-05	NA	NA	2.25E-06	6.30E-09	2.25E-03	6.30E-06
Chromium (C)	3.68E-07	1.17E-07	4.95E-08	1.47E-04	3.89E-05	1.65E-05	NA	NA	5.08E-05	1.42E-06	1.69E-02	4.74E-04
Chromium (total) (C)	1.67E-06	5.30E-07	2.25E-07	6.70E-04	1.77E-04	7.50E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	6.70E-07	4.24E-08	1.80E-08	4.02E-05	2.12E-06	9.00E-07	NA	NA	1.29E-05	3.60E-07	6.43E-04	1.80E-05
Copper (NC)	1.15E-05	1.82E-06	7.72E-07	3.45E-04	4.55E-05	1.93E-05	NA	NA	9.11E-05	2.55E-06	2.28E-03	6.38E-05
Iron (NC)	3.55E-04	5.62E-05	2.39E-05	1.42E-03	1.87E-04	7.95E-05	NA	NA	4.45E-02	1.25E-03	1.48E-01	4.16E-03
Lead (C)	5.93E-05	9.39E-07	3.98E-07	NA	NA	NA	NA	NA	4.61E-04	1.29E-05	NA	NA
Manganese (NC)	1.35E-04	2.13E-05	9.05E-06	8.08E-03	1.07E-03	4.52E-04	NA	NA	6.69E-04	1.87E-05	3.34E-02	9.36E-04
Mercury (NC)	1.67E-07	2.65E-08	1.13E-08	2.34E-03	3.09E-04	1.31E-04	NA	NA	4.82E-07	1.35E-08	5.63E-03	1.58E-04
Nickel (NC)	7.33E-06	2.32E-07	9.86E-08	4.40E-04	1.16E-05	4.93E-06	NA	NA	8.71E-05	2.44E-06	4.36E-03	1.22E-04
Thallium (NC)	1.67E-06	2.65E-07	1.13E-07	2.87E-02	3.79E-03	1.61E-03	NA	NA	3.20E-06	8.96E-08	4.57E-02	1.28E-03
Vanadium (NC)	6.70E-07	1.06E-07	4.50E-08	2.68E-03	3.54E-04	1.50E-04	NA	NA	4.26E-05	1.19E-06	1.42E-01	3.98E-03
Zinc (NC)	1.59E-04	2.52E-05	1.07E-05	6.36E-04	8.40E-05	3.56E-05	NA	NA	1.94E-03	5.45E-05	6.48E-03	1.82E-04
Acenaphthylene (C)	1.67E-06	3.74E-05	1.59E-05	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	1.67E-06	5.97E-05	2.53E-05	6.70E-06	1.99E-04	8.44E-05	NA	NA	5.30E-06	1.93E-06	1.77E-05	6.44E-06
Benzo(a)anthracene (C)	1.67E-06	2.51E-04	1.07E-04	NA	NA	NA	NA	NA	9.00E-06	3.28E-06	NA	NA
Benzo(a)pyrene (C)	1.67E-06	3.29E-04	1.40E-04	NA	NA	NA	NA	NA	9.00E-06	3.28E-06	NA	NA
Benzo(b)fluoranthene (C)	1.67E-06	1.85E-04	7.86E-05	NA	NA	NA	NA	NA	7.72E-06	2.81E-06	NA	NA
Benzo(g,h,i)perylene	1.67E-06	5.30E-04	2.25E-04	NA	NA	NA	NA	NA	3.21E-06	1.17E-06	NA	NA
Benzo(k)fluoranthene (C)	1.67E-06	3.18E-04	1.35E-04	NA	NA	NA	NA	NA	8.04E-06	2.93E-06	NA	NA
Chrysene (C)	1.67E-06	2.73E-04	1.16E-04	NA	NA	NA	NA	NA	8.36E-06	3.04E-06	NA	NA
Dibenz(a,h)anthracene (C)		4.46E-04	1.89E-04	NA	NA	NA	NA	NA	1.51E-06	5.50E-07	NA	NA
Fluoranthene (NC)	1.67E-06	1.36E-04	5.77E-05	5.02E-05	3.40E-03	1.44E-03	NA	NA	1.93E-05	7.02E-06	4.82E-04	1.76E-04
Indeno(1,2,3-cd)pyrene (C)	1.67E-06	5.91E-04	2.51E-04	NA	NA	NA	NA	NA	4.02E-06	1.46E-06	NA	NA
Naphthalene (NC)	1.67E-06	1.84E-05	7.81E-06	1.00E-04	9.20E-04	3.90E-04	NA	NA	1.93E-07	7.02E-08	9.64E-06	3.51E-06
Phenanthrene (C)	1.67E-06	6.07E-05	2.58E-05	NA	NA	NA	NA	NA	1.61E-05	5.85E-06	NA	NA
2-Methylnaphthylene (NC)	1.67E-07	3.77E-06	1.60E-06	5.02E-05	9.41E-04	3.99E-04	NA	NA	3.38E-07	1.23E-07	8.44E-05	3.07E-05
1,2-Dichloroethane (C)	1.67E-07	1.42E-07	6.01E-08	1.00E-05	7.08E-06	3.00E-06	NA	NA	3.38E-07	2.84E-08	1.69E-05	1.42E-06
1,2,4-Trimethylbenzene (NC)	1.67E-06	2.84E-05	1.20E-05	4.02E-05	5.68E-04	2.41E-04	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	1.67E-07	2.84E-06	1.20E-06	4.02E-06	5.68E-05	2.41E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	3.35E-08	2.12E-06	9.00E-07	NA	NA	NA	NA	NA	9.48E-06	2.66E-06	NA	NA
4,4'-DDE (C)	3.35E-08	4.86E-06	2.06E-06	NA	NA	NA	NA	NA	5.95E-06	1.67E-06	NA	NA
4,4'-DDT (C)	3.35E-08	5.62E-06	2.39E-06	8.04E-05	1.12E-02	4.77E-03	NA	NA	1.22E-04	1.03E-05	2.44E-01	2.05E-02
Aroclor 1248 (C)	1.84E-07	2.89E-05	1.23E-05	NA	NA	NA	NA	NA	1.25E-07	4.91E-08	NA	NA
Aroclor 1260 (C)	3.35E-07	2.91E-04	1.23E-04	NA	NA	NA	NA	NA	1.77E-07	6.93E-08	NA	NA
Benzene (C)	8.37E-07	4.91E-05	2.08E-05	2.51E-04	1.23E-02	5.20E-03	NA	NA	1.40E-08	1.96E-11	3.51E-06	4.91E-09
bis(2-Ethylhexyl)phthalate (C)	1.67E-06	1.75E-04	7.43E-05	1.00E-04	8.75E-03	3.71E-03	NA	NA	4.82E-07	1.35E-07	2.41E-05	6.75E-06
Bromodichloromethane (C)	6.70E-07	1.17E-05	4.95E-06	4.02E-05	5.83E-04	2.48E-04	NA	NA	1.40E-08	1.18E-09	7.02E-07	5.89E-08
Chloroform (C)	2.01E-06	5.41E-05	2.30E-05	2.41E-04	5.41E-03	2.30E-03	NA	NA	1.40E-08	1.18E-09	1.40E-06	1.18E-07
Dibromochloromethane (C)	2.01E-07	1.24E-07	5.27E-08	1.21E-05	6.21E-06	2.63E-06	NA	NA	1.40E-08	1.18E-09	7.02E-07	5.89E-08
Di-n-butylphthalate (NC)	4.35E-06	4.21E-04	1.78E-04	5.22E-05	4.21E-03	1.78E-03	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	8.37E-07	1.59E-04	6.75E-05	1.00E-05	1.59E-03	6.75E-04	NA	NA	1.40E-08	1.18E-09	1.40E-07	1.18E-08
Methyl tert-butyl ether (C)	1.67E-07	6.82E-08	2.89E-08	2.34E-07	7.95E-08	3.37E-08	NA	NA	1.40E-08	1.18E-09	1.64E-08	1.38E-09
n-Butylbenzene (NC)	1.67E-07	0.00E+00	0.00E+00	5.02E-06	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	2.08E-06	2.57E-04	1.09E-04	1.25E-05	1.28E-03	5.44E-04	NA	NA	2.25E-07	1.89E-08	1.13E-06	9.45E-08
Vinyl Chloride (C)	1.67E-07	3.71E-06	1.58E-06	6.70E-05	1.24E-03	5.25E-04	NA	NA	1.40E-08	1.96E-11	4.68E-06	6.55E-09
m,p-Xylene (NC)	1.67E-07	3.71E-05	1.58E-05	1.00E-06	1.86E-04	7.88E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	1.67E-07	3.71E-05	1.58E-05	1.00E-06	1.86E-04	7.88E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	1.67E-06	3.71E-04	1.58E-04	1.00E-06	1.86E-03	7.88E-04	NA	NA	1.40E-08	1.18E-09	7.02E-08	5.89E-09
beta-BHC (C)	1.67E-08	7.16E-07	3.04E-07	NA	NA	NA	NA	NA	2.54E-09	7.11E-10	NA	NA
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA

Table 3-26: Cont'd

Chemical (Qualifier)	F. Fish		Total	Total
	Exposure	HQ	Hazard	Hazard
	Ingestion	Ingestion	Quotient	No Fish
Aluminum (NC)	6.68E-04	6.68E-04	1.56E+00	1.56E+00
Antimony (NC)	6.60E-05	1.65E-01	2.58E-01	9.27E-02
Arsenic (C)	3.36E-03	1.12E+01	1.17E+01	5.17E-01
Barium (NC)	3.53E-02	5.05E-01	6.15E-01	1.10E-01
Beryllium (C)	2.10E-05	1.05E-02	2.95E-02	1.90E-02
Cadmium (C)	1.65E-03	1.65E+00	1.66E+00	1.16E-02
Chromium (C)	1.72E-05	5.75E-03	2.27E-01	2.22E-01
Chromium (total) (C)	7.84E-05	2.61E-02	1.42E-01	1.16E-01
Cobalt (C)	2.97E-03	1.49E-01	3.59E-01	2.10E-01
Copper (NC)	2.01E-02	5.02E-01	5.07E-01	4.83E-03
Iron (NC)	1.57E+00	5.25E+00	5.62E+00	3.72E-01
Lead (C)	1.31E-05	NA	NA	NA
Manganese (NC)	5.97E-01	2.98E+01	3.40E+01	4.14E+00
Mercury (NC)	1.44E-03	1.68E+01	1.69E+01	1.45E-02
Nickel (NC)	1.41E-03	7.05E-02	7.81E-02	7.66E-03
Thallium (NC)	4.13E-02	5.89E+02	5.89E+02	1.76E-01
Vanadium (NC)	2.97E-03	9.90E+00	1.03E+01	4.13E-01
Zinc (NC)	8.23E-01	2.74E+00	2.75E+00	9.35E-03
Acenaphthylene (C)	2.06E-03	NA	NA	NA
Anthracene (NC)	2.06E-03	6.88E-03	7.20E-03	3.24E-04
Benzo(a)anthracene (C)	2.06E-03	NA	NA	NA
Benzo(a)pyrene (C)	2.06E-03	NA	NA	NA
Benzo(b)fluoranthene (C)	2.06E-03	NA	NA	NA
Benzo(g,h,i)perylene	2.06E-03	NA	NA	NA
Benzo(k)fluoranthene (C)	2.06E-03	NA	NA	NA
Chrysene (C)	2.06E-03	NA	NA	NA
Dibenz(a,h)anthracene (C)	2.06E-03	NA	NA	NA
Fluoranthene (NC)	2.06E-03	5.16E-02	5.79E-02	6.36E-03
Indeno(1,2,3-cd)pyrene (C)	2.06E-03	NA	NA	NA
Naphthalene (NC)	2.06E-03	1.03E-01	1.05E-01	1.81E-03
Phenanthrene (C)	2.06E-03	NA	NA	NA
2-Methylnaphthylene (NC)	2.06E-04	5.16E-02	5.55E-02	3.96E-03
1,2-Dichloroethane (C)	2.06E-04	1.03E-02	1.09E-02	5.87E-04
1,2,4-Trimethylbenzene (NC)	7.22E-03	1.44E-01	1.45E-01	8.42E-04
1,3,5-Trimethylbenzene (NC)	4.46E-04	8.91E-03	9.00E-03	8.43E-05
4,4'-DDD (C)	4.79E-03	NA	NA	NA
4,4'-DDE (C)	2.18E-03	NA	NA	NA
4,4'-DDT (C)	1.16E-02	2.31E+01	2.34E+01	3.45E-01
Aroclor 1248 (C)	2.68E-02	NA	NA	NA
Aroclor 1260 (C)	2.64E-01	NA	NA	NA
Benzene (C)	1.49E-04	3.73E-02	5.50E-02	1.77E-02
bis(2-Ethylhexyl)phthalate (C)	1.54E-01	7.69E+00	7.71E+00	1.69E-02
Bromodichloromethane (C)	1.12E-04	5.61E-03	6.47E-03	8.65E-04
Chloroform (C)	1.78E-05	1.78E-03	9.69E-03	7.91E-03
Dibromochloromethane (C)	4.51E-05	2.26E-03	2.28E-03	1.97E-05
Di-n-butylphthalate (NC)	2.75E-02	2.75E-01	2.81E-01	6.21E-03
Ethylbenzene (NC)	1.27E-03	1.27E-02	1.49E-02	2.27E-03
Methyl tert-butyl ether (C)	5.25E-06	6.12E-06	6.46E-06	3.38E-07
n-Butylbenzene (NC)	2.59E-03	6.48E-02	6.48E-02	4.27E-06
Toluene (NC)	1.20E-03	5.99E-03	7.82E-03	1.84E-03
Vinyl Chloride (C)	6.20E-06	2.07E-03	3.89E-03	1.82E-03
m,p-Xylene (NC)	0.00E+00	0.00E+00	2.65E-04	2.65E-04
ortho-xylene (NC)	0.00E+00	0.00E+00	2.65E-04	2.65E-04
Xylenes (total) (NC)	2.81E-03	1.41E-02	1.67E-02	2.65E-03
beta-BHC (C)	9.48E-05	NA	NA	NA
Total TCDD (C)	0.00E+00	NA	NA	NA

Table 3-27: Summary of exposure dose and ILCR by media for off-site receptors (child and adult).

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	2.41E-03	1.93E-04	4.18E-04	2.41E-03	1.93E-04	4.18E-01	NA	NA	3.09E-05	NA	NA	3.09E-02
Antimony (NC)	2.27E-06	1.81E-07	3.93E-07	5.68E-03	4.53E-04	6.88E-03	NA	NA	2.36E-08	NA	NA	4.13E-04
Arsenic (C)	3.94E-06	9.43E-07	6.82E-07	1.31E-02	3.14E-03	2.27E-03	NA	NA	4.34E-08	NA	NA	1.45E-04
Barium (NC)	2.28E-05	1.82E-06	3.95E-06	3.26E-04	2.60E-05	2.82E-02	NA	NA	2.94E-07	NA	NA	2.10E-03
Beryllium (C)	1.63E-07	1.30E-08	2.81E-08	8.13E-05	6.49E-06	4.92E-03	NA	NA	1.80E-09	NA	NA	3.15E-04
Cadmium (C)	4.30E-07	3.43E-09	7.45E-08	4.30E-04	3.43E-06	1.31E-03	NA	NA	3.75E-09	NA	NA	6.58E-05
Chromium (C)	9.19E-06	7.34E-07	1.59E-06	3.06E-03	2.45E-04	5.57E-02	NA	NA	4.42E-08	NA	NA	1.55E-03
Chromium (total) (C)	4.80E-06	3.83E-07	8.31E-07	1.60E-03	1.28E-04	2.91E-02	NA	NA	4.49E-08	NA	NA	1.57E-03
Cobalt (C)	1.86E-06	1.49E-07	3.22E-07	9.31E-05	7.43E-06	5.65E-02	NA	NA	2.51E-08	NA	NA	4.40E-03
Copper (NC)	8.20E-06	6.54E-07	1.42E-06	2.05E-04	1.64E-05	3.55E-05	NA	NA	5.00E-08	NA	NA	1.25E-06
Iron (NC)	6.32E-03	5.04E-04	1.09E-03	2.11E-02	1.68E-03	3.64E-03	NA	NA	4.41E-08	NA	NA	1.47E-07
Lead (C)	2.92E-05	2.33E-06	5.06E-06	NA	NA	NA	NA	NA	1.64E-07	NA	NA	NA
Manganese (NC)	9.36E-05	7.47E-06	1.62E-05	4.68E-03	3.74E-04	1.13E+00	NA	NA	1.10E-06	NA	NA	7.71E-02
Mercury (NC)	5.22E-08	4.17E-09	9.03E-09	6.09E-04	4.86E-05	1.05E-04	NA	NA	5.30E-10	NA	NA	6.18E-06
Nickel (NC)	5.35E-06	4.27E-07	9.26E-07	2.67E-04	2.13E-05	4.63E-05	NA	NA	6.03E-08	NA	NA	3.01E-06
Thallium (NC)	6.69E-07	5.34E-08	1.16E-07	9.55E-03	7.62E-04	1.65E-03	NA	NA	3.81E-09	NA	NA	5.45E-05
Vanadium (NC)	7.60E-06	6.07E-07	1.32E-06	2.53E-02	2.02E-03	4.39E-03	NA	NA	6.39E-08	NA	NA	2.13E-04
Zinc (NC)	5.90E-05	4.71E-06	1.02E-05	1.97E-04	1.57E-05	3.40E-05	NA	NA	2.00E-07	NA	NA	6.66E-07
Acenaphthylene (C)	1.07E-06	1.11E-06	1.86E-07	NA	NA	NA	NA	NA	3.14E-08	NA	NA	NA
Anthracene (NC)	1.93E-07	2.01E-07	3.35E-08	6.45E-07	6.69E-07	1.12E-07	NA	NA	1.30E-08	NA	NA	4.33E-08
Benzo(a)anthracene (C)	7.88E-07	8.17E-07	1.36E-07	NA	NA	NA	NA	NA	1.36E-08	NA	NA	NA
Benzo(a)pyrene (C)	1.06E-06	1.09E-06	1.83E-07	NA	NA	NA	NA	NA	1.05E-08	NA	NA	NA
Benzo(b)fluoranthene (C)	1.58E-06	1.64E-06	2.73E-07	NA	NA	NA	NA	NA	1.02E-08	NA	NA	NA
Benzo(g,h,i)perylene	4.67E-07	4.85E-07	8.08E-08	NA	NA	NA	NA	NA	1.30E-08	NA	NA	NA
Benzo(k)fluoranthene (C)	9.16E-08	9.50E-08	1.59E-08	NA	NA	NA	NA	NA	1.22E-08	NA	NA	NA
Chrysene (C)	2.27E-06	2.36E-06	3.93E-07	NA	NA	NA	NA	NA	9.30E-09	NA	NA	NA
Dibenz(a,h)anthracene (C)	1.89E-07	1.96E-07	3.27E-08	NA	NA	NA	NA	NA	1.30E-08	NA	NA	NA
Fluoranthene (NC)	1.96E-06	2.03E-06	3.39E-07	4.89E-05	5.08E-05	8.47E-06	NA	NA	1.47E-08	NA	NA	3.67E-07
Indeno(1,2,3-cd)pyrene (C)	3.57E-07	3.71E-07	6.18E-08	NA	NA	NA	NA	NA	1.30E-08	NA	NA	NA
Naphthalene (NC)	1.94E-07	2.01E-07	3.35E-08	9.69E-06	1.00E-05	3.91E-05	NA	NA	1.02E-08	NA	NA	1.19E-05
Phenanthrene (C)	5.52E-07	5.72E-07	9.55E-08	NA	NA	NA	NA	NA	1.41E-08	NA	NA	NA
2-Methylnaphthylene (NC)	5.91E-07	6.13E-07	1.02E-07	1.48E-04	1.53E-04	2.56E-05	NA	NA	2.91E-09	NA	NA	7.26E-07
1,2-Dichloroethane (C)	5.91E-07	1.41E-07	1.02E-07	2.95E-05	7.07E-06	7.30E-05	NA	NA	2.91E-09	NA	NA	2.08E-06
1,2,4-Trimethylbenzene (NC)	1.49E-10	3.56E-11	2.58E-11	2.98E-09	7.13E-10	1.52E-08	NA	NA	1.07E-12	NA	NA	6.31E-10
1,3,5-Trimethylbenzene (NC)	1.49E-10	3.56E-11	2.58E-11	2.98E-09	7.13E-10	1.52E-08	NA	NA	1.07E-11	NA	NA	6.31E-09
4,4'-DDD (C)	3.10E-06	2.48E-06	5.37E-07	NA	NA	NA	NA	NA	1.46E-09	NA	NA	NA
4,4'-DDE (C)	3.11E-07	2.48E-07	5.39E-08	NA	NA	NA	NA	NA	1.13E-09	NA	NA	NA
4,4'-DDT (C)	2.82E-06	6.75E-07	4.88E-07	5.64E-03	1.35E-03	9.76E-04	NA	NA	7.08E-10	NA	NA	1.42E-06
Aroclor 1248 (C)	1.99E-07	2.23E-07	3.45E-08	NA	NA	NA	NA	NA	8.09E-11	NA	NA	NA
Aroclor 1260 (C)	5.27E-07	5.88E-07	9.11E-08	NA	NA	NA	NA	NA	1.03E-09	NA	NA	NA
Benzene (C)	1.02E-09	4.07E-12	1.76E-10	2.55E-07	1.02E-09	2.06E-08	NA	NA	1.38E-11	NA	NA	1.61E-09
bis(2-Ethylhexyl)phthalate (C)	5.72E-06	4.57E-06	9.91E-07	2.86E-04	2.28E-04	4.95E-05	NA	NA	1.20E-08	NA	NA	5.98E-07
Bromodichloromethane (C)	1.49E-10	3.56E-11	2.58E-11	7.44E-09	1.78E-09	1.29E-09	NA	NA	1.07E-12	NA	NA	5.37E-11
Chloroform (C)	1.02E-09	2.44E-10	1.76E-10	1.02E-07	2.44E-08	1.26E-08	NA	NA	7.35E-12	NA	NA	5.25E-10
Dibromochloromethane (C)	1.49E-10	3.56E-11	2.58E-11	7.44E-09	1.78E-09	1.29E-09	NA	NA	1.07E-12	NA	NA	5.37E-11
Di-n-butylphthalate (NC)	1.13E-06	9.03E-07	1.96E-07	1.13E-05	9.03E-06	1.96E-06	NA	NA	6.87E-09	NA	NA	6.87E-08
Ethylbenzene (NC)	1.02E-09	2.44E-10	1.76E-10	1.02E-08	2.44E-09	6.17E-10	NA	NA	1.58E-11	NA	NA	5.52E-11
Methyl tert-butyl ether (C)	7.10E-10	1.70E-10	1.23E-10	8.28E-10	1.98E-10	1.43E-10	NA	NA	1.62E-10	NA	NA	1.89E-10
n-Butylbenzene (NC)	3.09E-10	7.40E-11	5.35E-11	7.73E-09	1.85E-09	1.34E-09	NA	NA	2.15E-12	NA	NA	5.37E-11
Toluene (NC)	2.29E-10	5.48E-11	3.96E-11	1.14E-09	2.74E-10	3.47E-10	NA	NA	1.43E-11	NA	NA	1.25E-10
Vinyl Chloride (C)	1.49E-10	5.94E-13	2.58E-11	4.96E-08	1.98E-10	9.01E-10	NA	NA	1.07E-12	NA	NA	3.76E-11
m,p-Xylene (NC)	1.49E-10	3.56E-11	2.58E-11	7.44E-10	1.78E-10	9.01E-10	NA	NA	1.07E-12	NA	NA	3.76E-11
ortho-xylene (NC)	1.49E-10	3.56E-11	2.58E-11	7.44E-10	1.78E-10	9.01E-10	NA	NA	1.07E-12	NA	NA	3.76E-11
Xylenes (total) (NC)	1.99E-09	4.77E-10	3.45E-10	9.96E-09	2.38E-09	1.21E-08	NA	NA	2.81E-11	NA	NA	9.82E-10
beta-BHC (C)	6.18E-10	4.93E-10	1.07E-10	NA	NA	NA	NA	NA	1.16E-10	NA	NA	NA
Total TCDD (C)	2.52E-12	6.03E-13	4.36E-13	NA	NA	NA	NA	NA	0.00E+00	NA	NA	NA

