Ecological Risk Assessment

Remedial Investigation/Feasibility Study

Donna Reservoir and Canal System
Donna, Hidalgo County, Texas
EPA Identification No. TX0000605363

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/kg	Microgram(s) per kilogram
95UCLM	95 Percent Upper Confidence Limit of the Mean
95UPL	95 Percent Upper Prediction Limit
ATSDR	Agency for Toxic Substances and Disease Registry
BAF	Bioaccumulation Factor
BCF	Bioconcentration Factors
BRAPF	Baseline Risk Assessment Problem Formulation
BSAF	Biota-Sediment Accumulation Factors
Bw-d	Body weight per day
COPC	Chemicals of Potential Concern
CSM	Conceptual Site Model
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DDTr	Sum of DDT, DDD, and DDE
DRCS	Donna Reservoir and Canal System
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
FI	Food ingestion rate
FS	Feasibility Study
g	Gram(s)
HMW	High molecular weight
HQ	Hazard Quotient
LMW	Low molecular weight
LOAEL	Lowest Observed Adverse Effect Levels
LWMCU	Lower West Main Canal Unlined
mg/kg	Milligram(s) per kilogram
mg/L	Milligram(s) per liter
NAWQC	National Ambient Water Quality Criteria

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

NOAEL	No Observed Adverse Effect Level
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
RI	Remedial Investigation
RL	Reporting limit
Site	Donna Reservoir and Canal System site
SLERA	Screening Level Ecological Risk Assessment
SVOC	Semi-volatile organic compound
TCEQ	Texas Commission on Environmental Quality
TDH	Texas Department of Health
TEL	Threshold Effects Levels
TNRCC	Texas Natural Resource Conservation Commission
TRV	Toxicity reference value
UF	Uptake factor
UPL	Upper Prediction Limit
USACHPPM	U.S. Army Center for Health Promotion and Preventative Medicine
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	Volatile organic compound

1. INTRODUCTION

EA Engineering, Science, and Technology, Inc., PBC (EA) has been authorized by the U.S. Environmental Protection Agency (EPA), under Remedial Action Contract Number EP-W-06-004, Task Order 0082-RICO-06NS, to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the Donna Reservoir and Canal System (DRCS) site. EA has prepared this Ecological Risk Assessment (ERA) in accordance with: (1) specifications provided in the EPA Statement of Work, Revision 03, dated 17 April 2013 (EPA 2013); and (2) the EPA-approved EA Work Plan and Cost Estimate, Revision 03, dated 12 June 2013 (EA 2013).

1.1 PURPOSE

The purpose of this ERA is to characterize and quantify potential environmental impacts from chemicals in soil, sediment, and surface water at the site. The assessment was conducted in accordance with the process outlined in the document *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997), other relevant EPA guidance, as well as the Texas Commission on Environmental Quality (TCEQ) guidance *Conducting Ecological Risk Assessments at Remediation Sites in Texas* (TCEQ 2014a) and *Texas Surface Water Quality Standards* (TCEQ 2014b).

The process for an ERA outlined in EPA guidance includes eight steps (EPA 1997, 1998), and this document presents the first three steps of the ERA process (Figure 1-1). Steps 1 and 2 represent the Screening Level Ecological Risk Assessment (SLERA). The SLERA uses highly precautionary assumptions regarding exposure and toxicity to develop a Conceptual Site Model (CSM) and identify Chemicals of Potential Concern (COPCs). The CSM defines complete and significant exposure pathways and identifies assessment and measurement endpoints. The screening level evaluation typically relies on chemical analytical data.

Steps 3 through 7 of the SLERA process include the Baseline Risk Assessment Problem Formulation (BRAPF), data collection, data evaluation, and risk characterization. The BRAPF draws from the risk evaluation performed in the SLERA to identify COPCs, exposure pathways, assessment endpoints, and risk questions requiring further consideration. Data collection includes identification and collection of data to meet specific needs of the risk assessment; in this case, data regarding fish and mollusk tissue was compiled and utilized. Data evaluation and risk characterization use food web modeling, benchmark comparisons, and other lines of evidence to draw conclusions for the site.

This document is organized as follows:

- Section 1 presents and scope, site history, and a summary of data used in the ERA.
- Section 2 presents the ecological CSM for the site.

- Section 3 presents Step 1 and Step 2 of the ERA process, the SLERA. This includes the development of the screening level problem formulation, the ecological effects evaluation, the screening level exposure, and the screening level risk calculation based on media of concern.
- Section 4 presents the methodology of Steps 3 through 7 of the ERA process, including the BRAPF. Measurement and assessment endpoints are identified, toxicity and exposure assessments are performed, and refined risk calculations and a weight of evidence approach based on site-specific information are set forth for refining the list of COPCs and better defining the ecological endpoints that require further attention.
- Section 5 through 9 present the results of the data evaluation and risk characterization for each grouping. The results for all measurement endpoints are combined in a qualitative weight of evidence approach to provide a preliminary risk characterization for each assessment endpoint.
- Section 10 presents the uncertainties that may impact the assessment of risks.
- Section 11 presents a summary of ERA results.
- Section 12 presents the ecological risk management considerations.
- Section 13 presents the conclusions of the ERA based on risk management considerations.
- Section 14 presents references used in the ERA.

1.2 BACKGROUND

The DRCS site includes a system of canals, reservoirs, and adjacent waterways in which sediment and fish have been found to contain elevated concentrations of polychlorinated biphenyls (PCBs). The subsections below provide information regarding the site description, history, and previous investigations.

1.2.1 Site Description

The site is located in south Texas near the United States border with Mexico and the Gulf of Mexico, southwest of the city of Donna (Figure 1-2). The DRCS is the dominant feature of the site and includes the 400-acre Donna Reservoir and a system of lateral canals and pipes that supply water to the City of Donna and the North Alamo Water Supply Plant No. 5, and irrigate the surrounding farmland (Figure 1-3). The DRCS extends north from the Rio Grande River approximately 17 miles with lateral canals that extend approximately five miles to the east and west.

Water is pumped into the DRCS from the Rio Grande River through five pipes at a point approximately one mile downstream from Reynosa, Tamaulipas, Mexico. The volume and velocity of the water entering the canal system and thus the reservoir can be controlled by the number of operational pumps. The water enters the canal at an average rate of 3.4 cubic meters per second (120 cubic feet per second) (U.S. Geological Survey [USGS] 2002) and travels north by gravity flow for approximately two miles in an unlined, earthen canal until it reaches a siphon. The siphon submerges below the Arroyo Colorado River in a concrete tube 9 feet (ft) in diameter for a distance of 1,600 ft. After the siphon, water flow continues a short distance in the unlined, earthen canal before it reaches a concrete-lined channel that conveys water north an additional 1.75 miles to the reservoirs (Texas Natural Resource Conservation Commission [TNRCC] 2001).

The reservoir has an average depth of 5 ft, can store up to 1,200 acre-ft (390 million gallons) of water, and is made up of three major segments: the East, West, and Northwest sections (Figure 1-3; TNRCC 2001). The Lower West Main Canal flows directly into the West Reservoir, where water flows freely into the East Reservoir through two conduits beneath South Valley View Road, which divides the west and east reservoir segments. The Northwest Reservoir is being reworked and is currently not in use. The reservoir system is surrounded by earthen levees that slope outward to prevent surface water runoff from entering the system. Access to the site is not restricted, though signs are in place to warn the public of the contaminated fish.

Re-lift Pumping Plant No. 3 uses electric drive pumps to lift water from the north side of the West Reservoir into the confluence of the Upper West Main Canal and the Cross Over Main Canal. The Upper West Main Canal extends north along the western boundary of Donna Irrigation District for approximately six miles. The Cross Over Main Canal extends east for two miles, past the City of Donna Water Treatment Plant, before turning north and continuing for 10 miles. Numerous lateral canals connect to the main canals and sub-canals, one of which serves the North Alamo Water Supply Corporation Plant No. 5. Any remaining water that enters the DRCS and is not diverted for irrigation or drinking water supply flows north of the site into the Donna Drain then east into the North Floodway (TNRCC 2001).

South of the reservoirs, the DRCS is surrounded by irrigated agricultural land. Residential development is occurring immediately north of the Northwest Reservoir, while a combination of agriculture and residential areas exist north of the East and West Reservoirs (Figure 1-3).

1.2.2 Site History

In 1906, construction of the DRCS began with the Rio Grande Pump Station. The pump station was soon expanded to include a set of five diesel pump engines that lifted water through pipes from the Rio Grande River into the Main Canal. In 1913, the Northwest Reservoir was placed into service with the construction of Re-lift Pumping Plant No. 3 on the north side of the reservoir. The siphon at the Arroyo Colorado River was constructed in 1928, replacing the original canal that stretched above the Arroyo Colorado River on concrete pillars. In 1954–1955, the 120-acre West Reservoir section of the Donna Reservoir was placed into service (TNRCC 2001).

In 1963–1964, a new section of the main canal was constructed (Lower West Main Canal Lined), as well as the East Reservoir of Donna Reservoir No. 3. The new, concrete-lined channel constructed due north of the Donna Reservoir from the north bank of the Arroyo Colorado River replaced approximately two miles of the original unlined, earthen canal system, which was abandoned and filled. The East Reservoir was connected to the West Reservoir by conduits underneath South Valley View Road, which added an additional 240 surface acres to Donna Reservoir No 3.

From 1990 to 1991, the Donna Irrigation District performed maintenance on the Lower West Main Canal Unlined (LWMCU) from the siphon outlet to the concrete lined channel section; approximately 30 inches of bottom sludge and material was removed and placed on top of the banks of the canal (TNRCC 2001).

1.3 PREVIOUS INVESTIGATIONS

Routine environmental monitoring of the Lower Rio Grande Valley during the 1970s and 1980s revealed elevated concentrations of PCBs in fish (0.04 to 0.49 milligrams per kilogram [mg/kg]) and sediment (0.02 to 0.40 mg/kg). However, PCBs were not detected among the 124 water samples collected during that time period (TNRCC 1998).

During the Lower Rio Grande Valley Environmental Study of 1992, the DRCS became an area of interest. In response to the elevated rate of infants born with neural tube defects in Cameron County in 1991, the Interagency Coordinating Committee for United States/Mexico Border Environmental Health initiated the Lower Rio Grande Valley Environmental Study. The Lower Rio Grande Valley Environmental Study included a contaminant exposure study of nine families residing in Cameron and Hidalgo Counties (TNRCC 1998). The concentration of PCBs in a common carp taken from a local family was 399 mg/kg. This carp was reportedly caught in the DRCS Main Canal. Blood samples from the residents in possession of the fish also had elevated concentrations of PCBs (TNRCC 2001).

Following the results of the Lower Rio Grande Valley Environmental Study, the Texas Department of Health (TDH) and TNRCC conducted extensive sampling throughout Hidalgo County and along the Rio Grande River from El Paso to Brownsville. The DRCS contained elevated concentrations of PCBs, while other waters studied did not reveal elevated concentrations (TNRCC 2001). Following the TDH Risk Determination for Consumption of Fish from the Donna Irrigation System on 4 February 1994, the TDH issued Aquatic Life Order Number 9, ordering that the Donna Irrigation System be declared a prohibited area for the taking of all species of aquatic life.

In 2001, a Screening Site Inspection was conducted at the site. Elevated concentrations of PCB Aroclor-1254 were found in suspended sediment samples. Concentrations ranged from 15 micrograms per kilogram (µg/kg) to 53 µg/kg over an approximate 5.75 mile distance in the DRCS. The conclusions presented in the Screening Site Inspection stated that concentrations of the hazardous substance PCB Aroclor-1254 met the observed release criteria (TNRCC 2001).

The 2005 fish tissue collection by the Texas Department of State Health Services revealed that PCBs were present in most of the 30 fish collected in the Main Canal and Reservoir at concentrations ranging from below detection limits (<0.005 µg/kg) to 2,706 µg/kg. Fish and suspended sediments have already been impacted, and residents continue to consume fish regardless of the ban. Additional details regarding previous investigations at the site are provided in the *Conceptual Understanding of the Site Technical Memorandum* (EA 2012).

In March 2008, the site was listed on the National Priorities List due to PCB contamination in fish. The contamination source had not been identified and the nature and extent of contamination were not fully delineated at that time.

On 6 August 2008, an action memorandum was signed and approved by EPA Region 6 for the removal of fish from the DRCS. The removal action involved the depopulation of edible size PCB-contaminated fish from the canal area. The removal was coordinated with U.S. Fish and Wildlife Service (USFWS), Agency for Toxic Substances and Disease Registry (ATSDR), Texas Department of State Health Services, TCEQ, and the Donna Irrigation District.

Fish removal actions were conducted in August 2008, February 2009, August 2009, and October 2012. Approximately 38,940 fish were removed during these removal actions of the canal and reservoir system. Discussion of sampling results from the fish removals is included in the *Remedial Investigation Report* (EA 2016).

1.4 SUMMARY OF DATA USED IN THE ERA

The ERA incorporates the results of samples collected and analyzed as part of the RI field activities. The RI field activities were conducted from 2012 to 2015 and are documented in the RI Report. Environmental media sampled included soil, surface water, sediment, suspended sediment, ground water, fish tissue, mollusk tissue, and passive samplers. Sample results from the fish removal actions completed in August 2008, February 2009, and August 2009 (Dynamac Corporation 2009) were also evaluated in the ERA. A list of samples evaluated for the site is presented in Table 1-1. Sample locations are presented on Figure 1-4, and exposure areas are presented in Figure 1-5.

Only validated data were evaluated in the ERA. Data validation is a systematic process of reviewing sample/analyte-specific data against a set of method criteria and data quality objectives to determine whether the quality of the data set is adequate for its intended use. The *Data Evaluation Technical Memorandum* (EA 2015) discusses the results of the data validation and analytical methods. Details about field activities and sample collection can be found in the *Remedial Investigation Report* (EA 2016).

1.4.1 Data Quality Evaluation

The inclusion or exclusion of data within the ERA on the basis of analytical qualifiers was performed in accordance with EPA guidance (EPA 1989). Analytical qualifiers were applied during the data validation process. The following procedures were followed if qualifiers were present:

- Analytical results bearing the U qualifier (indicating that the analyte was not detected at the given reporting limit [RL]) were retained in the data set and considered non-detects at the given RL.
- Analytical results for organic and inorganic analytes bearing the J qualifier (indicating that the reported value was estimated because the analyte was detected at a concentration below the RL or for other reasons) were retained at the reported concentration.
- Inorganic analytical results bearing the B qualifier (indicating the analyte was detected between the method detection limit and the RL) were retained at the reported concentration.
- Analytical results bearing the R qualifier (indicating that the data were rejected during the validation process) were not used in the ERA.

If duplicate samples were collected or duplicate analyses were conducted on a single sample, the following guidelines were employed to select the appropriate sample measurement:

- If both samples/analyses show that the analyte was present, the maximum detected concentration of the two samples was retained for analysis.
- If both samples/analyses were not detected, the maximum of the two non-detect RLs was retained for analysis.
- If only one sample/analysis indicated that the analyte was present, it was retained for analysis and the non-detect value was discarded.

Organic contaminants detected in laboratory method blanks and blanks collected in the field may indicate that a contaminant could be present due to sample handling procedures. Organic sample results determined to be present from laboratory or field contamination were qualified "B" by the data validator. Organic analytes that are common laboratory contaminants were qualified if detected at less than 10 times the blank concentration. All other organic analytes were qualified if detected at less than five times the blank concentration. Organic analytes determined by the validator to be due to blank contamination are not presented in the sample results summary.

Laboratory quality control samples, spikes, and blanks were not included in the ERA. Arithmetic means and other statistical measures were calculated separately for each reduced databases (i.e., excluding R qualified data) as detailed in the above discussion. The frequency of detection is based on the number of detected concentrations out of the total number of samples, excluding R qualified data. Since samples were sometimes analyzed for different sets of analytes, the total number of samples used in calculation of the frequency of detection may vary by analyte.

1.5 EXPOSURE AREAS

For the purpose of this ERA, the area has been divided into separate exposure areas based upon potential sources, habitat and connectivity. Figure 1-5 presents the exposure areas, which are used to group data for evaluation in this ERA.

1.5.1 Exposure Area 1: Upstream of the Siphon

Exposure Area 1: Upstream of the Siphon includes samples from the Rio Grande River and the Main Canal in the southernmost region of the site (Figure 1-5). As described above, water is pumped from the Rio Grande River into the DRCS. These two sample areas were grouped together as they are upstream from the source and because the Main Canal is unlined, they are expected to have similar habitat types. Exposure Area 1: Upstream of the Siphon includes sediment, surface water, and fish samples.

1.5.2 Exposure Area 2: Arroyo Colorado

Exposure Area 2: Arroyo Colorado includes samples collected from the Arroyo Colorado River and the Arroyo Colorado Tributary (Figure 1-5). The two sample areas are expected to have similar habitat types. The Arroyo Colorado River is not connected to the DRCS and is not expected to be impacted by the potential source as water from the DRCS is directed under the Arroyo Colorado River inside a concrete inverted siphon. Exposure Area 2: Arroyo Colorado includes sediment, surface water, and fish samples.

1.5.3 Exposure Area 3: LWMCU at the Siphon Exit

Exposure Area 3: LWMCU at the Siphon Exit includes samples from the siphon and the LWMCU south of the 90 degree bend in the DRCS (Figure 1-5). The siphon conveys water below the Arroyo Colorado River inside a concrete tube. Exposure Area 3: LWMCU at the Siphon Exit includes sediment, surface water, fish, and mollusk samples.

1.5.4 Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Area 4: LWMCU Downstream of the Siphon includes samples from the LWMCU northwest of the 90 degree bend in the DRCS (Figure 1-5). This area is directly downstream from Exposure Area 3: LWMCU at the Siphon Exit in the DRCS. Exposure Area 4: LWMCU Downstream of the Siphon has been excluded from Exposure Area 5: Lined Canals, Reservoirs, and Soil because it is unlined and Exposure Area 5: Lined Canals, Reservoirs, and Soil is not expected to provide the same habitat type. Exposure Area 4: LWMCU Downstream of the Siphon includes sediment, surface water, fish, and mollusk samples.

1.5.5 Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Area 5: Lined Canals, Reservoirs, and Soil includes samples from the remaining lined canals and the reservoirs in the DRCS as well as all of the surface soil collected (Figure 1-5). The aquatic areas are located downstream from source area and may be impacted. Exposure Area 5: Lined Canals, Reservoirs, and Soil includes surface soil, sediment, surface water, and fish samples.

2. ECOLOGICAL CONCEPTUAL SITE MODEL

The SLERA is based on a CSM for the site investigation area, which defines the potential source area, suspected COPCs, media of concern, habitats and possible receptors, and complete exposure pathways. In this SLERA, the CSM is used to define the assessment and measurement endpoints.

As part of the CSM, potential sources of chemicals and exposure pathways are characterized for the site (Figure 2-1). The model illustrates the pathways through which receptors may be exposed to sources of COPCs. A graphical representation of the ecological conceptual model is presented in Figure 2-2. Sources and exposure pathways are discussed further below.

2.1 SITE CHARACTERISTICS

The following provides a description of the site characteristics relevant to the ERA. Additional site characteristics are discussed in the *Remedial Investigation Report* (EA 2016).

2.1.1 Meteorology

Historical meteorological data are not available from the National Weather Service for Donna, Texas. However, there are records for Weslaco, Texas, a town with a similar climate less than five miles to the east of Donna. The average yearly precipitation for Weslaco is 25.27 inches. The average high temperature in January is 70.6°F and the average low is 49.5°F, while the average high temperature in August is 96.6°F and the average low is 75.3°F (National Weather Service 2011). The climate of the site is classified as subtropical sub-humid (Bomar and Larkin 1983).

2.1.2 Natural Resource Features and Land Use

The Rio Grande River serves an important biological, hydrological, and economic function for the region. Water from the Rio Grande River is used for drinking water and irrigation of agriculture throughout the Lower Rio Grande River Valley. The priority riparian habitat and extensive freshwater habitat provide high aesthetic value and high economic value for outdoor recreation associated with fishing, boating, and birding. In addition, the riparian corridor on the floodplain provides downstream flood control and mitigation of storm damage, regulation and protection of ground water, protection of fisheries, and protection of public and private water supplies through pollution filtration (El-Hage and Moulton 2000).

The Arroyo Colorado River performs similar functions, but on smaller scale. The riparian corridor provides additional downstream flood control and mitigation of storm damage protection of fisheries habitat, and protection of ground water. The Arroyo Colorado River also provides habitat for threatened and endangered species and unique communities. Exceptional aquatic life, high water quality, and high aesthetic value are provided by the river, which is popular with birdwatchers and contributes significantly to the local nature tourism industry (El-Hage and Moulton 2000).

The majority of the land area near the site is currently used for commercial agriculture. The primary crops cultivated in Hidalgo County are sugarcane, sorghum, cotton, corn, vegetables, and citrus fruits. In 2006, Hidalgo County was the state's largest sugarcane producer with 882,000 tons harvested and the state's largest producer of grain sorghum with 4,409,000 bushels harvested (Texas Comptroller of Public Accounts 2008). In addition, Hidalgo County contains 85 percent of all citrus acres in Texas, making Texas the nation's third-largest citrus producer (Sauls 2008). Other natural resources in Hidalgo County include caliche, sand, gravel, oil, and gas (Garza 2011), although quarrying and energy resource exploration have not been documented as occurring near the city of Donna.

2.1.3 Ecological Features

Most of the native vegetation of the Lower Rio Grande Valley has been cleared for agriculture (MacWhorter 2015). Much of the water diverted from the DRCS is used for irrigation. Where native habitat remains in Hidalgo County, it contains vegetative communities unique to the Lower Rio Grande Valley. The area is characterized by a semi-arid and subtropical climate (Jahrsdoerfer and Leslie 1988) and includes mid-delta thorn forest, which once covered most of the Rio Grande Delta. Today, less than 5 percent of this plant community remains in the area. The small remnant tracts can be found in fence rows, highway rights-of-way, canals, and ditch banks (Jahrsdoerfer and Leslie 1988).

Plant species in the area around the site are expected to include agricultural crops and small stands of shrubs and low trees. Wildlife in these terrestrial habitats are expected to include birds, mammals, reptiles, and amphibians typical of the South Texas Plains (Table 2-1). It is also expected that livestock will utilize the terrestrial habitats irrigated by the canals.

The following types of fish were removed from the DRCS during the 2012 removal action: common carp, grass carp, gizzard shad, threadfin shad, buffalo, freshwater drum, redear sunfish, redbreast sunfish, bluegill, warmouth, largemouth bass, white crappie, Rio Grande cichlid, blue tilapia, channel catfish, blue catfish, white bass, longnose gar, alligator gar, spotted gar, Mexican tetra, bigmouth sleeper, plecostomus, and silverslove (Dynamac Corporation 2013); so it is probable these fish are common in the reservoir and canal system.

Table 2-1 lists other wildlife as well as vegetation common to the South Texas plains area in specific. Because land use in the area is primarily agricultural, wildlife would also include species habituated to man-made environments. Birds at the site are expected to include common species such as redwing blackbird, green jay, and red-tailed hawk which utilize the riparian corridor, as well as waterbirds such as great blue heron that utilize the waterways and reservoir. It is anticipated that the site would be used by both full-year resident and migratory birds. Mammals likely include raccoon, red fox, rodents, and shrews. Reptiles would include a variety of snakes and turtles which would utilize the waterways. Amphibians would include the leopard frog and Mexican burrowing toad.

2.1.4 Threatened and Endangered Species

The Texas Parks and Wildlife Department Texas Natural Diversity Database was used as a source to determine the list of endangered and threatened species likely to be present at the site. Texas Parks and Wildlife Department resources regarding endangered species can be found at the following website:

http://www.tpwd.state.tx.us/huntwild/wild/species/endang/index.phtml

According to the Texas Parks and Wildlife Department (2011) there is a chance that federal and state listed threatened and endangered species shown in Table 2-2 could occur within the county. Considering the disturbed nature of the habitats surrounding the site, it probably does not serve many of these threatened and endangered species. Species with specific habitat needs, such as thick brush land or wetlands, are less likely to occur.

This SLERA assumes that any threatened or endangered species that could occur within Hidalgo County may be present at the site. Suitable surrogate species have been identified in Section 2.5.4, and this relationship will be carried throughout the risk evaluation discussion. When evaluating risk to a protected species via a surrogate, it is important that the individual be protected.

Special Considerations Regarding Reptiles and Amphibians

Reptiles and amphibians are among the species expected to be potentially present at the site, and threatened reptiles such as the Texas tortoise and indigo snake are listed in Table 2-1 as common wildlife found in the South Texas Plains. There is little toxicity data available for the evaluation of potential risk to reptiles and amphibians. In lieu of a cross-class extrapolation, reptiles and amphibians will be assumed to be at risk if any ecological receptor is at risk, and will be assumed to not be at risk if all ecological receptors are not at risk. Uncertainties associated with these assumptions will be discussed in Section 10.

2.1.5 Surface Water

The DRCS is a freshwater system fed from the Rio Grande River. Water levels in the canal system are highly variable, ranging from a foot or less in some places during periods of low agricultural water demand (e.g., rainy cold seasons) to over 15 feet in others during periods of high agricultural water demands (e.g., dry summers). The water level in the reservoirs varies from one to three feet. During periods of high flow, the water may contain elevated levels of suspended solids. Given the climate and shallow depths, periods of low dissolved oxygen are expected. During periods of drought, the surface water has high conductivity and some estuarine fish species have been found during de-population efforts.

Surface water in the Arroyo Colorado River is freshwater sourced from runoff from agricultural fields and the surrounding land. The water depth normally varies from 2 to 8 feet through the site, with the deepest section immediately down gradient from where the inverted siphon passes under the Arroyo Colorado River.

2.1.6 Sediment

Sediment characteristics throughout the site vary widely. The unlined canals and reservoirs have the thickest sediments, up to a maximum recorded thickness of 20 inches in the LWMCU near the siphon exit. The lined canals tend to have very limited to no sediment deposition. Sediment within the system is primarily fine grained consisting of silt and clay with minor amounts of fine sand. Sand is deposited as a result of decreased flow velocity. In the Arroyo Colorado, these sediments tend to consist of natural fine grained sediments. In the downstream and northern areas, the canal is lined with concrete and sediment forms an overlying layer of variable thickness and consistency, ranging from silts to sands. In the reservoir, sediments are more fine grained and contain higher organic carbon.

2.1.7 Soil

There are seven different soil units encompassing the site. The soil units differ in grain size, composition, and terrain slope. Of the seven units, the majority of the site resides in Harlingen Clay and Runn Silty Clay. The dominant soil type from the Rio Grande River to the city of Donna is Harlingen Clay, a deep, nearly level soil primarily composed of calcareous clay. Harlingen Clay is moderately well drained, surface runoff is very slow, permeability is very low, and available water capacity is low. Runn Silty Clay is primarily composed of calcareous, silty clay that changes from dark grayish brown at the surface to pale brown at greater depths. Runn Silty Clay is moderately well drained, surface runoff is slow, permeability is low, and the available water capacity is high. Runn Silty Clay is primarily used for irrigated cropland (U.S. Department of Agriculture 1981).

The non-dominant soil profiles are concentrated in small areas of the canal system. At the Rio Grande River, the Rio Grande Silt Loam and the Reynosa Silty Clay Loam are prevalent. The Rio Grande Silt Loam and Reynosa Silty Clay Loam are calcareous, have slow surface runoff, moderate permeability, and high water capacity. At the Arroyo Colorado River the soil is largely saline Harlingen Clay and borrow pits. These areas of Harlingen Clay have higher salinity content due to over irrigation and evaporation. The borrow pits are long, narrow areas usually containing water where soil was excavated for civil use. The final soil profile, Hidalgo Sandy Clay Loam, is found north of the reservoirs, and is a well-drained, calcareous upland soil with characteristic slow surface runoff, moderate permeability, and high water capacity (U.S. Department of Agriculture 1981).

2.2 CHEMICALS OF POTENTIAL CONCERN

The primary COPCs for the site are PCBs. PCBs—specifically Aroclor-1254—were initially identified as a COPC due to elevated concentrations (up to 399 mg/kg) in fish tissue collected in 1994 (EPA 1994). PCBs (of which Aroclor-1254 was a commonly used mixture) consist of mixtures of 209 different congeners, each with similar structure but different numbers of chlorine atoms and arranged in different configurations. Commercially, congeners were mixed together to provide the desired electrical or engineering properties and the mixture was called an Aroclor. The manufacture of PCBs was discontinued in the United States in 1977 given the compounds' toxicity and persistence in the environment (ATSDR 2000).

2.3 CONTAMINANT FATE AND TRANSPORT

Key fate and transport pathways at the site for PCBs are erosion and deposition, adsorption and desorption, and bioaccumulation. Anthropogenic transport may also play a role due to dredging and agricultural activities. Chemical degradation may also play a role in fate and transport, but is less significant due the persistence of the compounds involved.

2.3.1 Contaminant Migration

PCBs are hydrophobic (ATSDR 2009). Therefore, they tend to bind to sediment particles, organic matter in sediments, and tissue. As such, migration of soil, sediment, or aquatic life in surface water are all potential routes of migration for PCBs.

2.3.1.1 Erosion and Deposition

The most important transport pathway for PCBs at the site is erosion and deposition. As indicated previously, PCBs are not typically water soluble and they sorb strongly to particulate matter (ATSDR 2000). Since PCBs bind to sediment particles, they will be transported with the movement of the sediment. Therefore, erosion and deposition of sediment is an important pathway. Fine-grained sediments and bank soils may be eroded from the sediment bed or banks during periods of high flow, transported to other areas, and deposited as flow velocities decrease. Erosion is most likely to occur in areas of high water velocity; for example, the center of the canal channel, on steep portions of the canal banks, or in areas where the canal narrows or becomes shallower. Deposition is most likely to occur in areas of low water velocity; for example, where the canal widens or deepens, in the channel near the banks, in the reservoir, in agricultural fields, or in areas where obstructions or stream features create eddies. Fine-grained sediments and organic matter in sediment (i.e., colloids) are most likely to be eroded and transported longer distances because they are lighter and/or less dense.