Table 3-27: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure	HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	2.58E-05	9.30E-06	2.94E-06	2.58E-05	9.30E-06	2.94E-06	NA	NA	1.21E-03	2.07E-04	1.21E-03	2.07E-04
Antimony (NC)	1.72E-07	6.20E-08	1.96E-08	4.31E-04	1.55E-04	4.91E-05	NA	NA	4.48E-07	7.66E-08	1.12E-03	1.91E-04
Arsenic (C)	3.19E-06	1.15E-06	3.63E-07	1.06E-02	3.82E-03	1.21E-03	NA	NA	9.35E-06	4.80E-06	3.12E-02	1.60E-02
Barium (NC)	5.86E-06	2.11E-06	6.67E-07	8.36E-05	3.01E-05	9.54E-06	NA	NA	2.27E-05	3.89E-06	3.25E-04	5.55E-05
Beryllium (C)	3.53E-08	1.27E-08	4.02E-09	1.77E-05	6.35E-06	2.01E-06	NA	NA	1.58E-07	2.71E-08	7.92E-05	1.35E-05
Cadmium (C)	1.89E-07	6.82E-08	2.16E-08	1.89E-04	6.82E-05	2.16E-05	NA	NA	2.41E-07	4.12E-09	2.41E-04	4.12E-06
Chromium (C)	9.47E-08	6.82E-08	2.16E-08	3.16E-05	2.27E-05	7.20E-06	NA	NA	5.44E-06	9.31E-07	1.81E-03	3.10E-04
Chromium (total) (C)	4.31E-07	3.10E-07	9.82E-08	1.44E-04	1.03E-04	3.27E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	1.72E-07	2.48E-08	7.85E-09	8.61E-06	1.24E-06	3.93E-07	NA	NA	1.38E-06	2.36E-07	6.89E-05	1.18E-05
Copper (NC)	2.95E-06	1.06E-06	3.37E-07	7.38E-05	2.66E-05	8.42E-06	NA	NA	9.76E-06	1.67E-06	2.44E-04	4.17E-05
Iron (NC)	9.13E-05	3.29E-05	1.04E-05	3.04E-04	1.10E-04	3.47E-05	NA	NA	4.77E-03	8.16E-04	1.59E-02	2.72E-03
Lead (C)	1.52E-05	5.49E-07	1.74E-07	NA	NA	NA	NA	NA	4.94E-05	8.45E-06	NA	NA
Manganese (NC)	3.46E-05	1.25E-05	3.95E-06	1.73E-03	6.23E-04	1.97E-04	NA	NA	7.16E-05	1.23E-05	3.58E-03	6.13E-04
Mercury (NC)	4.31E-08	1.55E-08	4.91E-09	5.02E-04	1.81E-04	5.73E-05	NA	NA	5.17E-08	8.83E-09	6.03E-04	1.03E-04
Nickel (NC)	1.89E-06	1.36E-07	4.30E-08	9.43E-05	6.79E-06	2.15E-06	NA	NA	9.33E-06	1.60E-06	4.67E-04	7.98E-05
Thallium (NC)	4.31E-07	1.55E-07	4.91E-08	6.15E-03	2.21E-03	7.01E-04	NA	NA	3.43E-07	5.86E-08	4.90E-03	8.37E-04
Vanadium (NC)	1.72E-07	6.20E-08	1.96E-08	5.74E-04	2.07E-04	6.54E-05	NA	NA	4.56E-06	7.80E-07	1.52E-02	2.60E-03
Zinc (NC)	4.09E-05	1.47E-05	4.66E-06	1.36E-04	4.91E-05	1.55E-05	NA	NA	2.08E-04	3.56E-05	6.95E-04	1.19E-04
Acenaphthylene (C)	4.31E-07	2.19E-05	6.92E-06	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	4.31E-07	3.49E-05	1.10E-05	1.44E-06	1.16E-04	3.68E-05	NA	NA	5.68E-07	1.26E-06	1.89E-06	4.21E-06
Benzo(a)anthracene (C)	4.31E-07	1.47E-04	4.65E-05	NA	NA	NA	NA	NA	9.64E-07	2.14E-06	NA	NA
Benzo(a)pyrene (C)	4.31E-07	1.92E-04	6.09E-05	NA	NA	NA	NA	NA	9.64E-07	2.14E-06	NA	NA
Benzo(b)fluoranthene (C)	4.31E-07	1.08E-04	3.43E-05	NA	NA	NA	NA	NA	8.27E-07	1.84E-06	NA	NA
Benzo(g,h,i)perylene	4.31E-07	3.10E-04	9.82E-05	NA	NA	NA	NA	NA	3.44E-07	7.66E-07	NA	NA
Benzo(k)fluoranthene (C)	4.31E-07	1.86E-04	5.89E-05	NA	NA	NA	NA	NA	8.61E-07	1.91E-06	NA	NA
Chrysene (C)	4.31E-07	1.60E-04	5.06E-05	NA	NA	NA	NA	NA	8.95E-07	1.99E-06	NA	NA
Dibenz(a,h)anthracene (C)		2.60E-04	8.25E-05	NA	NA	NA	NA	NA	1.62E-07	3.60E-07	NA	NA
Fluoranthene (NC)	4.31E-07	7.95E-05	2.52E-05	1.08E-05	1.99E-03	6.29E-04	NA	NA	2.07E-06	4.59E-06	5.17E-05	1.15E-04
Indeno(1,2,3-cd)pyrene (C)	4.31E-07	3.46E-04	1.09E-04	NA	NA	NA	NA	NA	4.31E-07	9.57E-07	NA	NA
Naphthalene (NC)	4.31E-07	1.08E-05	3.41E-06	2.15E-05	5.38E-04	1.70E-04	NA	NA	2.07E-08	4.59E-08	1.03E-06	2.30E-06
Phenanthrene (C)	4.31E-07	3.55E-05	1.12E-05	NA	NA	NA	NA	NA	1.72E-06	3.83E-06	NA	NA
2-Methylnaphthylene (NC)	4.31E-08	2.20E-06	6.97E-07	1.08E-05	5.50E-04	1.74E-04	NA	NA	3.62E-08	8.04E-08	9.04E-06	2.01E-05
1,2-Dichloroethane (C)	4.31E-08	8.28E-08	2.62E-08	2.15E-06	4.14E-06	1.31E-06	NA	NA	3.62E-08	1.86E-08	1.81E-06	9.28E-07
1,2,4-Trimethylbenzene (NC)	4.31E-07	1.66E-05	5.25E-06	8.61E-06	3.32E-04	1.05E-04	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	4.31E-08	1.66E-06	5.25E-07	8.61E-07	3.32E-05	1.05E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	8.61E-09	1.24E-06	3.93E-07	NA	NA	NA	NA	NA	1.02E-06	1.74E-06	NA	NA
4,4'-DDE (C)	8.61E-09	2.84E-06	8.99E-07	NA	NA	NA	NA	NA	6.37E-07	1.09E-06	NA	NA
4,4'-DDT (C)	8.61E-09	3.29E-06	1.04E-06	1.72E-05	6.57E-03	2.08E-03	NA	NA	1.31E-05	6.71E-06	2.62E-02	1.34E-02
Aroclor 1248 (C)	4.74E-08	1.69E-05	5.36E-06	NA	NA	NA	NA	NA	1.34E-08	3.22E-08	NA	NA
Aroclor 1260 (C)	8.61E-08	1.70E-04	5.38E-05	NA	NA	NA	NA	NA	1.89E-08	4.54E-08	NA	NA
Benzene (C)	2.15E-07	2.87E-05	9.08E-06	5.38E-05	7.17E-03	2.27E-03	NA	NA	1.50E-09	1.29E-11	3.76E-07	3.21E-09
bis(2-Ethylhexyl)phthalate (C)	4.31E-07	1.02E-04	3.24E-05	2.15E-05	5.11E-03	1.62E-03	NA	NA	5.17E-08	8.83E-08	2.58E-06	4.42E-06
Bromodichloromethane (C)	1.72E-07	6.82E-06	2.16E-06	8.61E-06	3.41E-04	1.08E-04	NA	NA	1.50E-09	7.71E-10	7.52E-08	3.86E-08
Chloroform (C)	5.17E-07	3.16E-05	1.00E-05	5.17E-05	3.16E-03	1.00E-03	NA	NA	1.50E-09	7.71E-10	1.50E-07	7.71E-08
Dibromochloromethane (C)	5.17E-08	7.25E-08	2.30E-08	2.58E-06	3.63E-06	1.15E-06	NA	NA	1.50E-09	7.71E-10	7.52E-08	3.86E-08
Di-n-butylphthalate (NC)	1.12E-06	2.46E-04	7.78E-05	1.12E-05	2.46E-03	7.78E-04	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	2.15E-07	9.30E-05	2.94E-05	2.15E-06	9.30E-04	2.94E-04	NA	NA	1.50E-09	7.71E-10	1.50E-08	7.71E-09
Methyl tert-butyl ether (C)	4.31E-08	3.98E-08	1.26E-08	5.02E-08	4.65E-08	1.47E-08	NA	NA	1.50E-09	7.71E-10	1.75E-09	9.00E-10
n-Butylbenzene (NC)	4.31E-08	0.00E+00	0.00E+00	1.08E-06	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	5.34E-07	1.50E-04	4.75E-05	2.67E-06	7.50E-04	2.37E-04	NA	NA	2.41E-08	1.24E-08	1.21E-07	6.18E-08
Vinyl Chloride (C)	4.31E-08	2.17E-06	6.87E-07	1.44E-05	7.23E-04	2.29E-04	NA	NA	1.50E-09	1.29E-11	5.01E-07	4.28E-09
m,p-Xylene (NC)	4.31E-08	2.17E-05	6.87E-06	2.15E-07	1.08E-04	3.44E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	4.31E-08	2.17E-05	6.87E-06	2.15E-07	1.08E-04	3.44E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	4.31E-07	2.17E-04	6.87E-05	2.15E-06	1.08E-03	3.44E-04	NA	NA	1.50E-09	7.71E-10	7.52E-09	3.86E-09
beta-BHC (C)	4.31E-09	4.18E-07	1.33E-07	NA	NA	NA	NA	NA	2.72E-10	4.65E-10	NA	NA
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA

Table 3-27: Cont'd

Chemical (Qualifier)	F. Fish		Total	Total
	Exposure	HQ	Hazard	Hazard
	Ingestion	Ingestion	Quotient	No Fish
Aluminum (NC)	3.65E-04	3.65E-04	4.53E-01	4.52E-01
Antimony (NC)	3.60E-05	9.00E-02	1.05E-01	1.54E-02
Arsenic (C)	1.83E-03	6.11E+00	6.19E+00	8.15E-02
Barium (NC)	1.93E-02	2.75E-01	3.07E-01	3.12E-02
Beryllium (C)	1.14E-05	5.72E-03	1.12E-02	5.44E-03
Cadmium (C)	8.98E-04	8.98E-01	9.00E-01	2.33E-03
Chromium (C)	9.41E-06	3.14E-03	6.59E-02	6.27E-02
Chromium (total) (C)	4.28E-05	1.43E-02	4.69E-02	3.27E-02
Cobalt (C)	1.62E-03	8.10E-02	1.42E-01	6.11E-02
Copper (NC)	1.10E-02	2.74E-01	2.75E-01	6.53E-04
Iron (NC)	8.59E-01	2.86E+00	2.91E+00	4.55E-02
Lead (C)	7.17E-06	NA	NA	NA
Manganese (NC)	3.26E-01	1.63E+01	1.75E+01	1.22E+00
Mercury (NC)	7.88E-04	9.19E+00	9.19E+00	2.22E-03
Nickel (NC)	7.69E-04	3.84E-02	3.94E-02	9.88E-04
Thallium (NC)	2.25E-02	3.21E+02	3.21E+02	2.68E-02
Vanadium (NC)	1.62E-03	5.40E+00	5.45E+00	5.06E-02
Zinc (NC)	4.49E-01	1.50E+00	1.50E+00	1.26E-03
Acenaphthylene (C)	1.13E-03	NA	NA	NA
Anthracene (NC)	1.13E-03	3.75E-03	3.91E-03	1.62E-04
Benzo(a)anthracene (C)	1.13E-03	NA	NA	NA
Benzo(a)pyrene (C)	1.13E-03	NA	NA	NA
Benzo(b)fluoranthene (C)	1.13E-03	NA	NA	NA
Benzo(g,h,i)perylene	1.13E-03	NA	NA	NA
Benzo(k)fluoranthene (C)	1.13E-03	NA	NA	NA
Chrysene (C)	1.13E-03	NA	NA	NA
Dibenz(a,h)anthracene (C)	1.13E-03	NA	NA	NA
Fluoranthene (NC)	1.13E-03	2.81E-02	3.10E-02	2.90E-03
Indeno(1,2,3-cd)pyrene (C)	1.13E-03	NA	NA	NA
Naphthalene (NC)	1.13E-03	5.63E-02	5.71E-02	8.04E-04
Phenanthrene (C)	1.13E-03	NA	NA	NA
2-Methylnaphthylene (NC)	1.13E-04	2.81E-02	2.92E-02	1.09E-03
1,2-Dichloroethane (C)	1.13E-04	5.63E-03	5.75E-03	1.22E-04
1,2,4-Trimethylbenzene (NC)	3.94E-03	7.87E-02	7.92E-02	4.45E-04
1,3,5-Trimethylbenzene (NC)	2.43E-04	4.86E-03	4.91E-03	4.46E-05
4,4'-DDD (C)	2.61E-03	NA	NA	NA
4,4'-DDE (C)	1.19E-03	NA	NA	NA
4,4'-DDT (C)	6.30E-03	1.26E+01	1.27E+01	5.62E-02
Aroclor 1248 (C)	1.46E-02	NA	NA	NA
Aroclor 1260 (C)	1.44E-01	NA	NA	NA
Benzene (C)	8.14E-05	2.04E-02	2.99E-02	9.49E-03
bis(2-Ethylhexyl)phthalate (C)	8.39E-02	4.19E+00	4.20E+00	7.33E-03
Bromodichloromethane (C)	6.12E-05	3.06E-03	3.52E-03	4.58E-04
Chloroform (C)	9.69E-06	9.69E-04	5.18E-03	4.22E-03
Dibromochloromethane (C)	2.46E-05	1.23E-03	1.24E-03	7.48E-06
Di-n-butylphthalate (NC)	1.50E-02	1.50E-01	1.53E-01	3.27E-03
Ethylbenzene (NC)	6.90E-04	6.90E-03	8.13E-03	1.23E-03
Methyl tert-butyl ether (C)	2.86E-06	3.34E-06	3.45E-06	1.15E-07
n-Butylbenzene (NC)	1.41E-03	3.53E-02	3.53E-02	1.09E-06
Toluene (NC)	6.53E-04	3.26E-03	4.25E-03	9.90E-04
Vinyl Chloride (C)	3.38E-06	1.13E-03	2.10E-03	9.67E-04
m,p-Xylene (NC)	0.00E+00	0.00E+00	1.43E-04	1.43E-04
ortho-xylene (NC)	0.00E+00	0.00E+00	1.43E-04	1.43E-04
Xylenes (total) (NC)	1.53E-03	7.67E-03	9.10E-03	1.43E-03
beta-BHC (C)	5.17E-05	NA	NA	NA
Total TCDD (C)	0.00E+00	NA	NA	NA