2.3.1.2 Anthropogenic Factors

There are three major anthropogenic factors that influence fate and transport at the site. The first is dredging, which has been conducted at the canal in the past. Dredging typically disturbs sediment and results in high levels of suspended sediment in the water column which contributed to mobilization of sediments. Another factor influencing transport is irrigation. As noted above, water is periodically released from the canal system to irrigate agricultural fields. This moves water and suspended sediments from the canal and reservoir system onto nearby fields and deposits sediments onto soil. The third anthropogenic influence is tilling associated with agriculture. Tilling turns the soil and may move chemicals in sediment deposited on the soil surface to lower in the soil profile via mixing.

2.3.1.3 Adsorption and Desorption

As a transport process, adsorption is an important process for PCBs because PCBs tend to bind and adsorb to sediments and are unlikely to desorb under typical conditions. This allows these contaminants to transport readily with sediments in response to changing flow conditions.

2.3.2 Contaminant Persistence

2.3.2.1 Bioaccumulation

PCBs are classified as bioaccumulative (EPA 2000). Hydrophobic compounds such as PCBs tend to adsorb to fat and lipids within tissue and are not readily eliminated from the body. Through this bioaccumulation of chemicals, organisms may accumulate concentrations of chemicals in tissue higher than in the media to which they were exposed. Bioaccumulation is considered an important fate and transport pathway within the aquatic environments. Bioaccumulation factors (BAFs) from water into tissue are often higher than 10,000 (ATSDR 2000).

In addition to bioaccumulation, PCBs may biomagnify up to three orders of magnitude compared to sediment concentrations (ATSDR 2000). Biomagnification occurs when lower trophic level organisms (e.g. worms, insects and crustacean) bioaccumulate chemicals in their tissue. Small fish that consume these organisms may eat many individuals, and thus accumulate PCBs and pesticides from all of the tissues they consume. Larger fish and wildlife in turn consume many smaller fish, and thus may receive large doses of chemicals. In cases where biomagnification is observed, organisms at the top of the food chain have the highest levels of chemicals in their tissue because of the compounded accumulation up each trophic level. PCBs have been observed to biomagnify as well as bioaccumulate.

Bioaccumulation and biomagnification may also occur in terrestrial environments. PCBs tend to be poorly taken up by plant roots, which must compete with adsorption to soil particles; however, plants may absorb chemicals aerially deposited on their leaves. BAFs relating soil concentrations to crop plant concentrations range from less than one to six (ATSDR 2000). Crop plants which produce large underground roots (i.e., carrots) or which have large leaf areas (i.e. lettuce) may be susceptible to bioaccumulation (ATSDR 2000), and some studies have shown that members of the squash/gourd family may bioaccumulate PCBs (Peters et al. 2007). Soil invertebrates such as earthworms may bioaccumulate PCBs and pesticides as has been demonstrated in numerous studies (Peters et al. 2007). Wildlife eating these invertebrates could potentially experience biomagnification. However, the largest reservoir of PCBs at the site are in sediment, and not located in soil or agricultural fields adjacent to the canal. Consequently, potential bioaccumulation into terrestrial plants and invertebrates is possible; it is not consequential for the site.

2.3.2.2 Degradation

Breakdown of PCBs is a slow process and is not considered likely to contribute significantly to loss of these chemicals from the site.

2.4 EXPOSURE PATHWAY ANALYSIS

Based on the ecological setting and media of concern discussed above, ecological receptors potentially present at the site include plants, soil invertebrates, wildlife (birds and mammals), benthic invertebrates, aquatic organisms and reptiles and amphibians (Figure 2-1). Media of concern and ecological receptors are evaluated to determine potential exposure routes linking the two and to determine which pathways are complete and significant. The sections below identify the major routes of exposure and their applicability to each of these receptor groups.

2.4.1 Terrestrial Plants and Invertebrates

Terrestrial plants and invertebrates may be exposed to environmental media through direct contact. Plants may absorb chemicals from surface and subsurface soil via their roots. They may also absorb chemicals from air or airborne particles through their leaves; although the waxy surfaces of leaves limit this exposure. Soil invertebrates may be exposed to chemicals in soil through direct contact, and chemicals may be absorbed from soil through the skin. Because the most organic matter is found in the top 0 to 12 inches, plant and invertebrate exposures are expected to occur primarily in surface soil. Therefore, exposure pathways linking plants and soil invertebrates to surface soil are complete and thus relevant for assessment.

2.4.2 Wildlife (Birds and Mammals)

The most significant exposure route for wildlife is ingestion of chemicals in contaminated media (EPA 2003a) which includes surface soil, sediment, surface water, and food items. Wildlife may ingest chemicals in environmental media by incidentally ingesting soil or sediment while grooming or foraging. As discussed above, chemicals may bioaccumulate in animal tissues. Therefore, wildlife may also ingest chemicals through the animals that they consume as food. Ingestion of chemicals in sediment, surface water, and/or food is considered a complete and potentially significant exposure pathway for wildlife.

Wildlife may be exposed to chemicals in air, sediment, or water via direct contact during foraging or burrowing. Most wildlife have protective outer coverings such as fur, feathers, or scales that prevent or limit the dermal absorption of chemicals from environmental media (U.S. Army Center for Health Promotion and Preventative Medicine [USACHPPM] 2004). EPA guidance identifies that, in most cases, dermal exposures are likely to be less significant than exposures through ingestion, and their evaluation involves considerable uncertainty (EPA 2003a, USACHPPM 2004). This exposure route is considered complete but relatively insignificant for wildlife.

Inhalation is a potentially complete pathway for both soil invertebrates and wildlife. These animals may inhale chemicals that have volatilized or that are adsorbed to airborne particulates. EPA guidance indicates that, in general, inhalation pathways are likely to be insignificant compared to ingestion pathways (EPA 2003a).

In summary, ingestion of chemicals in surface soil, sediment, surface water, and food are considered complete and significant exposure pathways for wildlife assessment in this SLERA.

2.4.3 Wetland and Aquatic Plants

These receptors are exposed to chemical contaminants by direct contact with sediments and surface waters; these are the only complete exposure pathways identified (Figure 2-1). The roots of wetland and aquatic plants are in continuous contact with bottom sediments and active uptake of contaminants by roots can occur. Stems and other immersed tissues could uptake contaminants from surface water through stomata. No other exposure pathways are complete, because root systems are not deep enough to penetrate to subsurface layers or ground water. Transfer of particulates from air to the surface of the plant is expected but this is not likely to be a route of exposure because of the relatively impermeable nature of plant cell walls.

2.4.4 Aquatic and Benthic Organisms

Aquatic and benthic organisms may be exposed to chemicals in surface water and sediment through direct contact and absorption through the skin and gills. Direct exposure to these media is considered a complete and significant pathway for aquatic and benthic organisms, and therefore relevant for the assessment of sediment and water exposures. While not quantitatively evaluated, aquatic organisms receive significant exposure via ingestion and foodchain transfer of COPCs with biomagnification potential. Given results of passive samplers, biomagnification may play a key role in driving observed fish tissue concentrations.

2.4.5 Reptiles and Amphibians

Reptiles and amphibians are exposed to chemical contaminants from surface water, sediment, soil, airborne dust, and prey. These receptors are exposed to contaminants via direct contact with and ingestion of sediment, surface water, airborne dust, and soil as well as ingestion of food (prey tissue). All of these represent complete pathways but only the ingestion of food and the ingestion of and direct contact with sediment and soil are considered significant (Figure 2-1). Dermal contact with water may constitute an exposure pathway, but there are insufficient data to quantify this pathway. Exposure to airborne particulates is a complete pathway; however, it is not quantifiable as insufficient data exist to determine exposure estimates from particulates during inhalation. Exposure to ground water and subsurface soil are incomplete pathways because these organisms feed above surface.

2.5 SELECTION OF REPRESENTATIVE RECEPTORS

Specific receptor groups and representative receptor species are selected to represent each of the ecological resource categories identified above. Ecological receptors that could possibly utilize the site include plants, soil invertebrates, wildlife (reptiles, amphibians, birds, and mammals), benthic invertebrates, and aquatic organisms. Selection of representative receptor species is based primarily on several factors: (1) the likelihood of a species to use the site and the area immediately surrounding the site, (2) the potential for exposure to site-related contaminants based on the feeding habits and life history of the organisms/guild represented by the receptor species, (3) the availability of life history and exposure information for the selected receptor species, and (4) the availability of toxicity information for the representative receptor species. Potential representative receptors were evaluated based on these criteria and based on the applicability of available toxicity benchmarks to plants, soil invertebrates, wildlife, benthic invertebrates, and aquatic organisms. The receptors of concern (and representative receptor species) included in this SLERA are:

- Terrestrial plants (multiple species)
- Soil invertebrates (earthworm)
- Terrestrial herbivorous birds (northern bobwhite)
- Terrestrial omnivorous birds (American robin)
- Predatory birds (red-tailed hawk)
- Terrestrial herbivorous mammals (white-footed mouse)
- Terrestrial insectivorous mammals (least shrew)
- Predatory mammals (coyote)
- Aquatic herbivorous birds (Canada goose)
- Aquatic insectivorous birds (laughing gull)
- Small piscivorous birds (belted kingfisher)
- Large piscivorous birds (great blue heron)
- Aquatic herbivorous mammals (nutria)
- Aquatic carnivorous mammals (raccoon)
- Piscivorous mammals (river otter)
- Benthic invertebrates (multiple species)
- Aquatic organisms (multiple species)
- Amphibians (American bullfrog)
- Reptiles (diamondback water snake).

2.5.1 Terrestrial Species

2.5.1.1 Terrestrial Plants

Based on the general nature of available plant toxicity data, no specific plant species are selected for evaluation. Instead, the assessments evaluate the potential for adverse effects to terrestrial plant communities and crops.

2.5.1.2 Soil Invertebrates

The site is expected to provide habitat for a range of invertebrates, including earthworms and arthropods. The earthworm was selected as the representative receptor species for soil invertebrates. Earthworms are an ideal receptor because they are in constant contact with the soil, have a significant lipid content that may accumulate chemicals, and do not have an exoskeleton; as such, they represent a precautionary estimate of exposure.

2.5.1.3 Herbivorous Wildlife

The northern bobwhite (*Colinus virginianus*) was selected as the representative receptor species to evaluate the potential for adverse effects to herbivorous birds. Northern bobwhite is an appropriate representative receptor because they are expected to be present at the site as they live in agricultural fields. Northern bobwhites eat mostly seeds and leaves and sufficient data is available for this species to support quantitative evaluation of food web exposures, thus making it an appropriate herbivorous bird receptor.

The white-footed mouse (*Peromyscus leucopus*) was selected as the representative receptor species to evaluate the potential for adverse effects to herbivorous mammals. The white-footed mouse is an appropriate receptor species because it is likely to occur at the site, it is a potential food source for other animals, and has a life history similar to that of many other small mammals. Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

2.5.1.4 Omnivorous Wildlife

The American robin (*Turdus migratorius*) was selected as the representative receptor species to evaluate the potential for adverse effects to omnivorous birds. American robin is an appropriate receptor because it occurs in a wide range of habitat types, is expected to be present at the site, feeds primarily on invertebrates, and has a life history similar to that of many other passerine birds. Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

2.5.1.5 Insectivorous Wildlife

The least shrew (*Cryptotis parva*) was selected as the representative receptor species to evaluate the potential for adverse effects to insectivorous mammals. The least shrew is an appropriate receptor species because it is a potential food source for other animals, is likely to occur around the site, and has a life history similar to that of many other small mammals. Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

2.5.1.6 Predatory Wildlife

The red-tailed hawk (*Buteo jamaicensis*) was selected as the representative receptor for predatory birds because it is likely to be present at the site. The red-tailed hawk is selected as a suitable representative for a predatory bird receptor, because it feeds predominantly on small mammals (such as mice, shrews, voles, rabbits, and squirrels). Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

Coyote (*Canis latrans*) was selected as the representative receptor for predatory mammals because it is expected to be present at the site, feeds primarily on small mammals, has a high potential for exposure due to bioaccumulation though the food chain, and is a valuable component to ecosystem structure by regulating the abundance, reproduction, distribution, and recruitment of lower trophic level prey (EPA 1999). Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

2.5.2 Aquatic Species

2.5.2.1 Herbivorous Wildlife

The Canada goose (*Branta canadensis*) is selected as the representative receptor species to evaluate the potential for adverse effects to herbivorous birds from the ingestion of chemicals in aquatic plant material. Birds can be more sensitive to certain contaminants, such as dichlorodiphenyltrichloroethane (DDT) (Sample et al. 1996), and it is therefore more conservative to include an avian receptor. The Canada goose is selected as a representative receptor species because it is has been observed in the study area and has a diet comprised of plant material (EPA 1993). Also, this species can be an important part of the diet of predatory mammals.

The nutria (*Myocaster coypus*) is selected as the mammalian receptor species for evaluating potential adverse effects to mammals from the ingestion of plants. The nutria, widely introduced in Texas, has a varied diet that includes significant amounts of plant food items (Texas Tech University 1997). For muskrats, native mammalian aquatic herbivores, exposure information is readily available, but its range does not include Hidalgo County. Although the nutria is a nonnative species, it is found in the area so muskrat exposure information, available from the EPA's guidance document titled "*Wildlife Exposure Factors Handbook*" (EPA 1993), will be used for the nutria. Therefore, the nutria is selected as the indicator species for the evaluation of potential adverse effects to mammals from feeding at the site.

2.5.2.2 Insectivorous Wildlife

The laughing gull (*Egretta thula*) is selected as the representative receptor species to evaluate the potential for adverse effects from the ingestion of chemicals in benthic invertebrate tissue. Birds can be more sensitive to certain contaminants, such as DDT (Sample et al. 1996), and it is therefore more conservative to include an avian receptor. Therefore, the laughing gull is selected as the indicator species for the evaluation of potential adverse effects to birds from feeding at the site.

2.5.2.3 Carnivorous Wildlife

The raccoon (*Procyon lotor*) is selected as the mammalian receptor species for evaluating potential adverse effects to small mammals from the ingestion of benthic and aquatic invertebrates. The raccoon has a varied diet that can include over 60 percent aquatic or benthic food items (EPA 1993). Therefore, the raccoon is selected as the indicator species for the evaluation of potential adverse effects to mammals from feeding at the site.

2.5.2.4 Piscivorous Wildlife

The belted kingfisher (*Megaceryle alcyon*) is selected as the small avian receptor species for evaluating potential adverse effects to birds from the ingestion of fish, amphibians, and crayfish from the area. The belted kingfisher is selected for evaluation because a large proportion of its diet is comprised of smaller fish and aquatic invertebrates and it may forage in the areas bordering the site. Typically fish caught and eaten by belted kingfishers are less than 10.2 centimeters long (Imhof 1962).

The great blue heron (*Ardea herodias*) is selected as the large avian receptor species for evaluating potential adverse effects to birds from the ingestion of fish, amphibians, and crayfish from the area. The great blue heron is selected for evaluation, because a large proportion of the diet is comprised of fish (including game fish) and larger aquatic invertebrates, and this heron may forage in the areas bordering the site. In some areas, game fish (such as large-mouth bass) can comprise one-quarter of a heron's diet (Cottam and Uhler 1945).

The North American river otter (*Lutra canadensis*) was selected as the mammalian receptor species for evaluating potential adverse effects to mammals from the ingestion of fish. Since a large proportion of their diet is comprised of fish and larger aquatic invertebrates, the river otter was selected as the representative piscivorous mammal.

2.5.2.5 Wetland and Aquatic Plants

Based on the general nature of available plant toxicity data, no specific plant species are selected for evaluation. Instead, the assessments evaluate the potential for adverse effects to wetland and aquatic plant communities.

2.5.2.6 Aquatic and Benthic Organisms

The toxicity data being used in the risk assessment are designed to evaluate the potential for adverse effects to aquatic and benthic organisms. Therefore, individual species are not selected for evaluation, and the assessments evaluate the potential for adverse effects to the overall aquatic and benthic populations.

2.5.3 Reptiles and Amphibians

Reptiles and amphibians are exposed to chemical contaminants from surface water, sediment, soil, airborne dust, and prey. These receptors are exposed to contaminants via direct contact with and ingestion of sediment, surface water, airborne dust, and soil as well as ingestion of food (prey tissue). All of these represent complete pathways but only the ingestion of food and the ingestion of and direct contact with sediment and soil are considered significant (Figure 2-1). Dermal contact with water may constitute an exposure pathway, but there are insufficient data to quantify this pathway. Exposure to airborne particulates is a complete pathway; however, it is not quantifiable as insufficient data exist to determine exposure estimates from particulates during inhalation. Exposure to ground water and subsurface soil are incomplete pathways because these organisms feed above surface.

The American bullfrog (*Rana catesbeiana*) was selected as the representative receptor for amphibians because it is likely to be present at the site, given its home range and habitat needs. Also, there is sufficient data available to support quantitative evaluation of food web exposures. Bullfrogs are carnivorous and eat a wide variety of food items including small mammals, fish, snakes, birds, insects, and tadpoles. This amphibian is a common prey item of piscivorous wildlife.

The diamondback water snake (*Nerodia rhombifer*) was selected as the representative receptor for reptiles because it has been found in Hidalgo County (Keown 2007) in the past. In addition, the species inhabits canals (Behler and King 1979) so it is possible individuals would use the aquatic habitat provided by the site. Like all snakes, the diamondback water snake is carnivorous, but this aquatic snake mostly feeds on fish and amphibians.

2.5.4 Threatened and Endangered Species

An important consideration in forming an ecological CSM is the presence of endangered, threatened, and rare species on the site. As discussed in Section 2.1.4, protected species may exist near the project area. For each species that may be present, a surrogate receptor has been identified and carried through the risk assessment. The following receptors are identified as surrogate receptors for at least one threatened or endangered species (Table 2-2): American robin, red-tailed hawk, least shrew, coyote, laughing gull, belted kingfisher, great blue heron, raccoon, multiple species of benthic invertebrates, multiple species of aquatic organisms, American bullfrog, and the diamond back water snake.

3. STEPS 1 AND 2: SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

The first two steps of the eight-step ERA process (Figure 1-1) constitute the SLERA. The SLERA includes screening-level problem formulation, ecological effects evaluation, exposure estimate, and risk calculation. This section presents the SLERA for the site and is organized into the following subsections:

- Screening-level problem formulation
- Summary of the SLERA results.

3.1 SCREENING LEVEL PROBLEM FORMULATION

The screening-level problem formulation includes development of a CSM and assessment and measurement endpoints. Assessment and measurement endpoints are identified for each representative receptor species evaluated at the site. Measurement endpoints are measurable ecological characteristics that are related to the assessment endpoints (EPA 1997). The measurement endpoints are used to assess the potential for effects on the assessment endpoints through their comparison to screening level concentrations or toxicity values. The measurement endpoints for the site are provided in Table 3-1.

3.2 ASSESSMENT AND MEASUREMENT ENDPOINTS

EPA guidance stresses the importance of ecologically significant endpoints. As discussed by EPA, "Assessment endpoints are explicit expressions of the actual environmental value that is to be protected, operationally defined by an ecological entity and its attributes" (EPA 1998). Failure to select appropriate assessment and measurement endpoints can result in the inability to answer the risk questions central to a SLERA. Several criteria are applicable for endpoint selection (Suter 1993; EPA 1998):

1. ***Unambiguous Definition***—Assessment endpoints should indicate a subject and a characteristic of the subject (e.g., fish reproduction).

2. ***Accessibility to Prediction and Measurement***—Assessment endpoints should be reliably predictable from measurements.

3. ***Susceptibility to the Hazardous Agent/Stressor***—Susceptibility of an organism (plant or animal) results from the combination of potential for exposure and the sensitivity to the concentrations of contaminants or other stressors of concern.

4. ***Biological Relevance***—Biological relevance of impacts to an individual organism is determined by the importance of the impact to higher levels of biological organization (e.g., populations or communities).

5. ***Social Relevance and Policy Goals***—Assessment endpoints should be of value to decision-makers and the public. The assessment endpoints should represent effects that would warrant consideration of site remediation or alteration of project plans. Assessment endpoint selection should also include endpoints that may be mandated legally (e.g., protected species).

The ecological assessment endpoints applicable to this site are discussed below:

- Protection of organisms exposed directly or indirectly to surface soil to ensure that COPCs in surface soil do not have unacceptable adverse effects on organism survival, growth, and reproduction, which may result in adverse effects to the community structure (e.g., diversity or biomass).

- Protection of organisms exposed directly or indirectly to sediment to ensure that COPCs in sediment do not have unacceptable adverse effects on organism survival, growth, and reproduction, which may result in adverse effects to the community structure (e.g., diversity or biomass).

- Protection of animals exposed directly or indirectly to surface water to ensure that COPCs in surface water do not have unacceptable adverse effects on organism survival, growth, and reproduction, which may result in adverse effects to the community structure (e.g., diversity or biomass).

These assessment endpoints are general and are refined and revised for sample types warranting evaluation in the refined assessment conducted in Step 3.

The measurement endpoints are measurable ecological characteristics that are related to the assessment endpoints (EPA 1998). Because it is difficult to "measure" assessment endpoints, measurement endpoints were chosen that permit inference regarding the assessment endpoints described above. Measurement endpoints for the Step 1 and 2 SLERA selected for this risk assessment are the following:

1. ***Media Chemistry for Surface Soil***—The measurement of maximum COPC concentrations in surface soil provides the means, when compared to conservative (based on chronic or no effects levels), ecotoxicological-based screening concentrations, for drawing inferences regarding the assessment endpoint for surface soil.

2. ***Media Chemistry for Sediment***—The measurement of maximum COPC concentrations in sediment provides the means, when compared to conservative (based on chronic or no effects levels), ecotoxicological-based screening concentrations, for drawing inferences regarding the assessment endpoint for sediment.

3. ***Media Chemistry for Surface Water***—The measurement of maximum COPC concentrations in surface water provides the means, when compared to conservative (based on chronic or no effects levels), ecotoxicological-based screening concentrations, for drawing inferences regarding the assessment endpoint for surface water.

3.3 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

COPCs are selected by comparison of maximum concentrations found in media to ecological risk screening values.

Maximum concentrations in surface soil, sediment, and surface water were compared to TCEQ (2014a) values. The criteria are presented in Table 3-2 and can be found at the link presented below:

http://www.tceq.texas.gov/assets/public/remediation/trrp/rg263-draft.pdf.

To support comparisons using PCB concentrations, individual PCB Aroclors, the sum of PCB Aroclors, and the sum of PCB congeners were compared to screening values separately and carried through the risk assessment as such. Polycyclic aromatic hydrocarbons (PAHs) were summed separately for high molecular weight (HMW) PAHs and low molecular weight (LMW) PAHs. HMW PAHs were defined as have four carbon rings or more, while LMW PAHs were defined as having less than four carbon rings. DDT and its metabolites, dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethylene (DDE) were summed and are reported as DDTr.

3.4 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT RESULTS

Maximum exposure estimates were compared to media-specific screening levels and are shown in Tables 3-3 through 3-7. The results of this risk calculation are used to identify COPCs. The SLERA risk calculation is performed by comparing the maximum exposure concentration to the screening level. When the screening level is greater than the maximum concentration, the potential for adverse effects is considered unlikely. Because of the conservative nature of the SLERA, only chemicals with maximum concentrations less than the screening level can be removed from further examination. If the maximum concentration is equal to or greater than the screening leve1, or if a media-specific screening criterion is not available, the chemical is retained as a COPC and examined further. Inclusion of these chemicals as COPCs does not necessarily indicate that they pose risks; it indicates that the chemicals cannot be definitively eliminated from further consideration.

Essential nutrients, although detected in media, are not included in the list of COPCs. Essential nutrients include calcium, iron, magnesium, sodium, and potassium. These chemicals are necessary for metabolic processes in organisms and, thus, are considered essential nutrients for wildlife. At naturally occurring concentrations, receptors are able to regulate uptake and metabolism of these elements. However, as with all chemicals, it is possible that nutrients may produce toxic effects at very highly elevated concentrations. These five chemicals generally do not have screening level concentrations or toxicity reference values (TRVs) (except iron). They have been eliminated from further evaluation in this ERA. The uncertainty associated with the toxicity of essential nutrients is discussed in Section 10.

Aluminum naturally occurs and is a large component of most soil types, typically contributing one to 30 percent. However, high concentrations of aluminum do not correlate with toxicity as aluminum must be in a soluble form in order to adversely affect ecological receptors. EPA has determined that the most appropriate way to determine if aluminum is a COPC is by measuring pH, because bioavailability of aluminum for uptake and toxicity varies with pH. Solubility and bioavailability increase with lower pH (EPA 2003b); pH below 5.5 is potentially associated with toxicity. There is no site specific pH data available for sediment, but there is site-specific data for surface water. The pH range in site surface water ranges from 6.8 to 8.8; this indicates that aluminum is unlikely to pose toxicity. Given the close ties between water chemistry and sediment chemistry, it is expected that sediment pH would be similar, and that aluminum in sediment and surface water would likely be in non-toxic forms. Therefore the risk characterization results find that aluminum is unlikely to cause risks and is therefore not a COPC.

As discussed above, PCBs are the main COPC for the site. If any PCB congeners were detected in media (soil, sediment, surface water, benthos tissue, or fish tissue) within an exposure grouping, then total PCB congeners will be carried through the ERA. If any PCB Aroclors were detected in media within the exposure grouping, then the Aroclor and total PCB Aroclors will be carried through the ERA. In order to determine whether or not there is risk to wildlife, these COPC will be carried through the ERA whether or not the sediment, surface water, and surface soil pass the initial screen.

The results of the SLERA represent maximum estimates of risk, and are not necessarily representative of population-wide risks. Therefore, Step 3 of the ERA (the BRAPF) includes a refinement of risk estimates. Risks from chemicals that do not have a screening value could not fully be evaluated and remain an uncertainty. Uncertainties associated with the SLERA are discussed in Section 10.