Table 3-28: Summary of exposure dose and hazard quotient by media for park users and off-site child receptors.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Arsenic (C)	1.35E-06	3.23E-07	2.34E-07	2.03E-06	4.85E-07	3.52E-06	NA	NA	1.49E-08	NA	NA	2.24E-07
Beryllium (C)	5.57E-08	4.45E-09	9.65E-09	4.68E-07	3.74E-08	8.10E-08	NA	NA	6.17E-10	NA	NA	5.18E-09
Cadmium (C)	1.48E-07	1.18E-09	2.55E-08	9.30E-07	7.42E-09	1.61E-07	NA	NA	1.28E-09	NA	NA	8.10E-09
Chromium (C)	3.15E-06	2.52E-07	5.45E-07	1.32E-04	1.06E-05	2.29E-05	NA	NA	1.52E-08	NA	NA	6.37E-07
Chromium (total) (C)	1.65E-06	1.31E-07	2.85E-07	6.91E-05	5.52E-06	1.20E-05	NA	NA	1.54E-08	NA	NA	6.47E-07
Cobalt (C)	6.38E-07	5.09E-08	1.10E-07	6.25E-06	4.99E-07	1.08E-06	NA	NA	8.60E-09	NA	NA	8.43E-08
Lead (C)	1.00E-05	8.00E-07	1.73E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.62E-08	NA	NA	0.00E+00
Acenaphthylene (C)	3.68E-07	3.82E-07	6.37E-08	2.69E-09	2.79E-09	1.98E-10	NA	NA	1.08E-08	NA	NA	3.33E-11
Anthracene (NC)	6.63E-08	6.88E-08	1.15E-08	0.00E+00	0.00E+00	0.00E+00	NA	NA	4.45E-09	NA	NA	0.00E+00
Benzo(a)anthracene (C)	2.70E-07	2.80E-07	4.67E-08	1.97E-07	2.05E-07	1.45E-08	NA	NA	4.66E-09	NA	NA	1.44E-09
Benzo(a)pyrene (C)	3.62E-07	3.75E-07	6.26E-08	2.64E-06	2.74E-06	1.94E-07	NA	NA	3.61E-09	NA	NA	1.12E-08
Benzo(b)fluoranthene (C)	5.41E-07	5.61E-07	9.36E-08	3.95E-07	4.10E-07	2.90E-08	NA	NA	3.49E-09	NA	NA	1.08E-09
Benzo(g,h,i)perylene	1.60E-07	1.66E-07	2.77E-08	1.17E-08	1.21E-08	8.59E-10	NA	NA	4.45E-09	NA	NA	1.38E-10
Benzo(k)fluoranthene (C)	3.14E-08	3.26E-08	5.43E-09	2.29E-09	2.38E-09	1.68E-10	NA	NA	4.19E-09	NA	NA	1.30E-10
Chrysene (C)	7.79E-07	8.08E-07	1.35E-07	5.68E-09	5.90E-09	4.18E-10	NA	NA	3.19E-09	NA	NA	9.88E-12
Dibenz(a,h)anthracene (C)	6.48E-08	6.73E-08	1.12E-08	4.73E-07	4.91E-07	3.48E-08	NA	NA	4.45E-09	NA	NA	1.38E-08
Fluoranthene (NC)	6.71E-07	6.96E-07	1.16E-07	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.04E-09	NA	NA	0.00E+00
Indeno(1,2,3-cd)pyrene (C)	1.22E-07	1.27E-07	2.12E-08	8.94E-08	9.27E-08	6.57E-09	NA	NA	4.45E-09	NA	NA	1.38E-09
Naphthalene (NC)	6.64E-08	6.89E-08	1.15E-08	0.00E+00	0.00E+00	0.00E+00	NA	NA	3.51E-09	NA	NA	0.00E+00
Phenanthrene (C)	1.89E-07	1.96E-07	3.27E-08	1.38E-09	1.43E-09	1.01E-10	NA	NA	4.82E-09	NA	NA	1.50E-11
2-Methylnaphthylene (NC)	2.03E-07	2.10E-07	3.51E-08	0.00E+00	0.00E+00	0.00E+00	NA	NA	9.96E-10	NA	NA	0.00E+00
1,2-Dichloroethane (C)	2.03E-07	4.85E-08	3.51E-08	1.84E-08	4.41E-09	3.19E-09	NA	NA	9.96E-10	NA	NA	9.07E-11
1,2,4-Trimethylbenzene (NC)	5.10E-11	1.22E-11	8.83E-12	0.00E+00	0.00E+00	0.00E+00	NA	NA	3.68E-13	NA	NA	0.00E+00
1,3,5-Trimethylbenzene (NC)	5.10E-11	1.22E-11	8.83E-12	0.00E+00	0.00E+00	0.00E+00	NA	NA	3.68E-12	NA	NA	0.00E+00
4,4'-DDD (C)	1.06E-06	8.49E-07	1.84E-07	2.55E-07	2.04E-07	4.42E-08	NA	NA	5.02E-10	NA	NA	1.21E-10
4,4'-DDE (C)	1.07E-07	8.52E-08	1.85E-08	3.63E-08	2.90E-08	6.28E-09	NA	NA	3.88E-10	NA	NA	1.32E-10
4,4'-DDT (C)	9.66E-07	2.31E-07	1.67E-07	3.29E-07	7.87E-08	5.68E-08	NA	NA	2.43E-10	NA	NA	8.24E-11
Aroclor 1248 (C)	6.83E-08	7.63E-08	1.18E-08	1.37E-07	1.53E-07	2.36E-08	NA	NA	2.77E-11	NA	NA	5.55E-11
Aroclor 1260 (C)	1.81E-07	2.02E-07	3.12E-08	3.61E-07	4.03E-07	6.25E-08	NA	NA	3.54E-10	NA	NA	7.08E-10
Benzene (C)	3.49E-10	1.39E-12	6.05E-11	1.92E-11	7.67E-14	1.65E-12	NA	NA	4.73E-12	NA	NA	1.29E-13
bis(2-Ethylhexyl)phthalate (C)	1.96E-06	1.57E-06	3.40E-07	2.75E-08	2.19E-08	4.76E-09	NA	NA	4.10E-09	NA	NA	5.74E-11
Bromodichloromethane (C)	5.10E-11	1.22E-11	8.83E-12	3.16E-12	7.57E-13	5.48E-13	NA	NA	3.68E-13	NA	NA	2.28E-14
Chloroform (C)	3.49E-10	8.36E-11	6.05E-11	0.00E+00	0.00E+00	4.87E-12	NA	NA	2.52E-12	NA	NA	2.03E-13
Dibromochloromethane (C)	5.10E-11	1.22E-11	8.83E-12	4.29E-12	1.03E-12	7.42E-13	NA	NA	3.68E-13	NA	NA	3.09E-14
Di-n-butylphthalate (NC)	3.88E-07	3.09E-07	6.71E-08	0.00E+00	0.00E+00	0.00E+00	NA	NA	2.35E-09	NA	NA	0.00E+00
Ethylbenzene (NC)	3.49E-10	8.36E-11	6.05E-11	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.41E-12	NA	NA	0.00E+00
Methyl tert-butyl ether (C)	2.43E-10	5.83E-11	4.21E-11	9.73E-13	2.33E-13	1.68E-13	NA	NA	5.55E-11	NA	NA	2.22E-13
n-Butylbenzene (NC)	1.06E-10	2.54E-11	1.83E-11	0.00E+00	0.00E+00	0.00E+00	NA	NA	7.36E-13	NA	NA	0.00E+00
Toluene (NC)	7.85E-11	1.88E-11	1.36E-11	0.00E+00	0.00E+00	0.00E+00	NA	NA	4.90E-12	NA	NA	0.00E+00
Vinyl Chloride (C)	5.10E-11	2.04E-13	8.83E-12	3.83E-11	1.53E-13	1.36E-13	NA	NA	3.68E-13	NA	NA	5.67E-15
m,p-Xylene (NC)	5.10E-11	1.22E-11	8.83E-12	0.00E+00	0.00E+00	0.00E+00	NA	NA	3.68E-13	NA	NA	0.00E+00
ortho-xylene (NC)	5.10E-11	1.22E-11	8.83E-12	0.00E+00	0.00E+00	0.00E+00	NA	NA	3.68E-13	NA	NA	0.00E+00
Xylenes (total) (NC)	6.83E-10	1.64E-10	1.18E-10	0.00E+00	0.00E+00	0.00E+00	NA	NA	9.62E-12	NA	NA	0.00E+00
beta-BHC (C)	2.12E-10	1.69E-10	3.67E-11	3.82E-10	3.04E-10	6.60E-11	NA	NA	3.96E-11	NA	NA	7.13E-11
Total TCDD (C)	8.64E-13	2.07E-13	1.49E-13	1.30E-07	3.10E-08	1.73E-08	NA	NA	0.00E+00	NA	NA	0.00E+00

Table 3-28: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	ILCR - Swimming		CR - Wadin	Exposure	ILCR	Exposure		ILCR	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	1.09E-06	3.93E-07	1.25E-07	1.64E-06	5.90E-07	1.87E-07	NA	NA	3.21E-06	1.64E-06	4.81E-06	2.47E-06
Beryllium (C)	1.21E-08	4.36E-09	1.38E-09	1.02E-07	3.66E-08	1.16E-08	NA	NA	5.43E-08	9.29E-09	4.56E-07	7.80E-08
Cadmium (C)	6.49E-08	2.34E-08	7.40E-09	4.09E-07	1.47E-07	4.66E-08	NA	NA	8.27E-08	1.41E-09	5.21E-07	8.91E-09
Chromium (C)	3.25E-08	2.34E-08	7.40E-09	1.36E-06	9.82E-07	3.11E-07	NA	NA	1.87E-06	3.19E-07	7.84E-05	1.34E-05
Chromium (total) (C)	1.48E-07	1.06E-07	3.37E-08	6.20E-06	4.46E-06	1.41E-06	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	5.90E-08	8.50E-09	2.69E-09	5.79E-07	8.33E-08	2.64E-08	NA	NA	4.72E-07	8.08E-08	4.63E-06	7.92E-07
Lead (C)	5.23E-06	1.88E-07	5.96E-08	0.00E+00	0.00E+00	0.00E+00	NA	NA	1.69E-05	2.90E-06	0.00E+00	0.00E+00
Acenaphthylene (C)	1.48E-07	7.49E-06	2.37E-06	1.08E-09	5.47E-08	1.73E-08	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene (NC)	1.48E-07	1.20E-05	3.79E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	1.95E-07	4.33E-07	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	1.48E-07	5.04E-05	1.60E-05	1.08E-07	3.68E-05	1.16E-05	NA	NA	3.31E-07	7.35E-07	2.41E-07	5.37E-07
Benzo(a)pyrene (C)	1.48E-07	6.59E-05	2.09E-05	1.08E-06	4.81E-04	1.52E-04	NA	NA	3.31E-07	7.35E-07	2.41E-06	5.37E-06
Benzo(b)fluoranthene (C)	1.48E-07	3.71E-05	1.18E-05	1.08E-07	2.71E-05	8.59E-06	NA	NA	2.83E-07	6.30E-07	2.07E-07	4.60E-07
Benzo(g,h,i)perylene	1.48E-07	1.06E-04	3.37E-05	1.08E-08	7.76E-06	2.46E-06	NA	NA	1.18E-07	2.63E-07	8.62E-09	1.92E-08
Benzo(k)fluoranthene (C)	1.48E-07	6.38E-05	2.02E-05	1.08E-08	4.66E-06	1.47E-06	NA	NA	2.95E-07	6.56E-07	2.16E-08	4.79E-08
Chrysene (C)	1.48E-07	5.47E-05	1.73E-05	1.08E-09	4.00E-07	1.27E-07	NA	NA	3.07E-07	6.83E-07	2.24E-09	4.98E-09
Dibenz(a,h)anthracene (C)	1.48E-07	8.93E-05	2.83E-05	1.08E-06	6.52E-04	2.06E-04	NA	NA	5.55E-08	1.23E-07	4.05E-07	9.01E-07
Fluoranthene (NC)	1.48E-07	2.73E-05	8.63E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	7.09E-07	1.58E-06	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene (C)	1.48E-07	1.19E-04	3.75E-05	1.08E-07	8.65E-05	2.74E-05	NA	NA	1.48E-07	3.28E-07	1.08E-07	2.40E-07
Naphthalene (NC)	1.48E-07	3.69E-06	1.17E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	7.09E-09	1.58E-08	0.00E+00	0.00E+00
Phenanthrene (C)	1.48E-07	1.22E-05	3.85E-06	1.08E-09	8.88E-08	2.81E-08	NA	NA	5.90E-07	1.31E-06	4.31E-09	9.58E-09
2-Methylnaphthylene (NC)	1.48E-08	7.55E-07	2.39E-07	0.00E+00	0.00E+00	0.00E+00	NA	NA	1.24E-08	2.76E-08	0.00E+00	0.00E+00
1,2-Dichloroethane (C)	1.48E-08	2.84E-08	8.99E-09	1.34E-09	2.58E-09	8.18E-10	NA	NA	1.24E-08	6.36E-09	1.13E-09	5.79E-10
1,2,4-Trimethylbenzene (NC)	1.48E-07	5.69E-06	1.80E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	1.48E-08	5.69E-07	1.80E-07	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	2.95E-09	4.25E-07	1.35E-07	7.09E-10	1.02E-07	3.23E-08	NA	NA	3.48E-07	5.96E-07	8.36E-08	1.43E-07
4,4'-DDE (C)	2.95E-09	9.74E-07	3.08E-07	1.00E-09	3.31E-07	1.05E-07	NA	NA	2.18E-07	3.74E-07	7.43E-08	1.27E-07
4,4'-DDT (C)	2.95E-09	1.13E-06	3.57E-07	1.00E-09	3.83E-07	1.21E-07	NA	NA	4.49E-06	2.30E-06	1.53E-06	7.83E-07
Aroclor 1248 (C)	1.62E-08	5.80E-06	1.84E-06	3.25E-08	1.16E-05	3.67E-06	NA	NA	4.61E-09	1.10E-08	9.21E-09	2.21E-08
Aroclor 1260 (C)	2.95E-08	5.82E-05	1.84E-05	5.90E-08	1.16E-04	3.69E-05	NA	NA	6.49E-09	1.55E-08	1.30E-08	3.11E-08
Benzene (C)	7.38E-08	9.83E-06	3.11E-06	4.06E-09	5.41E-07	1.71E-07	NA	NA	5.15E-10	4.41E-12	2.83E-11	2.42E-13
bis(2-Ethylhexyl)phthalate (C)	1.48E-07	3.51E-05	1.11E-05	2.07E-09	4.91E-07	1.55E-07	NA	NA	1.77E-08	3.03E-08	2.48E-10	4.24E-10
Bromodichloromethane (C)	5.90E-08	2.34E-06	7.40E-07	3.66E-09	1.45E-07	4.59E-08	NA	NA	5.15E-10	2.64E-10	3.20E-11	1.64E-11
Chloroform (C)	1.77E-07	1.08E-05	3.43E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.15E-10	2.64E-10	0.00E+00	0.00E+00
Dibromochloromethane (C)	1.77E-08	2.49E-08	7.88E-09	1.49E-09	2.09E-09	6.62E-10	NA	NA	5.15E-10	2.64E-10	4.33E-11	2.22E-11
Di-n-butylphthalate (NC)	3.84E-07	8.43E-05	2.67E-05	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	7.38E-08	3.19E-05	1.01E-05	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.15E-10	2.64E-10	0.00E+00	0.00E+00
Methyl tert-butyl ether (C)	1.48E-08	1.37E-08	4.32E-09	5.90E-11	5.46E-11	1.73E-11	NA	NA	5.15E-10	2.64E-10	2.06E-12	1.06E-12
n-Butylbenzene (NC)	1.48E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	1.83E-07	5.14E-05	1.63E-05	0.00E+00	0.00E+00	0.00E+00	NA	NA	8.27E-09	4.24E-09	0.00E+00	0.00E+00
Vinyl Chloride (C)	1.48E-08	7.44E-07	2.36E-07	1.11E-08	5.58E-07	1.77E-07	NA	NA	5.15E-10	4.41E-12	3.87E-10	3.31E-12
m,p-Xylene (NC)	1.48E-08	7.44E-06	2.36E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	1.48E-08	7.44E-06	2.36E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	1.48E-07	7.44E-05	2.36E-05	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.15E-10	2.64E-10	0.00E+00	0.00E+00
beta-BHC (C)	1.48E-09	1.43E-07	4.54E-08	2.66E-09	2.58E-07	8.18E-08	NA	NA	9.33E-11	1.60E-10	1.68E-10	2.87E-10
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-28: Cont'd

Chemical (Qualifier)	F. Fish		Total	Total
	Exposure Ingestion	ILCR Ingestion	ILCR	ILCR No Fish
Arsenic (C)	6.28E-04	9.42E-04	9.58E-04	1.59E-05
Beryllium (C)	3.92E-06	3.29E-05	3.42E-05	1.28E-06
Cadmium (C)	3.08E-04	1.94E-03	1.94E-03	2.24E-06
Chromium (C)	3.22E-06	1.35E-04	3.96E-04	2.61E-04
Chromium (total) (C)	1.47E-05	6.16E-04	7.15E-04	9.93E-05
Cobalt (C)	5.55E-04	5.44E-03	5.46E-03	1.40E-05
Lead (C)	2.46E-06	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene (C)	3.86E-04	2.82E-06	2.89E-06	7.88E-08
Anthracene (NC)	3.86E-04	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	3.86E-04	2.82E-04	3.31E-04	4.97E-05
Benzo(a)pyrene (C)	3.86E-04	2.82E-03	3.46E-03	6.48E-04
Benzo(b)fluoranthene (C)	3.86E-04	2.82E-04	3.19E-04	3.73E-05
Benzo(g,h,i)perylene	3.86E-04	2.82E-05	3.84E-05	1.03E-05
Benzo(k)fluoranthene (C)	3.86E-04	2.82E-05	3.44E-05	6.21E-06
Chrysene (C)	3.86E-04	2.82E-06	3.36E-06	5.46E-07
Dibenz(a,h)anthracene (C)	3.86E-04	2.82E-03	3.68E-03	8.61E-04
Fluoranthene (NC)	3.86E-04	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene (C)	3.86E-04	2.82E-04	3.96E-04	1.15E-04
Naphthalene (NC)	3.86E-04	0.00E+00	0.00E+00	0.00E+00
Phenanthrene (C)	3.86E-04	2.82E-06	2.95E-06	1.35E-07
2-Methylnaphthylene (NC)	3.86E-05	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane (C)	3.86E-05	3.51E-06	3.54E-06	3.26E-08
1,2,4-Trimethylbenzene (NC)	1.35E-03	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	8.33E-05	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	8.95E-04	2.15E-04	2.16E-04	8.65E-07
4,4'-DDE (C)	4.07E-04	1.38E-04	1.39E-04	7.10E-07
4,4'-DDT (C)	2.16E-03	7.34E-04	7.38E-04	3.28E-06
Aroclor 1248 (C)	5.01E-03	1.00E-02	1.00E-02	1.56E-05
Aroclor 1260 (C)	4.94E-02	9.87E-02	9.89E-02	1.54E-04
Benzene (C)	2.79E-05	1.54E-06	2.25E-06	7.16E-07
bis(2-Ethylhexyl)phthalate (C)	2.88E-02	4.03E-04	4.03E-04	7.03E-07
Bromodichloromethane (C)	2.10E-05	1.30E-06	1.50E-06	1.95E-07
Chloroform (C)	3.32E-06	0.00E+00	5.07E-12	5.07E-12
Dibromochloromethane (C)	8.44E-06	7.09E-07	7.13E-07	4.31E-09
Di-n-butylphthalate (NC)	5.14E-03	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	2.37E-04	0.00E+00	0.00E+00	0.00E+00
Methyl tert-butyl ether (C)	9.81E-07	3.92E-09	4.06E-09	1.36E-10
n-Butylbenzene (NC)	4.84E-04	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	2.24E-04	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride (C)	1.16E-06	8.70E-07	1.62E-06	7.46E-07
m,p-Xylene (NC)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	5.26E-04	0.00E+00	0.00E+00	0.00E+00
beta-BHC (C)	1.77E-05	3.19E-05	3.22E-05	3.44E-07
Total TCDD (C)	0.00E+00	0.00E+00	1.78E-07	1.78E-07

Table 3-29: Summary of exposure dose and hazard quotient by media for park users and off-site adult receptors.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	NA	NA	2.44E-04	NA	NA	2.44E-01	NA	NA	2.47E-05	NA	NA	2.47E-02
Antimony (NC)	NA	NA	2.29E-07	NA	NA	4.02E-03	NA	NA	1.89E-08	NA	NA	3.31E-04
Arsenic (C)	NA	NA	3.98E-07	NA	NA	1.33E-03	NA	NA	3.47E-08	NA	NA	1.16E-04
Barium (NC)	NA	NA	2.31E-06	NA	NA	1.65E-02	NA	NA	2.35E-07	NA	NA	1.68E-03
Beryllium (C)	NA	NA	1.64E-08	NA	NA	2.87E-03	NA	NA	1.44E-09	NA	NA	2.52E-04
Cadmium (C)	NA	NA	4.35E-08	NA	NA	7.63E-04	NA	NA	3.00E-09	NA	NA	5.26E-05
Chromium (C)	NA	NA	9.29E-07	NA	NA	3.25E-02	NA	NA	3.54E-08	NA	NA	1.24E-03
Chromium (total) (C)	NA	NA	4.85E-07	NA	NA	1.70E-02	NA	NA	3.59E-08	NA	NA	1.26E-03
Cobalt (C)	NA	NA	1.88E-07	NA	NA	3.30E-02	NA	NA	2.01E-08	NA	NA	3.52E-03
Copper (NC)	NA	NA	8.28E-07	NA	NA	2.07E-05	NA	NA	4.00E-08	NA	NA	1.00E-06
Iron (NC)	NA	NA	6.38E-04	NA	NA	2.13E-03	NA	NA	3.53E-08	NA	NA	1.18E-07
Lead (C)	NA	NA	2.95E-06	NA	NA	NA	NA	NA	1.31E-07	NA	NA	NA
Manganese (NC)	NA	NA	9.46E-06	NA	NA	6.62E-01	NA	NA	8.81E-07	NA	NA	6.17E-02
Mercury (NC)	NA	NA	5.27E-09	NA	NA	6.15E-05	NA	NA	4.24E-10	NA	NA	4.95E-06
Nickel (NC)	NA	NA	5.40E-07	NA	NA	2.70E-05	NA	NA	4.82E-08	NA	NA	2.41E-06
Thallium (NC)	NA	NA	6.76E-08	NA	NA	9.65E-04	NA	NA	3.05E-09	NA	NA	4.36E-05
Vanadium (NC)	NA	NA	7.68E-07	NA	NA	2.56E-03	NA	NA	5.11E-08	NA	NA	1.70E-04
Zinc (NC)	NA	NA	5.96E-06	NA	NA	1.99E-05	NA	NA	1.60E-07	NA	NA	5.33E-07
Acenaphthylene (C)	NA	NA	1.08E-07	NA	NA	NA	NA	NA	2.51E-08	NA	NA	NA
Anthracene (NC)	NA	NA	1.95E-08	NA	NA	6.52E-08	NA	NA	1.04E-08	NA	NA	3.46E-08
Benzo(a)anthracene (C)	NA	NA	7.96E-08	NA	NA	NA	NA	NA	1.09E-08	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	1.07E-07	NA	NA	NA	NA	NA	8.41E-09	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	1.59E-07	NA	NA	NA	NA	NA	8.15E-09	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	4.72E-08	NA	NA	NA	NA	NA	1.04E-08	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	9.25E-09	NA	NA	NA	NA	NA	9.79E-09	NA	NA	NA
Chrysene (C)	NA	NA	2.29E-07	NA	NA	NA	NA	NA	7.44E-09	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	1.91E-08	NA	NA	NA	NA	NA	1.04E-08	NA	NA	NA
Fluoranthene (NC)	NA	NA	1.98E-07	NA	NA	4.94E-06	NA	NA	1.18E-08	NA	NA	2.94E-07
Indeno(1,2,3-cd)pyrene (C)	NA	NA	3.61E-08	NA	NA	NA	NA	NA	1.04E-08	NA	NA	NA
Naphthalene (NC)	NA	NA	1.96E-08	NA	NA	2.28E-05	NA	NA	8.19E-09	NA	NA	9.55E-06
Phenanthrene (C)	NA	NA	5.58E-08	NA	NA	NA	NA	NA	1.13E-08	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	5.97E-08	NA	NA	1.49E-05	NA	NA	2.32E-09	NA	NA	5.81E-07
1,2-Dichloroethane (C)	NA	NA	5.97E-08	NA	NA	4.26E-05	NA	NA	2.32E-09	NA	NA	1.66E-06
1,2,4-Trimethylbenzene (NC)	NA	NA	1.50E-11	NA	NA	8.85E-09	NA	NA	8.59E-13	NA	NA	5.05E-10
1,3,5-Trimethylbenzene (NC)	NA	NA	1.50E-11	NA	NA	8.85E-09	NA	NA	8.59E-12	NA	NA	5.05E-09
4,4'-DDD (C)	NA	NA	3.14E-07	NA	NA	NA	NA	NA	1.17E-09	NA	NA	NA
4,4'-DDE (C)	NA	NA	3.15E-08	NA	NA	NA	NA	NA	9.06E-10	NA	NA	NA
4,4'-DDT (C)	NA	NA	2.85E-07	NA	NA	5.70E-04	NA	NA	5.67E-10	NA	NA	1.13E-06
Aroclor 1248 (C)	NA	NA	2.01E-08	NA	NA	NA	NA	NA	6.47E-11	NA	NA	NA
Aroclor 1260 (C)	NA	NA	5.32E-08	NA	NA	NA	NA	NA	8.26E-10	NA	NA	NA
Benzene (C)	NA	NA	1.03E-10	NA	NA	1.20E-08	NA	NA	1.10E-11	NA	NA	1.29E-09
bis(2-Ethylhexyl)phthalate (C)	NA	NA	5.78E-07	NA	NA	2.89E-05	NA	NA	9.56E-09	NA	NA	4.78E-07
Bromodichloromethane (C)	NA	NA	1.50E-11	NA	NA	7.52E-10	NA	NA	8.59E-13	NA	NA	4.29E-11
Chloroform (C)	NA	NA	1.03E-10	NA	NA	7.35E-09	NA	NA	5.88E-12	NA	NA	4.20E-10
Dibromochloromethane (C)	NA	NA	1.50E-11	NA	NA	7.52E-10	NA	NA	8.59E-13	NA	NA	4.29E-11
Di-n-butylphthalate (NC)	NA	NA	1.14E-07	NA	NA	1.14E-06	NA	NA	5.49E-09	NA	NA	5.49E-08
Ethylbenzene (NC)	NA	NA	1.03E-10	NA	NA	3.60E-10	NA	NA	1.26E-11	NA	NA	4.41E-11
Methyl tert-butyl ether (C)	NA	NA	7.17E-11	NA	NA	8.37E-11	NA	NA	1.29E-10	NA	NA	1.51E-10
n-Butylbenzene (NC)	NA	NA	3.12E-11	NA	NA	7.81E-10	NA	NA	1.72E-12	NA	NA	4.29E-11
Toluene (NC)	NA	NA	2.31E-11	NA	NA	2.02E-10	NA	NA	1.14E-11	NA	NA	1.00E-10
Vinyl Chloride (C)	NA	NA	1.50E-11	NA	NA	5.26E-10	NA	NA	8.59E-13	NA	NA	3.00E-11
m,p-Xylene (NC)	NA	NA	1.50E-11	NA	NA	5.26E-10	NA	NA	8.59E-13	NA	NA	3.00E-11
ortho-xylene (NC)	NA	NA	1.50E-11	NA	NA	5.26E-10	NA	NA	8.59E-13	NA	NA	3.00E-11
Xylenes (total) (NC)	NA	NA	2.01E-10	NA	NA	7.04E-09	NA	NA	2.25E-11	NA	NA	7.86E-10
beta-BHC (C)	NA	NA	6.25E-11	NA	NA	NA	NA	NA	9.25E-11	NA	NA	NA
Total TCDD (C)	NA	NA	2.54E-13	NA	NA	NA	NA	NA	0.00E+00	NA	NA	NA

Table 3-29: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure	HQ	Exposure		Hazard Quotient	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-29: Cont'd

Chemical (Qualifier)	F. Fish		Total Hazard Quotient	Total Hazard No Fish
	Exposure Ingestion	HQ Ingestion		
Aluminum (NC)	NA	NA	2.68E-01	2.68E-01
Antimony (NC)	NA	NA	4.35E-03	4.35E-03
Arsenic (C)	NA	NA	1.44E-03	1.44E-03
Barium (NC)	NA	NA	1.82E-02	1.82E-02
Beryllium (C)	NA	NA	3.13E-03	3.13E-03
Cadmium (C)	NA	NA	8.16E-04	8.16E-04
Chromium (C)	NA	NA	3.37E-02	3.37E-02
Chromium (total) (C)	NA	NA	1.82E-02	1.82E-02
Cobalt (C)	NA	NA	3.65E-02	3.65E-02
Copper (NC)	NA	NA	2.17E-05	2.17E-05
Iron (NC)	NA	NA	2.13E-03	2.13E-03
Lead (C)	NA	NA	NA	NA
Manganese (NC)	NA	NA	7.24E-01	7.24E-01
Mercury (NC)	NA	NA	6.65E-05	6.65E-05
Nickel (NC)	NA	NA	2.94E-05	2.94E-05
Thallium (NC)	NA	NA	1.01E-03	1.01E-03
Vanadium (NC)	NA	NA	2.73E-03	2.73E-03
Zinc (NC)	NA	NA	2.04E-05	2.04E-05
Acenaphthylene (C)	NA	NA	NA	NA
Anthracene (NC)	NA	NA	9.98E-08	9.98E-08
Benzo(a)anthracene (C)	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	5.24E-06	5.24E-06
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	3.24E-05	3.24E-05
Phenanthrene (C)	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	1.55E-05	1.55E-05
1,2-Dichloroethane (C)	NA	NA	4.43E-05	4.43E-05
1,2,4-Trimethylbenzene (NC)	NA	NA	9.35E-09	9.35E-09
1,3,5-Trimethylbenzene (NC)	NA	NA	1.39E-08	1.39E-08
4,4'-DDD (C)	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	5.71E-04	5.71E-04
Aroclor 1248 (C)	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA
Benzene (C)	NA	NA	1.33E-08	1.33E-08
bis(2-Ethylhexyl)phthalate (C)	NA	NA	2.94E-05	2.94E-05
Bromodichloromethane (C)	NA	NA	7.95E-10	7.95E-10
Chloroform (C)	NA	NA	7.77E-09	7.77E-09
Dibromochloromethane (C)	NA	NA	7.95E-10	7.95E-10
Di-n-butylphthalate (NC)	NA	NA	1.20E-06	1.20E-06
Ethylbenzene (NC)	NA	NA	4.04E-10	4.04E-10
Methyl tert-butyl ether (C)	NA	NA	2.35E-10	2.35E-10
n-Butylbenzene (NC)	NA	NA	8.24E-10	8.24E-10
Toluene (NC)	NA	NA	3.03E-10	3.03E-10
Vinyl Chloride (C)	NA	NA	5.56E-10	5.56E-10
m,p-Xylene (NC)	NA	NA	5.56E-10	5.56E-10
ortho-xylene (NC)	NA	NA	5.56E-10	5.56E-10
Xylenes (total) (NC)	NA	NA	7.83E-09	7.83E-09
beta-BHC (C)	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA

Table 3-30: Summary of exposure dose and ILCR by media for park users and off-site adult receptors.

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Arsenic (C)	NA	NA	1.71E-07	NA	NA	2.57E-06	NA	NA	1.49E-08	NA	NA	2.24E-07
Beryllium (C)	NA	NA	7.04E-09	NA	NA	5.91E-08	NA	NA	6.17E-10	NA	NA	5.18E-09
Cadmium (C)	NA	NA	1.86E-08	NA	NA	1.17E-07	NA	NA	1.28E-09	NA	NA	8.10E-09
Chromium (C)	NA	NA	3.98E-07	NA	NA	1.67E-05	NA	NA	1.52E-08	NA	NA	6.37E-07
Chromium (total) (C)	NA	NA	2.08E-07	NA	NA	8.73E-06	NA	NA	1.54E-08	NA	NA	6.47E-07
Cobalt (C)	NA	NA	8.06E-08	NA	NA	7.90E-07	NA	NA	8.60E-09	NA	NA	8.43E-08
Lead (C)	NA	NA	1.27E-06	NA	NA	0.00E+00	NA	NA	5.62E-08	NA	NA	0.00E+00
Acenaphthylene (C)	NA	NA	4.65E-08	NA	NA	1.44E-10	NA	NA	1.08E-08	NA	NA	3.33E-11
Anthracene (NC)	NA	NA	8.38E-09	NA	NA	0.00E+00	NA	NA	4.45E-09	NA	NA	0.00E+00
Benzo(a)anthracene (C)	NA	NA	3.41E-08	NA	NA	1.06E-08	NA	NA	4.66E-09	NA	NA	1.44E-09
Benzo(a)pyrene (C)	NA	NA	4.57E-08	NA	NA	1.42E-07	NA	NA	3.61E-09	NA	NA	1.12E-08
Benzo(b)fluoranthene (C)	NA	NA	6.83E-08	NA	NA	2.12E-08	NA	NA	3.49E-09	NA	NA	1.08E-09
Benzo(g,h,i)perylene	NA	NA	2.02E-08	NA	NA	6.27E-10	NA	NA	4.45E-09	NA	NA	1.38E-10
Benzo(k)fluoranthene (C)	NA	NA	3.97E-09	NA	NA	1.23E-10	NA	NA	4.19E-09	NA	NA	1.30E-10
Chrysene (C)	NA	NA	9.84E-08	NA	NA	3.05E-10	NA	NA	3.19E-09	NA	NA	9.88E-12
Dibenz(a,h)anthracene (C)	NA	NA	8.19E-09	NA	NA	2.54E-08	NA	NA	4.45E-09	NA	NA	1.38E-08
Fluoranthene (NC)	NA	NA	8.48E-08	NA	NA	0.00E+00	NA	NA	5.04E-09	NA	NA	0.00E+00
Indeno(1,2,3-cd)pyrene (C)	NA	NA	1.55E-08	NA	NA	4.79E-09	NA	NA	4.45E-09	NA	NA	1.38E-09
Naphthalene (NC)	NA	NA	8.39E-09	NA	NA	0.00E+00	NA	NA	3.51E-09	NA	NA	0.00E+00
Phenanthrene (C)	NA	NA	2.39E-08	NA	NA	7.41E-11	NA	NA	4.82E-09	NA	NA	1.50E-11
2-Methylnaphthylene (NC)	NA	NA	2.56E-08	NA	NA	0.00E+00	NA	NA	9.96E-10	NA	NA	0.00E+00
1,2-Dichloroethane (C)	NA	NA	2.56E-08	NA	NA	2.33E-09	NA	NA	9.96E-10	NA	NA	9.07E-11
1,2,4-Trimethylbenzene (NC)	NA	NA	6.44E-12	NA	NA	0.00E+00	NA	NA	3.68E-13	NA	NA	0.00E+00
1,3,5-Trimethylbenzene (NC)	NA	NA	6.44E-12	NA	NA	0.00E+00	NA	NA	3.68E-12	NA	NA	0.00E+00
4,4'-DDD (C)	NA	NA	1.34E-07	NA	NA	3.23E-08	NA	NA	5.02E-10	NA	NA	1.21E-10
4,4'-DDE (C)	NA	NA	1.35E-08	NA	NA	4.58E-09	NA	NA	3.88E-10	NA	NA	1.32E-10
4,4'-DDT (C)	NA	NA	1.22E-07	NA	NA	4.14E-08	NA	NA	2.43E-10	NA	NA	8.24E-11
Aroclor 1248 (C)	NA	NA	8.63E-09	NA	NA	1.73E-08	NA	NA	2.77E-11	NA	NA	5.55E-11
Aroclor 1260 (C)	NA	NA	2.28E-08	NA	NA	4.56E-08	NA	NA	3.54E-10	NA	NA	7.08E-10
Benzene (C)	NA	NA	4.41E-11	NA	NA	1.20E-12	NA	NA	4.73E-12	NA	NA	1.29E-13
bis(2-Ethylhexyl)phthalate (C)	NA	NA	2.48E-07	NA	NA	3.47E-09	NA	NA	4.10E-09	NA	NA	5.74E-11
Bromodichloromethane (C)	NA	NA	6.44E-12	NA	NA	4.00E-13	NA	NA	3.68E-13	NA	NA	2.28E-14
Chloroform (C)	NA	NA	4.41E-11	NA	NA	3.55E-12	NA	NA	2.52E-12	NA	NA	2.03E-13
Dibromochloromethane (C)	NA	NA	6.44E-12	NA	NA	5.41E-13	NA	NA	3.68E-13	NA	NA	3.09E-14
Di-n-butylphthalate (NC)	NA	NA	4.90E-08	NA	NA	0.00E+00	NA	NA	2.35E-09	NA	NA	0.00E+00
Ethylbenzene (NC)	NA	NA	4.41E-11	NA	NA	0.00E+00	NA	NA	5.41E-12	NA	NA	0.00E+00
Methyl tert-butyl ether (C)	NA	NA	3.07E-11	NA	NA	1.23E-13	NA	NA	5.55E-11	NA	NA	2.22E-13
n-Butylbenzene (NC)	NA	NA	1.34E-11	NA	NA	0.00E+00	NA	NA	7.36E-13	NA	NA	0.00E+00
Toluene (NC)	NA	NA	9.91E-12	NA	NA	0.00E+00	NA	NA	4.90E-12	NA	NA	0.00E+00
Vinyl Chloride (C)	NA	NA	6.44E-12	NA	NA	1.98E-13	NA	NA	3.68E-13	NA	NA	1.13E-14
m,p-Xylene (NC)	NA	NA	6.44E-12	NA	NA	0.00E+00	NA	NA	3.68E-13	NA	NA	0.00E+00
ortho-xylene (NC)	NA	NA	6.44E-12	NA	NA	0.00E+00	NA	NA	3.68E-13	NA	NA	0.00E+00
Xylenes (total) (NC)	NA	NA	8.63E-11	NA	NA	0.00E+00	NA	NA	9.62E-12	NA	NA	0.00E+00
beta-BHC (C)	NA	NA	2.68E-11	NA	NA	4.82E-11	NA	NA	3.96E-11	NA	NA	7.13E-11
Total TCDD (C)	NA	NA	1.09E-13	NA	NA	1.26E-08	NA	NA	0.00E+00	NA	NA	0.00E+00

Table 3-30: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	ICLR - Swimming		ICLR - Wading	Exposure	ICLR	Exposure		ILCR	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (total) (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ortho-xylene (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total) (NC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-30: Cont'd

Chemical (Qualifier)	F. Fish		Total ILCR	Total ILCR
	Exposure Ingestion	ICLR Ingestion		No Fish
Arsenic (C)	NA	NA	2.79E-06	2.79E-06
Beryllium (C)	NA	NA	6.43E-08	6.43E-08
Cadmium (C)	NA	NA	1.26E-07	1.26E-07
Chromium (C)	NA	NA	1.74E-05	1.74E-05
Chromium (total) (C)	NA	NA	9.38E-06	9.38E-06
Cobalt (C)	NA	NA	8.74E-07	8.74E-07
Lead (C)	NA	NA	0.00E+00	0.00E+00
Acenaphthylene (C)	NA	NA	1.77E-10	1.77E-10
Anthracene (NC)	NA	NA	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	NA	NA	1.20E-08	1.20E-08
Benzo(a)pyrene (C)	NA	NA	1.53E-07	1.53E-07
Benzo(b)fluoranthene (C)	NA	NA	2.23E-08	2.23E-08
Benzo(g,h,i)perylene	NA	NA	7.65E-10	7.65E-10
Benzo(k)fluoranthene (C)	NA	NA	2.53E-10	2.53E-10
Chrysene (C)	NA	NA	3.15E-10	3.15E-10
Dibenz(a,h)anthracene (C)	NA	NA	3.92E-08	3.92E-08
Fluoranthene (NC)	NA	NA	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene (C)	NA	NA	6.17E-09	6.17E-09
Naphthalene (NC)	NA	NA	0.00E+00	0.00E+00
Phenanthrene (C)	NA	NA	8.90E-11	8.90E-11
2-Methylnaphthylene (NC)	NA	NA	0.00E+00	0.00E+00
1,2-Dichloroethane (C)	NA	NA	2.42E-09	2.42E-09
1,2,4-Trimethylbenzene (NC)	NA	NA	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	NA	NA	0.00E+00	0.00E+00
4,4'-DDD (C)	NA	NA	3.24E-08	3.24E-08
4,4'-DDE (C)	NA	NA	4.72E-09	4.72E-09
4,4'-DDT (C)	NA	NA	4.15E-08	4.15E-08
Aroclor 1248 (C)	NA	NA	1.73E-08	1.73E-08
Aroclor 1260 (C)	NA	NA	4.63E-08	4.63E-08
Benzene (C)	NA	NA	1.33E-12	1.33E-12
bis(2-Ethylhexyl)phthalate (C)	NA	NA	3.53E-09	3.53E-09
Bromodichloromethane (C)	NA	NA	4.22E-13	4.22E-13
Chloroform (C)	NA	NA	3.75E-12	3.75E-12
Dibromochloromethane (C)	NA	NA	5.72E-13	5.72E-13
Di-n-butylphthalate (NC)	NA	NA	0.00E+00	0.00E+00
Ethylbenzene (NC)	NA	NA	0.00E+00	0.00E+00
Methyl tert-butyl ether (C)	NA	NA	3.45E-13	3.45E-13
n-Butylbenzene (NC)	NA	NA	0.00E+00	0.00E+00
Toluene (NC)	NA	NA	0.00E+00	0.00E+00
Vinyl Chloride (C)	NA	NA	2.10E-13	2.10E-13
m,p-Xylene (NC)	NA	NA	0.00E+00	0.00E+00
ortho-xylene (NC)	NA	NA	0.00E+00	0.00E+00
Xylenes (total) (NC)	NA	NA	0.00E+00	0.00E+00
beta-BHC (C)	NA	NA	1.20E-10	1.20E-10
Total TCDD (C)	NA	NA	1.26E-08	1.26E-08

Table 3-31: Summary of exposure dose and hazard quotient by media for park users and off-site receptors (child and adult).