3.4.1 Exposure Area 1: Upstream of the Siphon Results

Exposure Area 1: Upstream of the Siphon Sediment COPCs, see Table 3-3:

The following chemicals exceeded the sediment screening values and were retained as COPCs in Exposure Area 1: Upstream of the Siphon:

Pesticides
DDTr
SVOCs
Bis(2-ethylhexl)phthalate

The following chemicals were retained as COPCs in Exposure Area 1: Upstream of the Siphon due to lack of a sediment screening value:

Metals

Barium	Beryllium	Vanadium

SVOCs
Phenol
VOCs
Acetophenone

The following PCBs were detected in sediment within Exposure Area 1: Upstream of the Siphon and were therefore retained as COPCs:

PCBs

Aroclor-1260	Total PCB Congeners	Total PCB Aroclors

<u>Exposure Area 1: Upstream of the Siphon Surface Water COPCs,</u> see Table 3-3:

The following chemicals exceeded the surface water screening values and were retained as COPCs in Exposure Area 1: Upstream of the Siphon:

Metals
Lead

The following PCBs were detected in surface water within Exposure Area 1: Upstream of the Siphon and were therefore retained as COPCs:

PCBs
Total PCB Congeners

3.4.2 Exposure Area 2: Arroyo Colorado Results

<u>Exposure Area 2: Arroyo Colorado Sediment COPCs,</u> see Table 3-4:

The following chemicals exceeded the sediment screening values and were retained as COPCs in Exposure Area 2: Arroyo Colorado:

Metals

Manganese	Mercury

Pesticides
DDTr
PCBs
Aroclor-1260

The following chemicals were retained as COPCs in Exposure Area 2: Arroyo Colorado due to lack of a sediment screening value:

Metals

Barium	Beryllium	Vanadium

The following PCBs were detected in sediment within Exposure Area 2: Arroyo Colorado and were therefore retained as COPCs:

PCBs

Total PCB Congeners	Total PCB Aroclors

Exposure Area 2: Arroyo Colorado Surface Water COPCs, see Table 3-4:

The following chemicals exceeded the surface water screening values and were retained as COPCs in Exposure Area 2: Arroyo Colorado:

Metals		
Cadmium	Copper	Lead
Manganese	Selenium	

The following chemical was retained as a COPC in Exposure Area 2: Arroyo Colorado due to lack of a surface water screening value:

VOCs
Acetophenone

The following PCBs were detected in surface water within Exposure Area 2: Arroyo Colorado and were therefore retained as COPCs:

PCBs
Total PCB Congeners

3.4.3 Exposure Area 3: LWMCU at the Siphon Exit Results

Exposure Area 3: LWMCU at the Siphon Exit Sediment COPCs, see Table 3-5:

The following chemicals exceeded the sediment screening values and were retained as COPCs in Exposure Area 3: LWMCU at the Siphon Exit:

Metals		
Manganese		
PCBs		
Aroclor-1242	Aroclor-1254	Aroclor-1260
Total PCB Congeners	Total PCB Aroclors	
Pesticides		
DDTr	Dieldrin	Endrin
gamma-Chlordane	Heptachlor epoxide	
PAHs		
Total LMW PAHs	Total HMW PAHs	
SVOCs		
Bis(2-ethylhexl)phthalate		

The following chemicals were retained as COPCs in Exposure Area 3: LWMCU at the Siphon Exit due to lack of a sediment screening value:

Metals		
Barium	Beryllium	Selenium
Vanadium		
Pesticides		
Endosulfan I	Endosulfan II	Endrin aldehyde
SVOCs		
Carbazole	Di-n-butyl phthalate	Phenol
VOCs		
Acetophenone		

The following PCBs were detected in sediment within Exposure Area 3: LWMCU at the Siphon Exit and were therefore retained as COPCs:

PCBs	
Aroclor-1221	Aroclor-1248

<u>Exposure Area 3: LWMCU at the Siphon Exit Surface Water COPCs,</u> see Table 3-5:

The following chemicals exceeded the surface water screening values and were retained as COPCs in Exposure Area 3: LWMCU at the Siphon Exit:

Metals		
Lead	Manganese	
PCBs		
Aroclor-1254	Total PCB Congeners	Total PCB Aroclors

3.4.4 Exposure Area 4: LWMCU Downstream of the Siphon Results

<u>Exposure Area 4: LWMCU Downstream of the Siphon Sediment COPCs,</u> see Table 3-6:

The following chemicals exceeded the sediment screening values and were retained as COPCs in Exposure Area 4: LWMCU Downstream of the Siphon:

Metals	
Manganese	
PCBs	
Aroclor-1254	Total PCB Aroclors
Pesticides	
DDTr	gamma-Chordane

The following chemicals were retained as COPCs in Exposure Area 4: LWMCU Downstream of the Siphon due to lack of a sediment screening value:

Metals

Barium	Vanadium

The following PCBs were detected in sediment within Exposure Area 4: LWMCU Downstream of the Siphon and were therefore retained as COPCs:

PCBs
Total PCB Congeners

__**Exposure Area 4: LWMCU Downstream of the Siphon Surface Water COPCs,**__ see Table 3-6:

The following chemicals exceeded the surface water screening values and were retained as COPCs in Exposure Area 4: LWMCU Downstream of the Siphon:

Metals
Lead
Pesticides
4,4'-DDT

The following chemical was retained as a COPC in Exposure Area 4: LWMCU Downstream of the Siphon due to lack of a surface water screening value:

Pesticides
DDTr

3.4.5 Exposure Area 5: Lined Canals, Reservoirs, and Soil Results

__**Exposure Area 5: Lined Canals, Reservoirs, and Soil Surface Soil COPCs,**__ see Table 3-7:

The following chemicals exceeded the surface soil screening values and were identified as COPCs in Exposure Area 5: Lined Canals, Reservoirs, and Soil:

Metals

Barium	Chromium	Manganese
Vanadium	Zinc	

The following chemicals were retained as COPCs in Exposure Area 5: Lined Canals, Reservoirs, and Soil due to lack of soil screening values:

Pesticides

DDTr	alpha-Chlordane	Dieldrin
Endosulfan I	Endosulfan II	Endosulfan sulfate

Endrin	Endrin aldehyde	Endrin ketone
gamma-Chlordane	Heptachlor epoxide	Methoxychlor
Toxaphene		
SVOCs		
Bis(2-ethylhexl)phthalate	Butylbenzylphthalate	
VOCs		
Acetone	Methylene chloride	

The following PCBs were detected in soil within Exposure Area 5: Lined Canals, Reservoirs, and Soil and were therefore retained as COPCs:

PCBs		
Aroclor-1016	Aroclor-1254	Aroclor-1260
Total PCB Congeners	Total PCB Aroclors	

Exposure Area 5: Lined Canals, Reservoirs, and Soil Sediment COPCs, see Table 3-7:

The following chemicals exceeded the sediment screening values and were retained as COPCs in Exposure Area 5: Lined Canals, Reservoirs, and Soil:

Metals		
Arsenic	Copper	Lead
Manganese		
Pesticides		
DDTr	Delta-BHC	Dieldrin
PAHs		
Total LMW PAHs	Total HMW PAHs	
SVOCs		
Bis(2-ethylhexl)phthalate		

The following chemicals were retained as COPCs in Exposure Area 5: Lined Canals, Reservoirs, and Soil due to lack of a sediment screening value:

Metals		
Barium	Beryllium	Selenium
Vanadium		
Pesticides		
Endosulfan II	Endosulfan sulfate	Endrin aldehyde
Endrin ketone	Heptachlor	Methyoxychlor
SVOCs		
Butylbenzylphthalate	Carbazole	Dibenzofuran

The following PCBs were detected in sediment within Exposure Area 5: Lined Canals, Reservoirs, and Soil and were therefore retained as COPCs:

PCBs

Aroclor-1254	Aroclor-1260	Total PCB Congeners
Total PCB Aroclors		

Exposure Area 5: Lined Canals, Reservoirs, and Soil Surface Water COPCs, see Table 3-7:

The following chemicals exceeded the surface water screening values and were retained as COPCs in Exposure Area 5: Lined Canals, Reservoirs, and Soil:

Metals

Copper	Lead	Manganese

Pesticides

4,4'-DDT

The following chemicals were retained as COPCs in Exposure Area 5: Lined Canals, Reservoirs, and Soil due to lack of a surface water screening value:

Pesticides

DDTr

SVOCs

Benzaldehyde	Caprolactam

The following PCBs were detected in surface water within Exposure Area 5: Lined Canals, Reservoirs, and Soil and were therefore retained as COPCs:

PCBs

Total PCB Congeners

4. ECOLOGICAL RISK ASSESSMENT REFINEMENT

Steps 4 through 7 of the 8-step ERA process are required only for compounds for which the SLERA (Steps 1 and 2) indicates a need for further ecological risk evaluation. Consistent with ERA guidance (EPA 1997), highly conservative assumptions were used in the SLERA to provide an upper bound estimate of risk to ecological resources. Such an approach meets with the objectives of the SLERA, which are to screen out chemicals that do not have the potential to adversely affect ecological resources and to maintain chemicals that have potential to cause risks.

These conservative assumptions are expected to overestimate actual levels of risk to most ecological receptors. Consequently, some chemicals that may not pose risk may be retained as COPCs at the outset of Step 3. The objective of Steps 4 through 7 is to determine the scope and goals of the baseline ERA by considering more advanced models of risk that move from media-specific to receptor-specific assessment, including, where available, additional site-specific information and more realistic assumptions in the estimates of risk. The results of this evaluation build upon the risk results presented in the SLERA and are intended to help in making scientific management decisions about the need for further investigation.

4.1 ASSESSMENT AND MEASUREMENT ENDPOINTS

The following refined assessment endpoints were defined (Table 3-1) to reflect the potential impacts of the complete and significant exposure pathways discussed above:

The selection of assessment endpoints is based on the fundamental knowledge of local ecology. Assessment endpoints typically relate to an effect on a population or community. Survival of a specific species of insect is an example of a population level assessment endpoint. Community level assessment endpoints could include survival of benthic invertebrates or maintenance of multiple populations of birds.

Based on the CSM, ecological receptors may be exposed to COPCs from food, surface water, airborne dust, soil, and sediment. Based on the identified ecological receptors, habitats, and the above observations, the following ecological assessment endpoints are defined:

1. Protection of **plant** survival, growth, and reproduction from adverse effects of COPCs in soil, airborne dust, sediment, and surface water.

2. Protection of **soil invertebrates** exposed to COPCs in soil, airborne dust, and food from adverse effects on survival, growth, and reproduction.

3. Protection of **wildlife** (birds and mammals of different feeding guilds) to ensure that ingestion of COPCs in soil, airborne dust, sediment, surface water, and food do not have adverse effects on survival, growth, and reproduction.

4. Protection of **aquatic and benthic communities** (e.g., fish and crustaceans) exposed to COPCs in sediment, surface water, and food from adverse effects on survival, growth, and reproduction.

5. Protection of **reptiles and amphibians** to ensure that ingestion of COPCs through contact with soil, airborne dust, sediment, surface water, and food does not have adverse effects on survival, growth, and reproduction.

Per EPA guidance (EPA 1999), the goal of the ERA is to protect the above receptor groups from population impacts. This ERA uses methods that assess impacts to individuals as a highly conservative estimator of potential impacts on populations. This is a source of uncertainty that may lead to the overestimation of risks.

Because assessment endpoints are often defined in terms of ecological characteristics that are difficult to measure (e.g., the health of a population or community), measurement endpoints are selected to provide a quantifiable means of characterizing risks. Measurement endpoints are quantifiable ecological characteristics that are related to each assessment endpoint (EPA 1989). The following refined measurement endpoints were defined to draw inferences regarding the refined assessment endpoints:

1. ***Protection of Terrestrial Plant Communities*—**The measurement of maximum COPC concentrations in surface soil and the calculation of 95 percent upper confidence limit of the mean (95UCLM) COPC concentrations in surface soil provide the means, when compared to relevant receptor-specific benchmarks, for drawing inferences regarding the first assessment endpoint above.

2. ***Protection of Soil Invertebrate Communities*—**The measurement of maximum COPC concentrations in soil and the calculation of 95UCLM COPC concentrations in soil provide the means, when compared to relevant receptor-specific benchmarks, for drawing inferences regarding the second assessment endpoint above.

3. ***Protection of Terrestrial Wildlife*—**The measurement of maximum COPC concentrations in soil and the calculation of 95UCLM COPC concentrations in soil provide the means to model wildlife doses, which can be compared to relevant receptor-specific benchmarks, to draw inferences regarding the fifth assessment endpoint above.

4. ***Protection of Aquatic Wildlife*—**The measurement of maximum COPC concentrations in sediment and surface water and the calculation of 95UCLM COPC concentrations in sediment and surface water provide the means to model wildlife doses, which can be compared to relevant (based on acute or low effects levels) receptor-specific benchmarks, to draw inferences regarding the second assessment endpoint above.

5. ***Protection of Benthic Invertebrate Communities*—**The measurement of maximum COPC concentrations in sediment and the calculation of 95UCLM COPC concentrations in sediment provide the means, when compared to relevant (based on acute or low effects levels) receptor-specific benchmarks, for drawing inferences regarding the first assessment endpoint above.

6. ***Protection of Aquatic Organism Communities***—The measurement of maximum COPC concentrations in surface water and the calculation of 95UCLM COPC concentrations in surface water provide the means, when compared to relevant (based on acute or chronic levels) receptor-specific benchmarks, for drawing inferences regarding the first assessment endpoint above.

7. ***Protection of Reptiles and Amphibians—***The assessment of risks to amphibians and reptiles is limited by the lack of sufficient literature-based exposure and toxicity information. Also, there are currently no assessment methods for evaluating these receptors.

4.1.1 Plants and Invertebrates

The measurement endpoints for plants and soil invertebrates include comparison of Exposure Point Concentrations (EPCs) to benchmarks called TRVs protective of exposures to soil. Potential risks to plants and soil invertebrates were evaluated by comparing EPCs in soil to TRVs for these media. TRVs represent the threshold above which effects are expected and below which no effect is expected. Conservative benchmarks have been selected to ensure that all chemicals that may pose a risk are accurately identified. Comparisons were initially made using maximum EPCs as a precautionary initial screen. Comparisons were then refined using 95UCLM and point-by-point concentrations as EPCs. As defined in EPA guidance (EPA 1997), the ratio of a chemical's concentration to its TRV is called a Hazard Quotient (HQ). HQs greater than or equal to 1.0 indicate a potential for unacceptable risk, while HQs less than 1.0 indicate no potential for unacceptable risk. Results of comparisons will be interpreted in light of the anticipated environmental chemistry of site media and spatial relationships that may affect comparison results and relevance.

4.1.2 Wildlife

For wildlife, measurement endpoints are based on the results of food web models that predict the dose of chemicals ingested by wildlife. These doses will be compared to TRVs for wildlife. The first measurement endpoint evaluated will be a comparison of doses based on maximum EPCs to no-effects TRVs. Refinement of the models will be conducted using 95UCLM EPCs. As discussed above, HQs greater than or equal to 1.0 indicate a potential for unacceptable risk, while HQs less than 1.0 indicate no potential for unacceptable risk. Results of comparisons will be interpreted in light of factors that include the anticipated environmental chemistry of site media and spatial relationships that may affect comparison results and relevance. More detailed presentation of measurement endpoints is provided in Table 3-1.

4.1.3 Aquatic Plants and Benthic Invertebrates

The measurement endpoints for aquatic plants and benthic invertebrates include comparison of EPCs to benchmarks called TRVs protective of exposures to sediment. Potential risks to aquatic plants and benthic organisms were evaluated by comparing EPCs in sediment to TRVs for these media. TRVs represent the threshold above which effects are expected and below which either no effect or a low effect is expected. Conservative benchmarks have been selected to ensure that all chemicals that may pose a risk are accurately identified. Comparisons were initially made using maximum EPCs as a precautionary initial screen. Comparisons were then refined using 95UCLM and point-by-point concentrations as EPCs. As defined in EPA guidance (EPA 1997), the ratio of a chemical's concentration to its TRV is called an HQ. HQs greater than or equal to 1.0 indicate a potential for unacceptable risk, while HQs less than 1.0 indicate no potential for unacceptable risk. Results of comparisons will be interpreted in light of the anticipated environmental chemistry of site media and spatial relationships that may affect comparison results and relevance.

4.1.4 Aquatic Organisms

The measurement endpoints for aquatic organisms (e.g., fish and invertebrates) include comparison of EPCs to water quality criteria protective of exposures to surface water. Water quality criteria represent the threshold above which effects are expected and below which either chronic (long-term exposure) or acute (short-term exposure) effects are expected. Conservative benchmarks have been selected to ensure that all chemicals that may pose a risk are accurately identified. Comparisons were initially made using maximum EPCs as a precautionary initial screen. Comparisons were then refined using 95UCLM and point-by-point concentrations as EPCs. As discussed above, HQs are used to assess risk. Results of comparisons will be interpreted in light of the anticipated environmental chemistry of site media and spatial relationships that may affect comparison results and relevance.

4.1.5 Amphibians and Reptiles

Exposure estimates are not developed for amphibians or reptiles, because a quantitative measurement endpoint for this ecological resource cannot be identified. Literature and database resources were examined for exposure and toxicity information that could be used to quantitatively evaluate risks to amphibians and reptiles. Despite searches of the EPA ECOTOX database, Canadian-based Reptile and Amphibian Toxicology Literature database, and other various literature sources, inadequate data are available for a quantitative evaluation. Therefore, the potentials for risks to amphibians and reptiles will be maintained as an uncertainty throughout this SLERA (Section 10: Uncertainties).

4.2 EXPOSURE ASSESSMENT

Many of the measurement endpoints identified rely on exposure estimation using chemical analytical data. In some cases, chemical concentrations are used as the exposure estimate, and the calculated 95UCLM concentrations are identified as EPCs for comparison to benchmarks. In other cases, chemical concentrations are the EPC inputs for food web models that estimate exposures as ingested doses. The exposure assessment identifies the models and input parameters that were used in benchmark comparisons and food web dose modeling. These parameters include identification of EPCs, food web model assumptions, and literature-based uptake factors (UFs). These are discussed on a receptor-by-receptor basis.

4.2.1 Exposure Point Concentrations

EPCs are the COPC concentrations that a receptor is assumed to be exposed to within an exposure area. Two separate EPCs were used in the ERA. The initial measurement endpoint for each receptor consists of a screening level comparison of the maximum case scenario exposure estimate to no-effects benchmarks. Therefore, the maximum concentrations detected in onsite media were used as the EPC in exposure estimation. The maximum EPC is a realistic estimate of hot-spot exposures to organisms that may spend their entire lives in a small area. However, use of the maximum EPCs for assessment of some organisms is conservative and is likely to overestimate risks because it assumes that individual organisms spend 100 percent of their time inhabiting and feeding from the most contaminated sample location at the site.

Additional measurement endpoints were evaluated based on 95UCLM concentrations found in onsite soils. The 95UCLM is a more realistic and yet still conservative value for consideration of the site-wide populations and exposures for mobile receptors, because it assumes an upper-bound estimate of the average exposure across the site. The 95UCLM concentration of a chemical within a given sample data grouping was calculated with the EPA statistical software package ProUCL Version 5.1 following EPA guidance (EPA 2002a, 2007a). ProUCL was used for calculating the 95UCLMs in this risk assessment, as this program allows the user to calculate distribution-specific UCLMs, as well as UCLMs for data that do not exhibit a specific distribution. If the calculated 95UCLM exceeded the maximum detected concentration, then the maximum concentration was used as the EPC. Where the 95UCLM could not be calculated because of low-detection frequencies, the maximum was used in its place. This creates uncertainties that are discussed further in Section 10; however, it is consistent with the methods utilized in ProUCL Version 5.1.

It is important to note that many fish and wildlife species are highly mobile and may forage over a wide home range. This is especially relevant for the canals where seasonal changes in water level may alter the quality of habitat and influence receptors to move between canal segments or even to leave the site. This ERA is conservative in that it assumes that receptors receive 100 percent of their exposure from the exposure area for which EPC are calculated. This is useful for evaluating the role of each area in driving risk; however, it may overestimate the actual exposure for mobile species. Risk management, as discussed in Section 12, may consider the fact that area use for mobile receptors may span multiple exposure areas and that area use for the site may differ from 100 percent.

4.2.2 Exposure Modeling for Lower Trophic Level Wildlife

The measurement endpoints for terrestrial plants, soil invertebrates, benthic invertebrates, and aquatic organisms include comparison of EPCs to TRVs protective of exposures to environmental media. The use of EPCs to represent exposures for these organisms is discussed further below.

Terrestrial Plants—Chemical concentrations measured in the soil of the site were used to evaluate the potential for adverse effects to terrestrial plants. Consistent with EPA guidance (EPA 1997), the maximum detected concentration was used as the initial EPC in comparisons against benchmarks protective of plants. In addition, the chemical concentrations at each sample location were used as sample-specific EPCs in comparisons to benchmarks; the results of these sample-specific comparisons were used to calculate site-wide frequencies of exceedance. Finally, a conservative estimate of the 95UCLM concentration was evaluated as an EPC in comparisons to indicate the potential for population-wide impacts.

Soil Invertebrates—Chemical concentrations measured in the soil were used to evaluate the potential for adverse effects to soil invertebrates. Consistent with EPA guidance (EPA 1997), the maximum detected concentration was used as the initial EPC in comparisons against benchmarks protective of soil invertebrates. In addition, the chemical concentrations at each sample location were used as sample-specific EPCs in comparisons to benchmarks; the results of these sample-specific comparisons were used to calculate site-wide frequencies of exceedance. Finally, a conservative estimate of the 95UCLM concentration was evaluated as an EPC in comparisons to indicate the potential for population-wide impacts.

Benthic Organisms—Chemical concentrations detected in the sediment samples were used to evaluate the potential for adverse effects to benthic organisms. Data were compared to literature-based toxicity values for benthic organisms. The maximum detected concentrations of chemicals within the site were used in the evaluation of sediment contamination in accordance with EPA guidance (EPA 1997). Although use of the maximum concentration is conservative, it is relevant in the evaluation of potential adverse effects to benthic organisms. If a chemical was not detected at concentrations exceeding the available toxicity value, it was concluded that the chemical is not likely to adversely affect benthic organisms in that area. The 95UCLM sediment concentration was also evaluated as an indicator of site-wide risks.

Aquatic Organisms—Chemical concentrations measured in surface water samples were used to evaluate the potential for adverse effects to aquatic life. Data were compared to literature-based toxicity values for aquatic life. Both the maximum and 95UCLM concentrations of chemicals were used to evaluate the potential for adverse effects to aquatic life from the presence of chemicals in surface water.

4.2.3 Exposure Modeling for Higher Trophic Level Wildlife

Food web modeling was used to derive the dose-based exposure estimates for wildlife. This section presents the methods used to quantify the potential exposure of wildlife to chemicals via the ingestion of food and surface soil. The methods are based on equations presented in EPA (1993) and Sample et al. (1996). The equations and exposure parameters discussed below are consistent with EPA (1997) guidance and standard risk assessment practice.

Chemicals in the exposure media for each receptor were evaluated in the exposure models. Tables 4-1 through 4-5 provide UFs for prey used in the exposure models. Table 4-6 provides a summary of exposure parameters for the avian and mammalian representative receptor species identified for evaluation, and food web models are presented in Appendix A.

It should be noted that, in general, conservative assumptions were used in the food web models. The objective of the models is to provide an upper bound risk estimate. Accordingly, in almost all cases, actual risks are likely to be overestimated by the models. Uncertainties associated with conservative assumptions and other exposure estimation factors are discussed in Section 10.

Two separate EPCs were used in food web dose modeling. The initial measurement endpoint for each bird and mammal receptor consists of a comparison of the maximum case scenario exposure estimate to No Observed Adverse Effect Level (NOAEL) benchmarks. Therefore, the maximum concentration detected in onsite media was used as the EPC in exposure estimation for this endpoint. Use of the maximum is highly conservative and is likely to overestimate risks because it assumes that that wildlife spend 100 percent of their time inhabiting and feeding from the most contaminated sample location at the site.

Therefore, food web modeling for the other wildlife measurement endpoints was based on the 95UCLM concentration in the exposure media. The 95UCLM is a more realistic value for consideration of the site-wide population, because it assumes an average exposure across the site. As discussed above, the 95UCLM concentration of a chemical within a given sample data grouping was calculated as the 95UCLM derived by the EPA statistical software package ProUCL Version 5.1. Where the 95UCLM could not be calculated because of low detection frequencies, the maximum was used instead.

4.2.3.1 Ingestion of Chemicals From Abiotic Media

Wildlife may ingest soil while foraging or grooming. Therefore, food web models account for incidental ingestion of soil or sediment.

The following equation was used to calculate the dose of chemical wildlife would obtain from the ingestion of soil or sediment ($Dose_{soil}$, mg/kg):

$$\boxed{Dose_{soil} = SI * C_{soil}}$$

Where:

$Dose_{soil}$ = Amount of chemical ingested per day from soil or sediment (mg/kg-day)

SI = Soil and sediment ingestion rate (kilogram soil per kilogram body weight per day [kg/kg bw-d])

C_{soil} = Chemical concentration in surface soil or sediment (mg/kg).

Percent soil or sediment ingestion values taken from the scientific literature for the terrestrial wildlife species of concern were multiplied by the food ingestion rates (FI) for these species to estimate soil or sediment ingestion rates. A summary of the percent soil or sediment ingestion rates and FI taken from the scientific literature is presented in Table 4-6.

Exposures to surface water were calculated in a manner similar to those in soil by multiplying the daily drinking water ingestion rate by the concentrations of chemicals in surface water. The following equation was used to calculate the upper bound dose of chemical that terrestrial wildlife could obtain from the ingestion of surface water:

$$\boxed{Dose_{sw} = WI * C_{sw}}$$

Where:

$Dose_{sw}$ = amount of chemical ingested per day from surface water (milligram surface water per kilogram body weight per day [mg/kg bw-d])

WI = surface water ingestion rate (liters per kilogram of body weight per day [L/kg bw-d])

C_{sw} = maximum chemical concentration in surface water (milligram per liter [mg/L]).

4.2.3.2 Ingestion of Chemicals from Food

The following equation was used to calculate the dose of chemicals that a terrestrial wildlife species could obtain from the ingestion of food (Dose $_{food/prey}$, mg/kg bw-d):

$$\boxed{Dose_{food/prey} = FI * C_{food/prey}}$$

Where:

FI = food ingestion rate (kilogram food per kilogram body weight per day [kg/kg bw-d])

$C_{food/prey}$ = estimated maximum concentration of chemical in food (mg/kg).

A summary of the FI used in the SLERA for each of the terrestrial wildlife species selected for evaluation is presented in Table 4-6. The following section discusses the equations used to estimate chemical concentrations within each food group ($C_{plant/invert/prey}$).

Fish and benthic invertebrate tissue sample concentrations were used as available. Where no data was available, food item concentrations were developed using BAFs/Bioconcentration Factors (BCFs). A hierarchy was used to select BAFs and BCFs. In general, values were selected from defensible, compilation- and consensus-based sources or sources which include validation models (i.e., EPA 2005a–h, Sample et al. 1998a, etc.) instead of values from single studies. First preference was given to regression equations derived from paired field- or laboratory-based measurements. Second preference was given to ratio-derived BAFs developed based on paired data of tissue concentrations compared to media concentrations unless validation studies showed these to be preferable to regressions. Examples of regression and ratio BAF development can be found in Sample et al. (1998a). Third preference was given to modeled equilibrium partitioning-derived BAFs based on physical or chemical characteristics. If no values could be identified, a BAF or BCF of 1 was selected.

EPCs in Plants – Plant tissue concentrations were derived from literature-based UFs for this receptor (Table 4-1). Maximum case scenario dry weight plant tissue concentration was calculated by multiplying the dry weight soil (for terrestrial herbivorous receptors) or the dry weight sediment (for aquatic herbivorous receptors) times the UF or, where a regression was used, by entering the dry weight soil concentration into the equation. 95UCLM case scenario tissue concentrations were calculated using the 95UCLM dry weight soil/sediment concentration. Where conversion to wet weight values was required, terrestrial plants were considered to contain 75 percent moisture as a default (USACHPPM 2004).

EPCs in Soil Invertebrates – Soil invertebrate concentrations were derived from literature-based UFs for uptake in earthworms (Table 4-2). Maximum case scenario dry weight worm tissue concentration was calculated by multiplying the dry weight soil times the UF or, where a regression was used, by entering the dry weight soil concentration into the equation. 95UCLM case scenario tissue concentrations were calculated using the 95UCLM dry weight soil concentration. Where conversion to wet weight values was required, soil invertebrates were considered to contain 75 percent moisture as a default (USACHPPM 2004).

EPCs in Small Mammals – Small mammal concentrations were derived from literature-based UFs for uptake in small mammals (Table 4-3). Maximum case scenario dry weight mammal tissue concentration was calculated by multiplying the dry weight soil times the UF or, where a regression was used, by entering the dry weight soil concentration into the equation. 95UCLM case scenario tissue concentrations were calculated using the 95UCLM dry weight soil concentration.

EPCs in Aquatic Prey Items – Fish were selected as representatives of the potential for chemicals to accumulate from surface water into aquatic food items. In the SLERA, fish were used as model prey items to evaluate the potential for adverse effects to piscivorous wildlife, because they are important dietary components for these species.

In the SLERA, literature-based water-to-fish UFs or bioaccumulation equations were used to estimate concentrations of COPCs in fish tissue using the following equation:

$$\boxed{C_{fish} = C_{water} * UF}$$

Where:

C_{water} = maximum concentration of COPC in water (mg/L);

UF = uptake factor for chemicals in fish (unit less).

The maximum concentrations of surface water detected at each site were used as the C_{water} value in the equation. UFs and log K_{ow}s for organic chemicals, and their sources are summarized in Table 4-4. First preference was given to measured UFs like the ones available in EPA water quality criteria documents which are available for inorganic COPCs. For COPCs that have little or no uptake data, RAIS was consulted for available uptake values. For COPCs that did not have data in RAIS, EPI Suite was used to find UF estimates. EPI Suite UF estimation is only available for organic COPCs. In the absence of a literature-based bioaccumulation model or UF for a COPC, an accumulation factor of one was used to estimate chemical concentrations in fish. Use of this default accumulation factor is expected to provide a conservative estimate of accumulation for most chemicals and is expected to overestimate accumulation for non-bioaccumulative compounds.

EPCs in Benthos– Benthic invertebrates were selected as representatives of the potential for chemicals to accumulate from sediment into food items. In the SLERA, benthic invertebrates were used as model prey items to evaluate the potential for adverse effects to aquatic insectivorous birds and aquatic carnivorous mammals, because they are important dietary components for these species.

In the SLERA, for organic analytes, Biota-Sediment Accumulation Factors (BSAFs) were utilized to estimate benthos concentrations using the following equation:

$$\mathbf{BSAF} = \frac{\dfrac{\text{benthos concentration } (\frac{\text{mg}}{\text{kg}} \text{ wet weight})}{\text{lipid fraction of tissue } (\frac{\text{g lipid}}{\text{g tissue}} \text{ wet weight})}}{\dfrac{\text{sediment concentration } (\frac{\text{mg}}{\text{kg}} \text{ dry weight})}{\text{fraction of organic carbon } (\frac{\text{g carbon carbon}}{\text{g sediment}} \text{ dry weight})}}$$

Where:

- Lipid fraction was equal to the default of 3 percent on a wet weight basis
- Fraction of organic carbon was equal to the default of 1 percent on a dry weight basis
- Freshwater BSAFs from the EPA (2009) dataset were utilized as available. Where no BSAF was available, a default of 4 was utilized per guidance (EPA 1998).

The equation above was used with the sediment concentration to estimate the benthos tissue concentration of organic analytes. BSAFs and sources are presented in Table 4-5.

For metals, literature-based sediment-to-benthos UFs (Bechtel Jacobs 1998a) were used to estimate concentrations of COPCs in benthos tissue using the following equation:

$$C_{benthos} = C_{sediment} + UF$$

Where:

$C_{sediment}$ = maximum concentration of COPC in sediment (mg/kg dry weight)

UF = uptake factor for chemicals in benthos (unit less). Where no uptake factor was available, a default of 1 was utilized.

The maximum concentrations of sediment detected at each site were used as the $C_{sediment}$ value in the equation. UFs for metals are from Bechtel Jacobs (1998b). In the absence of a literature-based uptake factor for a metal, an accumulation factor of one was used to estimate chemical concentrations in benthos. Use of this default accumulation factor is expected to provide a conservative estimate of accumulation for most chemicals and is expected to overestimate accumulation for non-bioaccumulative compounds.