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			Hazard Quotient			Exposure			Hazard Quotient		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Aluminum (NC)	2.75E-03	1.54E-04	2.44E-04	2.75E-03	1.54E-04	2.44E-01	NA	NA	2.47E-05	NA	NA	2.47E-02
Antimony (NC)	2.59E-06	1.45E-07	2.29E-07	6.47E-03	3.63E-04	4.02E-03	NA	NA	1.89E-08	NA	NA	3.31E-04
Arsenic (C)	4.49E-06	7.55E-07	3.98E-07	1.50E-02	2.52E-03	1.33E-03	NA	NA	3.47E-08	NA	NA	1.16E-04
Barium (NC)	2.60E-05	1.46E-06	2.31E-06	3.72E-04	2.09E-05	1.65E-02	NA	NA	2.35E-07	NA	NA	1.68E-03
Beryllium (C)	1.85E-07	1.04E-08	1.64E-08	9.27E-05	5.20E-06	2.87E-03	NA	NA	1.44E-09	NA	NA	2.52E-04
Cadmium (C)	4.91E-07	2.75E-09	4.35E-08	4.91E-04	2.75E-06	7.63E-04	NA	NA	3.00E-09	NA	NA	5.26E-05
Chromium (C)	1.05E-05	5.88E-07	9.29E-07	3.49E-03	1.96E-04	3.25E-02	NA	NA	3.54E-08	NA	NA	1.24E-03
Chromium (total) (C)	5.47E-06	3.07E-07	4.85E-07	1.82E-03	1.02E-04	1.70E-02	NA	NA	3.59E-08	NA	NA	1.26E-03
Cobalt (C)	2.12E-06	1.19E-07	1.88E-07	1.06E-04	5.95E-06	3.30E-02	NA	NA	2.01E-08	NA	NA	3.52E-03
Copper (NC)	9.34E-06	5.24E-07	8.28E-07	2.34E-04	1.31E-05	2.07E-05	NA	NA	4.00E-08	NA	NA	1.00E-06
Iron (NC)	7.20E-03	4.04E-04	6.38E-04	2.40E-02	1.35E-03	2.13E-03	NA	NA	3.53E-08	NA	NA	1.18E-07
Lead (C)	3.33E-05	1.87E-06	2.95E-06	NA	NA	NA	NA	NA	1.31E-07	NA	NA	NA
Manganese (NC)	1.07E-04	5.99E-06	9.46E-06	5.34E-03	2.99E-04	6.62E-01	NA	NA	8.81E-07	NA	NA	6.17E-02
Mercury (NC)	5.95E-08	3.34E-09	5.27E-09	6.94E-04	3.89E-05	6.15E-05	NA	NA	4.24E-10	NA	NA	4.95E-06
Nickel (NC)	6.10E-06	3.42E-07	5.40E-07	3.05E-04	1.71E-05	2.70E-05	NA	NA	4.82E-08	NA	NA	2.41E-06
Thallium (NC)	7.62E-07	4.28E-08	6.76E-08	1.09E-02	6.11E-04	9.65E-04	NA	NA	3.05E-09	NA	NA	4.36E-05
Vanadium (NC)	8.67E-06	4.86E-07	7.68E-07	2.89E-02	1.62E-03	2.56E-03	NA	NA	5.11E-08	NA	NA	1.70E-04
Zinc (NC)	6.72E-05	3.77E-06	5.96E-06	2.24E-04	1.26E-05	1.99E-05	NA	NA	1.60E-07	NA	NA	5.33E-07
Acenaphthylene (C)	1.22E-06	8.93E-07	1.08E-07	NA	NA	NA	NA	NA	2.51E-08	NA	NA	NA
Anthracene (NC)	2.21E-07	1.61E-07	1.95E-08	7.35E-07	5.36E-07	6.52E-08	NA	NA	1.04E-08	NA	NA	3.46E-08
Benzo(a)anthracene (C)	8.98E-07	6.55E-07	7.96E-08	NA	NA	NA	NA	NA	1.09E-08	NA	NA	NA
Benzo(a)pyrene (C)	1.20E-06	8.77E-07	1.07E-07	NA	NA	NA	NA	NA	8.41E-09	NA	NA	NA
Benzo(b)fluoranthene (C)	1.80E-06	1.31E-06	1.59E-07	NA	NA	NA	NA	NA	8.15E-09	NA	NA	NA
Benzo(g,h,i)perylene	5.32E-07	3.88E-07	4.72E-08	NA	NA	NA	NA	NA	1.04E-08	NA	NA	NA
Benzo(k)fluoranthene (C)	1.04E-07	7.61E-08	9.25E-09	NA	NA	NA	NA	NA	9.79E-09	NA	NA	NA
Chrysene (C)	2.59E-06	1.89E-06	2.29E-07	NA	NA	NA	NA	NA	7.44E-09	NA	NA	NA
Dibenz(a,h)anthracene (C)	2.16E-07	1.57E-07	1.91E-08	NA	NA	NA	NA	NA	1.04E-08	NA	NA	NA
Fluoranthene (NC)	2.23E-06	1.63E-06	1.98E-07	5.58E-05	4.07E-05	4.94E-06	NA	NA	1.18E-08	NA	NA	2.94E-07
Indeno(1,2,3-cd)pyrene (C)	4.07E-07	2.97E-07	3.61E-08	NA	NA	NA	NA	NA	1.04E-08	NA	NA	NA
Naphthalene (NC)	2.21E-07	1.61E-07	1.96E-08	1.10E-05	8.05E-06	2.28E-05	NA	NA	8.19E-09	NA	NA	9.55E-06
Phenanthrene (C)	6.29E-07	4.59E-07	5.58E-08	NA	NA	NA	NA	NA	1.13E-08	NA	NA	NA
2-Methylnaphthylene (NC)	6.73E-07	4.91E-07	5.97E-08	1.68E-04	1.23E-04	1.49E-05	NA	NA	2.32E-09	NA	NA	5.81E-07
1,2-Dichloroethane (C)	6.73E-07	1.13E-07	5.97E-08	3.37E-05	5.67E-06	4.26E-05	NA	NA	2.32E-09	NA	NA	1.66E-06
1,2,4-Trimethylbenzene (NC)	1.70E-10	2.86E-11	1.50E-11	3.39E-09	5.71E-10	8.85E-09	NA	NA	8.59E-13	NA	NA	5.05E-10
1,3,5-Trimethylbenzene (NC)	1.70E-10	2.86E-11	1.50E-11	3.39E-09	5.71E-10	8.85E-09	NA	NA	8.59E-12	NA	NA	5.05E-09
4,4'-DDD (C)	3.54E-06	1.99E-06	3.14E-07	NA	NA	NA	NA	NA	1.17E-09	NA	NA	NA
4,4'-DDE (C)	3.55E-07	1.99E-07	3.15E-08	NA	NA	NA	NA	NA	9.06E-10	NA	NA	NA
4,4'-DDT (C)	3.21E-06	5.41E-07	2.85E-07	6.43E-03	1.08E-03	5.70E-04	NA	NA	5.67E-10	NA	NA	1.13E-06
Aroclor 1248 (C)	2.27E-07	1.78E-07	2.01E-08	NA	NA	NA	NA	NA	6.47E-11	NA	NA	NA
Aroclor 1260 (C)	6.00E-07	4.71E-07	5.32E-08	NA	NA	NA	NA	NA	8.26E-10	NA	NA	NA
Benzene (C)	1.16E-09	3.26E-12	1.03E-10	2.90E-07	8.14E-10	1.20E-08	NA	NA	1.10E-11	NA	NA	1.29E-09
bis(2-Ethylhexyl)phthalate (C)	6.53E-06	3.66E-06	5.78E-07	3.26E-04	1.83E-04	2.89E-05	NA	NA	9.56E-09	NA	NA	4.78E-07
Bromodichloromethane (C)	1.70E-10	2.86E-11	1.50E-11	8.48E-09	1.43E-09	7.52E-10	NA	NA	8.59E-13	NA	NA	4.29E-11
Chloroform (C)	1.16E-09	1.95E-10	1.03E-10	1.16E-07	1.95E-08	7.35E-09	NA	NA	5.88E-12	NA	NA	4.20E-10
Dibromochloromethane (C)	1.70E-10	2.86E-11	1.50E-11	8.48E-09	1.43E-09	7.52E-10	NA	NA	8.59E-13	NA	NA	4.29E-11
Di-n-butylphthalate (NC)	1.29E-06	7.23E-07	1.14E-07	1.29E-05	7.23E-06	1.14E-06	NA	NA	5.49E-09	NA	NA	5.49E-08
Ethylbenzene (NC)	1.16E-09	1.95E-10	1.03E-10	1.16E-08	1.95E-09	3.60E-10	NA	NA	1.26E-11	NA	NA	4.41E-11
Methyl tert-butyl ether (C)	8.09E-10	1.36E-10	7.17E-11	9.44E-10	1.59E-10	8.37E-11	NA	NA	1.29E-10	NA	NA	1.51E-10
n-Butylbenzene (NC)	3.52E-10	5.93E-11	3.12E-11	8.81E-09	1.48E-09	7.81E-10	NA	NA	1.72E-12	NA	NA	4.29E-11
Toluene (NC)	2.61E-10	4.39E-11	2.31E-11	1.31E-09	2.20E-10	2.02E-10	NA	NA	1.14E-11	NA	NA	1.00E-10
Vinyl Chloride (C)	1.70E-10	4.76E-13	1.50E-11	5.66E-08	1.59E-10	5.26E-10	NA	NA	8.59E-13	NA	NA	3.00E-11
m,p-Xylene (NC)	1.70E-10	2.86E-11	1.50E-11	8.48E-10	1.43E-10	5.26E-10	NA	NA	8.59E-13	NA	NA	3.00E-11
ortho-xylene (NC)	1.70E-10	2.86E-11	1.50E-11	8.48E-10	1.43E-10	5.26E-10	NA	NA	8.59E-13	NA	NA	3.00E-11
Xylenes (total) (NC)	2.27E-09	3.82E-10	2.01E-10	1.14E-08	1.91E-09	7.04E-09	NA	NA	2.25E-11	NA	NA	7.86E-10
beta-BHC (C)	7.05E-10	3.95E-10	6.25E-11	NA	NA	NA	NA	NA	9.25E-11	NA	NA	NA
Total TCDD (C)	2.87E-12	4.83E-13	2.54E-13	NA	NA	NA	NA	NA	0.00E+00	NA	NA	NA

Table 3-31: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	HQ - Swimming		HQ - Wading	Exposure	HQ	Exposure		Hazard	Quotient
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Aluminum (NC)	2.58E-05	4.55E-06	1.59E-06	2.58E-05	4.55E-06	1.59E-06	NA	NA	1.10E-03	6.81E-05	1.10E-03	6.81E-05
Antimony (NC)	1.72E-07	3.03E-08	1.06E-08	4.31E-04	7.59E-05	2.65E-05	NA	NA	4.08E-07	2.52E-08	1.02E-03	6.29E-05
Arsenic (C)	3.19E-06	5.61E-07	1.96E-07	1.06E-02	1.87E-03	6.53E-04	NA	NA	8.53E-06	1.58E-06	2.84E-02	5.26E-03
Barium (NC)	5.86E-06	1.03E-06	3.60E-07	8.36E-05	1.47E-05	5.14E-06	NA	NA	2.07E-05	1.28E-06	2.96E-04	1.83E-05
Beryllium (C)	3.53E-08	6.22E-09	2.17E-09	1.77E-05	3.11E-06	1.09E-06	NA	NA	1.44E-07	8.91E-09	7.22E-05	4.45E-06
Cadmium (C)	1.89E-07	3.34E-08	1.16E-08	1.89E-04	3.34E-05	1.16E-05	NA	NA	2.20E-07	1.36E-09	2.20E-04	1.36E-06
Chromium (C)	9.47E-08	3.34E-08	1.16E-08	3.16E-05	1.11E-05	3.88E-06	NA	NA	4.96E-06	3.06E-07	1.65E-03	1.02E-04
Chromium (total) (C)	4.31E-07	1.52E-07	5.29E-08	1.44E-04	5.06E-05	1.76E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	1.72E-07	1.21E-08	4.24E-09	8.61E-06	6.07E-07	2.12E-07	NA	NA	1.26E-06	7.74E-08	6.28E-05	3.87E-06
Copper (NC)	2.95E-06	5.20E-07	1.82E-07	7.38E-05	1.30E-05	4.54E-06	NA	NA	8.91E-06	5.49E-07	2.23E-04	1.37E-05
Iron (NC)	9.13E-05	1.61E-05	5.61E-06	3.04E-04	5.36E-05	1.87E-05	NA	NA	4.35E-03	2.68E-04	1.45E-02	8.94E-04
Lead (C)	1.52E-05	2.69E-07	9.37E-08	NA	NA	NA	NA	NA	4.51E-05	2.78E-06	NA	NA
Manganese (NC)	3.46E-05	6.10E-06	2.13E-06	1.73E-03	3.05E-04	1.06E-04	NA	NA	6.53E-05	4.03E-06	3.27E-03	2.01E-04
Mercury (NC)	4.31E-08	7.59E-09	2.65E-09	5.02E-04	8.85E-05	3.09E-05	NA	NA	4.71E-08	2.90E-09	5.50E-04	3.39E-05
Nickel (NC)	1.89E-06	6.65E-08	2.32E-08	9.43E-05	3.32E-06	1.16E-06	NA	NA	8.51E-06	5.25E-07	4.26E-04	2.62E-05
Thallium (NC)	4.31E-07	7.59E-08	2.65E-08	6.15E-03	1.08E-03	3.78E-04	NA	NA	3.13E-07	1.93E-08	4.46E-03	2.75E-04
Vanadium (NC)	1.72E-07	3.03E-08	1.06E-08	5.74E-04	1.01E-04	3.53E-05	NA	NA	4.16E-06	2.57E-07	1.39E-02	8.55E-04
Zinc (NC)	4.09E-05	7.21E-06	2.51E-06	1.36E-04	2.40E-05	8.38E-06	NA	NA	1.90E-04	1.17E-05	6.33E-04	3.90E-05
Acenaphthylene (C)	4.31E-07	1.07E-05	3.73E-06	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA
Anthracene (NC)	4.31E-07	1.71E-05	5.96E-06	1.44E-06	5.69E-05	1.99E-05	NA	NA	5.18E-07	4.15E-07	1.73E-06	1.38E-06
Benzo(a)anthracene (C)	4.31E-07	7.19E-05	2.51E-05	NA	NA	NA	NA	NA	8.80E-07	7.05E-07	NA	NA
Benzo(a)pyrene (C)	4.31E-07	9.41E-05	3.28E-05	NA	NA	NA	NA	NA	8.80E-07	7.05E-07	NA	NA
Benzo(b)fluoranthene (C)	4.31E-07	5.30E-05	1.85E-05	NA	NA	NA	NA	NA	7.54E-07	6.04E-07	NA	NA
Benzo(g,h,i)perylene	4.31E-07	1.52E-04	5.29E-05	NA	NA	NA	NA	NA	3.14E-07	2.52E-07	NA	NA
Benzo(k)fluoranthene (C)	4.31E-07	9.10E-05	3.18E-05	NA	NA	NA	NA	NA	7.85E-07	6.29E-07	NA	NA
Chrysene (C)	4.31E-07	7.81E-05	2.73E-05	NA	NA	NA	NA	NA	8.17E-07	6.54E-07	NA	NA
Dibenz(a,h)anthracene (C)		1.27E-04	4.45E-05	NA	NA	NA	NA	NA	1.48E-07	1.18E-07	NA	NA
Fluoranthene (NC)	4.31E-07	3.89E-05	1.36E-05	1.08E-05	9.73E-04	3.39E-04	NA	NA	1.88E-06	1.51E-06	4.71E-05	3.78E-05
Indeno(1,2,3-cd)pyrene (C)	4.31E-07	1.69E-04	5.90E-05	NA	NA	NA	NA	NA	3.93E-07	3.15E-07	NA	NA
Naphthalene (NC)	4.31E-07	5.27E-06	1.84E-06	2.15E-05	2.63E-04	9.19E-05	NA	NA	1.88E-08	1.51E-08	9.42E-07	7.55E-07
Phenanthrene (C)	4.31E-07	1.74E-05	6.06E-06	NA	NA	NA	NA	NA	1.57E-06	1.26E-06	NA	NA
2-Methylnaphthylene (NC)	4.31E-08	1.08E-06	3.76E-07	1.08E-05	2.69E-04	9.40E-05	NA	NA	3.30E-08	2.64E-08	8.25E-06	6.61E-06
1,2-Dichloroethane (C)	4.31E-08	4.05E-08	1.41E-08	2.15E-06	2.03E-06	7.07E-07	NA	NA	3.30E-08	6.10E-09	1.65E-06	3.05E-07
1,2,4-Trimethylbenzene (NC)	4.31E-07	8.12E-06	2.83E-06	8.61E-06	1.62E-04	5.66E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-Trimethylbenzene (NC)	4.31E-08	8.12E-07	2.83E-07	8.61E-07	1.62E-05	5.66E-06	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD (C)	8.61E-09	6.07E-07	2.12E-07	NA	NA	NA	NA	NA	9.27E-07	5.71E-07	NA	NA
4,4'-DDE (C)	8.61E-09	1.39E-06	4.85E-07	NA	NA	NA	NA	NA	5.81E-07	3.58E-07	NA	NA
4,4'-DDT (C)	8.61E-09	1.61E-06	5.61E-07	1.72E-05	3.22E-03	1.12E-03	NA	NA	1.19E-05	2.21E-06	2.39E-02	4.41E-03
Aroclor 1248 (C)	4.74E-08	8.28E-06	2.89E-06	NA	NA	NA	NA	NA	1.23E-08	1.06E-08	NA	NA
Aroclor 1260 (C)	8.61E-08	8.32E-05	2.90E-05	NA	NA	NA	NA	NA	1.73E-08	1.49E-08	NA	NA
Benzene (C)	2.15E-07	1.40E-05	4.90E-06	5.38E-05	3.51E-03	1.22E-03	NA	NA	1.37E-09	4.23E-12	3.43E-07	1.06E-09
bis(2-Ethylhexyl)phthalate (C)	4.31E-07	5.01E-05	1.75E-05	2.15E-05	2.50E-03	8.74E-04	NA	NA	4.71E-08	2.90E-08	2.36E-06	1.45E-06
Bromodichloromethane (C)	1.72E-07	3.34E-06	1.16E-06	8.61E-06	1.67E-04	5.82E-05	NA	NA	1.37E-09	2.54E-10	6.86E-08	1.27E-08
Chloroform (C)	5.17E-07	1.55E-05	5.40E-06	5.17E-05	1.55E-03	5.40E-04	NA	NA	1.37E-09	2.54E-10	1.37E-07	2.54E-08
Dibromochloromethane (C)	5.17E-08	3.55E-08	1.24E-08	2.58E-06	1.78E-06	6.19E-07	NA	NA	1.37E-09	2.54E-10	6.86E-08	1.27E-08
Di-n-butylphthalate (NC)	1.12E-06	1.20E-04	4.20E-05	1.12E-05	1.20E-03	4.20E-04	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene (NC)	2.15E-07	4.55E-05	1.59E-05	2.15E-06	4.55E-04	1.59E-04	NA	NA	1.37E-09	2.54E-10	1.37E-08	2.54E-09
Methyl tert-butyl ether (C)	4.31E-08	1.95E-08	6.80E-09	5.02E-08	2.27E-08	7.94E-09	NA	NA	1.37E-09	2.54E-10	1.60E-09	2.96E-10
n-Butylbenzene (NC)	4.31E-08	0.00E+00	0.00E+00	1.08E-06	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (NC)	5.34E-07	7.34E-05	2.56E-05	2.67E-06	3.67E-04	1.28E-04	NA	NA	2.20E-08	4.07E-09	1.10E-07	2.03E-08
Vinyl Chloride (C)	4.31E-08	1.06E-06	3.71E-07	1.44E-05	3.54E-04	1.24E-04	NA	NA	1.37E-09	4.23E-12	4.57E-07	1.41E-09
m,p-Xylene (NC)	4.31E-08	1.06E-05	3.71E-06	2.15E-07	5.31E-05	1.85E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ortho-xylene (NC)	4.31E-08	1.06E-05	3.71E-06	2.15E-07	5.31E-05	1.85E-05	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total) (NC)	4.31E-07	1.06E-04	3.71E-05	2.15E-06	5.31E-04	1.85E-04	NA	NA	1.37E-09	2.54E-10	6.86E-09	1.27E-09
beta-BHC (C)	4.31E-09	2.05E-07	7.15E-08	NA	NA	NA	NA	NA	2.48E-10	1.53E-10	NA	NA
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	NA

Table 3-31: Cont'd

Chemical (Qualifier)	F. Fish		Total	Total
	Exposure	HQ	Hazard	Hazard
	Ingestion	Ingestion	Quotient	No Fish
Aluminum (NC)	1.82E-04	1.82E-04	2.73E-01	2.73E-01
Antimony (NC)	1.80E-05	4.50E-02	5.78E-02	1.28E-02
Arsenic (C)	9.16E-04	3.05E+00	3.12E+00	6.58E-02
Barium (NC)	9.64E-03	1.38E-01	1.57E-01	1.90E-02
Beryllium (C)	5.72E-06	2.86E-03	6.18E-03	3.32E-03
Cadmium (C)	4.49E-04	4.49E-01	4.51E-01	1.76E-03
Chromium (C)	4.70E-06	1.57E-03	4.08E-02	3.92E-02
Chromium (total) (C)	2.14E-05	7.13E-03	2.75E-02	2.04E-02
Cobalt (C)	8.10E-04	4.05E-02	7.72E-02	3.67E-02
Copper (NC)	5.48E-03	1.37E-01	1.38E-01	5.96E-04
Iron (NC)	4.29E-01	1.43E+00	1.47E+00	4.33E-02
Lead (C)	3.58E-06	NA	NA	NA
Manganese (NC)	1.63E-01	8.14E+00	8.88E+00	7.35E-01
Mercury (NC)	3.94E-04	4.59E+00	4.60E+00	2.01E-03
Nickel (NC)	3.84E-04	1.92E-02	2.01E-02	9.02E-04
Thallium (NC)	1.13E-02	1.61E+02	1.61E+02	2.49E-02
Vanadium (NC)	8.10E-04	2.70E+00	2.75E+00	4.87E-02
Zinc (NC)	2.24E-01	7.48E-01	7.49E-01	1.10E-03
Acenaphthylene (C)	5.63E-04	NA	NA	NA
Anthracene (NC)	5.63E-04	1.88E-03	1.96E-03	8.27E-05
Benzo(a)anthracene (C)	5.63E-04	NA	NA	NA
Benzo(a)pyrene (C)	5.63E-04	NA	NA	NA
Benzo(b)fluoranthene (C)	5.63E-04	NA	NA	NA
Benzo(g,h,i)perylene	5.63E-04	NA	NA	NA
Benzo(k)fluoranthene (C)	5.63E-04	NA	NA	NA
Chrysene (C)	5.63E-04	NA	NA	NA
Dibenz(a,h)anthracene (C)	5.63E-04	NA	NA	NA
Fluoranthene (NC)	5.63E-04	1.41E-02	1.56E-02	1.51E-03
Indeno(1,2,3-cd)pyrene (C)	5.63E-04	NA	NA	NA
Naphthalene (NC)	5.63E-04	2.81E-02	2.86E-02	4.30E-04
Phenanthrene (C)	5.63E-04	NA	NA	NA
2-Methylnaphthylene (NC)	5.63E-05	1.41E-02	1.48E-02	6.96E-04
1,2-Dichloroethane (C)	5.63E-05	2.81E-03	2.90E-03	9.05E-05
1,2,4-Trimethylbenzene (NC)	1.97E-03	3.94E-02	3.96E-02	2.28E-04
1,3,5-Trimethylbenzene (NC)	1.22E-04	2.43E-03	2.45E-03	2.28E-05
4,4'-DDD (C)	1.31E-03	NA	NA	NA
4,4'-DDE (C)	5.94E-04	NA	NA	NA
4,4'-DDT (C)	3.15E-03	6.30E+00	6.34E+00	4.07E-02
Aroclor 1248 (C)	7.30E-03	NA	NA	NA
Aroclor 1260 (C)	7.20E-02	NA	NA	NA
Benzene (C)	4.07E-05	1.02E-02	1.50E-02	4.79E-03
bis(2-Ethylhexyl)phthalate (C)	4.19E-02	2.10E+00	2.10E+00	3.94E-03
Bromodichloromethane (C)	3.06E-05	1.53E-03	1.76E-03	2.34E-04
Chloroform (C)	4.85E-06	4.85E-04	2.62E-03	2.14E-03
Dibromochloromethane (C)	1.23E-05	6.15E-04	6.20E-04	5.07E-06
Di-n-butylphthalate (NC)	7.50E-03	7.50E-02	7.67E-02	1.66E-03
Ethylbenzene (NC)	3.45E-04	3.45E-03	4.07E-03	6.16E-04
Methyl tert-butyl ether (C)	1.43E-06	1.67E-06	1.75E-06	8.41E-08
n-Butylbenzene (NC)	7.07E-04	1.77E-02	1.77E-02	1.09E-06
Toluene (NC)	3.26E-04	1.63E-03	2.13E-03	4.98E-04
Vinyl Chloride (C)	1.69E-06	5.64E-04	1.06E-03	4.92E-04
m,p-Xylene (NC)	0.00E+00	0.00E+00	7.19E-05	7.19E-05
ortho-xylene (NC)	0.00E+00	0.00E+00	7.19E-05	7.19E-05
Xylenes (total) (NC)	7.67E-04	3.83E-03	4.55E-03	7.19E-04
beta-BHC (C)	2.58E-05	NA	NA	NA
Total TCDD (C)	0.00E+00	NA	NA	NA

Table 3-32: Summary of exposure dose and ILCR by media for park users and off-site receptors (child and adult).

Chemical (Qualifier)	A. Surface Soil						B. Subsurface Soil					
	Exposure			ILCR			Exposure			ILCR		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Arsenic (C)	1.92E-06	3.24E-07	1.71E-07	2.89E-06	4.86E-07	2.57E-06	NA	NA	1.49E-08	NA	NA	2.24E-07
Beryllium (C)	7.94E-08	4.46E-09	7.04E-09	6.67E-07	3.74E-08	5.91E-08	NA	NA	6.17E-10	NA	NA	5.18E-09
Cadmium (C)	2.10E-07	1.18E-09	1.86E-08	1.32E-06	7.43E-09	1.17E-07	NA	NA	1.28E-09	NA	NA	8.10E-09
Chromium (C)	4.49E-06	2.52E-07	3.98E-07	1.89E-04	1.06E-05	1.67E-05	NA	NA	1.52E-08	NA	NA	6.37E-07
Chromium (total) (C)	2.35E-06	1.32E-07	2.08E-07	9.85E-05	5.53E-06	8.73E-06	NA	NA	1.54E-08	NA	NA	6.47E-07
Cobalt (C)	9.09E-07	5.10E-08	8.06E-08	8.91E-06	5.00E-07	7.90E-07	NA	NA	8.60E-09	NA	NA	8.43E-08
Lead (C)	1.43E-05	8.01E-07	1.27E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.62E-08	NA	NA	0.00E+00
Acenaphthylene (C)	5.25E-07	3.83E-07	4.65E-08	3.83E-09	2.79E-09	1.44E-10	NA	NA	1.08E-08	NA	NA	3.33E-11
Benzo(a)anthracene (C)	3.85E-07	2.81E-07	3.41E-08	2.81E-07	2.05E-07	1.06E-08	NA	NA	4.66E-09	NA	NA	1.44E-09
Benzo(a)pyrene (C)	5.16E-07	3.76E-07	4.57E-08	3.76E-06	2.75E-06	1.42E-07	NA	NA	3.61E-09	NA	NA	1.12E-08
Benzo(b)fluoranthene (C)	7.71E-07	5.62E-07	6.83E-08	5.63E-07	4.10E-07	2.12E-08	NA	NA	3.49E-09	NA	NA	1.08E-09
Benzo(g,h,i)perylene	2.28E-07	1.66E-07	2.02E-08	1.67E-08	1.21E-08	6.27E-10	NA	NA	4.45E-09	NA	NA	1.38E-10
Benzo(k)fluoranthene (C)	4.47E-08	3.26E-08	3.97E-09	3.27E-09	2.38E-09	1.23E-10	NA	NA	4.19E-09	NA	NA	1.30E-10
Chrysene (C)	1.11E-06	8.09E-07	9.84E-08	8.10E-09	5.91E-09	3.05E-10	NA	NA	3.19E-09	NA	NA	9.88E-12
Dibenz(a,h)anthracene (C)	9.24E-08	6.74E-08	8.19E-09	6.75E-07	4.92E-07	2.54E-08	NA	NA	4.45E-09	NA	NA	1.38E-08
Indeno(1,2,3-cd)pyrene (C)	1.75E-07	1.27E-07	1.55E-08	1.27E-07	9.29E-08	4.79E-09	NA	NA	4.45E-09	NA	NA	1.38E-09
Phenanthrene (C)	2.70E-07	1.97E-07	2.39E-08	1.97E-09	1.44E-09	7.41E-11	NA	NA	4.82E-09	NA	NA	1.50E-11
1,2-Dichloroethane (C)	2.89E-07	4.86E-08	2.56E-08	2.63E-08	4.42E-09	2.33E-09	NA	NA	9.96E-10	NA	NA	9.07E-11
4,4'-DDD (C)	1.52E-06	8.51E-07	1.34E-07	3.64E-07	2.04E-07	3.23E-08	NA	NA	5.02E-10	NA	NA	1.21E-10
4,4'-DDE (C)	1.52E-07	8.53E-08	1.35E-08	5.17E-08	2.90E-08	4.58E-09	NA	NA	3.88E-10	NA	NA	1.32E-10
4,4'-DDT (C)	1.38E-06	2.32E-07	1.22E-07	4.68E-07	7.88E-08	4.14E-08	NA	NA	2.43E-10	NA	NA	8.24E-11
Aroclor 1248 (C)	9.73E-08	7.64E-08	8.63E-09	1.95E-07	1.53E-07	1.73E-08	NA	NA	2.77E-11	NA	NA	5.55E-11
Aroclor 1260 (C)	2.57E-07	2.02E-07	2.28E-08	5.15E-07	4.04E-07	4.56E-08	NA	NA	3.54E-10	NA	NA	7.08E-10
Benzene (C)	4.98E-10	1.40E-12	4.41E-11	2.74E-11	7.68E-14	1.20E-12	NA	NA	4.73E-12	NA	NA	1.29E-13
bis(2-Ethylhexyl)phthalate (C)	2.80E-06	1.57E-06	2.48E-07	3.92E-08	2.20E-08	3.47E-09	NA	NA	4.10E-09	NA	NA	5.74E-11
Bromodichloromethane (C)	7.27E-11	1.22E-11	6.44E-12	4.51E-12	7.59E-13	4.00E-13	NA	NA	3.68E-13	NA	NA	2.28E-14
Chloroform (C)	4.98E-10	8.38E-11	4.41E-11	0.00E+00	0.00E+00	3.55E-12	NA	NA	2.52E-12	NA	NA	2.03E-13
Dibromochloromethane (C)	7.27E-11	1.22E-11	6.44E-12	6.11E-12	1.03E-12	5.41E-13	NA	NA	3.68E-13	NA	NA	3.09E-14
Methyl tert-butyl ether (C)	3.47E-10	5.84E-11	3.07E-11	1.39E-12	2.33E-13	1.23E-13	NA	NA	5.55E-11	NA	NA	2.22E-13
Vinyl Chloride (C)	7.27E-11	2.04E-13	6.44E-12	1.09E-10	3.06E-13	1.98E-13	NA	NA	3.68E-13	NA	NA	1.13E-14
beta-BHC (C)	3.02E-10	1.69E-10	2.68E-11	5.44E-10	3.05E-10	4.82E-11	NA	NA	3.96E-11	NA	NA	7.13E-11
Total TCDD (C)	1.23E-12	2.07E-13	1.09E-13	1.85E-07	3.11E-08	1.26E-08	NA	NA	0.00E+00	NA	NA	0.00E+00

Table 3-32: Cont'd

Chemical (Qualifier)	C. Surface Water						D. Groundwater		E. Sediments			
	Exposure - Swimming		Wading	ILCR - Swimming		Wading	Exposure	ILCR	Exposure		ILCR	
	Ingestion	Dermal	Dermal	Ingestion	Dermal	Dermal	Dermal	Dermal	Ingestion	Dermal	Ingestion	Dermal
Arsenic (C)	1.37E-06	2.41E-07	8.40E-08	2.05E-06	3.61E-07	1.26E-07	NA	NA	3.65E-06	6.76E-07	5.48E-06	1.01E-06
Beryllium (C)	1.51E-08	2.67E-09	9.30E-10	1.27E-07	2.24E-08	7.81E-09	NA	NA	6.19E-08	3.82E-09	5.20E-07	3.21E-08
Cadmium (C)	8.12E-08	1.43E-08	4.99E-09	5.11E-07	9.01E-08	3.14E-08	NA	NA	9.42E-08	5.81E-10	5.94E-07	3.66E-09
Chromium (C)	4.06E-08	1.43E-08	4.99E-09	1.70E-06	6.01E-07	2.10E-07	NA	NA	2.13E-06	1.31E-07	8.93E-05	5.51E-06
Chromium (total) (C)	1.85E-07	6.50E-08	2.27E-08	7.75E-06	2.73E-06	9.53E-07	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt (C)	7.38E-08	5.20E-09	1.82E-09	7.23E-07	5.10E-08	1.78E-08	NA	NA	5.38E-07	3.32E-08	5.28E-06	3.25E-07
Lead (C)	6.53E-06	1.15E-07	4.02E-08	0.00E+00	0.00E+00	0.00E+00	NA	NA	1.93E-05	1.19E-06	0.00E+00	0.00E+00
Acenaphthylene (C)	1.85E-07	4.58E-06	1.60E-06	1.35E-09	3.35E-08	1.17E-08	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene (C)	1.85E-07	3.08E-05	1.08E-05	1.35E-07	2.25E-05	7.85E-06	NA	NA	3.77E-07	3.02E-07	2.75E-07	2.20E-07
Benzo(a)pyrene (C)	1.85E-07	4.03E-05	1.41E-05	1.35E-06	2.94E-04	1.03E-04	NA	NA	3.77E-07	3.02E-07	2.75E-06	2.20E-06
Benzo(b)fluoranthene (C)	1.85E-07	2.27E-05	7.93E-06	1.35E-07	1.66E-05	5.79E-06	NA	NA	3.23E-07	2.59E-07	2.36E-07	1.89E-07
Benzo(g,h,i)perylene	1.85E-07	6.50E-05	2.27E-05	1.35E-08	4.75E-06	1.66E-06	NA	NA	1.35E-07	1.08E-07	9.83E-09	7.87E-09
Benzo(k)fluoranthene (C)	1.85E-07	3.90E-05	1.36E-05	1.35E-08	2.85E-06	9.94E-07	NA	NA	3.37E-07	2.70E-07	2.46E-08	1.97E-08
Chrysene (C)	1.85E-07	3.35E-05	1.17E-05	1.35E-09	2.44E-07	8.53E-08	NA	NA	3.50E-07	2.80E-07	2.56E-09	2.05E-09
Dibenz(a,h)anthracene (C)	1.85E-07	5.46E-05	1.91E-05	1.35E-06	3.99E-04	1.39E-04	NA	NA	6.33E-08	5.07E-08	4.62E-07	3.70E-07
Indeno(1,2,3-cd)pyrene (C)	1.85E-07	7.25E-05	2.53E-05	1.35E-07	5.29E-05	1.85E-05	NA	NA	1.68E-07	1.35E-07	1.23E-07	9.84E-08
Phenanthrene (C)	1.85E-07	7.45E-06	2.60E-06	1.35E-09	5.44E-08	1.90E-08	NA	NA	6.73E-07	5.39E-07	4.91E-09	3.94E-09
1,2-Dichloroethane (C)	1.85E-08	1.74E-08	6.06E-09	1.68E-09	1.58E-09	5.51E-10	NA	NA	1.41E-08	2.61E-09	1.29E-09	2.38E-10
4,4'-DDD (C)	3.69E-09	2.60E-07	9.08E-08	8.86E-10	6.24E-08	2.18E-08	NA	NA	3.97E-07	2.45E-07	9.53E-08	5.87E-08
4,4'-DDE (C)	3.69E-09	5.96E-07	2.08E-07	1.25E-09	2.03E-07	7.07E-08	NA	NA	2.49E-07	1.54E-07	8.47E-08	5.22E-08
4,4'-DDT (C)	3.69E-09	6.89E-07	2.41E-07	1.25E-09	2.34E-07	8.18E-08	NA	NA	5.12E-06	9.46E-07	1.74E-06	3.22E-07
Aroclor 1248 (C)	2.03E-08	3.55E-06	1.24E-06	4.06E-08	7.10E-06	2.48E-06	NA	NA	5.25E-09	4.53E-09	1.05E-08	9.06E-09
Aroclor 1260 (C)	3.69E-08	3.56E-05	1.24E-05	7.38E-08	7.13E-05	2.49E-05	NA	NA	7.40E-09	6.39E-09	1.48E-08	1.28E-08
Benzene (C)	9.23E-08	6.02E-06	2.10E-06	5.07E-09	3.31E-07	1.15E-07	NA	NA	5.88E-10	1.81E-12	3.23E-11	9.96E-14
bis(2-Ethylhexyl)phthalate (C)	1.85E-07	2.15E-05	7.49E-06	2.58E-09	3.00E-07	1.05E-07	NA	NA	2.02E-08	1.24E-08	2.83E-10	1.74E-10
Bromodichloromethane (C)	7.38E-08	1.43E-06	4.99E-07	4.58E-09	8.87E-08	3.09E-08	NA	NA	5.88E-10	1.09E-10	3.64E-11	6.74E-12
Chloroform (C)	2.21E-07	6.63E-06	2.31E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	5.88E-10	1.09E-10	0.00E+00	0.00E+00
Dibromochloromethane (C)	2.21E-08	1.52E-08	5.31E-09	1.86E-09	1.28E-09	4.46E-10	NA	NA	5.88E-10	1.09E-10	4.94E-11	9.13E-12
Methyl tert-butyl ether (C)	1.85E-08	8.36E-09	2.92E-09	7.38E-11	3.34E-11	1.17E-11	NA	NA	5.88E-10	1.09E-10	2.35E-12	4.35E-13
Vinyl Chloride (C)	1.85E-08	4.55E-07	1.59E-07	2.77E-08	6.83E-07	2.38E-07	NA	NA	5.88E-10	1.81E-12	8.81E-10	2.72E-12
beta-BHC (C)	1.85E-09	8.78E-08	3.06E-08	3.32E-09	1.58E-07	5.51E-08	NA	NA	1.06E-10	6.56E-11	1.91E-10	1.18E-10
Total TCDD (C)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 3-32: Cont'd

Chemical (Qualifier)	F. Fish		Total	Total
	Exposure Ingestion	ILCR Ingestion	ILCR	ILCR No Fish
Arsenic (C)	3.92E-04	5.89E-04	6.04E-04	1.52E-05
Beryllium (C)	2.45E-06	2.06E-05	2.21E-05	1.48E-06
Cadmium (C)	1.92E-04	1.21E-03	1.21E-03	2.69E-06
Chromium (C)	2.02E-06	8.46E-05	3.99E-04	3.14E-04
Chromium (total) (C)	9.16E-06	3.85E-04	5.10E-04	1.25E-04
Cobalt (C)	3.47E-04	3.40E-03	3.42E-03	1.67E-05
Lead (C)	1.54E-06	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene (C)	2.41E-04	1.76E-06	1.81E-06	5.33E-08
Benzo(a)anthracene (C)	2.41E-04	1.76E-04	2.07E-04	3.15E-05
Benzo(a)pyrene (C)	2.41E-04	1.76E-03	2.17E-03	4.10E-04
Benzo(b)fluoranthene (C)	2.41E-04	1.76E-04	2.00E-04	2.39E-05
Benzo(g,h,i)perylene	2.41E-04	1.76E-05	2.41E-05	6.46E-06
Benzo(k)fluoranthene (C)	2.41E-04	1.76E-05	2.15E-05	3.91E-06
Chrysene (C)	2.41E-04	1.76E-06	2.11E-06	3.50E-07
Dibenz(a,h)anthracene (C)	2.41E-04	1.76E-03	2.30E-03	5.41E-04
Indeno(1,2,3-cd)pyrene (C)	2.41E-04	1.76E-04	2.48E-04	7.20E-05
Phenanthrene (C)	2.41E-04	1.76E-06	1.85E-06	8.70E-08
1,2-Dichloroethane (C)	2.41E-05	2.19E-06	2.23E-06	3.84E-08
4,4'-DDD (C)	5.59E-04	1.34E-04	1.35E-04	8.40E-07
4,4'-DDE (C)	2.55E-04	8.66E-05	8.71E-05	4.97E-07
4,4'-DDT (C)	1.35E-03	4.59E-04	4.62E-04	2.97E-06
Aroclor 1248 (C)	3.13E-03	6.26E-03	6.27E-03	1.00E-05
Aroclor 1260 (C)	3.09E-02	6.17E-02	6.18E-02	9.72E-05
Benzene (C)	1.75E-05	9.60E-07	1.41E-06	4.51E-07
bis(2-Ethylhexyl)phthalate (C)	1.80E-02	2.52E-04	2.52E-04	4.73E-07
Bromodichloromethane (C)	1.31E-05	8.13E-07	9.37E-07	1.24E-07
Chloroform (C)	2.08E-06	0.00E+00	3.75E-12	3.75E-12
Dibromochloromethane (C)	5.27E-06	4.43E-07	4.47E-07	3.65E-09
Methyl tert-butyl ether (C)	6.13E-07	2.45E-09	2.58E-09	1.24E-10
Vinyl Chloride (C)	7.25E-07	1.09E-06	2.04E-06	9.50E-07
beta-BHC (C)	1.11E-05	1.99E-05	2.02E-05	2.18E-07
Total TCDD (C)	0.00E+00	0.00E+00	2.28E-07	2.28E-07

Table 3-33: Summary of hazard quotients (non-carcinogenic assessment). Fish consumption not included.