4.2.3.3 Total Chemical Ingestion

The total dietary exposure doses ($Dose_{total}$, mg/kg bw-d) to wildlife for the evaluated COPCs were determined using the following equation.

$$\boxed{Dose_{total} = Dose_{food} + Dose_{soil} + Dose_{water}}$$

Where:

$Dose_{food}$ = amount of chemical ingested per day from food (prey) (mg/kg bw-d)

$Dose_{soil}$ = amount of chemical ingested per day from soil or sediment (mg/kg bw-d)

$Dose_{water}$ = amount of chemical ingested per day from water (mg/kg bw-d).

The total dietary intakes are compared to dietary toxicity values to determine if adverse effects are likely to occur to wildlife from the ingestion of COPCs in food, soil sediment, and surface water.

4.3 REFINED TOXICITY ASSESSMENT

This section derives toxicity values for use in evaluating exposure estimates for each representative receptor reference values for evaluation. The TRVs represent concentrations or doses of the chemicals that are protective of the ecological receptors being evaluated. TRVs are compared to EPCs or estimated doses to evaluate each chemical's potential for adverse effects on the receptor in question. The following sections summarize TRVs for each indicator species or community identified for evaluation.

4.3.1 Overview of Bioavailability and Toxicity

The toxicity of chemicals is related to their bioavailability. Organic compounds may form complexes or compounds that bind them to soil and make them chemically inaccessible to ecological receptors. Alternatively, these elements and compounds may be present in forms that are easily dissolved and absorbed, or in forms that tend to bind to biological tissues. It is these forms of easily absorbed chemicals that are most toxic. Most TRVs are based on forms of chemicals that are readily bioavailable.

Metals

For metals, bioavailability is governed largely by formation of metallic compounds, binding to the soil matrix, and speciation. The compounds and bonds formed by metals are determined by reduction and oxidation reactions, by the dominant pH in soil and sediment, and by the presence of organic carbon. Toxicological benchmarks such as those provided in EPA Ecological Soil Screening Levels are developed based on moderately bioavailable forms of metals; these benchmarks may overestimate toxicity for less bioavailable forms, or underestimate toxicity for more bioavailable forms. Acidity increases the bioavailability of many cationic metals, such as barium, chromium, copper, lead, vanadium, and zinc, which may become more soluble at pH below 5. Soil surveys for the area (Natural Resources Conservation Service 2015) indicate that soils tend to be moderately alkaline; therefore, many metals are expected to be less mobile and less bioavailable. Some metals, may also form complexes with iron oxides and hydroxides; this makes these metals less bioavailable and less mobile. The effect of acidity on other metals is complex. Arsenic, for example may form compounds that are less bioavailable under acidic conditions; however, it may also become more bioavailable if arsenic bound to iron hydroxide compounds is released (Bodek et al. 1988).

Reduction and oxidation conditions and pH also determine the speciation of metals. Some metals may exist in different valence states or chemical forms that demonstrate different toxicity and bioavailability. For example, arsenic can be found in nature as III or As V, with higher toxicity and mobility typically exhibited by As III (EPA 2005a).

Organic Compounds

For organic compounds, the primary factors determining persistence, mobility, and fate are: (1) degradation, (2) volatilization, and (3) binding to soil. PAHs may degrade over time, resulting in lower concentrations.

Another factor affecting semi-volatile organic compounds (SVOCs: particularly LMW PAHs) and volatile organic compounds (VOCs) is volatilization. Concentrations of these chemicals may decrease in soil over time due to transfer to and dispersion in the air. Volatilization may be an important factor in eliminating them from soil. Expected contributions of these chemicals to air pathways are insignificant.

Perhaps the most important factor affecting fate of organic compounds in soil is their affinity for binding to fine grained soils and organic matter. Many organic compounds, including PAHs, are hydrophobic and will bind tightly to these soil particles. This decreases the mobility of these compounds, preventing them from dissolving in the water column. However, while the hydrophobicity of these organic compounds may decrease solubility, it may also increase their uptake into the tissues of biota and the potential for bioaccumulation. Hydrophobic compounds may bioaccumulate and biomagnify in fats and lipids within fish, invertebrates, or wildlife (EPA 2000). Soils at the site tend to consist of fine sands with a low percentage of organic matter; therefore, binding to soil is not expected to be a significant factor affecting bioavailability of organics.

4.3.2 Plant TRVs for Exposure to Soil

To assess the potential for chemicals to adversely affect terrestrial and aquatic plants, soil and sediment concentrations were compared to TRVs protective of plants (Table 4-7) (EPA 2005 a–h; EPA 2006; EPA 2007 b–g). TRVs from studies by Efroymson et al. (1997a) were established at a level associated with a 20 percent reduction in growth or other measured toxicological endpoints. This level is consistent with other screening level benchmarks for SLERA and the current regulatory approach. Because few toxicity values have been developed for organic chemicals, surrogate organic chemical TRVs were used for the evaluation of potential adverse effects to plants, as applicable; surrogates are identified in Table 4-7.

4.3.3 Soil Invertebrate TRVs for Exposure to Soil

To assess the potential for inorganic and organic chemicals to adversely affect soil invertebrates, soil concentrations were compared to TRVs protective of soil invertebrates (Table 4-7) (Efroymson et al. 1997b; EPA 2005 a–h; EPA 2007 b–g). TRVs protective of earthworms were used to assess the potential for inorganic and organic chemicals to adversely affect worms (Efroymson et al. 1997b). TRVs from studies by Efroymson et al. (1997b) were established at a level associated with a 20 percent mortality or other measured toxicological endpoint for earthworms. This level is consistent with other screening level benchmarks for SLERA and the current regulatory approach. Because few toxicity values have been developed for organic chemicals, surrogate organic chemical TRVs were used for the evaluation of potential adverse effects to soil invertebrates, as applicable (Table 4-7).

4.3.4 Wildlife TRVs

Chemicals identified as having the potential to adversely affect wildlife species were evaluated using dose-based toxicological benchmarks. Two types of benchmarks were used, each corresponding to a different level of ecological impacts for birds (Table 4-8) and mammals (Table 4-9). First, modeled doses were compared to dose-based NOAELs. NOAELs are doses that have been shown to cause no adverse impacts in test species. The NOAELs used in this ERA were derived from studies by Hill (1979), EPA Ecological Soil Screening Levels (EPA 2005a–h, 2006, 2007b–g, 2008), and by Oak Ridge National Laboratory (Sample et al. 1996). The Oak Ridge National Laboratory NOAELs were generally derived based upon measurements of survival, growth, or reproduction in the laboratory. Values from EPA

Ecological Soil Screening Levels were derived through statistical analyses of results from multiple toxicological studies with multiple endpoints (EPA 2005i). Because NOAELs are conservative and highly protective, they were used as TRVs in this ERA.

The second set of benchmarks utilized was Lowest Observed Adverse Effects Levels (LOAELs). These are the lowest concentrations at which adverse effects are observed on individual test organisms. The severity of effects considered "low level" varies based on the study from which LOAELs are derived; in general, they correspond to minor changes in growth or reproduction. LOAELs are useful because there is considerable uncertainty associated with NOAELs. Because NOAELs are associated with no effects in a test study, it is uncertain whether they are close to or far below the threshold value at which effects would first be observed. LOAELs thus serve to bound the range of NOAELs, and the threshold of toxic effects is considered to lie between the NOAEL and the LOAEL. Therefore, LOAELs were also utilized as TRVs. In some cases, LOAELs were available from studies EPA Ecological Soil Screening Level sources or by Oak Ridge National Laboratory (Sample et al. 1996). The corresponding LOAEL was used from the EPA Ecological Soil Screening Level document when available. When there was no corresponding LOAEL value, the geometric mean of the LOAELs for growth and reproduction was calculated; this approach is similar to that used for derivation of many Ecological Soil Screening Level NOAELs.

In general, chemical exposures and toxicity were evaluated on a chemical-by-chemical basis. However, combined effects were evaluated for PAHs. EPA studies show that the PAHs can be grouped into HMW and LMW groups and concentrations summed for comparison to benchmarks (EPA 2007f). Toxicity evaluation using summed PAH concentrations is performed for invertebrates, birds, and mammals throughout the ERA.

TRVs could not be found for certain chemicals due to a lack of available information in the scientific literature. The uncertainty associated with the lack of TRVs is discussed in Section 10.

4.3.5 Benthic Invertebrate TRVs for Exposure to Sediment

Several sources of toxicity data were used to identify the potential for chemicals in sediment to cause adverse effects to benthic communities (Table 4-10). Wherever possible, Threshold Effects Levels (TELs) and Probable Effects Levels from Long et al. (1995) and MacDonald et al. (1996) were utilized as chronic and acute TRVs, respectively, to determine whether chemicals in the sediments are likely to impact benthic organisms. In the absence of the above TRVs, the following values were used: Assessment and Remediation of Contaminated Sediments *Hyalella* TELs for chronic TRVs, and Lowest Effects Levels from *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario* (Persuad et al. 1993) for acute TRVs.

4.3.6 Aquatic Organism TRVs for Exposure to Surface Water

Freshwater chronic and acute National Ambient Water Quality Criteria (NAWQC) (EPA 2015) were used as TRVs to evaluate the potential for adverse effects to aquatic life from chemicals measured in the surface water samples (Table 4-11). In most cases, NAWQC are consistent with TCEQ screening values (TCEQ 2014b) for surface water, although they may include consideration of site specific hardness. When the NAWQC values were not available, the Tier II value from Suter and Tsao (1996) or values from National Oceanic and Atmospheric Administration Quick Reference Screening Tables (Buchman 2008) were used to assess potential impacts to aquatic species from chemicals in surface water.

4.4 REFINED RISK CALCULATION

To calculate a refined estimate of risks, refined estimates of exposure are compared to receptor-specific TRVs. Risk calculation is performed by dividing EPCs by TRVs. As defined in EPA guidance (EPA 1997), the ratio of a chemical's concentration to its TRV is called an HQ. HQs greater than or equal to 1.0 indicate a potential for unacceptable risk, while HQs less than 1.0 indicate no potential for unacceptable risk. Results of comparisons will be interpreted in light of factors that include the anticipated environmental chemistry of site media and spatial relationships that may affect comparison results and relevance.

4.4.1 Refined Risk Characterization

The purpose of the risk characterization is to draw conclusions regarding the potential for risks to each assessment endpoint/representative receptor. This is done using a qualitative weight of evidence approach in which results for each measurement endpoint are considered as lines of evidence. In general, lines of evidence that provide results based on site-specific data applicable at the population level are given the greatest weight. Per EPA guidance (EPA 1997), the focus of the ERA is to protect the ecological values at the site-wide population or community level except where threatened or endangered species are concerned.

4.4.2 Comparisons to Receptor-Based TRVs

Receptor-specific COPCs for the site were identified through the comparison of receptor-specific exposure estimates to TRVs. As presented in Section 2.5, TRVs were selected from the literature. Consistent with ERA guidance (EPA 1997), the models used to quantify the potential exposure to higher trophic level organisms were designed to estimate an upper bound potential for adverse effects to the selected representative receptor species. Therefore, exceedance of a TRV indicates the potential for adverse effects, but does not indicate that an adverse effect is occurring from the chemical (Tannenbaum et al. 2003).

The refinement of the risk calculation compares exposure estimates of the COPCs identified in the first phase to TRVs for each representative receptor species. For plant and soil invertebrates, the maximum detected chemical concentrations in soil are used as exposure estimates respectively.

LOAELs are a valuable indicator of risk because they provide an upper bound to NOAELs. Exceeding a NOAEL-based TRV does not necessarily indicate a risk, because NOAELs, by definition, correspond to no effects and may not be the highest concentration at which no effects occur. LOAELs provide a clear indication of potential effects and a potential for risk; therefore, comparisons to LOAEL-based TRVs provide an important tool. Comparisons focus on

95UCLM case scenario exposure estimates because they are the most relevant estimates for mobile wildlife populations.

It is important to note that the quality of the TRV can influence the HQ. With metals, for instance, one must consider the bioavailable form of the metal from which the TRV is generated and the bioavailable/toxic form of the metal that is most likely present onsite. Additionally, other literature TRVs are available and may generate different HQs. Uncertainties associated with the selection and use of TRVs are discussed in Section 10.

TRVs are not available for all COPCs and, therefore, there is uncertainty associated with the lack of toxicity information for some COPCs. Chemicals that lacked TRVs or had exposure estimates that equaled or exceeded TRVs were considered a COPC (with the exception of essential nutrients). Those chemicals that had exposure estimates below TRVs (HQs less than 1.0) were removed from further consideration.

4.4.3 Background Data

Background data specific to the project are used as comparison criteria as part of a weight of evidence approach to inform risk management. Ten background surface soil samples (AMB-101-SO through AMB-110-SO) were collected from the Las Palomas Wildlife Management Area, Toramina Unit and Baird Unit (Figure 1-3). The 95UCLMs were calculated for background soil samples using ProUCL (Version 5.1) and compared to the maximum and 95UCLMs (Table 4-12). Comparisons to background are discussed as a factor relevant to risk characterization for receptors that may be exposed to surface soil.

For sediment and surface water, it is difficult to identify background areas that are potentially representative of site conditions but free from the influence of other, unrelated sources. The Rio Grande River was considered as a location to collect background sediment and surface water samples, however based on potential unknown sources of contaminants from upstream (e.g., Mexico) it was eliminated. Adjacent irrigation canals, not connected to the Donna Irrigation District canals, were also considered, however the distance from the site and limited exposure of unlined canals resulted in elimination of this option. Areas upgradient of the primary source of site PCBs (i.e., Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado) were selected as upgradient reference areas for sediment and surface water concentrations.

The RI Report identifies that the siphon is the primary source of site PCBs, the main chemicals driving risks at the site. This ERA evaluates sediment and surface water in exposure areas both downstream of the siphon (Exposure Area 3: LWMCU at the Siphon Exit, Exposure Area 4: LWMCU Downstream of the Siphon, and Exposure Area 5: Lined Canals, Reservoirs, and Soil) and upstream of the siphon (Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado). Upstream areas are outside the direct influence of the siphon (water in the canal only flows south to north) but are subject to the same non-source-related influences (i.e. agricultural land use) as downstream areas. As such, the upstream areas (Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado) provide a useful source of upgradient reference concentrations for comparison to downstream areas to determine source-relatedness of risks.

To characterize upgradient reference concentrations, sediment concentrations and total surface water concentrations from the Exposure Area 1: Upstream of the Siphon and the Exposure Area 2: Arroyo Colorado exposure groupings were combined. Nonparametric Upper Prediction Limits (UPLs) were computed as the nonparametric 95th percentile for both sediment and surface water. Non-parametric statistics were selected based on the sample size. The 95 percent UPL (95UPL) is an appropriate comparison statistic for evaluating individual data points within the sediment and surface water data set. The range of concentrations detected in the upgradient reference areas, as well as the 95UPL, is presented in Table 4-13 for sediment and Table 4-14 for surface water.

Upstream areas (Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado) serve as upgradient reference values for downstream areas. However, there is no background data available for evaluating the upstream areas. Thus background comparisons for Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado could not be performed. Instead, risk management should consider that these areas are beyond the direct influence of the siphon, which is considered the primary source of contamination to the site.

It should also be noted that while Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado were selected as upstream reference areas, these areas may preserve concentrations lower than ambient background concentrations. The Main Canal, where most of the samples in Exposure Area 1: Upstream of the Siphon were collected, is an unlined earthen canal that requires periodic dredging in order for the irrigation district to maintain canal capacity. As such, any chemicals that were historically allowed for agricultural use and no longer used in the U.S. (e.g., DDT) may have been partially removed from this canal segment. The lined canals and reservoirs of Exposure Area 5, are not known to ever have had sediments removed from them. Exposure Area 2: Arroyo Colorado has not known to have had historical dredging, however this area is somewhat removed from direct overspray from agricultural fields because of the distance between the channel of the Arroyo Colorado and agricultural fields (hundreds of feet). The Arroyo Colorado is also subject to flood episodes and reworking of sediments, historical contaminants may be buried under more recently deposited sediment.

4.5 REFINEMENT AND PROBLEM FORMULATION

The results of comparisons performed for the SLERA refinement for the groupings are presented in Sections 5 through 9.

5. RISK CHARACTERIZATION FOR EXPOSURE AREA 1: UPSTREAM OF THE SIPHON

EPCs for COPCs at Exposure Area 1: Upstream of the Siphon are presented in Table 5-1.

5.1 AVIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of birds from impacts of COPCs in sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to birds:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL and LOAEL-based benchmarks protective of birds
- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL and LOAEL-based benchmarks protective of birds.

5.1.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 1: Upstream of the Siphon to NOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 5-2:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (3.31) DDTr (59.1) Bis(2-ethylhexl)phthalate (1.30)	DDTr (17.8)	DDTr (6.41)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of avian NOAEL-based TRVs:

Metals
Beryllium
VOCs
Acetophenone

5.1.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 1: Upstream of the Siphon to LOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 5-2:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (1.66) DDTr (5.91)	DDTr (1.78)	None

5.1.3 Measurement Endpoint 3: Comparison of 95UCLM Case Scenario Modeled Doses from Exposure Area 1: Upstream of the Siphon to LOAEL Benchmarks Protective of Birds

The third measurement endpoint evaluated the comparison of ingested doses for birds based on 95UCLM EPCs to LOAEL-based TRVs. The HQ for each chemical is calculated based on the comparison of the dose from 95UCLM concentrations in sediment, surface water, and food to the LOAEL.

COPCs for Avian Wildlife, see Table 5-3:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (1.43) DDTr (5.91)	DDTr (1.78)	None

5.1.4 Risk Characterization for Avian Wildlife for Exposure Area 1: Upstream of the Siphon

When maximum doses are compared to NOAEL-based TRVs protective of birds, vanadium, DDTr, and bis(2-ethylhexl)phthalate are in exceedance for at least one avian receptor. Each of the chemicals with doses that exceeded the NOAEL will be discussed below.

<u>Vanadium</u>

Vanadium was detected in 11 of 11 sediment samples and 4 of 4 surface water samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL-and LOAEL-based TRVs with HQs of 3.31 and 1.66, respectively. When the 95UCLM dose is compared to the NOAEL-and LOAEL-based TRVs, the HQs fall to 2.87 and 1.43, respectively. Due to the exceedance of the NOAEL and LOAEL-based TRVs, vanadium may pose risks to aquatic insectivorous birds. It is also important to note that vanadium is elevated throughout the site, even in areas that are not associated with a known source of metals contamination. As such, it may be possible that vanadium in sediment is present at background levels.

DDTr

DDTr was detected in 9 of 13 sediment samples. The maximum dose exceeded the NOAEL-based TRVs for aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds with HQs of 59.1, 17.8, and 6.41, respectively. The maximum dose exceeded the LOAEL-based TRV for aquatic insectivorous birds and small piscivorous birds with HQs of 5.91 and 1.78, respectively. Due to the exceedance of the NOAEL- and LOAEL-based TRVs; DDTr may pose risks to aquatic insectivorous birds and small piscivorous birds. It should also be noted that DDT may be relatively ubiquitous given that the site is located in an agricultural area. No background data are available to indicate whether DDT is a site-related compound or present due to past spraying.

Bis(2-ethylhexl)phthalate

Bis(2-ethylhexl)phthalate was detected in 6 of 13 sediment samples. The maximum dose exceeded the NOAEL-based TRV for aquatic insectivorous birds with an HQ of 1.30. The maximum dose falls below the LOAEL-based TRV and the 95UCLM dose falls below the NOAEL-based TRV. Due to the low magnitude of exceedance, and lack of exceedance of the LOAEL-based TRV, bis(2-ethylhexl)phthalate is not expected to pose risks to aquatic insectivorous birds.

5.1.4.1 *Threatened and Endangered Species*

It is possible that the following federally and/or state protected bird species may utilize habitat within Exposure Area 1: Upstream of the Siphon: common black-hawk, white-faced ibis, and wood stork. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the aquatic insectivorous bird surrogate, laughing gull, vanadium and DDTr are in exceedance. This indicates that if the common black-hawk, white-faced ibis, or wood stork is onsite, the species may be adversely affected due to those COPC within Exposure Area 1: Upstream of the Siphon.

It is possible that the interior least tern, a federal and state endangered bird, and the reddish egret, a state threatened species, may utilize habitat within Exposure Area 1: Upstream of the Siphon. When the maximum doses were compared to the NOAEL- based TRV for the small and large piscivorous bird surrogates, belted kingfisher and great blue heron, DDTr is in exceedance. This indicates that if the interior least tern or reddish egret is on site, the species may be adversely affected due to DDTr within Exposure Area 1: Upstream of the Siphon.

5.2 MAMMALIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of mammals from impacts of COPCs in sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to mammals:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals

- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals.

5.2.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 1: Upstream of the Siphon to NOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 5-4:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	Total PCB Congeners (1.50)	None

The following chemical cannot be evaluated in this measurement endpoint due to a lack of mammalian NOAEL-based TRVs:

VOCs
Acetophenone

5.2.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 1: Upstream of the Siphon to LOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified no chemicals as equaling or exceeding mammalian TRVs for each feeding guild:

COPCs for Mammalian Wildlife, see Table 5-4:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	None	None

5.2.3 Risk Characterization for Mammalian Wildlife for Exposure Area 1: Upstream of the Siphon

When maximum doses are compared to NOAEL-based TRVs protective of mammals, total PCB congeners are in exceedance for at least one receptor and are discussed below.

Total PCB Congeners

PCB congeners were detected in 10 of 10 sediment samples and 9 of 9 surface water samples. The maximum dose exceeded the NOAEL-based TRV for aquatic carnivorous mammals with an HQ of 1.50. When the 95UCLM dose or the LOAEL-based TRV is considered, the HQ falls below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV by the maximum dose, lack of exceedance by the 95UCLM dose, and lack of exceedance of the LOAEL-based TRV, PCB congeners are not expected to pose risks to aquatic carnivorous mammals.

5.2.3.1 *Threatened and Endangered Species*

It is possible that Coues' rice rat (*Oryzomys couesi*) a state threatened species may utilize habitat within Exposure Area 1: Upstream of the Siphon. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the aquatic carnivorous mammal surrogate, raccoon, no COPCs are in exceedance. This indicates that if the Coues' rice rat is onsite, the species are not expected to be adversely affected due to chemicals within Exposure Area 1: Upstream of the Siphon.

5.3 AQUATIC PLANTS

The CSM identifies protection of aquatic plant survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic plants (Table 5-6):

- Comparison of the chemical concentrations to benchmarks protective of plants including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). Comparison of the 95UCLM concentrations to benchmarks had the strongest weight of evidence as an indicator of population-wide risks in this ERA.

5.3.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 1: Upstream of the Siphon to TRVs Protective of Plants

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of plants. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentration exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals
Vanadium (9.90)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of plant TRVs:

Pesticides
DDTr
VOCs
Acetophenone

The uncertainty associated with the lack of TRVs is discussed in Section 10.

5.3.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 1: Upstream of the Siphon to TRVs Protective of Plants

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to plant TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

95UCLM Case Scenario

Metals
Vanadium (8.56)

5.3.3 Risk Characterization for Aquatic Plants for Exposure Area 1: Upstream of the Siphon

When maximum sediment concentrations are compared to TRVs protective of plants, vanadium is in exceedance. Further evaluation of vanadium is provided in the following subsection.

Vanadium

Vanadium was detected in 11 of 11 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 9.90 and 8.56, respectively. Due to the exceedance of the plant TRVs; vanadium may pose risks to aquatic plants.

5.4 BENTHIC INVERTEBRATES

The CSM identifies protection of benthic invertebrate survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to benthic invertebrates (Table 5-7):

- Comparison of the chemical concentrations to benchmarks protective of benthic invertebrates including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this refinement of the ERA.

5.4.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 1: Upstream of the Siphon to TRVs Protective of Benthic Organisms

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of benthic invertebrates. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals
Barium (1.28)
Pesticides
DDTr (10.2)
SVOCs
Bis(2-ethylhexl)phthalate (3.35) Phenol (1.34)

The following chemical cannot be evaluated in this measurement endpoint due to a lack of benthic invertebrate TRV:

VOCs
Acetophenone

The uncertainty associated with the lack of TRVs is discussed in Section 10.

5.4.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 1: Upstream of the Siphon to TRVs

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to benthic invertebrate TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

<u>**95UCLM Case Scenario**</u>

Metals
Barium (1.28)
Pesticides
DDTr (10.2)
SVOCs
Bis(2-ethylhexl)phthalate (1.65) Phenol (1.38)

5.4.3 Risk Characterization for Benthic Invertebrates for Exposure Area 1: Upstream of the Siphon

When maximum concentrations are compared to TRVs protective of benthic invertebrates, barium, DDTr, bis(2-ethylhexl)phthalate, and phenol are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

<u>Barium</u>

Barium was detected in 11 of 11 sediment samples. The maximum concentration exceeds the benthic TRV with an HQ of 1.28. Due to the low magnitude of exceedance of the benthic TRV, barium is not expected to pose risk to benthic invertebrates.

DDTr

DDTr was detected in 9 of 13 sediment samples. The maximum concentration exceeds the benthic TRV based on threshold effects with an HQ of 10.2. Due to exceedance of the benthic TRV, DDTr may pose risk to benthic invertebrates.

Bis(2-ethylhexl)phthalate

Bis(2-ethylhexl)phthalate was detected in 6 of 13 sediment samples. The maximum and 95UCLM concentrations exceeded the benthic TRV with HQs of 3.35 and 1.65, respectively. Due to the low magnitude of exceedance, bis(2-ethylhexl)phthalate is not expected to pose risks to benthic invertebrates.

Phenol

Phenol was detected in four of 13 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 1.34. Due to the low magnitude of exceedance, phenol is not expected to pose risks to benthic invertebrates.

5.4.3.1 Comparison to Probable Effects Levels

Comparison of sediment to the TEL is a conservative means to identify any COPC that may have an effect on benthic invertebrates. DDTr remains a COPC after this initial comparison.

A less conservative and more relevant means to identify drivers of risk to benthic invertebrates include comparison to the TEL and probable effects level midpoint (a value often chosen as ecological cleanup goals) and the probable effects level (Table 4-10). The maximum concentration of DDTr falls below both of these values. DDTr is not expected to pose risks to benthic invertebrates.

5.4.3.2 Threatened and Endangered Species

It is possible that the following state listed mollusks may utilize habitat within the Exposure Area 1: Upstream of the Siphon: false spike mussel, salina mucket, and Texas hornshell. When the maximum and 95UCLM concentrations were compared to benthic TRVs, barium, DDTr, bis(2-ethylhexl)phthalate, and phenol were in exceedance. This indicates that if the false spike mussel, salina mucket, or Texas hornshell is onsite, the species may be adversely affected due to these COPCs within Exposure Area 1: Upstream of the Siphon.

5.5 AQUATIC ORGANISMS

The CSM identifies protection of aquatic organism survival, growth, and reproduction from impacts of COPCs in surface water as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic organisms (Table 5-8):

- Comparison of the chemical concentrations to benchmarks protective of aquatic organisms including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this ERA.

5.5.1 Measurement Endpoint 1: Comparison of Maximum Surface Water Concentrations from Exposure Area 1: Upstream of the Siphon to TRVs Protective of Aquatic Organisms

When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals (total)
Barium (35.0)
Metals (dissolved)
Barium (31.3)

5.5.2 Measurement Endpoint 2: Comparison of 95UCLM Surface Water Concentrations from Exposure Area 1: Upstream of the Siphon to TRVs Protective of Aquatic Organisms

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

95UCLM Case Scenario

Metals (total)
Barium (35.0)
Metals (dissolved)
Barium (31.3)

5.5.3 Risk Characterization for Aquatic Organisms for Exposure Area 1: Upstream of the Siphon

When maximum concentrations are compared to TRVs protective of aquatic organisms, barium is in exceedance. Barium is discussed in the following subsection.

<u>Barium</u>

Total and dissolved barium was detected in 4 of 4 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 35.0. When the acute aquatic organism TRV is considered (Table 4-11), the HQs fall to 1.27 and 1.14 for the total and dissolved concentrations, respectively. Due to the low magnitude of exceedance of the acute aquatic organism TRV, barium is not expected to pose risk to aquatic organisms.

5.5.3.1 Threatened and Endangered Species

It is possible that the Rio Grande silvery minnow, a federal and state endangered fish species, and the river goby, a state threatened fish species may utilize habitat within Exposure Area 1: Upstream of the Siphon. When the maximum concentrations were compared to aquatic organism TRVs, barium is in exceedance. This indicates that if the Rio Grande silvery minnow or river goby is onsite, the species may be adversely affected due to these COPCs within Exposure Area 1: Upstream of the Siphon.

5.6 SUMMARY FOR EXPOSURE AREA 1: UPSTREAM OF THE SIPHON

The ERA for Exposure Area 1: Upstream of the Siphon evaluated risks to avian and mammalian wildlife, benthic organisms, and aquatic organisms and plants. Assessment based on food web models found that vanadium and DDTr may pose risks to aquatic insectivorous birds and DDTr may pose risks to small piscivorous birds. No chemicals are expected to pose risk to mammalian receptors. This finding is based on LOAEL exceedances by 95UCLM case scenario doses. Based on comparison to probable effects benchmarks and consideration of frequency of exceedance, there are no chemicals detected in the sediment or surface water that are expected to pose ecological risk to benthic invertebrates or aquatic organisms. Vanadium may pose risks to aquatic plants.

Risks to threatened and endangered species were considered separately based on 95UCLM case scenario exceedance of NOAELs for wildlife, TEL exceedances for benthos, and chronic criteria exceedance for surface water. COPCs within Exposure Area 1: Upstream of the Siphon may pose risk to threatened and endangered species that may be present. The common black-hawk, white-faced ibis, and wood stork may be adversely affected by vanadium and DDTr. The interior least tern or reddish egret may be adversely affected by DDTr. The false spike mussel, salina mucket, and Texas hornshell is onsite, the species may be adversely affected due to barium, DDTr, bis(2-ethylhexl)phthalate, and phenol. The Rio Grande silvery minnow and the river goby may be adversely affected due to barium.

In interpreting results, it is important to note that some of the detected chemicals are lacking a TRV and thus cannot be evaluated. The uncertainty associated with a lack of TRV is discussed in Section 10. Also, while risk assessment models may indicate that vanadium poses risks, metal bioavailability is highly dependent on pH. This is a source of uncertainty and is discussed further in the uncertainty section. It should also be noted that DDT may be relatively ubiquitous given that the site is located in an agricultural area. Finally, it is uncertain whether threatened and endangered species are actually present onsite and utilize it frequent enough that they would experience risks; this is an uncertainty. It is also possible that vanadium in sediment may be present at background levels; background data is lacking for sediment, and this is an uncertainty.

6. RISK CHARACTERIZATION RESULTS FOR EXPOSURE AREA 2: ARROYO COLORADO

EPCs for COPCs at Exposure Area 2: Arroyo Colorado are presented in Table 6-1.

6.1 AVIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of birds from impacts of COPCs in sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to birds:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of birds
- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of birds.

6.1.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 2: Arroyo Colorado to NOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 6-2:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Copper (1.10) Vanadium (4.77) DDTr (14.2)	DDTr (70)	DDTr (25.2)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of avian NOAEL-based TRVs:

Metals
Beryllium
VOCs
Acetophenone

6.1.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 2: Arroyo Colorado to LOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 6-2:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (2.39) DDTr (1.42)	DDTr (7.00)	DDTr (2.52)

6.1.3 Measurement Endpoint 3: Comparison of 95UCLM Case Scenario Modeled Doses from Exposure Area 2: Arroyo Colorado to LOAEL Benchmarks Protective of Birds

The third measurement endpoint evaluated the comparison of ingested doses for birds based on 95UCLM EPCs to LOAEL-based TRVs. The HQ for each chemical is calculated based on the comparison of the dose from 95UCLM concentrations in sediment, surface water, and food to the LOAEL.

COPCs for Avian Wildlife, see Table 6-3:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (1.99) DDTr (1.42)	DDTr (7.00)	DDTr (2.52)

6.1.4 Risk Characterization for Avian Wildlife for Exposure Area 2: Arroyo Colorado

When maximum doses are compared to NOAEL-based TRVs protective of birds, two metals (copper and vanadium) and DDTr are in exceedance for at least one avian receptor. Each of the chemicals with doses that exceeded the NOAEL will be discussed below.

<u>Copper</u>

Copper was detected in 14 of 14 sediment samples and 7 of 7 surface water samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL-based TRV with an HQ of 1.10. When the LOAEL-based TRV and the 95UCLM dose is considered, the HQs drop below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV by the maximum dose, lack of exceedance of the LOAEL-based TRV by the maximum dose, and lack of exceedance by the 95UCLM dose; copper is not expected to pose risks to aquatic insectivorous birds.

Vanadium

Vanadium was detected in 14 of 14 sediment samples and 7 of 7 surface water samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL-and LOAEL-based TRVs with HQs of 4.77 and 2.39, respectively. When the 95UCLM dose is compared to the NOAEL- and LOAEL-based TRVs, the HQs fall to 3.97 and 1.99, respectively. Due to the exceedance of the NOAEL- and LOAEL-based TRVs; vanadium may pose risks to aquatic insectivorous birds.

DDTr

DDTr was detected in 3 of 14 sediment samples. The maximum dose exceeded the NOAEL-based TRVs for aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds with HQs of 14.2, 70.0, and 25.2, respectively. The maximum dose exceeded the LOAEL-based TRV for aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds with HQs of 1.42, 7.00, and 2.52. Due to the exceedance of the NOAEL- and LOAEL-based TRVs; DDTr may pose risks to aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds. It should also be noted that DDT may be relatively ubiquitous given that the site is located in an agricultural area. No background data are available to indicate whether DDT is a site-related compound or present due to past spraying.

6.1.4.1 *Threatened and Endangered Species*

It is possible that the following federally and/or state protected bird species may utilize habitat within Exposure Area 2: Arroyo Colorado: common black-hawk, white-faced ibis, and wood stork. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the aquatic insectivorous bird surrogate, laughing gull, vanadium and DDTr are in exceedance. This indicates that if the common black-hawk, white-faced ibis, or wood stork is onsite, the species may be adversely affected due to those COPCs within Exposure Area 2: Arroyo Colorado.

It is possible that the interior least tern, a federal and state endangered bird, and the reddish egret, a state threatened species, may utilize habitat within Exposure Area 2: Arroyo Colorado. When the maximum doses were compared to the NOAEL- based TRV for the small and large piscivorous bird surrogates, belted kingfisher and great blue heron, DDTr is in exceedance. This indicates that if the interior least tern or reddish egret is onsite, the species may be adversely affected due to DDTr within Exposure Area 2: Arroyo Colorado.

6.2 MAMMALIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of mammals from impacts of COPCs in sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to mammals:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals

- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals.

6.2.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 2: Arroyo Colorado to NOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 6-4:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	Manganese (1.20) Aroclor-1260 (1.09) Total PCB congeners (2.34) Total PCB Aroclors (1.09)	None

The following chemical cannot be evaluated in this measurement endpoint due to a lack of mammalian NOAEL-based TRV:

VOCs
Acetophenone

6.2.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 2: Arroyo Colorado to LOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified no chemicals as equaling or exceeding mammalian TRVs for each feeding guild:

COPCs for Mammalian Wildlife, see Table 6-5:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	None	None

6.2.3 Risk Characterization for Mammalian Wildlife for Exposure Area 2: Arroyo Colorado

When maximum doses are compared to NOAEL-based TRVs protective of mammals, manganese, Aroclor-1260, total PCB congeners, and total PCB Aroclors are in exceedance for at least one receptor. Each of the chemicals with doses that exceeded the NOAEL will be discussed below.

Manganese

Manganese was detected in 14 of 14 sediment samples and 7 of 7 surface water samples. The maximum dose to aquatic carnivorous mammals exceeded the NOAEL-based TRV with an HQ of 1.20. When the 95UCLM dose and LOAEL-based TRVs are considered, the HQ drops below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV, lack of exceedance by the 95UCLM dose, and lack of exceedance of the LOAEL-based TRV; manganese is not expected to pose risks to aquatic carnivorous mammals.

Aroclor-1260/Total PCB Aroclors

Aroclor-1260/Total PCB Aroclors were detected in 5 of 22 sediment samples. The maximum dose to aquatic carnivorous mammals exceeded the NOAEL-based TRV with an HQ of 1.09. When the 95UCLM dose and LOAEL-based TRVs are considered, the HQ drops below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV, lack of exceedance by the 95UCLM dose, and lack of exceedance of the LOAEL-based TRV; Aroclor-1260/Total PCB Aroclors are not expected to pose risks to aquatic carnivorous mammals.

Total PCB Congeners

PCB congeners were detected in 4 of 4 sediment samples and 4 of 4 surface water samples. The maximum dose to aquatic carnivorous mammals exceeded the NOAEL-based TRV with an HQ of 2.34. When the LOAEL-based TRV is considered, the HQ drops below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV; Total PCB congeners are not expected to pose risks to aquatic carnivorous mammals.

6.2.3.1 *Threatened and Endangered Species*

It is possible that Coues' rice rat a state threatened species may utilize habitat within Exposure Area 2: Arroyo Colorado. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the aquatic carnivorous mammal surrogate, raccoon, total PCB congeners are in exceedance. This indicates that if the Coues' rice rat is onsite, the species may be adversely affected due to total PCB congeners within Exposure Area 2: Arroyo Colorado.

6.3 AQUATIC PLANTS

The CSM identifies protection of aquatic plant survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic plants (Table 6-6):

- Comparison of the chemical concentrations to benchmarks protective of plants including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). Comparison of the 95UCLM concentrations to benchmarks had the strongest weight of evidence as an indicator of population-wide risks in this ERA.

6.3.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 2: Arroyo Colorado to TRVs Protective of Plants

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of plants. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

<u>Maximum Case Scenario</u>

Metals
Manganese (5.36) Vanadium (14.3)

The following chemical cannot be evaluated in this measurement endpoint due to a lack of plant TRVs:

Pesticides
DDTr

The uncertainty associated with the lack of TRVs is discussed in Section 10.

6.3.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 2: Arroyo Colorado to TRVs Protective of Plants

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to plant TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

95UCLM Case Scenario

Metals

Manganese (3.10)	Vanadium (11.9)

6.3.3 Risk Characterization for Aquatic Plants for Exposure Area 2: Arroyo Colorado

When maximum sediment concentrations are compared to TRVs protective of plants, two metals (manganese and vanadium) are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

Manganese

Manganese was detected in 14 of 14 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 5.36 and 3.10, respectively. Due to the exceedance of the plant TRV; manganese may pose risks to aquatic plants.

Vanadium

Vanadium was detected in 14 of 14 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 14.3 and 11.9, respectively. Due to the exceedance of the plant TRVs; vanadium may pose risks to aquatic plants.

6.4 BENTHIC INVERTEBRATES

The CSM identifies protection of benthic invertebrate survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to benthic invertebrates (Table 6-7):

- Comparison of the chemical concentrations to benchmarks protective of benthic invertebrates including:
  - — Comparison using maximum EPCs
  - — Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this ERA.

6.4.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 2: Arroyo Colorado to TRVs Protective of Benthic Organisms

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of benthic invertebrates. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

<u>Maximum Case Scenario</u>

Metals
Barium (1.96) Manganese (2.57) Mercury (1.22)
PCBs
Aroclor-1260 (1.12)
Pesticides
DDTr (2.46)

6.4.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 2: Arroyo Colorado to TRVs

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to benthic invertebrate TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

<u>95UCLM Case Scenario</u>

Metals
Barium (1.52) Manganese (1.48)
Pesticides
DDTr (2.46)

6.4.3 Risk Characterization for Benthic Invertebrates for Exposure Area 2: Arroyo Colorado

When maximum concentrations are compared to TRVs protective of benthic invertebrates, barium, manganese, mercury, Aroclor-1260, and DDTr are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

Barium

Barium was detected in 14 of 14 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV with HQs of 1.96 and 1.52, respectively. Due to the low magnitude of exceedance of the benthic TRV, barium is not expected to pose risk to benthic invertebrates.

Manganese

Manganese was detected in 14 of 14 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV with HQs of 2.57 and 1.48, respectively. Due to the low magnitude of exceedance of the benthic TRV, manganese is not expected to pose risk to benthic invertebrates.

Mercury

Mercury was detected in 13 of 14 sediment samples. The maximum concentration exceeds the benthic TRV with an HQ of 1.22. Due to the low magnitude of exceedance of the benthic TRV by the maximum concentration, and lack of exceedance of the TRV by the 95UCLM concentration, mercury is not expected to pose risk to benthic invertebrates.

Aroclor-1260

Aroclor-1260 was detected in 5 of 22 sediment samples. The maximum concentration exceeds the benthic TRV with an HQ of 1.12. Due to the low magnitude of exceedance of the benthic TRV by the maximum concentration, and lack of exceedance of the TRV by the 95UCLM concentration, Aroclor-1260 is not expected to pose risk to benthic invertebrates.

DDTr

DDTr was detected in 3 of 14 sediment samples. The maximum concentration exceeds the benthic TRV based on threshold effects with an HQ of 2.46. Due to exceedance of the benthic TRV, DDTr may pose risks to benthic invertebrates.

6.4.3.1 Comparison to Probable Effects Levels

Comparison of sediment to the TEL is a conservative means to identify any COPC that may have an effect on benthic invertebrates. DDTr remains a COPC after this initial comparison.

A less conservative and more relevant means to identify drivers of risk to benthic invertebrates include comparison to the TEL and probable effects level midpoint (a value often chosen as ecological cleanup goals) and the probable effects level (Table 4-10). The maximum concentration of DDTr falls below both of these values. DDTr is not expected to pose risks to benthic invertebrates.

6.4.3.2 Threatened and Endangered Species

It is possible that the following state listed mollusks may utilize habitat within Exposure Area 2: Arroyo Colorado: false spike mussel, salina mucket, and Texas hornshell. When the maximum and 95UCLM concentrations were compared to benthic TRVs, the following COPCs were in exceedance: barium, manganese, and DDTr. This indicates that if the false spike mussel, salina mucket, or Texas hornshell is onsite, the species may be adversely affected due to these COPCs within Exposure Area 2: Arroyo Colorado.

6.5 AQUATIC ORGANISMS

The CSM identifies protection of aquatic organism survival, growth, and reproduction from impacts of COPCs in surface water as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic organisms (Table 6-8):

- Comparison of the chemical concentrations to benchmarks protective of aquatic organisms including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this ERA.

6.5.1 Measurement Endpoint 1: Comparison of Maximum Surface Water Concentrations from Exposure Area 2: Arroyo Colorado to TRVs Protective of Aquatic Organisms

When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals (total)		
Barium (41.0)	Manganese (2.85)	Selenium (1.12)
Metals (dissolved)		
Barium (38.0)	Manganese (1.15)	Selenium (1.20)

6.5.2 Measurement Endpoint 2: Comparison of 95UCLM Surface Water Concentrations from Exposure Area 2: Arroyo Colorado to TRVs Protective of Aquatic Organisms

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

95UCLM Case Scenario

Metals (total)

Barium (35.1)	Manganese (2.10)	Selenium (1.12)

Metals (dissolved)

Barium (30.0)	Selenium (1.20)

6.5.3 Risk Characterization for Aquatic Organisms for Exposure Area 2: Arroyo Colorado

When maximum concentrations are compared to TRVs protective of aquatic organisms, three metals (barium, manganese, and selenium) are in exceedance. The COPCs are discussed in the following subsections.

Barium

Total and dissolved barium was detected in 7 of 7 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 41.0. When the acute aquatic organism TRV is considered (Table 4-11), the HQs fall to 1.49 and 1.38 for the total and dissolved concentrations. Due to the low magnitude of exceedance of the acute aquatic organism TRV, barium is not expected to pose risk to aquatic organisms.

Manganese

Total and dissolved manganese was detected in 7 of 7 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 2.85. When the acute aquatic organism TRV (Table 4-11) is compared to the maximum total and dissolved concentrations, the HQs fall below 1. Due to the low magnitude of exceedance of the chronic aquatic organism TRV and lack of exceedance of the acute aquatic organism TRV, manganese is not expected to pose risk to aquatic organisms.

Selenium

Total and dissolved selenium was detected in 7 of 7 and 2 of 7 surface water samples, respectively. The maximum total and dissolved concentrations exceeded the chronic aquatic organism TRV with HQs of 1.12 and 1.20, respectively. Due to the low magnitude of exceedance of the chronic aquatic organism TRV, selenium is not expected to pose risk to aquatic organisms.

6.5.3.1 Threatened and Endangered Species

It is possible that the Rio Grande silvery minnow, a federal and state endangered fish species, and the river goby, a state threatened fish species may utilize habitat within Exposure Area 2: Arroyo Colorado. When the maximum concentrations were compared to aquatic organism TRVs, barium, manganese and selenium are in exceedance. This indicates that if the Rio Grande silvery minnow or river goby is onsite, the species may be adversely affected due to these COPCs within Exposure Area 2: Arroyo Colorado.

6.6 SUMMARY FOR EXPOSURE AREA 2: ARROYO COLORADO

ERA for Exposure Area 2: Arroyo Colorado evaluated risks to avian and mammalian wildlife, benthic organisms, and aquatic organisms. Assessment based on food web models found that vanadium and DDTr may pose risks to aquatic insectivorous birds and DDTr may pose risks to small and large piscivorous birds. No chemicals are expected to pose risk to mammalian receptors. This finding is based on LOAEL exceedances by 95UCLM case scenario doses. Based on comparison to probable effects benchmarks and consideration of frequency of exceedance, there are no chemicals detected in the sediment or surface water that are expected to pose ecological risk to benthic invertebrates or aquatic organisms. Manganese and vanadium may pose risks to aquatic plants.

Risks to threatened and endangered species were considered separately based on 95UCLM case scenario exceedance of NOAELs for wildlife, TEL exceedances for benthos, and chronic criteria exceedance for surface water. COPCs within Exposure Area 2: Arroyo Colorado may pose risk to threatened and endangered species that may be present. The common black-hawk, white-faced ibis, and wood stork may be adversely affected by vanadium and DDTr. The interior least tern or reddish egret may be adversely affected by DDTr. That Coues' rice rat may be adversely affected by total PCB congeners. If the false spike mussel, salina mucket, and Texas hornshell are onsite, the species may be adversely affected due to barium, manganese, and DDTr. The Rio Grande silvery minnow and the river goby may be adversely affected due to barium, manganese, and selenium.

Some of the detected chemicals are lacking a TRV and thus cannot be evaluated. The uncertainty associated with a lack of TRV is discussed in Section 10. Risk management should consider the fact that DDTr may be present due to regionally ubiquitous sources. It should also consider that vanadium in sediment may be present at background levels; background data for sediment are lacking and this is an uncertainty.

7. RISK CHARACTERIZATION RESULTS FOR EXPOSURE AREA 3: LWMCU AT THE SIPHON EXIT

EPCs for COPCs at Exposure Area 3: LWMCU at the Siphon Exit are presented in Table 7-1.

7.1 AVIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of birds from impacts of COPCs in sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to birds:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of birds

- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of birds.

7.1.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 3: LWMCU at the Siphon Exit to NOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 7-2:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (3.63) Aroclor-1260 (1.98) Total PCB Congeners (1.06) DDTr (85.4) Bis(2-ethylhexl)phthalate (1.43) Di-n-butyl phthalate (4.27)	Vanadium (2.49) Aroclor-1254 (3.21) Total PCB Congeners (14.3) Total PCB Aroclors (3.21) DDTr (34.4) Endrin (3.95)	Aroclor-1254 (1.16) Total PCB Congeners (5.13) DDTr (12.4) Endrin (1.42)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of avian NOAEL-based TRVs:

Metals
Beryllium
Pesticides
Endrin aldehyde Heptachlor epoxide
SVOCs
Carbazole
VOCs
Acetophenone

7.1.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 3: LWMCU at the Siphon Exit to LOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 7-2:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (1.82)	Vanadium (1.24)	DDTr (1.24)
	DDTr (8.54)	Total PCB Congeners (1.43)	
		DDTr (3.44)	

7.1.3 Measurement Endpoint 3: Comparison of 95UCLM Case Scenario Modeled Doses from Exposure Area 3: LWMCU at the Siphon Exit to LOAEL Benchmarks Protective of Birds

The third measurement endpoint evaluated the comparison of ingested doses for birds based on 95UCLM EPCs to LOAEL-based TRVs. The HQ for each chemical is calculated based on the comparison of the dose from 95UCLM concentrations in sediment, surface water, and food to the LOAEL.

COPCs for Avian Wildlife, see Table 7-3:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (1.51) DDTr (4.40)	Vanadium (1.23) Total PCB Congeners (1.42) DDTr (3.43)	DDTr (1.24)

7.1.4 Risk Characterization for Avian Wildlife for Exposure Area 3: LWMCU at the Siphon Exit

When maximum doses are compared to NOAEL-based TRVs protective of birds, vanadium, Aroclor-1254, Aroclor-1260, total PCB congeners, total PCB Aroclors, DDTr, endrin, bis(2-ethylhexl)phthalate, and di-n-butyl phthalate are in exceedance for at least one avian receptor. Each of the chemicals with doses that exceeded the NOAEL will be discussed below.

Vanadium

Vanadium was detected in 11 of 11 sediment samples and 3 of 3 surface water samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL-and LOAEL-based TRVs with HQs of 3.63 and 1.82, respectively. When the 95UCLM dose is compared to the NOAEL- and LOAEL-based TRVs, the HQs fall to 3.02 and 1.51, respectively. The maximum dose to small piscivorous birds exceeded the NOAEL-and LOAEL-based TRVs with HQs of 2.49 and 1.24, respectively. When the 95UCLM dose is compared to the NOAEL- and LOAEL-based TRVs, the HQs fall to 2.46 and 1.23, respectively. Due to the exceedance of the NOAEL- and LOAEL-based TRVs; vanadium may pose risks to aquatic insectivorous birds and small piscivorous birds.

Aroclor-1254

Aroclor-1254 was detected in 56 of 70 sediment samples and 1 of 20 surface water samples. The maximum doses to small and large piscivorous birds exceeded the NOAEL-based TRV with HQs of 3.21 and 1.16, respectively. When the maximum doses are compared to the LOAEL-based TRV, the HQs fall below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack exceedance of the LOAEL-based TRV by the maximum doses, Aroclor-1254 is not expected to pose risks to small or large piscivorous birds.

Aroclor-1260

Aroclor-1260 was detected in 10 of 70 sediment samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL-based TRV with an HQ of 1.98. When the maximum dose is compared to the LOAEL-based TRV, the HQ falls below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack exceedance of the LOAEL-based TRV by the maximum concentration, Aroclor-1260 is not expected to pose risks to aquatic insectivorous birds.

Total PCB Congeners

PCB congeners were detected in 17 of 17 sediment samples and 19 of 19 surface water samples. The maximum dose to aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds exceeded the NOAEL-based TRV with HQs of 1.06, 14.3, and 5.13, respectively. When the maximum doses are compared to the LOAEL-based TRV, the HQs for aquatic insectivorous birds and large piscivorous birds fall below 1 and the HQ for small piscivorous birds falls to 1.43. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack exceedance of the LOAEL-based TRV by the maximum doses, total PCB congeners is not expected to pose risks to aquatic insectivorous or large piscivorous birds. Due to exceedance of the NOAEL- and LOAEL-based TRVs, total PCB congeners may pose risk to small piscivorous birds.

DDTr

DDTr was detected in 11 of 11 sediment samples. The maximum dose exceeded the NOAEL-based TRVs for aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds with HQs of 85.4, 34.4, and 12.4, respectively. The maximum dose exceeded the LOAEL-based TRV for the receptors with HQs of 8.54, 3.44, and 1.24. Due to the exceedance of the NOAEL- and LOAEL-based TRVs; DDTr may pose risks to aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds.

Endrin

Endrin was detected in 6 of 11 sediment samples. The maximum dose exceeded the NOAEL-based TRVs for small piscivorous birds and large piscivorous birds with HQs of 3.95 and 1.42, respectively. When the maximum doses are compared to the LOAEL-based TRV, the HQs fall below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack exceedance of the LOAEL-based TRV by the maximum doses, endrin is not expected to pose risks to small or large piscivorous birds.

Bis(2-ethylhexl)phthalate

Bis(2-ethylhexl)phthalate was detected in 2 of 11 sediment samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL-based TRV with an HQ of 1.43. However, modeled doses of bis(2-ethylhexl)phthalate do not exceed LOAELs, and thus are unlikely to pose risks to aquatic insectivorous birds.

Di-n-butyl phthalate

Di-n-butyl phthalate was detected in 1 of 11 sediment samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL-based TRV with an HQ of 4.27. When the maximum dose is compared to the LOAEL-based TRV, the HQ falls below 1. Due to the low frequency of detection and low magnitude of exceedance of the NOAEL-based TRV and lack exceedance of the LOAEL-based TRV by the maximum concentration, di-n-butyl phthalate is not expected to pose risks to aquatic insectivorous birds.

7.1.4.1 *Threatened and Endangered Species*

It is possible that the following federally and/or state protected bird species may utilize habitat within Exposure Area 3: LWMCU at the Siphon Exit: common black-hawk, white-faced ibis, and wood stork. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the aquatic insectivorous bird surrogate, laughing gull, vanadium, DDTr, bis(2-ethylhexl)phthalate, and di-n-butyl phthalate are in exceedance. This indicates that if the common black-hawk, white-faced ibis, or wood stork is onsite, the species may be adversely affected due to those COPC within Exposure Area 3: LWMCU at the Siphon Exit.

It is possible that interior least tern a federal and state endangered bird may utilize habitat within Exposure Area 3: LWMCU at the Siphon Exit. When the maximum and 95UCLM doses were compared to the NOAEL- based TRV for the small piscivorous bird surrogate, belted kingfisher, vanadium, Aroclor-1254, total PCB congeners, total PCB Aroclors, DDTr, and endrin are in exceedance. This indicates that if the interior least tern is onsite, the species may be adversely affected due to those COPC within Exposure Area 3: LWMCU at the Siphon Exit.

It is possible that the reddish egret a state threatened species may utilize habitat within Exposure Area 3: LWMCU at the Siphon Exit. When the maximum and 95UCLM doses were compared to the NOAEL- based TRV for the large piscivorous bird surrogate, great blue heron, total PCB congeners, DDTr, and endrin are in exceedance. This indicates that if the reddish egret is onsite, the species may be adversely affected due to those COPC within Exposure Area 3: LWMCU at the Siphon Exit.

7.2 MAMMALIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of mammals from impacts of COPCs in sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to mammals:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals

- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals.

7.2.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 3: LWMCU at the Siphon Exit to NOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 7-4:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
Total PCB Aroclors (1.33)	Aroclor-1242 (4.80) Aroclor-1254 (1.27) Aroclor-1260 (35.1) Total PCB Congeners (16.2) Total PCB Aroclors (8.61) Dieldrin (1.13)	Aroclor-1254 (3.26) Total PCB Congeners (98.5) Total PCB Aroclors (22.2)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of mammalian NOAEL-based TRVs:

Pesticides
Endrin aldehyde
Heptachlor epoxide
SVOCs
Carbazole
VOCs
Acetophenone

7.2.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 3: LWMCU at the Siphon Exit to LOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 7-4:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	Aroclor-1260 (3.51) Total PCB Congeners (1.62)	Total PCB Congeners (9.85) Total PCB Aroclors (2.22)

7.2.3 Measurement Endpoint 3: Comparison of 95UCLM Case Scenario Modeled Doses from Exposure Area 3: LWMCU at the Siphon Exit to LOAEL Benchmarks Protective of Mammals

The third measurement endpoint evaluated the comparison of ingested doses for mammals based on 95UCLM EPCs to LOAEL-based TRVs. The HQ for each chemical is calculated based on the comparison of the dose from 95UCLM concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 7-5:

Aquatic Herbivorous Mammals	**Aquatic Carnivorous Mammals**	**Piscivorous Mammals**
None	None	Total PCB Congeners (9.82) Total PCB Aroclors (1.35)

7.2.4 Risk Characterization for Mammalian Wildlife for Exposure Area 3: LWMCU at the Siphon Exit

When maximum doses are compared to NOAEL-based TRVs protective of mammals, Aroclor-1242, Aroclor-1254, Aroclor-1260, total PCB congeners, total PCB Aroclors, and dieldrin are in exceedance for at least one receptor. Each of the chemicals with doses that exceeded the NOAEL will be discussed below.

<u>Aroclor-1242</u>

Aroclor-1242 was detected in 1 of 70 sediment samples. The maximum dose to aquatic carnivorous mammals exceeded the NOAEL-based TRVs with an HQ of 4.80 but fell below the LOAEL-based TRV. Due to the lack of exceedance of the LOAEL-based TRV; Aroclor-1242 is not expected to pose risks to aquatic carnivorous mammals.

<u>Aroclor-1254</u>

Aroclor-1254 was detected in 56 of 70 sediment samples and 1 of 20 surface water samples. The maximum doses to aquatic carnivorous mammals and piscivorous mammals exceeded the NOAEL with HQs of 1.27 and 3.26, respectively. When the LOAEL-based TRV is considered, the HQs fall below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV; Aroclor-1254 is not expected to pose risks to aquatic carnivorous mammals or piscivorous mammals.

Aroclor-1260

Aroclor-1260 was detected in 10 of 70 sediment samples. The maximum dose to aquatic carnivorous mammals exceeded the NOAEL and LOAEL-based TRVs with HQs of 35.1 and 3.51, respectively. When the 95UCLM doses are considered, the HQs falls to 2.28 and below 1, respectively. Due to the low magnitude of exceedance of maximum dose compared to the LOAEL-based TRV, the low magnitude of exceedance of the 95UCLM dose compared to the NOAEL-based TRV, and lack of exceedance of the 95UCLM dose compared to the LOAEL-based TRV; Aroclor-1260 is not expected to pose risks to aquatic carnivorous mammals.

Total PCB Congeners

PCB congeners were detected in 17 of 17 sediment samples and 19 of 19 surface water samples. The maximum dose to aquatic carnivorous mammals and piscivorous mammals exceeded the NOAEL-based TRV with HQs of 16.2 and 98.5, respectively. When the maximum doses are compared to the LOAEL-based TRV, the HQs fall to 1.62 and 9.85. When the 95UCLM dose is considered, the HQ for aquatic carnivorous mammals falls below 1 and the HQ for piscivorous mammals drops slightly but does not fall below 1. Due to the low magnitude of exceedance of the LOAEL-based TRV by the maximum dose and lack of exceedance of the LOAEL-based TRV by the 95UCLM dose, total PCB congeners are not expected to pose risk to aquatic carnivorous mammals. As the maximum and 95UCLM doses exceed NOAEL- and LOAEL-based TRVs for piscivorous mammals, total PCB congeners may pose risks to piscivorous mammals.

Total PCB Aroclors

PCB Aroclors were detected in 58 of 58 sediment samples and 1 of 1 surface water samples. The maximum dose to aquatic herbivorous mammals, aquatic carnivorous mammals, and piscivorous mammals exceeded the NOAEL-based TRV with HQs of 1.33, 8.61, and 22.2, respectively. When the maximum dose is compared to the LOAEL-based TRV, the HQs for aquatic herbivorous mammals and aquatic carnivorous mammals fall below 1 and the HQ for piscivorous mammals falls to 2.22. When the 95UCLM dose is compared to the LOAEL-based TRV, the HQ for piscivorous mammals falls to 1.35. Due to the lack of exceedance of the LOAEL-based TRV by the maximum doses, total PCB Aroclors are not expected to pose risk to aquatic herbivorous or aquatic carnivorous mammals. As the maximum and 95UCLM doses exceed the NOAEL- and LOAEL-based TRVs for piscivorous mammals, total PCB Aroclors may pose risks to piscivorous mammals.