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident (Current)[1]			Off-Site Resident (Future)[2]			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined	Child	Adult	Combined
Aluminum (NC)	4.38E-01	1.61E-01	4.00E-02	2.75E-02	1.90E-01	9.06E-01	**1.17E+00**	4.18E-01	2.44E-01	**1.52E+00**	4.48E-01	2.68E-01	1.56E+00	4.52E-01	2.73E-01
Antimony (NC)	4.47E-02	7.12E-02	8.67E-03	9.09E-03	2.48E-02	2.49E-01	1.93E-02	6.88E-03	4.02E-03	2.40E-02	7.29E-03	4.35E-03	9.31E-02	1.54E-02	1.28E-02
Arsenic (C)	4.17E-01	5.18E-01	7.93E-02	7.15E-02	1.15E-01	**1.02E+00**	6.39E-03	2.27E-03	1.33E-03	8.01E-03	2.42E-03	1.44E-03	5.25E-01	8.15E-02	6.58E-02
Barium (NC)	3.28E-02	1.53E-02	3.28E-03	2.45E-03	1.38E-02	8.46E-02	7.93E-02	2.82E-02	1.65E-02	1.03E-01	3.03E-02	1.82E-02	1.10E-01	3.12E-02	1.90E-02
Beryllium (C)	5.98E-03	3.14E-03	6.30E-04	4.87E-04	2.52E-03	1.38E-02	1.38E-02	4.92E-03	2.87E-03	1.74E-02	5.24E-03	3.13E-03	1.90E-02	5.44E-03	3.32E-03
Cadmium (C)	5.79E-03	7.74E-03	1.07E-03	1.08E-03	2.38E-03	2.50E-02	3.67E-03	1.31E-03	7.63E-04	4.41E-03	1.37E-03	8.16E-04	1.18E-02	2.33E-03	1.76E-03
Chromium (C)	8.62E-02	6.48E-02	1.03E-02	8.99E-03	3.72E-02	2.03E-01	1.57E-01	5.57E-02	3.25E-02	1.74E-01	5.72E-02	3.37E-02	2.22E-01	6.27E-02	3.92E-02
Chromium (total) (C)	3.78E-02	2.55E-02	4.51E-03	3.75E-03	1.84E-02	1.52E-01	8.18E-02	2.91E-02	1.70E-02	9.94E-02	3.07E-02	1.82E-02	1.16E-01	3.27E-02	2.04E-02
Cobalt (C)	5.76E-02	1.86E-02	5.06E-03	3.33E-03	2.47E-02	1.12E-01	1.59E-01	5.65E-02	3.30E-02	2.08E-01	6.09E-02	3.65E-02	2.10E-01	6.11E-02	3.67E-02
Copper (NC)	3.29E-03	4.77E-03	6.19E-04	6.32E-04	1.10E-03	7.45E-03	9.97E-05	3.55E-05	2.07E-05	1.14E-04	3.67E-05	2.17E-05	4.88E-03	6.53E-04	5.96E-04
Iron (NC)	2.34E-01	3.64E-01	4.21E-02	4.50E-02	9.64E-02	6.48E-01	1.02E-02	3.64E-03	2.13E-03	1.02E-02	3.64E-03	2.13E-03	3.72E-01	4.55E-02	4.33E-02
Lead (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	**1.19E+00**	4.32E-01	1.09E-01	7.48E-02	5.10E-01	**2.31E+00**	**3.19E+00**	**1.13E+00**	6.62E-01	**4.05E+00**	**1.21E+00**	7.24E-01	**4.14E+00**	**1.22E+00**	7.35E-01
Mercury (NC)	9.95E-03	1.46E-02	2.11E-03	2.08E-03	3.29E-03	2.79E-02	2.96E-04	1.05E-04	6.15E-05	3.66E-04	1.12E-04	6.65E-05	1.49E-02	2.22E-03	2.01E-03
Nickel (NC)	5.09E-03	7.58E-03	9.42E-04	9.82E-04	1.56E-03	1.35E-02	1.30E-04	4.63E-05	2.70E-05	1.64E-04	4.93E-05	2.94E-05	7.73E-03	9.88E-04	9.02E-04
Thallium (NC)	1.14E-01	1.76E-01	2.53E-02	2.51E-02	4.48E-02	3.07E-01	4.65E-03	1.65E-03	9.65E-04	5.26E-03	1.71E-03	1.01E-03	1.80E-01	2.68E-02	2.49E-02
Vanadium (NC)	2.45E-01	4.00E-01	4.64E-02	4.97E-02	1.11E-01	**1.34E+00**	1.23E-02	4.39E-03	2.56E-03	1.47E-02	4.60E-03	2.73E-03	4.14E-01	5.06E-02	4.87E-02
Zinc (NC)	6.72E-03	9.37E-03	1.23E-03	1.24E-03	1.67E-03	9.36E-03	9.56E-05	3.40E-05	1.99E-05	1.03E-04	3.47E-05	2.04E-05	9.46E-03	1.26E-03	1.10E-03
Acenaphthylene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	5.31E-04	3.25E-04	1.62E-04	8.30E-05	2.25E-04	1.54E-03	3.14E-07	1.12E-07	6.52E-08	8.00E-07	1.55E-07	9.98E-08	3.25E-04	1.62E-04	8.27E-05
Benzo(a)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	9.69E-03	6.34E-03	2.89E-03	1.52E-03	4.17E-03	2.64E-02	2.38E-05	8.47E-06	4.94E-06	2.79E-05	8.84E-06	5.24E-06	6.37E-03	2.90E-03	1.51E-03
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	2.44E-03	1.59E-03	7.56E-04	4.00E-04	1.07E-03	2.55E-02	1.10E-04	3.91E-05	2.28E-05	2.44E-04	5.11E-05	3.24E-05	1.82E-03	8.04E-04	4.30E-04
Phenanthrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	3.58E-03	3.90E-03	1.07E-03	6.84E-04	1.97E-03	1.99E-01	7.19E-05	2.56E-05	1.49E-05	8.00E-05	2.63E-05	1.55E-05	3.97E-03	1.09E-03	6.96E-04

Table 3-33: Cont'd.

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident (Current)[1]			Off-Site Resident (Future)[2]			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined	Child	Adult	Combined
1,2-Dichloroethane (C)	2.69E-04	3.82E-04	5.32E-05	5.06E-05	1.60E-04	2.32E-03	2.05E-04	7.30E-05	4.26E-05	2.29E-04	7.51E-05	4.43E-05	5.89E-04	1.22E-04	9.05E-05
1,2,4-Trimethylbenzene (NC)	1.41E-03	8.49E-04	4.45E-04	2.28E-04	6.08E-04	4.38E-03	4.26E-08	1.52E-08	8.85E-09	4.97E-08	1.58E-08	9.35E-09	8.49E-04	4.45E-04	2.28E-04
1,3,5-Trimethylbenzene (NC)	1.41E-04	8.49E-05	4.45E-05	2.28E-05	6.08E-05	1.04E-03	4.26E-08	1.52E-08	8.85E-09	1.14E-07	2.15E-08	1.39E-08	8.50E-05	4.46E-05	2.28E-05
4,4'-DDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	3.04E-01	3.43E-01	5.53E-02	4.62E-02	8.06E-02	3.39E-01	2.74E-03	9.76E-04	5.70E-04	2.76E-03	9.77E-04	5.71E-04	3.45E-01	5.62E-02	4.07E-02
Aroclor 1248 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	3.00E-02	1.77E-02	9.49E-03	4.79E-03	1.31E-02	**4.41E+00**	5.78E-08	2.06E-08	1.20E-08	7.59E-08	2.22E-08	1.33E-08	1.77E-02	9.49E-03	4.79E-03
bis(2-Ethylhexyl)phthalate (C)	2.33E-02	1.68E-02	7.28E-03	3.92E-03	1.10E-02	1.17E-01	1.39E-04	4.95E-05	2.89E-05	1.46E-04	5.01E-05	2.94E-05	1.69E-02	7.33E-03	3.94E-03
Bromodichloromethane (C)	1.45E-03	8.72E-04	4.58E-04	2.34E-04	6.25E-04	2.56E-03	3.62E-09	1.29E-09	7.52E-10	4.22E-09	1.34E-09	7.95E-10	8.72E-04	4.58E-04	2.34E-04
Chloroform (C)	1.33E-02	7.95E-03	4.22E-03	2.14E-03	5.80E-03	5.85E-02	3.54E-08	1.26E-08	7.35E-09	4.13E-08	1.31E-08	7.77E-09	7.95E-03	4.22E-03	2.14E-03
Dibromochloromethane (C)	2.49E-05	2.17E-05	7.48E-06	5.09E-06	6.81E-06	4.07E-05	3.62E-09	1.29E-09	7.52E-10	4.22E-09	1.34E-09	7.95E-10	2.17E-05	7.48E-06	5.07E-06
Di-n-butylphthalate (NC)	1.03E-02	6.21E-03	3.27E-03	1.65E-03	4.57E-03	2.08E-02	5.50E-06	1.96E-06	1.14E-06	6.28E-06	2.03E-06	1.20E-06	6.21E-03	3.27E-03	1.66E-03
Ethylbenzene (NC)	3.88E-03	2.28E-03	1.23E-03	6.16E-04	1.70E-03	4.10E-01	1.73E-09	6.17E-10	3.60E-10	2.36E-09	6.72E-10	4.04E-10	2.28E-03	1.23E-03	6.16E-04
Methyl tert-butyl ether (C)	3.90E-07	3.74E-07	1.15E-07	8.43E-08	9.16E-08	2.12E-04	4.03E-10	1.43E-10	8.37E-11	2.53E-09	3.32E-10	2.35E-10	3.77E-07	1.15E-07	8.41E-08
n-Butylbenzene (NC)	3.81E-06	5.11E-06	1.09E-06	1.09E-06	3.14E-08	2.35E-07	3.76E-09	1.34E-09	7.81E-10	4.36E-09	1.39E-09	8.24E-10	5.11E-06	1.09E-06	1.09E-06
Toluene (NC)	3.13E-03	1.84E-03	9.90E-04	4.98E-04	1.37E-03	4.29E-01	9.75E-10	3.47E-10	2.02E-10	2.38E-09	4.72E-10	3.03E-10	1.84E-03	9.90E-04	4.98E-04
Vinyl Chloride (C)	3.06E-03	1.83E-03	9.67E-04	4.93E-04	1.33E-03	2.34E-02	2.53E-09	9.01E-10	5.26E-10	2.96E-09	9.39E-10	5.56E-10	1.83E-03	9.67E-04	4.92E-04
m,p-Xylene (NC)	4.52E-04	2.65E-04	1.43E-04	7.19E-05	1.99E-04	8.92E-02	2.53E-09	9.01E-10	5.26E-10	2.96E-09	9.39E-10	5.56E-10	2.65E-04	1.43E-04	7.19E-05
ortho-xylene (NC)	4.52E-04	2.65E-04	1.43E-04	7.19E-05	1.99E-04	4.10E-02	2.53E-09	9.01E-10	5.26E-10	2.96E-09	9.39E-10	5.56E-10	2.65E-04	1.43E-04	7.19E-05
Xylenes (total) (NC)	4.52E-03	2.65E-03	1.43E-03	7.19E-04	1.99E-03	6.70E-01	3.39E-08	1.21E-08	7.04E-09	4.50E-08	1.30E-08	7.83E-09	2.65E-03	1.43E-03	7.19E-04
beta-BHC (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

[1] Exposed to dust from surface soil only

[2] Exposed to dust from both surface and sub-surface soil

NC = non-carcinogen, C = carcinogen

= HQ > 1

Table 3-34: Summary of incremental lifetime cancer risks (ILCR). Fish consumption not included.

	Adult	Park User			Park	Construction	Off-Site Resident (Current)[1]			Off-Site Resident (Future)[2]			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined	Child	Adult	Combined
Chemical															
Arsenic (C)	**1.40E-05**	NA	**1.25E-05**	**1.40E-05**	**2.38E-05**	**6.78E-06**	NA	**3.52E-06**	**2.57E-06**	NA	**3.74E-06**	**2.79E-06**	NA	**1.59E-05**	**1.52E-05**
Beryllium (C)	**1.29E-06**	NA	**1.20E-06**	**1.55E-06**	**2.92E-06**	**1.33E-06**	NA	8.10E-08	5.91E-08	NA	8.62E-08	6.43E-08	NA	**1.28E-06**	**1.48E-06**
Cadmium (C)	**2.05E-06**	NA	**2.08E-06**	**2.72E-06**	**4.99E-06**	**2.08E-06**	NA	1.61E-07	1.17E-07	NA	1.69E-07	1.26E-07	NA	**2.24E-06**	**2.69E-06**
Chromium (C)	**2.79E-04**	NA	**2.39E-04**	**3.20E-04**	**7.25E-04**	**2.56E-04**	NA	**2.29E-05**	**1.67E-05**	NA	**2.35E-05**	**1.74E-05**	NA	**2.61E-04**	**3.14E-04**
Chromium (total) (C)	**8.08E-05**	NA	**8.78E-05**	**1.16E-04**	**3.24E-04**	**1.95E-04**	NA	**1.20E-05**	**8.73E-06**	NA	**1.26E-05**	**9.38E-06**	NA	**9.93E-05**	**1.25E-04**
Cobalt (C)	**1.50E-05**	NA	**1.30E-05**	**1.72E-05**	**3.58E-05**	**1.42E-05**	NA	**1.08E-06**	7.90E-07	NA	**1.17E-06**	8.74E-07	NA	**1.40E-05**	**1.67E-05**
Lead (C)	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00
Acenaphthylene (C)	5.22E-08	NA	7.86E-08	5.31E-08	1.46E-07	3.72E-08	NA	1.98E-10	1.44E-10	NA	2.31E-10	1.77E-10	NA	7.88E-08	5.33E-08
Benzo(a)anthracene (C)	**3.32E-05**	NA	**4.97E-05**	**3.15E-05**	**8.71E-05**	**1.90E-05**	NA	1.45E-08	1.06E-08	NA	1.59E-08	1.20E-08	NA	**4.97E-05**	**3.15E-05**
Benzo(a)pyrene (C)	**4.32E-04**	NA	**6.48E-04**	**4.11E-04**	**1.14E-03**	**2.47E-04**	NA	1.94E-07	1.42E-07	NA	2.05E-07	1.53E-07	NA	**6.48E-04**	**4.10E-04**
Benzo(b)fluoranthene (C)	**2.50E-05**	NA	**3.73E-05**	**2.40E-05**	**6.63E-05**	**1.42E-05**	NA	2.90E-08	2.12E-08	NA	3.01E-08	2.23E-08	NA	**3.73E-05**	**2.39E-05**
Benzo(g,h,i)perylene	**6.78E-06**	NA	**1.03E-05**	**6.47E-06**	**1.79E-05**	**3.93E-06**	NA	8.59E-10	6.27E-10	NA	9.97E-10	7.65E-10	NA	**1.03E-05**	**6.46E-06**
Benzo(k)fluoranthene (C)	**4.13E-06**	NA	**6.21E-06**	**3.91E-06**	**1.08E-05**	**2.37E-06**	NA	1.68E-10	1.23E-10	NA	2.98E-10	2.53E-10	NA	**6.21E-06**	**3.91E-06**
Chrysene (C)	3.65E-07	NA	5.46E-07	3.50E-07	9.72E-07	2.08E-07	NA	4.18E-10	3.05E-10	NA	4.28E-10	3.15E-10	NA	5.46E-07	3.50E-07
Dibenz(a,h)anthracene (C)	**5.68E-04**	NA	**8.61E-04**	**5.41E-04**	**1.50E-03**	**3.30E-04**	NA	3.48E-08	2.54E-08	NA	4.86E-08	3.92E-08	NA	**8.61E-04**	**5.41E-04**
Indeno(1,2,3-cd)pyrene (C)	**7.56E-05**	NA	**1.15E-04**	**7.20E-05**	**2.00E-04**	**4.37E-05**	NA	6.57E-09	4.79E-09	NA	7.95E-09	6.17E-09	NA	**1.15E-04**	**7.20E-05**
Phenanthrene (C)	9.78E-08	NA	1.35E-07	8.82E-08	2.37E-07	5.17E-08	NA	1.01E-10	7.41E-11	NA	1.16E-10	8.90E-11	NA	1.35E-07	8.70E-08
1,2-Dichloroethane (C)	2.62E-08	NA	2.96E-08	3.66E-08	1.02E-07	5.84E-08	NA	3.19E-09	2.33E-09	NA	3.28E-09	2.42E-09	NA	3.26E-08	3.84E-08
4,4'-DDD (C)	7.38E-07	NA	8.25E-07	8.34E-07	**2.39E-06**	2.75E-07	NA	4.42E-08	3.23E-08	NA	4.43E-08	3.24E-08	NA	8.65E-07	8.40E-07
4,4'-DDE (C)	5.98E-07	NA	7.04E-07	5.14E-07	**1.34E-06**	2.03E-07	NA	6.28E-09	4.58E-09	NA	6.41E-09	4.72E-09	NA	7.10E-07	4.97E-07
4,4'-DDT (C)	**3.69E-06**	NA	**3.23E-06**	**3.36E-06**	**5.87E-06**	8.23E-07	NA	5.68E-08	4.14E-08	NA	5.69E-08	4.15E-08	NA	**3.28E-06**	**2.97E-06**
Aroclor 1248 (C)	2.52E-07	NA	**1.56E-05**	**9.98E-06**	**2.77E-05**	**3.01E-06**	NA	2.36E-08	1.73E-08	NA	2.37E-08	1.73E-08	NA	**1.56E-05**	**1.00E-05**
Aroclor 1260 (C)	**1.02E-04**	NA	**1.54E-04**	**9.72E-05**	**2.70E-04**	**5.86E-05**	NA	6.25E-08	4.56E-08	NA	6.32E-08	4.63E-08	NA	**1.54E-04**	**9.72E-05**
Benzene (C)	4.72E-07	NA	7.16E-07	4.51E-07	**1.24E-06**	**1.39E-05**	NA	1.65E-12	1.20E-12	NA	1.78E-12	1.33E-12	NA	7.16E-07	4.51E-07
bis(2-Ethylhexyl)phthalate (C)	4.66E-07	NA	6.99E-07	4.70E-07	**1.32E-06**	4.67E-07	NA	4.76E-09	3.47E-09	NA	4.81E-09	3.53E-09	NA	7.03E-07	4.73E-07
Bromodichloromethane (C)	1.28E-07	NA	1.95E-07	1.24E-07	3.32E-07	4.53E-08	NA	5.48E-13	4.00E-13	NA	5.70E-13	4.22E-13	NA	1.95E-07	1.24E-07
Chloroform (C)	1.01E-12	NA	4.19E-13	3.37E-13	2.62E-12	2.68E-13	NA	4.87E-12	3.55E-12	NA	5.07E-12	3.75E-12	NA	5.07E-12	3.75E-12
Dibromochloromethane (C)	2.98E-09	NA	4.31E-09	3.66E-09	4.90E-09	9.76E-10	NA	7.42E-13	5.41E-13	NA	7.73E-13	5.72E-13	NA	4.31E-09	3.65E-09
Methyl tert-butyl ether (C)	9.55E-11	NA	1.35E-10	1.24E-10	1.35E-10	1.04E-08	NA	1.68E-13	1.23E-13	NA	3.90E-13	3.45E-13	NA	1.36E-10	1.24E-10
Vinyl Chloride (C)	4.92E-07	NA	7.46E-07	9.50E-07	**1.28E-06**	7.53E-07	NA	1.36E-13	1.98E-13	NA	1.42E-13	2.10E-13	NA	7.46E-07	9.50E-07
beta-BHC (C)	2.27E-07	NA	3.44E-07	2.18E-07	5.95E-07	1.36E-07	NA	6.60E-11	4.82E-11	NA	1.37E-10	1.20E-10	NA	3.44E-07	2.18E-07
Total TCDD (C)	1.45E-07	NA	1.62E-07	2.17E-07	6.56E-07	8.35E-08	NA	1.73E-08	1.26E-08	NA	1.73E-08	1.26E-08	NA	1.78E-07	2.28E-07

NC = non-carcinogen, C = carcinogen

= ILCR > 1E-6

Table 3-35: Summary of hazard quotients (non-carcinogenic assessment). Fish consumption included.

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident (Current)[1]			Off-Site Resident (Future)[2]			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined	Child	Adult	Combined
Aluminum (NC)	4.38E-01	1.62E-01	4.04E-02	2.77E-02	1.90E-01	9.06E-01	**1.17E+00**	4.18E-01	2.44E-01	**1.52E+00**	4.48E-01	2.68E-01	**1.56E+00**	4.53E-01	2.73E-01
Antimony (NC)	4.47E-02	2.36E-01	9.87E-02	5.41E-02	2.48E-02	2.49E-01	1.93E-02	6.88E-03	4.02E-03	2.40E-02	7.29E-03	4.35E-03	2.58E-01	1.05E-01	5.78E-02
Arsenic (C)	4.17E-01	**1.17E+01**	**6.18E+00**	**3.12E+00**	1.15E-01	**1.02E+00**	6.39E-03	2.27E-03	1.33E-03	8.01E-03	2.42E-03	1.44E-03	**1.17E+01**	**6.19E+00**	**3.12E+00**
Barium (NC)	3.28E-02	5.20E-01	2.79E-01	1.40E-01	1.38E-02	8.46E-02	7.93E-02	2.82E-02	1.65E-02	1.03E-01	3.03E-02	1.82E-02	6.15E-01	3.07E-01	1.57E-01
Beryllium (C)	5.98E-03	1.36E-02	6.35E-03	3.35E-03	2.52E-03	1.38E-02	1.38E-02	4.92E-03	2.87E-03	1.74E-02	5.24E-03	3.13E-03	2.95E-02	1.12E-02	6.18E-03
Cadmium (C)	5.79E-03	**1.65E+00**	8.99E-01	4.50E-01	2.38E-03	2.50E-02	3.67E-03	1.31E-03	7.63E-04	4.41E-03	1.37E-03	8.16E-04	**1.66E+00**	9.00E-01	4.51E-01
Chromium (C)	8.62E-02	7.05E-02	1.34E-02	1.06E-02	3.72E-02	2.03E-01	1.57E-01	5.57E-02	3.25E-02	1.74E-01	5.72E-02	3.37E-02	2.28E-01	6.59E-02	4.08E-02
Chromium (total) (C)	3.78E-02	5.16E-02	1.88E-02	1.09E-02	1.84E-02	1.52E-01	8.18E-02	2.91E-02	1.70E-02	9.94E-02	3.07E-02	1.82E-02	1.42E-01	4.69E-02	2.75E-02
Cobalt (C)	5.76E-02	1.67E-01	8.61E-02	4.38E-02	2.47E-02	1.12E-01	1.59E-01	5.65E-02	3.30E-02	2.08E-01	6.09E-02	3.65E-02	3.59E-01	1.42E-01	7.72E-02
Copper (NC)	3.29E-03	5.07E-01	2.75E-01	1.38E-01	1.10E-03	7.45E-03	9.97E-05	3.55E-05	2.07E-05	1.14E-04	3.67E-05	2.17E-05	5.07E-01	2.75E-01	1.38E-01
Iron (NC)	2.34E-01	**5.61E+00**	**2.90E+00**	**1.48E+00**	9.64E-02	6.48E-01	1.02E-02	3.64E-03	2.13E-03	1.02E-02	3.64E-03	2.13E-03	**5.62E+00**	**2.91E+00**	**1.47E+00**
Lead (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (NC)	**1.19E+00**	**3.03E+01**	**1.64E+01**	**8.22E+00**	5.10E-01	**2.31E+00**	**3.19E+00**	**1.13E+00**	6.62E-01	**4.05E+00**	**1.21E+00**	7.24E-01	**3.40E+01**	**1.75E+01**	**8.88E+00**
Mercury (NC)	9.95E-03	**1.69E+01**	**9.19E+00**	**4.60E+00**	3.29E-03	2.79E-02	2.96E-04	1.05E-04	6.15E-05	3.66E-04	1.12E-04	6.65E-05	**1.69E+01**	**9.19E+00**	**4.60E+00**
Nickel (NC)	5.09E-03	7.80E-02	3.94E-02	2.02E-02	1.56E-03	1.35E-02	1.30E-04	4.63E-05	2.70E-05	1.64E-04	4.93E-05	2.94E-05	7.82E-02	3.94E-02	2.01E-02
Thallium (NC)	1.14E-01	**5.89E+02**	**3.21E+02**	**1.61E+02**	4.48E-02	3.07E-01	4.65E-03	1.65E-03	9.65E-04	5.26E-03	1.71E-03	1.01E-03	**5.89E+02**	**3.21E+02**	**1.61E+02**
Vanadium (NC)	2.45E-01	**1.03E+01**	**5.45E+00**	**2.75E+00**	1.11E-01	**1.34E+00**	1.23E-02	4.39E-03	2.56E-03	1.47E-02	4.60E-03	2.73E-03	**1.03E+01**	**5.45E+00**	**2.75E+00**
Zinc (NC)	6.72E-03	**2.75E+00**	**1.50E+00**	7.49E-01	1.67E-03	9.36E-03	9.56E-05	3.40E-05	1.99E-05	1.03E-04	3.47E-05	2.04E-05	**2.75E+00**	**1.50E+00**	7.49E-01
Acenaphthylene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene (NC)	5.31E-04	7.20E-03	3.91E-03	1.96E-03	2.25E-04	1.54E-03	3.14E-07	1.12E-07	6.52E-08	8.00E-07	1.55E-07	9.98E-08	7.20E-03	3.91E-03	1.96E-03
Benzo(a)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (NC)	9.69E-03	5.79E-02	3.10E-02	1.56E-02	4.17E-03	2.64E-02	2.38E-05	8.47E-06	4.94E-06	2.79E-05	8.84E-06	5.24E-06	5.79E-02	3.10E-02	1.56E-02
Indeno(1,2,3-cd)pyrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (NC)	2.44E-03	1.05E-01	5.70E-02	2.85E-02	1.07E-03	2.55E-02	1.10E-04	3.91E-05	2.28E-05	2.44E-04	5.11E-05	3.24E-05	1.05E-01	5.71E-02	2.86E-02
Phenanthrene (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthylene (NC)	3.58E-03	5.55E-02	2.92E-02	1.47E-02	1.97E-03	1.99E-01	7.19E-05	2.56E-05	1.49E-05	8.00E-05	2.63E-05	1.55E-05	5.55E-02	2.92E-02	1.48E-02

Table 3-35: Cont'd.