Dieldrin

Dieldrin was detected in 6 of 11 sediment samples. The maximum dose exceeded the NOAEL-based TRVs for aquatic carnivorous mammals with an HQ 1.13. The maximum dose falls below the LOAEL-based TRV for aquatic carnivorous mammals. The 95UCLM dose falls below the NOAEL-based TRV. Due to the low magnitude of exceedance of the NOAEL-based

TRV by the maximum dose and lack of exceedance of the LOAEL-based TRV; dieldrin is not expected to pose risks to aquatic carnivorous mammals.

7.2.4.1 *Threatened and Endangered Species*

It is possible that Coues' rice rat a state threatened species may utilize habitat within Exposure Area 3: LWMCU at the Siphon Exit. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the aquatic carnivorous mammal surrogate, raccoon, Aroclor-1242, Aroclor-1260, total PCB congeners, and total PCB Aroclors are in exceedance. This indicates that if the Coues' rice rat is onsite, the species may be adversely affected due to these COPC within Exposure Area 3: LWMCU at the Siphon Exit.

7.3 AQUATIC PLANTS

The CSM identifies protection of aquatic plant survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic plants (Table 7-6):

- Comparison of the chemical concentrations to benchmarks protective of plants including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). Comparison of the 95UCLM concentrations to benchmarks had the strongest weight of evidence as an indicator of population-wide risks in this ERA.

7.3.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 3: LWMCU at the Siphon Exit to TRVs Protective of Plants

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of plants. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

<u>Maximum Case Scenario</u>

Metals

Manganese (3.16)	Vanadium (10.9)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of plant TRVs:

Pesticides

DDTr	Dieldrin	Endosulfan I
Endosulfan II	Endrin	Endrin aldehyde
Gamma-Chlordane	Heptachlor epoxide	

SVOCs

Carbazole

VOCs

Acetophenone

The uncertainty associated with the lack of TRVs is discussed in Section 10.

7.3.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 3: LWMCU at the Siphon Exit to TRVs Protective of Plants

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to plant TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

<u>95UCLM Case Scenario</u>

Metals

Manganese (1.97) Vanadium (9.01)

7.3.3 Risk Characterization for Aquatic Plants for Exposure Area 3: LWMCU at the Siphon Exit

When maximum sediment concentrations are compared to TRVs protective of plants, two metals (manganese and vanadium) are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

<u>Manganese</u>

Manganese was detected in 11 of 11 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 3.16 and 1.97, respectively. Due to the low magnitude of exceedance of the plant TRV; manganese is not expected to pose risks to aquatic plants.

Vanadium

Vanadium was detected in 11 of 11 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 10.9 and 9.01, respectively. Due to the exceedance of the plant TRVs, vanadium may pose risks to aquatic plants.

7.4 BENTHIC INVERTEBRATES

The CSM identifies protection of benthic invertebrate survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to benthic invertebrates (Table 7-7):

- Comparison of the chemical concentrations to benchmarks protective of benthic invertebrates including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this ERA.

7.4.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 3: LWMCU at the Siphon Exit to TRVs Protective of Benthic Organisms

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of benthic invertebrates. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals
Barium (2.09) Manganese (1.51)
PCBs
Aroclor-1242 (34.0) Aroclor-1254 (183) Aroclor-1260 (36.0)
Total PCB Congeners (102) Total PCB Aroclors (184)
Pesticides
DDTr (14.8) Dieldrin (10.0) Endosulfan I (210)
Endosulfan II (610) Endrin (3.87) Gamma-Chlordane (5.56)
Heptachlor epoxide (3.48)
PAHs
Total HMW PAHs (1.70)

SVOCs
Bis(2-ethylhexl)phthalate (3.68) Phenol (1.66)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of benthic invertebrate TRVs:

Pesticides
Endrin aldehyde
SVOCs
Carbazole
VOCs
Acetophenone

The uncertainty associated with the lack of TRVs is discussed in Section 10.

7.4.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 3: LWMCU at the Siphon Exit to TRVs Protective of Benthic Organisms

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to benthic invertebrate TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

95UCLM Case Scenario

Metals
Barium (1.43)
PCBs
Aroclor-1242 (34.0) Aroclor-1254 (22.9) Aroclor-1260 (2.34)
Total PCB Congeners (45.3) Total PCB Aroclors (17.5)
Pesticides
DDTr (7.61) Dieldrin (4.16) Endosulfan I (210)
Endosulfan II (302) Endrin (2.34) Gamma-Chlordane (3.52)
Heptachlor epoxide (1.72)
PAHs
Total HMW PAHs (1.70)
SVOCs
Bis(2-ethylhexl)phthalate (3.68) Phenol (1.66)

7.4.3 Risk Characterization for Benthic Invertebrates for Exposure Area 3: LWMCU at the Siphon Exit

When maximum concentrations are compared to TRVs protective of benthic invertebrates, barium, manganese, Aroclor-1242, Aroclor-1254, Aroclor-1260, total PCB congeners, total PCB Aroclors, DDTr, dieldrin, endosulfan I, endosulfan II, endrin, gamma-Chlordane, heptachlor epoxide, total HMW PAHs, bis(2-ethylhexl)phthalate, and phenol are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

Barium

Barium was detected in 11 of 11 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV with HQs of 2.09 and 1.43. Due to the low magnitude of exceedance of the benthic TRV, barium is not expected to pose risk to benthic invertebrates.

Manganese

Manganese was detected in 11 of 11 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 1.51. When the 95UCLM concentration is considered, the HQ falls below 1. Due to the low magnitude of exceedance of the benthic TRV, manganese is not expected to pose risks to benthic invertebrates.

Aroclor-1242

Aroclor-1242 was detected in 1 of 70 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 34.0. As the concentration detected exceeds the benthic TRV, Aroclor-1242 may pose risk to benthic invertebrates.

Aroclor-1254

Aroclor-1254 was detected in 56 of 70 sediment samples. The maximum and 95UCLM concentrations exceeded the benthic TRV with HQs of 183 and 22.9, respectively. As the maximum and 95UCLM concentrations detected exceed the benthic TRV, Aroclor-1254 may pose risk to benthic invertebrates.

Aroclor-1260

Aroclor-1260 was detected in 10 of 70 sediment samples. The maximum and 95UCLM concentrations exceeded the benthic TRV with HQs of 36.0 and 2.34, respectively. As the maximum and 95UCLM concentrations detected exceed the benthic TRV, Aroclor-1260 may pose risk to benthic invertebrates.

Total PCB Congeners

PCB congeners were detected in 17 of 17 sediment samples. The maximum and 95UCLM concentrations exceeded the benthic TRV with HQs of 102 and 45.3, respectively. As the maximum and 95UCLM concentrations detected exceed the benthic TRV, total PCB congeners may pose risk to benthic invertebrates.

Total PCB Aroclors

PCB Aroclors were detected in 58 of 58 sediment samples. The maximum and 95UCLM concentrations exceeded the benthic TRV with HQs of 184 and 17.5, respectively. As the maximum and 95UCLM concentrations detected exceed the benthic TRV, total PCB congeners may pose risk to benthic invertebrates.

DDTr

DDTr was detected in 11 of 11 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV based on threshold effects with an HQ of 14.8 and 7.61, respectively. Due to exceedance of the benthic TRV, DDTr may pose risk to benthic invertebrates.

Dieldrin

Dieldrin was detected in 6 of 11 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV based on threshold effects with an HQ of 10.0 and 4.16, respectively. Due to exceedance of the benthic TRV, dieldrin may pose risk to benthic invertebrates.

Endosulfan I

Endosulfan I was detected in 3 of 11 sediment samples. The maximum concentration exceeds the benthic TRV based on threshold effects with an HQ of 210. Due to exceedance of the benthic TRV, endosulfan I may pose risk to benthic invertebrates.

Endosulfan II

Endosulfan II was detected in 6 of 11 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV based on threshold effects with an HQ of 610 and 302, respectively. Due to exceedance of the benthic TRV, endosulfan II may pose risk to benthic invertebrates.

Endrin

Endrin was detected in 6 of 11 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV based on threshold effects with an HQ of 3.87 and 2.34, respectively. Due to exceedance of the benthic TRV, endrin may pose risk to benthic invertebrates.

Gamma-Chlordane

Gamma-Chlordane was detected in 11 of 11 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV based on threshold effects with an HQ of 5.56 and 3.52, respectively. Due to exceedance of the benthic TRV, gamma-Chlordane may pose risk to benthic invertebrates.

Heptachlor epoxide

Heptachlor epoxide was detected in 11 of 11 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV based on threshold effects with an HQ of 3.48 and 1.72, respectively. Due to exceedance of the benthic TRV, heptachlor epoxide may pose risk to benthic invertebrates.

Total HMW PAHs

Total HMW PAHs were detected in 3 of 11 sediment samples. The maximum concentration exceeds the benthic TRV based on threshold effects with an HQ of 1.70. Due to exceedance of the benthic TRV, HMW PAHs may pose risk to benthic invertebrates.

Bis(2-ethylhexl)phthalate

Bis(2-ethylhexl)phthalate was detected in 2 of 11 sediment samples. The maximum concentration exceeds the benthic TRV with an HQ of 3.68. Due to exceedance of the benthic TRV, bis(2-ethylhexl)phthalate may pose risk to benthic invertebrates.

Phenol

Phenol was detected in 3 of 11 sediment samples. The maximum concentration exceeds the benthic TRV with an HQ of 3.68. Due to exceedance of the benthic TRV, phenol may pose risk to benthic invertebrates.

7.4.3.1 Comparison to Probable Effects Levels

Comparison of sediment to the TEL is a conservative means to identify any COPC that may have an effect on benthic invertebrates. The following analytes remain COPCs after this initial comparison: Aroclor-1242, Aroclor-1254, Aroclor-1260, total PCB congeners, total PCB Aroclors, DDTr, dieldrin, endosulfan I, endosulfan II, endrin, gamma-Chlordane, heptachlor epoxide, total HMW PAHs, bis(2-ethylhexl)phthalate, and phenol.

A less conservative and more relevant means to identify drivers of risk to benthic invertebrates include comparison to the TEL and probable effects level midpoint (a value often chosen as ecological cleanup goals) and the probable effects level (Table 4-10).

COPCs with 95UCLM concentrations that exceed the threshold effects and probable effects midpoint:

- Aroclor-1242
- Aroclor-1254
- total PCB congeners
- total PCB Aroclors
- gamma-Chlordane.

COPCs with 95UCLM concentrations that exceed the probable effects level:

- Aroclor-1254
- total PCB congeners
- total PCB Aroclors.

COPCs not expected to be risk drivers to benthic invertebrates:

- Aroclor-1242
- Aroclor-1260
- DDTr
- Dieldrin
- endosulfan I
- endosulfan II
- endrin
- gamma-Chlordane
- heptachlor epoxide
- total HMW PAHs
- bis(2-ethylhexl)phthalate
- phenol.

As the following COPC maximum and 95UCLM concentrations exceed both the midpoint between the TEL and the probable effects level, they remain as COPCs for benthic invertebrates: Aroclor-1254, total PCB congeners, total PCB Aroclors.

7.4.3.2 Threatened and Endangered Species

It is possible that the following state listed mollusks may utilize habitat within Exposure Area 3: LWMCU at the Siphon Exit: false spike mussel, salina mucket, and Texas hornshell. When the maximum and 95UCLM concentrations were compared to benthic TRVs, barium, Aroclor-1242, Aroclor-1254, Aroclor-1260, total PCB congeners, total PCB Aroclors, DDTr, dieldrin, endosulfan I, endosulfan II, endrin, gamma-Chlordane, heptachlor epoxide, total HMW PAHs, bis(2-ethylhexl)phthalate, and phenol are in exceedance. This indicates that if the false spike mussel, salina mucket, or Texas hornshell is onsite, the species may be adversely affected due to these COPCs within Exposure Area 3: LWMCU at the Siphon Exit.

7.5 AQUATIC ORGANISMS

The CSM identifies protection of aquatic organism survival, growth, and reproduction from impacts of COPCs in surface water as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic organisms (Table 7-8):

- Comparison of the chemical concentrations to benchmarks protective of aquatic organisms including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this ERA.

7.5.1 Measurement Endpoint 1: Comparison of Maximum Surface Water Concentrations from Exposure Area 3: LWMCU at the Siphon Exit to TRVs Protective of Aquatic Organisms

When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals (total)
Barium (38.0) Manganese (1.05)
Metals (dissolved)
Barium (31.0)
PCBs
Total PCB Congeners (1.86) Total PCB Aroclors (1.07)

7.5.2 Measurement Endpoint 2: Comparison of 95UCLM Surface Water Concentrations from Exposure Area 3: LWMCU at the Siphon Exit to TRVs Protective of Aquatic Organisms

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

95UCLM Case Scenario

Metals (total)
Barium (38.0) Manganese (1.05)

Metals (dissolved)
Barium (31.0)
PCBs
Total PCB Aroclors (1.07)

7.5.3 Risk Characterization for Aquatic Organisms for Exposure Area 3: LWMCU at the Siphon Exit

When maximum concentrations are compared to TRVs protective of aquatic organisms, two metals (barium and manganese), total PCB congeners, and total PCB Aroclors are in exceedance. The COPCs are discussed in the following subsections.

Barium

Total and dissolved barium was detected in 3 of 3 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 38.0. When the acute aquatic organism TRV is considered (Table 4-11), the HQ falls to 1.38. Due to the low magnitude of exceedance of the acute aquatic organism TRV, barium is not expected to pose risk to aquatic organisms.

Manganese

Total and dissolved manganese was detected in 3 of 3 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 1.05. When the acute aquatic organism TRV is considered (Table 4-11), the HQ falls below 1. Due to the low magnitude of exceedance of the chronic aquatic organism TRV and lack of exceedance of the acute aquatic organism TRV, manganese is not expected to pose risk to aquatic organisms.

Total PCB Congeners

PCB congeners were detected in 19 of 19 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 1.86. When the acute aquatic organism TRV is considered (Table 4-11), the HQ falls below 1. Due to the low magnitude of exceedance of the chronic aquatic organism TRV and lack of exceedance of the acute aquatic organism TRV, total PCB congeners is not expected to pose risk to aquatic organisms.

Total PCB Aroclors

PCB Aroclors were detected in 1 of 1 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 1.07. When the acute aquatic organism TRV is considered (Table 4-11), the HQ falls below 1. Due to the low magnitude of exceedance of the chronic aquatic organism TRV and lack of exceedance of the acute aquatic organism TRV, total PCB Aroclors are not expected to pose risk to aquatic organisms.

7.5.3.1 Threatened and Endangered Species

It is possible that the Rio Grande silvery minnow, a federal and state endangered fish species, and the river goby, a state threatened fish species may utilize habitat within Exposure Area 3: LWMCU at the Siphon Exit. When the maximum concentrations were compared to aquatic organism TRVs, barium, manganese, and total PCB Aroclors are in exceedance. This indicates that if the Rio Grande silvery minnow or river goby is onsite, the species may be adversely affected due to these COPCs within Exposure Area 3: LWMCU at the Siphon Exit.

7.6 COMPARISON TO UPGRADIENT REFERENCE CONCENTRATIONS

Sediment and surface water concentrations in Exposure Area 3: LWMCU at the Siphon Exit were compared to upgradient reference concentrations as represented by data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado. Comparisons are presented in Table 7-9 and Table 7-10. Discussion of results focuses on those chemicals identified as COPCs for the exposure area. DDTr, vanadium, and PCBs (Aroclor-1254, total PCB Aroclors, and total PCB congeners) were identified as potentially driving risks, with the following observations regarding comparison to background:

- **Vanadium**: Vanadium concentrations in Exposure Area 3: LWMCU at the Siphon Exit sediment and surface water are below the 95UPL for upgradient reference values.

- **PCBs**: PCB concentrations in Exposure Area 3: LWMCU at the Siphon Exit sediment and surface water exceed the 95UPL for upgradient reference values. Exceedance is by several orders of magnitude for sediment and an order of magnitude for surface water.

- **DDTr**: DDTr was not detected in surface water. DDTr concentrations in Exposure Area 3: LWMCU at the Siphon Exit sediment exceed the 95UPL for upgradient reference values. However, the 95UCLM for DDTr is less than that for upgradient reference values, and closer inspection reveals that exceedances of the 95UPL are limited to a small number of sample locations, with maximum detections less than twice the maximum upgradient reference concentration.

Based on these findings, vanadium concentrations are consistent with upgradient reference values, while PCBs are not and may be associated specifically with the exposure grouping. DDTr is often associated with agricultural land use, and comparisons indicate that the majority of concentrations detected in sediment are consistent with background. It should be noted that a number of additional chemicals were identified as a concern for threatened and endangered species only; these include pesticides, PAHs, and phthalates in sediment. Concentrations of all of these chemicals exceed the 95UPL for upgradient reference values.

There are a number of uncertainties associated with background comparisons that are discussed in Section 10. These include the fact that sediment and surface water evaluation is limited to comparison to upgradient reference values as represented by the two exposure groupings upstream of the siphon. Chemicals exceeding the upgradient reference values at the site include pesticides, phthalates, PAHs, and metals, all of which are commonly found in background sources such as road runoff, agricultural applications of pesticides, and atmospheric deposition.

7.7 SUMMARY FOR EXPOSURE AREA 3: LWMCU AT THE SIPHON EXIT

The ERA for Exposure Area 3: LWMCU at the Siphon Exit evaluated risks to avian and mammalian wildlife, benthic organisms, and aquatic organisms and plants. Vanadium and DDTr may pose risks to aquatic insectivorous birds. Vanadium, total PCB congeners, and DDTr may pose risks to small piscivorous birds. DDTr may pose risks to large piscivorous birds. Total PCB congeners and total PCB Aroclors may pose risks to piscivorous mammals. These findings are based on LOAEL exceedances by 95UCLM case scenario doses. There are no chemicals detected in the surface water that are expected to pose ecological risk to aquatic organisms. Vanadium may pose risks to aquatic plants. Aroclor-1254, total PCB congeners, and total PCB Aroclors may pose risks to benthic invertebrates. Based on comparisons to upgradient reference concentrations, vanadium concentrations are consistent with upgradient reference concentrations, while PCBs are not and may be associated specifically with the exposure grouping. DDTr is often associated with agricultural land use, and comparisons indicate that the majority of concentrations detected in sediment are consistent with upgradient reference concentrations.

Risks to threatened and endangered species were considered separately based on 95UCLM case scenario exceedance of NOAELs for wildlife, TEL exceedances for benthos, and chronic criteria exceedance for surface water. COPCs within Exposure Area 3: LWMCU at the Siphon Exit may pose risk to threatened and endangered species that may be present. The common black-hawk, white-faced ibis, and wood stork may be adversely affected by vanadium, DDTr, bis(2-ethylhexl)phthalate, and di-n-butyl phthalate. The interior least tern may be adversely affected by vanadium, Aroclor-1254, total PCB congeners, total PCB Aroclors, DDTr, and endrin. The reddish egret may be adversely affected by total PCB congeners, DDTr, and endrin. The Coues' rice rat may be adversely affected by Aroclor-1242, Aroclor-1260, total PCB congeners, and total PCB Aroclors. The false spike mussel, salina mucket, and Texas hornshell may be adversely affected due to barium, Aroclor-1242, Aroclor-1254, Aroclor-1260, total PCB congeners, total PCB Aroclors, DDTr, dieldrin, endosulfan I, endosulfan II, endrin, gamma-Chlordane, heptachlor epoxide, total HMW PAHs, bis(2-ethylhexl)phthalate, and phenol. The Rio Grande silvery minnow and the river goby may be adversely affected due to barium, manganese, and total PCB Aroclors.

Some of the detected chemicals are lacking a TRV and thus cannot be evaluated. The uncertainty associated with a lack of TRV is discussed in Section 10. As noted in previous sections, risk management should consider that DDT may be present due to ubiquitous sources, and that vanadium in sediment may be present at background levels.

8. RISK CHARACTERIZATION RESULTS FOR EXPOSURE AREA 4: LWMCU DOWNSTREAM OF THE SIPHON

EPCs for COPCs at Exposure Area 4: LWMCU Downstream of the Siphon are presented in Table 8-1.

8.1 AVIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of birds from impacts of COPCs in sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to birds:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of birds
- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of birds.

8.1.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 4: LWMCU Downstream of the Siphon to NOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 8-2:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (4.30)	Vanadium (2.52)	Aroclor-1254 (1.10)
	DDTr (20.5)	Aroclor-1254 (3.06)	Total PCB Congeners (1.28)
		Total PCB Congeners (14.2)	Total PCB Aroclors (1.10)
		Total PCB Aroclors (3.06)	DDTr (12.4)
		DDTr (34.3)	

8.1.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 4: LWMCU Downstream of the Siphon to LOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 8-2:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (2.15) DDTr (2.05)	Vanadium (1.26) Total PCB Congeners (1.42) DDTr (3.43)	DDTr (1.24)

8.1.3 Measurement Endpoint 3: Comparison of 95UCLM Case Scenario Modeled Doses from Exposure Area 4: LWMCU Downstream of the Siphon to LOAEL Benchmarks Protective of Birds

The third measurement endpoint evaluated the comparison of ingested doses for birds based on 95UCLM EPCs to LOAEL-based TRVs. The HQ for each chemical is calculated based on the comparison of the dose from 95UCLM concentrations in sediment, surface water, and food to the LOAEL.

COPCs for Avian Wildlife, see Table 8-3:

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Vanadium (1.80) DDTr (1.31)	Vanadium (1.24) Total PCB Congeners (1.42) DDTr (3.43)	DDTr (1.24)

8.1.4 Risk Characterization for Avian Wildlife for the Exposure Area 4: LWMCU Downstream of the Siphon

When maximum doses are compared to NOAEL-based TRVs protective of birds, vanadium, Aroclor-1254, total PCB congeners, total PCB Aroclors, DDTr are in exceedance for at least one avian receptor. Each of the chemicals with doses that exceeded the NOAEL will be discussed below.

<u>Vanadium</u>

Vanadium was detected in 8 of 8 sediment samples and 2 of 2 surface water samples. The maximum dose to aquatic insectivorous birds and small piscivorous birds exceeded the NOAEL-based TRV with HQs of 4.30 and 2.52, respectively. When the LOAEL-based TRV is considered, the HQs fall to 2.15 and 1.26. When the 95UCLM dose is compared to the LOAEL-based TRV, the HQs fall to 1.80 and 1.24. Due to the exceedance of the NOAEL and LOAEL-based TRVs; vanadium may pose risks to aquatic insectivorous birds and small piscivorous birds.

Aroclor-1254

Aroclor-1254 was detected in 21 of 24 sediment samples. The maximum dose to small and large piscivorous birds exceeded the NOAEL-based TRV with HQs of 3.06 and 1.10, respectively. When the LOAEL-based TRV is considered, the HQs drop below 1. Due to the lack of exceedance of the LOAEL-based TRV by the maximum doses, Aroclor-1254 is not expected to pose risks to small or large piscivorous birds.

Total PCB Congeners

PCB congeners were detected in 2 of 2 sediment samples. The maximum dose to small and large piscivorous birds exceeded the NOAEL-based TRV with HQs of 14.2 and 5.10, respectively. When the LOAEL-based TRV is considered, the HQs drop to 1.42 and below 1. Due to the lack of exceedance of the LOAEL-based TRV by the maximum dose to large piscivorous birds, total PCB congeners are not expected to pose risks to large piscivorous birds. As the maximum dose to small piscivorous birds exceeded the NOAEL and LOAEL-based TRVs, total PCB congeners may pose risk to small piscivorous birds.

Total PCB Aroclors

PCB congeners were detected in 21 of 24 sediment samples. The maximum dose to small and large piscivorous birds exceeded the NOAEL-based TRV with HQs of 3.06 and 1.10, respectively. When the LOAEL-based TRV is considered, the HQs drop below 1. Due to the lack of exceedance of the LOAEL-based TRV by the maximum doses, total PCB Aroclors are not expected to pose risks to small or large piscivorous birds.

DDTr

DDTr was detected in 10 of 10 sediment samples and 1 of 2 surface water samples. The maximum dose exceeded the NOAEL-based TRVs for aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds with HQs of 20.5, 34.3, and 12.4, respectively. The maximum dose exceeded the LOAEL-based TRV for the receptors with HQs of 2.05, 3.43, and 1.24. Due to the exceedance of the NOAEL- and LOAEL-based TRVs; DDTr may pose risks to aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds.

8.1.4.1 *Threatened and Endangered Species*

It is possible that the following federally and/or state protected bird species may utilize habitat within Exposure Area 4: LWMCU Downstream of the Siphon: common black-hawk, white-faced ibis, and wood stork. When the maximum and 95UCLM doses were compared to the

NOAEL- based TRV for the aquatic insectivorous bird surrogate, laughing gull, vanadium and DDTr are in exceedance. This indicates that if the common black-hawk, white-faced ibis, or wood stork is onsite, the species may be adversely affected due to those COPC within Exposure Area 4: LWMCU Downstream of the Siphon.

It is possible that interior least tern, a federal and state endangered small piscivorous bird, may utilize habitat within Exposure Area 4: LWMCU Downstream of the Siphon. When the maximum doses to small piscivorous birds were compared to the NOAEL- based TRV for the small piscivorous bird surrogate, belted kingfisher, vanadium, Aroclor-1254, total PCB congeners, total PCB Aroclors, and DDTr are in exceedance. This indicates that if the interior least tern is onsite, the species may be adversely affected due to these COPC within Exposure Area 4: LWMCU Downstream of the Siphon.

It is possible that the reddish egret, a state threatened large piscivorous bird, may utilize habitat within Exposure Area 4: LWMCU Downstream of the Siphon. When the maximum doses to large piscivorous birds were compared to the NOAEL- based TRV for the large piscivorous bird surrogate, great blue heron, total PCB congeners and DDTr are in exceedance. This indicates that if the reddish egret is onsite, the species may be adversely affected due to these COPC within Exposure Area 4: LWMCU Downstream of the Siphon.

8.2 MAMMALIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of mammals from impacts of COPCs in sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to mammals:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals

- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals.

8.2.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 4: LWMCU Downstream of the Siphon to NOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 8-4:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	Total PCB Congeners (3.09) Total PCB Aroclors (1.32)	Aroclor-1254 (3.11) Total PCB Congeners (97.9) Total PCB Aroclors (21.1)

8.2.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from the Exposure Area 4: LWMCU Downstream of the Siphon to LOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 8-4:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	None	Total PCB Congeners (9.79) Total PCB Aroclors (2.11)

8.2.3 Measurement Endpoint 3: Comparison of 95UCLM Case Scenario Modeled Doses from the Exposure Area 4: LWMCU Downstream of the Siphon to LOAEL Benchmarks Protective of Mammals

The third measurement endpoint evaluated the comparison of ingested doses for mammals based on 95UCLM EPCs to LOAEL-based TRVs. The HQ for each chemical is calculated based on the comparison of the dose from 95UCLM concentrations in sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 8-5:

Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	None	Total PCB Congeners (9.79) Total PCB Aroclors (1.34)

8.2.4 Risk Characterization for Mammalian Wildlife for Exposure Area 4: LWMCU Downstream of the Siphon

When maximum doses are compared to NOAEL-based TRVs protective of mammals, Aroclor-1254, total PCB congeners, and total PCB Aroclors are in exceedance for at least one receptor. Each of the chemicals with doses that exceeded the NOAEL will be discussed below.

Aroclor-1254

Aroclor-1254 was detected in 21 of 24 sediment samples. The maximum dose to piscivorous mammals exceeded the NOAEL-based TRV with an HQ of 3.11. When the maximum dose is compared to the LOAEL-based TRV, the HQ falls below 1. Due to the lack of exceedance of the LOAEL-based TRV by the maximum dose, Aroclor-1254 is not expected to pose risk to piscivorous mammals.

Total PCB Congeners

PCB congeners were detected in 2 of 2 sediment samples. The maximum dose to aquatic insectivorous and piscivorous mammals exceeded the NOAEL-based TRV with HQs of 3.09 and 97.9, respectively. When the maximum doses are compared to the LOAEL-based TRV, the HQs falls below 1 and to 9.79. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV, total PCB congeners are not expected to pose risk to aquatic insectivorous mammals. Due to the exceedance of the NOAEL- and LOAEL-based TRVs, total PCB congeners may pose risk to piscivorous mammals.

Total PCB Aroclors

PCB Aroclors were detected in 21 of 24 sediment samples. The maximum dose to aquatic carnivorous mammals and piscivorous mammals exceeded the NOAEL-based TRV with HQs of 1.32 and 21.1, respectively. When the maximum doses are compared to the LOAEL-based TRV, the HQs fall below 1 and to 2.11. The 95UCLM dose for piscivorous mammals also exceeds the LOAEL-based TRV with an HQ of 1.34. Due to the lack of exceedance of the LOAEL-based TRV by the maximum dose, total PCB Aroclors are not expected to pose risk to aquatic carnivorous mammals. Due to the exceedance of the NOAEL- and LOAEL-based TRVs, total PCB Aroclors may pose risk to piscivorous mammals.

8.2.4.1 *Threatened and Endangered Species*

It is possible that Coues' rice rat a state threatened species may utilize habitat within Exposure Area 4: LWMCU Downstream of the Siphon. When the maximum and 95UCLM doses were compared to the NOAEL- based TRV for the aquatic carnivorous mammal surrogate, raccoon, total PCB congeners and total PCB Aroclors are in exceedance. This indicates that if the Coues' rice rat is onsite, the species may be adversely affected due to these COPC within Exposure Area 4: LWMCU Downstream of the Siphon.

8.3 AQUATIC PLANTS

The CSM identifies protection of aquatic plant survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic plants (Table 8-6):

- Comparison of the chemical concentrations to benchmarks protective of plants including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). Comparison of the 95UCLM concentrations to benchmarks had the strongest weight of evidence as an indicator of population-wide risks in this ERA.

8.3.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 4: LWMCU Downstream of the Siphon to TRVs Protective of Plants

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of plants. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals

Manganese (2.46)	Vanadium (12.9)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of plant TRVs:

Pesticides

DDTr	Gamma-Chlordane

The uncertainty associated with the lack of TRVs is discussed in Section 10.

8.3.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 4: LWMCU Downstream of the Siphon to TRVs Protective of Plants

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to plant TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

<u>**95UCLM Case Scenario**</u>

Metals
Manganese (1.98) Vanadium (10.8)

8.3.3 Risk Characterization for Aquatic Plants for Exposure Area 4: LWMCU Downstream of the Siphon

When maximum sediment concentrations are compared to TRVs protective of plants, two metals (manganese, and vanadium) are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

<u>Manganese</u>

Manganese was detected in 8 of 8 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 2.46 and 1.98, respectively. Due to the low magnitude of exceedance of the plant TRV, manganese is not expected to pose risks to aquatic plants.

<u>Vanadium</u>

Vanadium was detected in 8 of 8 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 12.9 and 10.8, respectively. Due to the exceedance of the plant TRVs, vanadium may pose risks to aquatic plants.

8.4 BENTHIC INVERTEBRATES

The CSM identifies protection of benthic invertebrate survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to benthic invertebrates (Table 8-7):

- Comparison of the chemical concentrations to benchmarks protective of benthic invertebrates including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this ERA.

8.4.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 4: LWMCU Downstream of the Siphon to TRVs Protective of Benthic Organisms

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of benthic invertebrates. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals	
Barium (1.61)	Manganese (1.18)
PCBs	
Aroclor-1254 (1.83)	Total PCB Aroclors (1.84)
Pesticides	
DDTr (3.54)	Gamma-Chlordane (1.36)

8.4.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 4: LWMCU Downstream of the Siphon to TRVs Protective of Benthic Organisms

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to benthic invertebrate TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

<u>**95UCLM Case Scenario**</u>

Metals
Barium (1.39)
Pesticides
DDTr (2.27)

8.4.3 Risk Characterization for Benthic Invertebrates for Exposure Area 4: LWMCU Downstream of the Siphon

When maximum concentrations are compared to TRVs protective of benthic invertebrates, barium, manganese, Aroclor-1254, total PCB Aroclors, DDTr, and gamma-Chlordane are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

<u>Barium</u>

Barium was detected in 8 of 8 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV with HQs of 1.61 and 1.39. Due to the low magnitude of exceedance of the benthic TRV, barium is not expected to pose risk to benthic invertebrates.

<u>Manganese</u>

Manganese was detected in 8 of 8 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 1.18. When the 95UCLM concentration is considered, the HQ falls below 1. Due to the low magnitude of exceedance of the benthic TRV, manganese is not expected to pose risks to benthic invertebrates.

<u>Aroclor-1254</u>

Aroclor-1254 was detected in 21 of 24 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 1.83. When the 95UCLM concentration is considered, the HQ drops below 1. Due to the low magnitude of exceedance of the maximum concentration compared to the benthic TRV and the lack of exceedance by the 95UCLM concentration, Aroclor-1254 is not expected to pose risk to benthic invertebrates.

<u>Total PCB Aroclors,</u>

PCB Aroclors were detected in 21 of 24 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 1.84. When the 95UCLM concentration is considered, the HQ drops below 1. Due to the low magnitude of exceedance of the maximum concentration compared to the benthic TRV and the lack of exceedance by the 95UCLM concentration, total PCB Aroclors are not expected to pose risk to benthic invertebrates.

DDTr

DDTr was detected in 10 of 10 sediment samples and 1 of 2 surface water samples. The maximum and 95UCLM concentrations exceed the benthic TRV based on threshold effects with an HQ of 3.54 and 1.32, respectively. Due to exceedance of the benthic TRV, DDTr may pose risk to benthic invertebrates.

Gamma-Chlordane

Gamma-Chlordane was detected in 9 of 10 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 1.36. When the 95UCLM concentration is considered, the HQ drops below 1. Due to the low magnitude of exceedance of the maximum concentration compared to the benthic TRV and the lack of exceedance by the 95UCLM concentration, gamma-Chlordane is not expected to pose risk to benthic invertebrates.

8.4.3.1 Comparison to Probable Effects Levels

Comparison of sediment to the TEL is a conservative means to identify any COPC that may have an effect on benthic invertebrates. DDTr remains a COPC after this initial comparison.

A less conservative and more relevant means to identify drivers of risk to benthic invertebrates include comparison to the TEL and probable effects level midpoint (a value often chosen as ecological cleanup goals) and the probable effects level (Table 4-10). The maximum concentration of DDTr falls below both of these values. DDTr is not expected to pose risks to benthic invertebrates.

8.4.3.2 Threatened and Endangered Species

It is possible that the following state listed mollusks may utilize habitat within Exposure Area 4: LWMCU Downstream of the Siphon: false spike mussel, salina mucket, and Texas hornshell. When the maximum and 95UCLM concentrations were compared to benthic TRVs, barium and DDTr are in exceedance. This indicates that if the false spike mussel, salina mucket, or Texas hornshell is onsite, the species may be adversely affected due to these COPCs within Exposure Area 4: LWMCU Downstream of the Siphon.

8.5 AQUATIC ORGANISMS

The CSM identifies protection of aquatic organism survival, growth, and reproduction from impacts of COPCs in surface water as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic organisms (Table 8-8):

- Comparison of the chemical concentrations to benchmarks protective of aquatic organisms including:
  - Comparison using maximum EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots).

8.5.1 Measurement Endpoint 1: Comparison of Maximum Surface Water Concentrations from Exposure Area 4: LWMCU Downstream of the Siphon to TRVs Protective of Aquatic Organisms

When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals (total)
Barium (36.5)
Metals (dissolved)
Barium (32.0)
Pesticides
DDTr (74.0)

8.5.2 Risk Characterization for Aquatic Organisms for the Exposure Area 4: LWMCU Downstream of the Siphon

When maximum concentrations are compared to TRVs protective of aquatic organisms, barium and DDTr are in exceedance. The COPCs are discussed in the following subsections.

Barium

Total and dissolved barium was detected in 2 of 2 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 36.5. When the acute aquatic organism TRV is considered (Table 4-11), the HQ falls to 1.33. Due to the low magnitude of exceedance of the acute aquatic organism TRV, barium is not expected to pose risk to aquatic organisms.

DDTr

DDTr was detected in 1 of 2 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 74.0. When the acute aquatic organism TRV is considered (Table 4-11), the HQ falls below 1. Due to the lack of exceedance of the acute aquatic organism TRV, DDTr is not expected to pose risk to aquatic organisms.

8.5.2.1 Threatened and Endangered Species

It is possible that the Rio Grande silvery minnow, a federal and state endangered fish species, and the river goby, a state threatened fish species may utilize habitat within Exposure Area 4:

LWMCU Downstream of the Siphon. When the maximum concentrations were compared to aquatic organism TRVs, barium and DDTr are in exceedance. This indicates that if the Rio Grande silvery minnow or river goby is onsite, the species may be adversely affected due to these COPCs within Exposure Area 4: LWMCU Downstream of the Siphon.

8.6 COMPARISON TO UPGRADIENT REFERENCE CONCENTRATIONS

Sediment and surface water concentrations for Exposure Area 4: LWMCU Downstream of the Siphon were compared to upgradient reference concentrations as represented by data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado. Comparisons are presented in Table 8-9 and Table 8-10. Discussion of results focuses on those chemicals identified as COPCs for the exposure area. DDTr, vanadium, and PCBs (total PCB Aroclors and total PCB congeners) were identified as potentially driving risks, with the following observations regarding comparison to background:

- **Vanadium**: Vanadium concentrations in Exposure Area 4: LWMCU Downstream of the Siphon sediment and surface water are below the 95UPL for upgradient reference values.

- **PCBs**: PCB concentrations in Exposure Area 4: LWMCU Downstream of the Siphon sediment exceed the 95UPL for upgradient reference values.

- **DDTr**: DDTr concentrations in sediment from Exposure Area 4: LWMCU Downstream of the Siphon are below the 95UPL for upgradient reference values. DDTr was detected in one surface water sample from Esposure Area 4 but was not detected in surface water samples from the upstream reference area; however, it is likely that the detection was due to the presense of suspended sediment in the sample and is not considerd indicative of surface water contamination. Additional discussion is provided in Section 12.2.2.12.

Based on these findings, it is likely that vanadium and DDTr concentrations are consistent with background, while PCBs are not and are associated specifically with the exposure grouping. It should be noted that barium was also identified as a concern for threatened and endangered species only; barium concentrations did not exceed the 95UPL.

There are a number of uncertainties associated with background comparisons that are discussed in Section 10. These include the fact that sediment and surface water evaluation is limited to comparison to upgradient reference values as represented by the two exposure groupings upstream of the siphon. Chemicals exceeding the upgradient reference values at the site include pesticides, phthalates, PAHs, and metals, all of which are commonly found in background sources such as road runoff, agricultural applications of pesticides, and atmospheric deposition.

8.7 SUMMARY FOR EXPOSURE AREA 4: LWMCU DOWNSTREAM OF THE SIPHON

The ERA for Exposure Area 4: LWMCU Downstream of the Siphon evaluated risks to avian and mammalian wildlife, benthic organisms, and aquatic organisms and plants. Vanadium and DDTr may pose risks to aquatic insectivorous birds. Vanadium, total PCB congeners, and DDTr may pose risks to small piscivorous birds. DDTr may pose risks to large piscivorous birds. Total PCB congeners and total PCB Aroclors may pose risks to piscivorous mammals. These findings are based on LOAEL exceedances by 95UCLM case scenario doses. There are no chemicals detected in the surface water or sediment that are expected to pose ecological risk to benthic invertebrates or aquatic organisms. Vanadium may pose risks to aquatic plants. Based on comparisons to background, it is likely that vanadium and DDTr concentrations are consistent with background, while PCBs are not and may be associated specifically with the exposure grouping.

Risks to threatened and endangered species were considered separately based on 95UCLM case scenario exceedance of NOAELs for wildlife, TEL exceedances for benthos, and chronic criteria exceedance for surface water. COPCs within Exposure Area 4: LWMCU Downstream of the Siphon may pose risk to threatened and endangered species that may be present. The common black-hawk, white-faced ibis, and wood stork may be adversely affected by vanadium and DDTr. The interior least tern may be adversely affected by vanadium, Aroclor-1254, total PCB congeners, total PCB Aroclors, and DDTr. The reddish egret may be adversely affected by total PCB congeners and DDTr. That Coues' rice rat may be adversely affected by total PCB congeners and total PCB Aroclors. The false spike mussel, salina mucket, and Texas hornshell is onsite, the species may be adversely affected due to barium and DDTr. The Rio Grande silvery minnow and the river goby may be adversely affected due to barium and DDTr. Based on comparisons, to background, barium, vanadium, and DDTr are consistent with background while PCBs are associated with the exposure grouping in specific.

Some of the detected chemicals are lacking a TRV and thus cannot be evaluated. The uncertainty associated with a lack of TRV is discussed in Section 10. As noted in previous sections, risk management should consider that DDT may be present due to ubiquitous sources, and that vanadium in sediment may be present at background levels.

9. RISK CHARACTERIZATION RESULTS FOR EXPOSURE AREA 5: LINED CANALS, RESERVOIRS, AND SOIL

EPCs for COPCs at Exposure Area 5: Lined Canals, Reservoirs, and Soil are presented in Table 9-1.

9.1 TERRESTRIAL PLANTS

The CSM identifies protection of terrestrial plant survival, growth, and reproduction from impacts of COPCs in soil as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to terrestrial plants (Table 9-2):

- Comparison of the chemical concentrations to benchmarks protective of plants including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.
- Comparison of the chemical concentrations to background values including:
  - Comparison using maximum EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). Comparison of the 95UCLM concentrations to benchmarks had the strongest weight of evidence as an indicator of population-wide risks in this ERA.

9.1.1 Measurement Endpoint 1: Comparison of Maximum Soil Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Plants

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in soil to literature-based TRVs protective of plants. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

<u>Maximum Case Scenario</u>

Metals

Chromium (16.1)	Manganese (3.54)	Vanadium (15.7)
Zinc (1.00)		

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of plant TRVs:

Pesticides

DDTr	alpha-Chlordane	Dieldrin
Endosulfan I	Endosulfan II	Endosulfan sulfate
Endrin	Endrin aldehyde	Endrin ketone
gamma-Chlordane	Heptachlor epoxide	Methoxychlor
Toxaphene		

VOCs

Acetone	Methylene chloride

The uncertainty associated with the lack of TRVs is discussed in Section 10.

9.1.2 Measurement Endpoint 2: Comparison of 95UCLM Soil Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Plants

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to plant TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

<u>95UCLM Case Scenario</u>

Metals

Chromium (12.1)	Manganese (1.80)	Vanadium (11.6)

9.1.3 Risk Characterization for Terrestrial Plants for Exposure Area 5: Lined Canals, Reservoirs, and Soil

When maximum concentrations are compared to TRVs protective of terrestrial plants, four metals (chromium, manganese, vanadium, and zinc) are in exceedance. The 95UCLM concentration of chromium, manganese, and zinc falls below the background 95UCLM. This indicates that site concentrations of chromium, manganese, and zinc are within background and not expected to pose risk to terrestrial plants. The remaining COPC will be discussed further below.

<u>Vanadium</u>

Vanadium was detected in 58 of 58 surface soil samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 15.7 and 11.6, respectively. Due to the exceedance of the plant TRVs; vanadium may pose risks to terrestrial plants.

9.1.3.1 Threatened and Endangered Species

It is possible that the following federal and state endangered plants may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil: star cactus, Texas ayenia, and Walker's manioc. When the maximum and 95UCLM concentrations were compared to plant TRVs, chromium, manganese, and vanadium are in exceedance. This indicates that if the star cactus, Texas ayenia, or Walker's manioc is onsite, the species may be adversely affected due to these COPCs within Exposure Area 5: Lined Canals, Reservoirs, and Soil.

9.2 SOIL INVERTEBRATES

The CSM identifies protection of soil invertebrate survival, growth, and reproduction from impacts of COPCs in soil as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to soil invertebrates (Table 9-3):

- Comparison of the chemical concentrations to benchmarks protective of soil invertebrates including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

- Comparison of the chemical concentrations to background values including:
  - Comparison using maximum EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). Comparison of the 95UCLM concentrations to benchmarks had the strongest weight of evidence as an indicator of population-wide risks in this ERA.

9.2.1 Measurement Endpoint 1: Comparison of Maximum Soil Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Soil invertebrates

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in soil to literature-based TRVs protective of soil invertebrates. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of soil invertebrates; the HQ is included in parentheses next to each chemical:

<u>Maximum Case Scenario</u>

Metals

Barium (1.09)	Chromium (40.3)	Manganese (1.73)
Zinc (1.33)		

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of soil invertebrate TRVs:

Metals		
Vanadium		
Pesticides		
DDTr	alpha-Chlordane	Dieldrin
Endosulfan I	Endosulfan II	Endosulfan sulfate
Endrin	Endrin aldehyde	Endrin ketone
gamma-Chlordane	Heptachlor epoxide	Methoxychlor
Toxaphene		
PCBs		
Aroclor-1016	Aroclor-1254	Aroclor-1260
Total PCB Congeners	Total PCB Aroclors	
VOCs		
Acetone	Methylene chloride	

The uncertainty associated with the lack of TRVs is discussed in Section 10.

9.2.2 Measurement Endpoint 2: Comparison of 95UCLM Soil Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Soil invertebrates

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to soil invertebrate TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentration exceeded TRVs protective of soil invertebrates; the HQ is included in parentheses next to the chemical:

<u>95UCLM Case Scenario</u>

Metals
Chromium (30.3)

9.2.3 Risk Characterization for Soil invertebrates for Exposure Area 5: Lined Canals, Reservoirs, and Soil

When maximum concentrations are compared to TRVs protective of soil invertebrates, four metals (barium, chromium, manganese, and zinc) are in exceedance. The 95UCLM concentrations of chromium, manganese, and zinc fall below the background 95UCLM. This indicates that site concentrations are within background and not expected to pose risk to soil invertebrates. The remaining COPC will be discussed further below.

Barium

Barium was detected in 58 of 58 surface soil samples. The maximum concentration exceeded the soil invertebrate TRV with an HQ of 1.09. When the 95UCLM concentration is considered, the HQ falls below 1. Due to the low magnitude of exceedance of the soil invertebrate TRVs by the maximum concentration and lack of exceedance of the soil invertebrate TRV by the 95UCLM concentration; barium is not expected to pose risks to soil invertebrates.

9.3 AVIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of birds from impacts of COPCs in soil or sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to birds:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of birds

- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of birds.

9.3.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 5: Lined Canals, Reservoirs, and Soil NOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in soil or sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 9-4:

Terrestrial Herbivorous Birds	Terrestrial Omnivorous Birds	Predatory Birds
None	Barium (1.02)	DDTr (1.06)
	Vanadium (20.0)	Bis(2-ethylhexl)phthalate (6.83)
	Zinc (1.58)	
	DDTr (58.9)	
	Bis(2-ethylhexl)phthalate (1.16)	
	Butylbenzylphthalate (1.05)	

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
Copper (1.32)	Copper (496) Vanadium (5.99) DDTr (106) Total HMW PAHs (2.28) Bis(2-ethylhexl)phthalate (17.3) Butylbenzylphthalate (21.1)	Copper (4.81) Vanadium (1.03) DDTr (10.2) Bis(2-ethylhexl)phthalate (2.43)	Copper (1.73) DDTr (3.68)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of avian NOAEL-based TRVs:

Metals		
Beryllium		
Pesticides		
Endosulfan sulfate	Endrin aldehyde	Endrin ketone
Heptachlor	Heptachlor epoxide	Methoxychlor
Toxaphene		
SVOCs		
Benzaldehyde	Caprolactam	Carbazole
Dibenzofuran		
VOCs		
Acetone	Methylene chloride	

9.3.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 5: Lined Canals, Reservoirs, and Soil to LOAEL Benchmarks Protective of Birds

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in soil or sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding avian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Avian Wildlife, see Table 9-4:

Terrestrial Herbivorous Birds	Terrestrial Omnivorous Birds	Predatory Birds
None	Vanadium (10.0) DDTr (5.89)	None

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Copper (166) Vanadium (3.00) DDTr (10.6) Bis(2-ethylhexl)phthalate (1.73) Butylbenzylphthalate (2.11)	Copper (1.61) DDTr (1.02)	None

There is no available avian LOAEL for dieldrin, endosulfan I, or endosulfan II.

9.3.3 Measurement Endpoint 3: Comparison of 95UCLM Case Scenario Modeled Doses from Exposure Area 5: Lined Canals, Reservoirs, and Soil to LOAEL Benchmarks Protective of Birds

The third measurement endpoint evaluated the comparison of ingested doses for birds based on 95UCLM EPCs to LOAEL-based TRVs. The HQ for each chemical is calculated based on the comparison of the dose from 95UCLM concentrations in soil or sediment, surface water, and food to the LOAEL.

COPCs for Avian Wildlife, see Table 9-5:

Terrestrial Herbivorous Birds	Terrestrial Omnivorous Birds	Predatory Birds
None	Vanadium (7.42) DDTr (1.52)	None

Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
None	Copper (101) Vanadium (2.07) DDTr (4.94) Butylbenzylphthalate (2.11)	DDTr (1.02)	None

There are no available avian LOAELs for dieldrin, endosulfan I, or endosulfan II.

9.3.4 Risk Characterization for Avian Wildlife for Exposure Area 5: Lined Canals, Reservoirs, and Soil

9.3.4.1 Terrestrial Receptors

Maximum doses for terrestrial birds fall below NOAEL-based TRVs for all chemicals except for barium, vanadium, zinc, DDTr, bis(2-ethylhexl)phthalate, and butylbenzylphthalate. The

95UCLM concentrations of the zinc and DDTr fall below the 95UCLM background concentration, an indication site concentrations are within background and not expected to pose risk to terrestrial birds. The remaining COPCs are discussed further below.

Barium

Barium was detected in 58 of 58 surface soil samples. The maximum dose to terrestrial omnivorous birds exceeded the NOAEL-based TRV with an HQ of 1.02. When the 95UCLM dose is considered, the HQ falls below 1. The maximum dose falls below the LOAEL-based TRV. Due to the low magnitude of exceedance of the NOAEL-based TRV by the maximum dose, lack of exceedance of the NOAEL-based TRV by the 95UCLM dose, and lack of exceedance of the LOAEL-based TRV; barium is not expected to pose risks to terrestrial omnivorous birds.

Vanadium

Vanadium was detected in 58 of 58 surface soil samples. The maximum and 95UCLM doses to terrestrial omnivorous birds exceeded the NOAEL-based TRV with HQs of 20.0 and 10.0. When the LOAEL-based TRV is considered, the maximum and 95UCLM HQs fall to 14.8 and 7.42. Due to the exceedance of NOAEL and LOAEL-based TRVs by maximum and 95UCLM doses and the fact that vanadium in the surface soil is not within the background concentration, vanadium in the surface soil may pose risks to terrestrial omnivorous birds.

Bis(2-ethylhexl)phthalate

Bis(2-ethylhexl)phthalate was detected in 22 of 58 surface soil samples. The maximum doses to terrestrial omnivorous birds and predatory birds exceeded the NOAEL-based TRV with HQs of 1.16 and 6.83, respectively. When the 95UCLM dose is considered, the HQs fall below 1. Due to the relatively low magnitudes of exceedance of the NOAEL-based TRV by the maximum doses and lack of exceedance of the NOAEL-based TRV by the 95UCLM doses, bis(2-ethylhexl)phthalate is not expected to pose risks to terrestrial omnivorous birds or predatory birds.

Butylbenzylphthalate

Butylbenzylphthalate was detected in 1 of 58 surface soil samples. The maximum dose to terrestrial omnivorous birds exceeded the NOAEL-based TRV with an HQ of 1.05. The maximum dose falls below the LOAEL-based TRV. Due to the low magnitude of exceedance of the NOAEL-based TRV by the maximum dose and lack of exceedance of the LOAEL-based TRV, butylbenzylphthalate is not expected to pose risks to terrestrial omnivorous birds.

9.3.4.2 Aquatic Receptors

When maximum doses are compared to NOAEL-based TRVs protective of birds, two metals (copper and vanadium), DDTr, total HMW PAHs, bis(2-ethylhexl)phthalate, and butylbenzylphthalate are in exceedance for at least one aquatic receptor. Each COPC will be discussed further below.

Copper

Copper was detected in 18 of 18 sediment samples and 12 of 12 surface water samples. The maximum doses to each of the aquatic bird species exceeds the NOAEL-based TRV with the highest HQ attributed to the aquatic insectivorous birds (496). When the LOAEL-based TRV is considered, HQs for aquatic herbivorous and large piscivorous birds fall below 1 and HQs for aquatic insectivorous birds and small piscivorous birds fall to 166 and 1.61, respectively. The 95UCLM doses to aquatic insectivorous birds, small piscivorous birds and large piscivorous birds exceed the NOAEL-based TRVs with HQs of 302, 2.97, and 1.07, respectively. When the 95UCLM doses are compared to the LOAEL-based TRV, HQ for aquatic insectivorous birds falls to 101 and HQs for small and large piscivorous birds fall below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV, copper in the sediment is not expected to pose risk to aquatic herbivorous birds or large piscivorous birds. As the maximum and 95UCLM doses to aquatic insectivorous birds and small piscivorous birds exceed the NOAEL- and LOAEL-based TRVs, copper may pose risk to these aquatic avian receptors.

Vanadium

Vanadium was detected in 18 of 18 sediment samples and 12 of 12 surface water samples. The maximum dose to aquatic insectivorous birds and small piscivorous birds exceeded the NOAEL-based TRVs with HQs of 5.99 and 1.03, respectively. When the LOAEL-based TRV is considered, the HQs fall to 3.00 and below 1. When the 95UCLM dose is compared to the LOAEL-based TRV, the HQ for aquatic insectivorous birds falls to 2.07. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV, vanadium is not expected to pose risks to small piscivorous birds. As the maximum and 95UCLM doses exceed the NOAEL- and LOAEL-based TRVs, vanadium may pose risks to aquatic insectivorous birds.

DDTr

DDTr was detected in 16 of 19 sediment samples and 1 of 12 surface water samples. The maximum doses to aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds exceeded the NOAEL-based TRV with HQs of 106, 10.2, and 3.68, respectively. When the LOAEL-based TRV is considered, the HQs fall to 10.6, 1.02, and below 1. When the 95UCLM doses are considered, the HQs for aquatic insectivorous and small piscivorous birds do not fall below 1. As the maximum and 95UCLM doses exceed the NOAEL- and LOAEL-based TRVs, DDTr in the sediment may pose risks to aquatic insectivorous birds and small piscivorous birds.

Total HMW PAHs

HMW PAHs were detected in 3 of 19 sediment samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL-based TRV with an HQ 2.28. When the LOAEL-based TRV is considered, the HQ falls below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV, total HMW PAHs are not expected to pose risks to aquatic insectivorous birds.

Bis(2-ethylhexl)phthalate

Bis(2-ethylhexl)phthalate was detected in 5 of 19 sediment samples and 1 of 12 surface water samples. The maximum doses to aquatic insectivorous birds and small piscivorous birds exceeded the NOAEL-based TRV with HQs of 17.3 and 2.43, respectively. When the LOAEL-based TRV is considered, the HQs fall to 1.73 and below 1. 95UCLM doses did not exceed LOAEL-based TRVs. Bis(2-ethylhexl)phthalate is unlikely to pose risks to aquatic insectivorous birds and small piscivorous birds.

Butylbenzylphthalate

Butylbenzylphthalate was detected in 1 of 19 sediment samples. The maximum dose to aquatic insectivorous birds exceeded the NOAEL- and LOAEL-based TRVs with HQs of 21.1 and 2.11. As the maximum dose exceeded the NOAEL- and LOAEL-based TRVs, butylbenzylphthalate may pose risks to aquatic insectivorous birds.

9.3.4.3 Threatened and Endangered Species

It is possible that the following state threatened bird species may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil: northern beardless-tyrannulet, rose-throated becard, Sprague's Pipit, Texas Botteri's sparrow, and tropical parula. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the terrestrial omnivorous bird surrogate, American robin, two metals (vanadium and zinc), DDTr, and butylbenzylphthalate are in exceedance. This indicates that if northern beardless-tyrannulet, rose-throated becard, Sprague's pipit, Texas Botteri's sparrow, or tropical parula is onsite, the species may be adversely affected due to those COPC within Exposure Area 5: Lined Canals, Reservoirs, and Soil.

It is possible that the following federally or state protected bird species may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil: American peregrine falcon, arctic peregrine falcon, cactus ferruginous pygmy-owl, gray hawk, peregrine falcon, white-tailed hawk, and zone-tailed hawk. When the maximum doses were compared to the NOAEL- based TRVs for the predatory bird surrogate, red-tailed hawk, DDTr and bis(2-ethylhexl)phthalate are in exceedance. However, the 95UCLM doses fall below the NOAEL-based TRV. This indicates that if these species are onsite, adverse risks are not expected.

It is possible that the following federally and/or state protected bird species may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil: common black-hawk, white-faced ibis, and wood stork. When the maximum and 95UCLM doses were compared to the NOAEL- based TRV for the aquatic insectivorous bird surrogate, laughing gull, two metals (copper and vanadium), DDTr, total HMW PAHs, bis(2-ethylhexl)phthalate, and butylbenzylphthalate are in exceedance. This indicates that if the common black-hawk, white-faced ibis, or wood stork is onsite, the species may be adversely affected due to those COPC within Exposure Area 5: Lined Canals, Reservoirs, and Soil.

It is possible that the interior least tern, a federal and state endangered small piscivorous bird, and the reddish egret, a state threatened large piscivorous bird, may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil. When the maximum and 95UCLM doses to small piscivorous birds were compared to the NOAEL- based TRV for the small piscivorous bird surrogate, belted kingfisher, copper, DDTr, and bis(2-ethylhexl)phthalate are in exceedance. When the maximum and 95UCLM doses to large piscivorous birds were compared to the NOAEL-based TRV for the large piscivorous bird surrogate, great blue heron, copper and DDTr are in exceedance. This indicates that if the interior least tern or reddish egret is onsite, the species may be adversely affected due to these COPC within Exposure Area 5: Lined Canals, Reservoirs, and Soil.

9.4 MAMMALIAN WILDLIFE

The CSM identifies protection of the survival, growth, and reproduction of mammals from impacts of COPCs in soil or sediment, surface water, and food as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to mammals:

- Screening level comparison of maximum case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals

- Comparison of 95UCLM case scenario doses ingested through the food web to NOAEL- and LOAEL-based benchmarks protective of mammals.