Receptor data	Adult	Park User			Park	Construction	Off-Site Resident (Current)[1]			Off-Site Resident (Future)[2]			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined	Child		
1,2-Dichloroethane (C)	2.69E-04	1.07E-02	5.68E-03	2.86E-03	1.60E-04	2.32E-03	2.05E-04	7.30E-05	4.26E-05	2.29E-04	7.51E-05	4.43E-05	1.09E-02	5.75E-03	2.90E-03
1,2,4-Trimethylbenzene (NC)	1.41E-03	1.45E-01	7.92E-02	3.96E-02	6.08E-04	4.38E-03	4.26E-08	1.52E-08	8.85E-09	4.97E-08	1.58E-08	9.35E-09	1.45E-01	7.92E-02	3.96E-02
1,3,5-Trimethylbenzene (NC)	1.41E-04	9.00E-03	4.91E-03	2.45E-03	6.08E-05	1.04E-03	4.26E-08	1.52E-08	8.85E-09	1.14E-07	2.15E-08	1.39E-08	9.00E-03	4.91E-03	2.45E-03
4,4'-DDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT (C)	3.04E-01	**2.34E+01**	**1.27E+01**	**6.35E+00**	8.06E-02	3.39E-01	2.74E-03	9.76E-04	5.70E-04	2.76E-03	9.77E-04	5.71E-04	**2.34E+01**	**1.27E+01**	**6.34E+00**
Aroclor 1248 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260 (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (C)	3.00E-02	5.51E-02	2.99E-02	1.50E-02	1.31E-02	**4.41E+00**	5.78E-08	2.06E-08	1.20E-08	7.59E-08	2.22E-08	1.33E-08	5.50E-02	2.99E-02	1.50E-02
bis(2-Ethylhexyl)phthalate (C)	2.33E-02	**7.71E+00**	**4.20E+00**	**2.10E+00**	1.10E-02	1.17E-01	1.39E-04	4.95E-05	2.89E-05	1.46E-04	5.01E-05	2.94E-05	**7.71E+00**	**4.20E+00**	**2.10E+00**
Bromodichloromethane (C)	1.45E-03	6.48E-03	3.52E-03	1.76E-03	6.25E-04	2.56E-03	3.62E-09	1.29E-09	7.52E-10	4.22E-09	1.34E-09	7.95E-10	6.47E-03	3.52E-03	1.76E-03
Chloroform (C)	1.33E-02	9.73E-03	5.18E-03	2.62E-03	5.80E-03	5.85E-02	3.54E-08	1.26E-08	7.35E-09	4.13E-08	1.31E-08	7.77E-09	9.69E-03	5.18E-03	2.62E-03
Dibromochloromethane (C)	2.49E-05	2.28E-03	1.24E-03	6.20E-04	6.81E-06	4.07E-05	3.62E-09	1.29E-09	7.52E-10	4.22E-09	1.34E-09	7.95E-10	2.28E-03	1.24E-03	6.20E-04
Di-n-butylphthalate (NC)	1.03E-02	2.81E-01	1.53E-01	7.67E-02	4.57E-03	2.08E-02	5.50E-06	1.96E-06	1.14E-06	6.28E-06	2.03E-06	1.20E-06	2.81E-01	1.53E-01	7.67E-02
Ethylbenzene (NC)	3.88E-03	1.49E-02	8.13E-03	4.07E-03	1.70E-03	4.10E-01	1.73E-09	6.17E-10	3.60E-10	2.36E-09	6.72E-10	4.04E-10	1.49E-02	8.13E-03	4.07E-03
Methyl tert-butyl ether (C)	3.90E-07	6.49E-06	3.45E-06	1.75E-06	9.16E-08	2.12E-04	4.03E-10	1.43E-10	8.37E-11	2.53E-09	3.32E-10	2.35E-10	6.46E-06	3.45E-06	1.75E-06
n-Butylbenzene (NC)	3.81E-06	6.48E-02	3.53E-02	1.77E-02	3.14E-08	2.35E-07	3.76E-09	1.34E-09	7.81E-10	4.36E-09	1.39E-09	8.24E-10	6.48E-02	3.53E-02	1.77E-02
Toluene (NC)	3.13E-03	7.83E-03	4.25E-03	2.13E-03	1.37E-03	4.29E-01	9.75E-10	3.47E-10	2.02E-10	2.38E-09	4.72E-10	3.03E-10	7.83E-03	4.25E-03	2.13E-03
Vinyl Chloride (C)	3.06E-03	3.90E-03	2.10E-03	1.06E-03	1.33E-03	2.34E-02	2.53E-09	9.01E-10	5.26E-10	2.96E-09	9.39E-10	5.56E-10	3.90E-03	2.10E-03	1.06E-03
m,p-Xylene (NC)	4.52E-04	2.65E-04	1.43E-04	7.19E-05	1.99E-04	8.92E-02	2.53E-09	9.01E-10	5.26E-10	2.96E-09	9.39E-10	5.56E-10	2.65E-04	1.43E-04	7.19E-05
ortho-xylene (NC)	4.52E-04	2.65E-04	1.43E-04	7.19E-05	1.99E-04	4.10E-02	2.53E-09	9.01E-10	5.26E-10	2.96E-09	9.39E-10	5.56E-10	2.65E-04	1.43E-04	7.19E-05
Xylenes (total) (NC)	4.52E-03	1.67E-02	9.10E-03	4.55E-03	1.99E-03	6.70E-01	3.39E-08	1.21E-08	7.04E-09	4.50E-08	1.30E-08	7.83E-09	1.67E-02	9.10E-03	4.55E-03
beta-BHC (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD (C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

[1] Exposed to dust from surface soil only

[2] Exposed to dust from both surface and sub-surface soil

NC = non-carcinogen, C = carcinogen

= HQ > 1

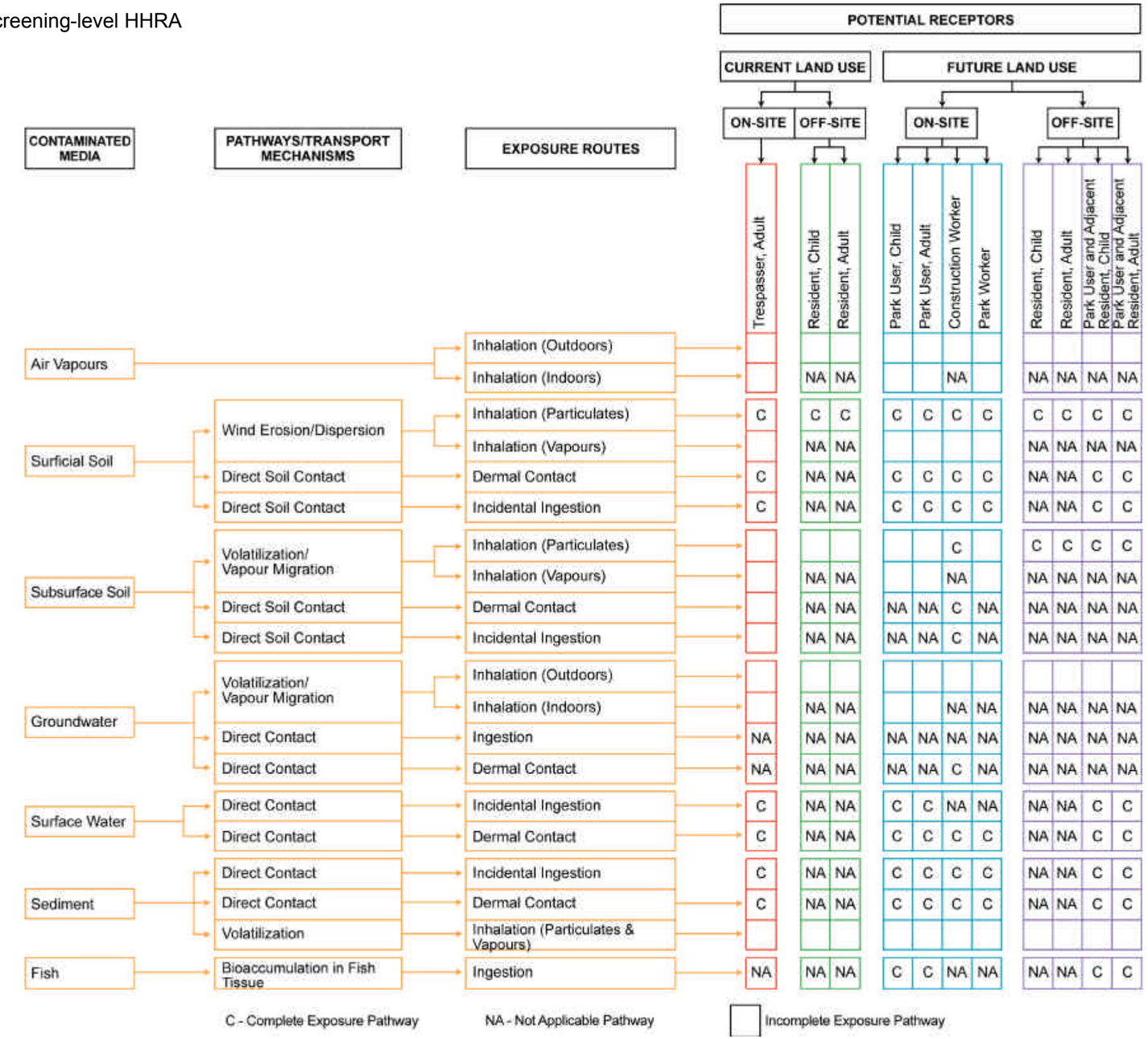
Table 3-36: Summary of incremental lifetime cancer risks (ILCR). Fish consumption included.

	Adult	Park User			Park	Construction	Off-Site Resident (Current)			Off-Site Resident (Future)			Park User & Off-Site Resident		
	Trespasser	Child	Adult	Combined	Worker	Worker	Child	Adult	Combined	Child	Adult	Combined	Child	Adult	Combined
Arsenic (C)	**1.40E-05**	NA	**9.54E-04**	**6.03E-04**	**2.38E-05**	**6.78E-06**	NA	**3.52E-06**	**2.57E-06**	NA	**3.74E-06**	**2.79E-06**	NA	**9.58E-04**	**6.04E-04**
Beryllium (C)	**1.29E-06**	NA	**3.41E-05**	**2.21E-05**	**2.92E-06**	**1.33E-06**	NA	8.10E-08	5.91E-08	NA	8.62E-08	6.43E-08	NA	**3.42E-05**	**2.21E-05**
Cadmium (C)	**2.05E-06**	NA	**1.94E-03**	**1.21E-03**	**4.99E-06**	**2.08E-06**	NA	1.61E-07	1.17E-07	NA	1.69E-07	1.26E-07	NA	**1.94E-03**	**1.21E-03**
Chromium (C)	**2.79E-04**	NA	**3.75E-04**	**4.05E-04**	**7.25E-04**	**2.56E-04**	NA	**2.29E-05**	**1.67E-05**	NA	**2.35E-05**	**1.74E-05**	NA	**3.96E-04**	**3.99E-04**
Chromium (total) (C)	**8.08E-05**	NA	**7.03E-04**	**5.01E-04**	**3.24E-04**	**1.95E-04**	NA	**1.20E-05**	**8.73E-06**	NA	**1.26E-05**	**9.38E-06**	NA	**7.15E-04**	**5.10E-04**
Cobalt (C)	**1.50E-05**	NA	**5.46E-03**	**3.42E-03**	**3.58E-05**	**1.42E-05**	NA	**1.08E-06**	7.90E-07	NA	**1.17E-06**	8.74E-07	NA	**5.46E-03**	**3.42E-03**
Lead (C)	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00
Acenaphthylene (C)	5.22E-08	NA	**2.89E-06**	**1.81E-06**	1.46E-07	3.72E-08	NA	1.98E-10	1.44E-10	NA	2.31E-10	1.77E-10	NA	**2.89E-06**	**1.81E-06**
Benzo(a)anthracene (C)	**3.32E-05**	NA	**3.31E-04**	**2.08E-04**	**8.71E-05**	**1.90E-05**	NA	1.45E-08	1.06E-08	NA	1.59E-08	1.20E-08	NA	**3.31E-04**	**2.07E-04**
Benzo(a)pyrene (C)	**4.32E-04**	NA	**3.46E-03**	**2.17E-03**	**1.14E-03**	**2.47E-04**	NA	1.94E-07	1.42E-07	NA	2.05E-07	1.53E-07	NA	**3.46E-03**	**2.17E-03**
Benzo(b)fluoranthene (C)	**2.50E-05**	NA	**3.19E-04**	**2.00E-04**	**6.63E-05**	**1.42E-05**	NA	2.90E-08	2.12E-08	NA	3.01E-08	2.23E-08	NA	**3.19E-04**	**2.00E-04**
Benzo(g,h,i)perylene	**6.78E-06**	NA	**3.84E-05**	**2.41E-05**	**1.79E-05**	**3.93E-06**	NA	8.59E-10	6.27E-10	NA	9.97E-10	7.65E-10	NA	**3.84E-05**	**2.41E-05**
Benzo(k)fluoranthene (C)	**4.13E-06**	NA	**3.44E-05**	**2.15E-05**	**1.08E-05**	**2.37E-06**	NA	1.68E-10	1.23E-10	NA	2.98E-10	2.53E-10	NA	**3.44E-05**	**2.15E-05**
Chrysene (C)	3.65E-07	NA	**3.36E-06**	**2.11E-06**	9.72E-07	2.08E-07	NA	4.18E-10	3.05E-10	NA	4.28E-10	3.15E-10	NA	**3.36E-06**	**2.11E-06**
Dibenz(a,h)anthracene (C)	**5.68E-04**	NA	**3.68E-03**	**2.30E-03**	**1.50E-03**	**3.30E-04**	NA	3.48E-08	2.54E-08	NA	4.86E-08	3.92E-08	NA	**3.68E-03**	**2.30E-03**
Indeno(1,2,3-cd)pyrene (C)	**7.56E-05**	NA	**3.96E-04**	**2.48E-04**	**2.00E-04**	**4.37E-05**	NA	6.57E-09	4.79E-09	NA	7.95E-09	6.17E-09	NA	**3.96E-04**	**2.48E-04**
Phenanthrene (C)	9.78E-08	NA	**2.95E-06**	**1.85E-06**	2.37E-07	5.17E-08	NA	1.01E-10	7.41E-11	NA	1.16E-10	8.90E-11	NA	**2.95E-06**	**1.85E-06**
1,2-Dichloroethane (C)	2.62E-08	NA	**3.54E-06**	**2.23E-06**	1.02E-07	5.84E-08	NA	3.19E-09	2.33E-09	NA	3.28E-09	2.42E-09	NA	**3.54E-06**	**2.23E-06**
4,4'-DDD (C)	7.38E-07	NA	**2.16E-04**	**1.35E-04**	**2.39E-06**	2.75E-07	NA	4.42E-08	3.23E-08	NA	4.43E-08	3.24E-08	NA	**2.16E-04**	**1.35E-04**
4,4'-DDE (C)	5.98E-07	NA	**1.39E-04**	**8.71E-05**	**1.34E-06**	2.03E-07	NA	6.28E-09	4.58E-09	NA	6.41E-09	4.72E-09	NA	**1.39E-04**	**8.71E-05**
4,4'-DDT (C)	**3.69E-06**	NA	**7.38E-04**	**4.62E-04**	**5.87E-06**	8.23E-07	NA	5.68E-08	4.14E-08	NA	5.69E-08	4.15E-08	NA	**7.38E-04**	**4.62E-04**
Aroclor 1248 (C)	2.52E-07	NA	**1.00E-02**	**6.27E-03**	**2.77E-05**	**3.01E-06**	NA	2.36E-08	1.73E-08	NA	2.37E-08	1.73E-08	NA	**1.00E-02**	**6.27E-03**
Aroclor 1260 (C)	**1.02E-04**	NA	**9.89E-02**	**6.18E-02**	**2.70E-04**	**5.86E-05**	NA	6.25E-08	4.56E-08	NA	6.32E-08	4.63E-08	NA	**9.89E-02**	**6.18E-02**
Benzene (C)	4.72E-07	NA	**2.25E-06**	**1.41E-06**	**1.24E-06**	**1.39E-05**	NA	1.65E-12	1.20E-12	NA	1.78E-12	1.33E-12	NA	**2.25E-06**	**1.41E-06**
bis(2-Ethylhexyl)phthalate (C)	4.66E-07	NA	**4.03E-04**	**2.52E-04**	**1.32E-06**	4.67E-07	NA	4.76E-09	3.47E-09	NA	4.81E-09	3.53E-09	NA	**4.03E-04**	**2.52E-04**
Bromodichloromethane (C)	1.28E-07	NA	**1.50E-06**	9.37E-07	3.32E-07	4.53E-08	NA	5.48E-13	4.00E-13	NA	5.70E-13	4.22E-13	NA	**1.50E-06**	9.37E-07
Chloroform (C)	1.01E-12	NA	4.19E-13	3.37E-13	2.62E-12	2.68E-13	NA	4.87E-12	3.55E-12	NA	5.07E-12	3.75E-12	NA	5.07E-12	3.75E-12
Dibromochloromethane (C)	2.98E-09	NA	7.13E-07	4.47E-07	4.90E-09	9.76E-10	NA	7.42E-13	5.41E-13	NA	7.73E-13	5.72E-13	NA	7.13E-07	4.47E-07
Methyl tert-butyl ether (C)	9.55E-11	NA	4.06E-09	2.58E-09	1.35E-10	1.04E-08	NA	1.68E-13	1.23E-13	NA	3.90E-13	3.45E-13	NA	4.06E-09	2.58E-09
Vinyl Chloride (C)	4.92E-07	NA	**1.62E-06**	**2.04E-06**	**1.28E-06**	7.53E-07	NA	1.36E-13	1.98E-13	NA	1.42E-13	2.10E-13	NA	**1.62E-06**	**2.04E-06**
beta-BHC (C)	2.27E-07	NA	**3.22E-05**	**2.02E-05**	5.95E-07	1.36E-07	NA	6.60E-11	4.82E-11	NA	1.37E-10	1.20E-10	NA	**3.22E-05**	**2.02E-05**
Total TCDD (C)	1.45E-07	NA	1.62E-07	2.17E-07	6.56E-07	8.35E-08	NA	1.73E-08	1.26E-08	NA	1.73E-08	1.26E-08	NA	1.78E-07	2.28E-07

NC = non-carcinogen, C = carcinogen

= ILCR > 1E-6

Figure 3-1: Conceptual model for Poplar Point screening-level HHRA



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