9.4.1 Measurement Endpoint 1: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 5: Lined Canals, Reservoirs, and Soil to NOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in soil or sediment, surface water, and food to the NOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 9-6:

Terrestrial Herbivorous Mammals	Terrestrial Insectivorous Mammals	Predatory Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	Vanadium (1.49) Zinc (1.23) Total PCB Congeners (1.29)	None	Copper (1.70) Total HMW PAHs (1.99)	Copper (348) Total PCB Congeners (4.09) Total PCB Aroclors (4.48) Total HMW PAHs (5.70) Bis(2-ethylhexl)phthalate (1.02)	Copper (1.34) Total PCB Congeners (2.30) Total PCB Aroclors (5.57)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of mammalian NOAEL-based TRVs:

Pesticides		
Endosulfan sulfate	Endrin aldehyde	Endrin ketone
Heptachlor epoxide		
SVOCs		
Benzaldehyde	Caprolactam	Carbazole
Dibenzofuran		

9.4.2 Measurement Endpoint 2: Comparison of Maximum Case Scenario Modeled Doses from Exposure Area 5: Lined Canals, Reservoirs, and Soil to LOAEL Benchmarks Protective of Mammals

The HQ for each chemical is calculated based on the comparison of the dose from maximum concentrations in soil or sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 9-6:

Terrestrial Herbivorous Mammals	Terrestrial Insectivorous Mammals	Predatory Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	None	None	Copper (1.02)	Copper (208) Total HMW PAHs (1.16)	None

9.4.3 Measurement Endpoint 3: Comparison of 95UCLM Case Scenario Modeled Doses from Exposure Area 5: Lined Canals, Reservoirs, and Soil to LOAEL Benchmarks Protective of Mammals

The third measurement endpoint evaluated the comparison of ingested doses for mammals based on 95UCLM EPCs to LOAEL-based TRVs. The HQ for each chemical is calculated based on the comparison of the dose from 95UCLM concentrations in soil or sediment, surface water, and food to the LOAEL.

Dose modeling and comparisons based on maximum EPCs identified the following chemicals as equaling or exceeding mammalian TRVs for each feeding guild; the HQ is included in parentheses next to each chemical:

COPCs for Mammalian Wildlife, see Table 9-7:

Terrestrial Herbivorous Mammals	Terrestrial Insectivorous Mammals	Predatory Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
None	None	None	None	Copper (127) Total HMW PAHs (1.16)	None

9.4.4 Risk Characterization for Mammalian Wildlife for Exposure Area 5: Lined Canals, Reservoirs, and Soil

9.4.4.1 Terrestrial Receptors

Maximum doses for terrestrial mammals fall below NOAEL-based TRVs for all chemicals except for vanadium, zinc, and total PCB congeners. The 95UCLM surface soil concentration of zinc falls below the background 95UCLM concentration. This indicates that site concentrations of zinc are within background and not expected to pose risk to terrestrial mammals. Vanadium and total PCB congeners will be discussed further below.

<u>Vanadium</u>

Vanadium was detected in 58 of 58 surface soil samples. The maximum and 95UCLM doses to terrestrial insectivorous mammals exceeded the NOAEL-based TRV with HQs of 1.49 and 1.11. When the LOAEL-based TRV is considered, the HQs fall below 1. Due to the low magnitude of exceedance of NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV by the maximum dose, vanadium is not expected to pose risk to terrestrial insectivorous mammals.

<u>Total PCB Congeners</u>

PCB congeners were detected in 24 of 24 surface soil samples. The maximum dose to terrestrial insectivorous mammals exceeded the NOAEL-based TRV with an HQ of 1.29. When the 95UCLM dose or the LOAEL-based TRV is considered, the HQs fall below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV by the maximum dose, lack of exceedance of the LOAEL-based TRV by the maximum dose, and lack of exceedance by the 95UCLM dose; total PCB congeners are not expected to pose risk to terrestrial insectivorous mammals.

9.4.4.2 Aquatic Receptors

When maximum doses are compared to NOAEL-based TRVs protective of mammals, copper, total PCB congeners, total PCB Aroclors, total HMW PAHs, and bis(2-ethylhexl)phthalate are in exceedance for at least one aquatic receptor.

Copper

Copper was detected in 18 of 18 sediment samples and 12 of 12 surface water samples. The maximum dose to aquatic herbivorous mammals, aquatic carnivorous mammals, and piscivorous mammals exceeded the NOAEL-based TRV with HQs of 1.70, 348, and 1.34, respectively. When the LOAEL-based TRV is considered, the HQs fall to 1.02, 208, and below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack or exceedance of the LOAEL-based TRV by the maximum dose, copper is not expected to pose risks to piscivorous mammals. Due to the low magnitude of exceedances of the NOAEL- and LOAEL-based TRVs by the maximum dose, copper is not expected to pose risks to aquatic herbivorous mammals. Due to the high magnitude of exceedance of both TRVs by both doses, copper may pose risk to aquatic carnivorous mammals.

Total PCB Congeners

PCB congeners were detected in 10 of 10 sediment samples and 6 of 6 surface water samples. The maximum doses to aquatic carnivorous mammals and piscivorous mammals exceeded the NOAEL-based TRV with HQs of 4.09 and 2.30, respectively. When the LOAEL-based TRV is considered, the HQs fall below 1. Due to the relatively low magnitude of exceedance of the NOAEL-based TRV by the maximum doses and lack of exceedance of the LOAEL-based TRV by the maximum doses, total PCB congeners are not expected to pose risk to aquatic carnivorous mammals or piscivorous mammals.

Total PCB Aroclors

PCB Aroclors were detected in 18 of 33 sediment samples. The maximum dose to aquatic carnivorous mammals and piscivorous mammals exceeded the NOAEL-based TRV with HQs of 4.48 and 5.57, respectively. When the LOAEL-based TRV is considered, the HQs fall below 1. When the 95UCLM doses are considered, the HQs fall slightly. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack or exceedance of the LOAEL-based TRV by the maximum dose, total PCB Aroclors are not expected to pose risks to aquatic carnivorous mammals or piscivorous mammals.

Total HMW PAHs

HMW PAHs were detected in 3 of 19 sediment samples. The maximum dose to aquatic herbivorous mammals exceeded the NOAEL-based TRV with an HQ of 1.99. When compared to the LOAEL-based TRV, the HQ falls below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV by the maximum dose, Total HMW PAHs are not expected to pose risk to aquatic herbivorous mammals. The maximum dose to aquatic carnivorous mammals exceeded the NOAEL and LOAEL-based TRVs with HQs of 5.70 and 1.16, respectively. As the maximum dose exceeds the NOAEL and LOAEL-based TRVs, HMW PAHs may pose risk to aquatic carnivorous mammals.

Bis(2-ethylhexl)phthalate

Bis(2-ethylhexl)phthalate was detected in 5 of 19 sediment samples and 1 of 12 surface water samples. The maximum dose to aquatic carnivorous mammals exceeded the NOAEL-based TRV with an HQ of 1.02. When the LOAEL-based TRV is considered, the HQ falls below 1. Due to the low magnitude of exceedance of the NOAEL-based TRV and lack of exceedance of the LOAEL-based TRV by the maximum dose, bis(2-ethylhexl)phthalate is not expected to pose risk to aquatic carnivorous mammals.

9.4.4.3 Threatened and Endangered Species

It is possible that the southern yellow bat and the white-nosed coati, state threatened species, may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the terrestrial insectivorous mammal surrogate, least shrew, vanadium is in exceedance. This indicates that if the southern yellow bat or the white-nosed coati is onsite, the species may be adversely affected due to vanadium within Exposure Area 5: Lined Canals, Reservoirs, and Soil.

It is possible that the jaguar, jaguarondi, and ocelot, federal and state endangered species, may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil. When the maximum doses were compared to the NOAEL-based TRV for the predatory mammal surrogate, coyote, no COPCs were in exceedance. This indicates that if the jaguar, jaguarondi, or ocelot is onsite, the species are not expected to be adversely affected within Exposure Area 5: Lined Canals, Reservoirs, and Soil.

It is possible that Coues' rice rat a state threatened species may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil. When the maximum and 95UCLM doses were compared to the NOAEL-based TRV for the aquatic carnivorous mammal surrogate, raccoon, copper, total PCB congeners, total PCB Aroclors, and total HMW PAHs are in exceedance. This indicates that if the Coues' rice rat is onsite, the species may be adversely affected due to these COPC within Exposure Area 5: Lined Canals, Reservoirs, and Soil.

9.5 AQUATIC PLANTS

The CSM identifies protection of aquatic plant survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic plants (Table 9-8):

- Comparison of the chemical concentrations to benchmarks protective of plants including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). Comparison of the 95UCLM concentrations to benchmarks had the strongest weight of evidence as an indicator of population-wide risks in this ERA.

9.5.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Plants

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of plants. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals		
Arsenic (1.39)	Copper (108)	Manganese (2.31)
Vanadium (17.9)		
PAHs		
LMW PAHs (1.39)	HMW PAHs (11.9)	

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of plant TRVs:

Pesticides		
DDTr	Delta-BHC	Dieldrin
Endosulfan II	Endosulfan sulfate	Endrin aldehyde
Endrin ketone	Heptachlor	Methoxychlor
SVOCS		
Carbazole	Dibenzofuran	

The uncertainty associated with the lack of TRVs is discussed in Section 10.

9.5.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Plants

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to plant TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of plants; the HQ is included in parentheses next to each chemical:

95UCLM Case Scenario

Metals

Copper (66.0)	Manganese (2.00)	Vanadium (12.4)

PAHs

LMW PAHs (1.39)	HMW PAHs (11.9)

9.5.3 Risk Characterization for Aquatic Plants for Exposure Area 5: Lined Canals, Reservoirs, and Soil

When maximum sediment concentrations are compared to TRVs protective of plants, five metals (arsenic, copper, manganese, and vanadium) are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

Arsenic

Arsenic was detected in 18 of 18 sediment samples. The maximum concentration exceeded the plant TRV with an HQ of 1.39. When the 95UCLM concentration is considered, the HQ falls below 1. Due to the low magnitude of exceedance by the maximum concentration and lack of exceedance of the plant TRV by the 95UCLM concentration; arsenic is not expected to pose risks to aquatic plants.

Copper

Copper was detected in 18 of 18 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 108 and 66.0, respectively. Due to the exceedance of the plant TRV, copper may pose risks to aquatic plants.

Manganese

Manganese was detected in 18 of 18 sediment samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 2.31 and 2, respectively. Due to the exceedance of the plant TRVs, manganese may pose risks to aquatic plants.

Vanadium

Vanadium was detected in 18 of 18 sediment samples and 12 of 12 surface water samples. The maximum and 95UCLM concentrations exceeded the plant TRV with HQs of 17.9 and 12.4, respectively. Due to the exceedance of the plant TRVs, vanadium may pose risks to aquatic plants.

Total LMW PAHs

LMW PAHs were detected in 2 of 19 sediment samples. The maximum concentration exceeded the plant TRV with an HQ of 1.39. Due to the low frequency of detection and low magnitude of exceedance of the plant TRV, LMW PAHs are not expected to pose risks to aquatic plants.

Total HMW PAHs

HMW PAHs were detected in 3 of 19 sediment samples. The maximum concentration exceeded the plant TRV with an HQ of 11.9. Due to the exceedance of the plant TRV, HMW PAHs may pose risks to aquatic plants.

9.6 BENTHIC INVERTEBRATES

The CSM identifies protection of benthic invertebrate survival, growth, and reproduction from impacts of COPCs in sediment as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to benthic invertebrates (Table 9-9):

- Comparison of the chemical concentrations to benchmarks protective of benthic invertebrates including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this ERA.

9.6.1 Measurement Endpoint 1: Comparison of Maximum Sediment Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Benthic Organisms

The first measurement endpoint evaluated was the screening-level comparison of maximum chemical concentrations in sediment to literature-based TRVs protective of benthic invertebrates. When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

<u>Maximum Case Scenario</u>

Metals

Arsenic (2.56) Barium (1.64) Copper (240)
Lead (1.14) Manganese (1.11)

Pesticides

DDTr (18.3) Delta-BHC (1.27) Dieldrin (3.95)
Endosulfan II (600) Heptachlor (5.57) Methoxychlor (1.58)

PAHs

Total LMW PAHs (17.2) Total HMW PAHs (148)

SVOCs

Bis(2-ethylhexl)phthalate (44.5)

The following chemicals cannot be evaluated in this measurement endpoint due to a lack of benthic invertebrate TRVs:

Pesticides

Endosulfan sulfate Endrin aldehyde Endrin ketone

SVOCs

Carbazole

The uncertainty associated with the lack of TRVs is discussed in Section 10.

9.6.2 Measurement Endpoint 2: Comparison of 95UCLM Sediment Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Benthic Organisms

The second measurement endpoint evaluated was a comparison of 95UCLM EPCs to benthic invertebrate TRVs. 95UCLM EPCs are a more realistic indicator of risk because the 95UCLM case scenario reflects exposures across the site, which are the focus of the ERA.

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of benthic invertebrates; the HQ is included in parentheses next to each chemical:

<u>95UCLM Case Scenario</u>

Metals

Barium (1.36) Copper (146)

Pesticides

DDTr (8.54) Delta-BHC (1.27) Dieldrin (3.95)
Endosulfan II (600) Heptachlor (5.57) Methoxychlor (1.58)

PAHs

Total LMW PAHs (17.2) Total HMW PAHs (148)

SVOCs
Bis(2-ethylhexl)phthalate (18.7)

9.6.3 Risk Characterization for Benthic Invertebrates for Exposure Area 5: Lined Canals, Reservoirs, and Soil

When maximum concentrations are compared to TRVs protective of benthic invertebrates, five metals (arsenic, barium, copper, lead, and manganese), DDTr, delta-BHC, dieldrin, endosulfan II, heptachlor, methoxychlor, total LMW PAHs, total HMW PAHs, and bis(2-ethylhexl)phthalate are in exceedance. Further evaluation of each of the COPCs is provided in the following subsections.

Arsenic

Arsenic was detected in 18 of 18 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 2.56. When the 95UCLM concentration is considered, the HQ falls below 1. Due to the low magnitude of exceedance by the maximum concentration and lack of exceedance of the benthic TRV by the 95UCLM concentration, arsenic is not expected to pose risks to benthic invertebrates.

Barium

Barium was detected in 18 of 18 sediment samples. The maximum and 95UCLM concentrations exceeded the benthic TRV with HQs of 1.64 and 1.36, respectively. Due to the low magnitude of exceedance of the benthic TRV, barium is not expected to pose risks to benthic invertebrates.

Copper

Copper was detected in 18 of 18 sediment samples. The maximum and 95UCLM concentrations exceeded the benthic TRV based on threshold effects with HQs of 240 and 146, respectively. Due to the exceedance of the benthic TRV, copper may pose risks to benthic invertebrates.

Lead

Lead was detected in 18 of 18 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 1.14. When the 95UCLM concentration is considered, the HQ falls below 1. Due to the low magnitude of exceedance by the maximum concentration and lack of exceedance of the benthic TRV by the 95UCLM concentration, lead is not expected to pose risks to benthic invertebrates.

Manganese

Manganese was detected in 18 of 18 sediment samples. The maximum concentration exceeded the benthic TRV with an HQ of 1.11. When the 95UCLM concentration is considered, the HQ falls below 1. Due to the low magnitude of exceedance by the maximum concentration and lack of exceedance of the benthic TRV by the 95UCLM concentration, manganese is not expected to pose risks to benthic invertebrates.

DDTr

DDTr was detected in 16 of 19 sediment samples. The maximum and 95UCLM concentrations exceed the benthic TRV based on threshold effects with HQs of 18.3 and 8.54, respectively. Due to the exceedance of the benthic TRV, DDTr may pose risks to benthic invertebrates.

Delta-BHC

Delta-BHC was detected in 2 of 19 sediment samples. The maximum concentration exceeds the benthic TRV based on threshold effects with an HQ of 1.27. Due to the exceedance of the benthic TRV, delta-BHC may pose risks to benthic invertebrates.

Dieldrin

Dieldrin was detected in 1 of 19 sediment samples. The maximum concentration exceeds the benthic TRV based on threshold effects with an HQ of 3.95. Due to the exceedance of the benthic TRV; dieldrin may pose risks to benthic invertebrates.

Endosulfan II

Endosulfan II was detected in 2 of 19 sediment samples. The maximum concentration exceeds the benthic TRV based on threshold effects with an HQ of 600. Due to the exceedance of the benthic TRV, endosulfan II may pose risks to benthic invertebrates.

Heptachlor

Heptachlor was detected in 1 of 19 sediment samples. The maximum concentration exceeds the benthic TRV based on threshold effects with an HQ of 5.57. Due to the exceedance of the benthic TRV, heptachlor may pose risks to benthic invertebrates.

Methoxychlor

Methoxychlor was detected in 1 of 19 sediment samples. The maximum concentration exceeds the benthic TRV with an HQ of 1.58. Due to the low magnitude of exceedance and the low frequency of detection, methoxychlor is not expected to pose risks to benthic invertebrates.

Total LMW PAHs

LMW PAHs were detected in 2 of 19 sediment samples. The maximum concentration exceeds the benthic TRV with an HQ of 17.2. Due to the exceedance of the benthic TRV, LMW PAHs may pose risks to benthic invertebrates.

Total HMW PAHs

HMW PAHs were detected in 3 of 19 sediment samples. The maximum concentration exceeds the benthic TRV with an HQ of 148. Due to the exceedance of the benthic TRV, total HMW PAHs may pose risks to benthic invertebrates.

Bis(2-ethylhexl)phthalate

Bis(2-ethylhexl)phthalate was detected in 5 of 19 sediment samples. The maximum and 95UCLM concentrations exceeded the benthic TRV based on threshold effects with HQs of 44.5 and 18.7, respectively. Due to the exceedance of the benthic TRV, bis(2-ethylhexl)phthalate may pose risks to benthic invertebrates.

9.6.3.1 Comparison to Probable Effects Levels

Comparison of sediment to the TEL is a conservative means to identify any COPC that may have an effect on benthic invertebrates. The following analytes remain COPCs after this initial comparison: copper, DDTr, delta-BHC, dieldrin, endosulfan II, heptachlor, total LMW PAHs, total HMW PAHs, and bis(2-ethylhexl)phthalate.

A less conservative and more relevant means to identify drivers of risk to benthic invertebrates include comparison to the TEL and probable effects level midpoint (a value often chosen as ecological cleanup goals) and the probable effects level (Table 4-10).

COPCs with 95UCLM concentrations that exceed the threshold effects and probable effects midpoint:

- copper
- total LMW PAHs
- total HMW PAHs
- bis(2-ethylhexl)phthalate.

COPCs with 95UCLM concentrations that exceed the probable effects level:

- copper
- total LMW PAHs
- total HMW PAHs
- bis(2-ethylhexl)phthalate.

COPCs not expected to be risk drivers to benthic invertebrates:

- DDTr
- delta-BHC
- dieldrin
- endosulfan II
- heptachlor.

As the following COPCs exceed both the midpoint between the TEL and the probable effects level, they remain as COPCs for benthic invertebrates: copper, total LMW PAHs, total HMW PAHs, and bis(2-ethylhexl)phthalate.

9.6.3.2 Threatened and Endangered Species

It is possible that the following state listed mollusks may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil: false spike mussel, salina mucket, and Texas hornshell. When the maximum and 95UCLM concentrations were compared to benthic TRVs, barium, copper, DDTr, delta-BHC, dieldrin, endosulfan II, heptachlor, methoxychlor, total LMW PAHs, total HMW PAHs, and bis(2-ethylhexl)phthalate are in exceedance. This indicates that if the false spike mussel, salina mucket, or Texas hornshell is onsite, the species may be adversely affected due to these COPCs within the Exposure Area 5: Lined Canals, Reservoirs, and Soil.

9.7 AQUATIC ORGANISMS

The CSM identifies protection of aquatic organism survival, growth, and reproduction from impacts of COPCs in surface water as an assessment endpoint. The following measurement endpoints were evaluated as indicators of risk to aquatic organisms (Table 9-10):

- Comparison of the chemical concentrations to benchmarks protective of aquatic organisms including:
  - Comparison using maximum EPCs
  - Comparison using 95UCLM EPCs.

Comparison of maximum concentrations to benchmarks is typically given the most weight in the weight of evidence approach because it is the most precautionary indicator of risks at specific locations (i.e., hotspots). The 95UCLM concentrations will be used to provide an indicator of population-wide risks in this ERA.

9.7.1 Measurement Endpoint 1: Comparison of Maximum Surface Water Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Aquatic Organisms

When maximum EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

Maximum Case Scenario

Metals (total)		
Barium (38.5)	Copper (22.0)	
Metals (dissolved)		
Barium (36.8)	Copper (20.8)	Manganese (1.09)

Pesticides
DDTr (31.0)
SVOCs
Bis(2-ethylhexl)phthalate (1.03)

9.7.2 Measurement Endpoint 2: Comparison of 95UCLM Surface Water Concentrations from Exposure Area 5: Lined Canals, Reservoirs, and Soil to TRVs Protective of Aquatic Organisms

When 95UCLM EPCs of COPCs were compared to TRVs, the following chemical concentrations exceeded TRVs protective of aquatic life; the HQ is included in parentheses next to each chemical:

95UCLM Case Scenario

Metals (total)
Barium (34.8) Copper (9.94)
Metals (dissolved)
Barium (31.8) Copper (20.8)
Pesticides
DDTr (31.0)
SVOCs
Bis(2-ethylhexl)phthalate (1.03)

9.7.3 Risk Characterization for Aquatic Organisms for Exposure Area 5: Lined Canals, Reservoirs, and Soil

When maximum concentrations are compared to TRVs protective of aquatic organisms, three metals (barium, copper, and manganese), DDTr, and bis(2-ethylhexl)phthalate are in exceedance. The COPCs are discussed in the following subsections.

Barium

Total and dissolved barium was detected in 12 of 12 surface water samples. The total maximum and 95UCLMs concentrations exceeded the chronic aquatic organism TRV with HQs of 38.5 and 34.8. The dissolved maximum and 95UCLM concentrations exceeded the chronic aquatic organism TRV with HQs of 36.8 and 31.8. When the acute aquatic organism TRV is considered (Table 4-11), the HQs fall to 1.40 and 1.27 for maximum and 95UCLM total concentrations and 1.34 and 1.15 for the maximum and 95UCLM dissolved concentrations. Due to the low magnitudes of exceedance of the acute aquatic organism TRV, barium is not expected to pose risk to aquatic organisms.

<u>Copper</u>

Total copper was detected in 11 of 12 surface water samples and dissolved copper was detected in 3 of 12 surface water samples. The total maximum and 95UCLMs concentrations exceeded the chronic aquatic organism TRV with HQs of 22.0 and 9.94. The dissolved maximum concentration exceeded the chronic aquatic organism TRV with an HQ of 20.8. When the acute aquatic organism TRV is considered (Table 4-11), the HQs fall to 14.7 and 6.63 for maximum and 95UCLM total concentrations and 13.9 for the maximum dissolved concentration. As concentrations of copper exceed chronic and acute aquatic organism TRVs, copper may pose risk to aquatic organisms.

<u>Manganese</u>

Total manganese was detected in 12 of 12 surface water samples and dissolved manganese was detected in 6 of 12 surface water samples. The total maximum and 95UCLMs concentrations fall below the chronic aquatic organism TRV. The dissolved maximum concentration exceeded the chronic aquatic organism TRV with an HQ of 1.09 and the 95UCLM concentration falls below the chronic aquatic organism TRV. When the acute aquatic organism TRV is considered (Table 4-11), the HQs fall below 1. Due to the low magnitudes of exceedance of the chronic aquatic organism TRV by the dissolved maximum concentration and lack of exceedance of the acute aquatic organism TRV, manganese is not expected to pose risk to aquatic organisms.

<u>DDTr</u>

DDTr was detected in 1 of 12 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 31.0. When the acute aquatic organism TRV is considered (Table 4-11), the HQ falls below 1. Due to the lack of exceedance of the acute aquatic organism TRV, DDTr is not expected to pose risk to aquatic organisms.

<u>Bis(2-ethylhexl)phthalate</u>

Bis(2-ethylhexl)phthalate was detected in 1 of 12 surface water samples. The maximum total concentration exceeded the chronic aquatic organism TRV with an HQ of 1.03. When the acute aquatic organism TRV is considered (Table 4-11), the HQ falls below 1. Due to the lack of exceedance of the acute aquatic organism TRV, bis(2-ethylhexl)phthalate is not expected to pose risk to aquatic organisms.

9.7.3.1 Threatened and Endangered Species

It is possible that the Rio Grande silvery minnow, a federal and state endangered fish species, and the river goby, a state threatened fish species may utilize habitat within Exposure Area 5: Lined Canals, Reservoirs, and Soil. When the maximum and 95UCLM concentrations were compared to aquatic organism TRVs, barium, copper, DDTr, and bis(2-ethylhexl)phthalate are in exceedance. This indicates that if the Rio Grande silvery minnow or river goby is onsite, the species may be adversely affected due to these COPCs within Exposure Area 5: Lined Canals, Reservoirs, and Soil.

9.8 COMPARISON TO BACKGROUND AND UPGRADIENT REFERENCE CONCENTRATIONS

Surface soil concentrations for Exposure Area 5: Lined Canals, Reservoirs, and Soil were compared to background soil concentrations. Comparisons are presented in Table 9-11. Vanadium was identified as a COPC. Maximum and 95UCLM Exposure Area 5 concentrations of vanadium exceeded maximum and 95UCLM concentrations in background; however, Exposure Area 5 vanadium concentrations exceeded background by less than 20 percent. A number of chemicals, including chromium, manganese, vanadium, zinc, DDTr, bis(2-ethylhexl)phthalate, and butylbenzylphthalate, were identified as potentially posing risks to threatened and endangered species. With the exception of DDTr, all had maximum concentrations exceeding background 95UCLM.

Sediment and surface water concentrations for Exposure Area 5: Lined Canals, Reservoirs, and Soil were compared to upgradient reference concentrations as represented by data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado. Comparisons are presented in Table 9-12 and Table 9-13. Discussion of results focuses on those chemicals identified as COPCs for the exposure area. Copper, manganese, vanadium, DDTr, butylbenzylphthalate, LMW PAHs, HMW PAHs, and bis(2-ethylhexl)phthalate were identified as potentially driving risks, with the following observations regarding comparison to background:

- **Copper:** Copper concentrations in sediment and surface water in Exposure Area 5: Lined Canals, Reservoirs, and Soil exceeds upgradient reference concentrations.

- **Manganese:** Manganese concentrations in Exposure Area 5: Lined Canals, Reservoirs, and Soil sediment and surface water are below the 95UPL for upgradient reference.

- **LMW and HMW PAHs:** LMW and HMW PAHs concentrations in sediment in Exposure Area 5: Lined Canals, Reservoirs, and Soil exceeds upgradient reference concentrations. LMW and HMW PAHs were not detected in surface water in Exposure Area 5.

- **Bis(2-ethylhexl)phthalate and butylbenzylphthalate:** Bis(2-ethylhexl)phthalate and butylbenzylphthalate concentrations in sediment and surface water in Exposure Area 5: Lined Canals, Reservoirs, and Soil exceeds upgradient reference concentrations.

- **Vanadium**: Maximum vanadium concentrations in Exposure Area 5: Lined Canals, Reservoirs, and Soil sediment exceed the 95UPL for upgradient reference values. However 95UCLM sediment concentrations and maximum surface water concentrations are consistent with upgradient reference values.

- **DDTr**: DDTr concentrations in Exposure Area 5: Lined Canals, Reservoirs, and Soil sediment exceeds the 95UPL for upgradient reference values. DDTr was detected in one surface water sample from Exposure Area 5 but was not detected in surface water samples from the upstream reference area; however, it is likely that the detection was due to the presense of suspended sediment in the sample and is not considered indicative of surface water contamination. Additional discussion is provided in Section 12.2.2.12.

Based on these findings, it is likely that manganese and possibly vanadium concentrations are consistent with background, while LMW PAHs, HMW PAHs, DDTr, bis(2-ethylhexl)phthalate and butylbenzylphthalate are not and are associated specifically with the exposure grouping. It is important to note that exceedances for these chemicals are associated with a small number of samples, several of which are associated with sludge from the water treatment plant. Barium, PCBs, and several pesticides are identified as potentially driving risks for threatened and endangered species. Concentrations of barium are consistent with background while concentrations of pesticides and PCBs are not.

There are a number of uncertainties associated with background comparisons that are discussed in Section 10. These include the fact that sediment and surface water evaluation is limited to comparison to upgradient reference values as represented by the two exposure groupings upstream of the siphon. Chemicals exceeding the upgradient reference values at the site include pesticides, phthalates, PAHs, and metals, all of which are commonly found in background sources such as road runoff, agricultural applications of pesticides, and atmospheric deposition.

9.9 SUMMARY FOR EXPOSURE AREA 5: LINED CANALS, RESERVOIRS, AND SOIL

The ERA for Exposure Area 5: Lined Canals, Reservoirs, and Soil evaluated risks to avian and mammalian wildlife, benthic organisms, and aquatic organisms and plants. It also evaluated risks to plants, soil invertebrates, avian and mammalian wildlife from chemicals in soil. For terrestrial exposures, there are no chemicals detected in the surface soil that are expected to pose ecological risk to soil invertebrates or terrestrial mammals. These findings are based on LOAEL exceedances by 95UCLM case scenario doses. Vanadium may pose risks to terrestrial plants and terrestrial omnivorous birds. Vanadium in soil exceeds background concentrations but are less than 20 percent above background.

For aquatic exposures, copper, vanadium, DDTr, and butylbenzylphthalate may pose risks to aquatic insectivorous birds. Copper and DDTr may pose risks to small piscivorous birds. Copper and HMW PAHs may pose risks to aquatic carnivorous mammals. Copper, manganese, vanadium, and HMW PAHs may pose risks to aquatic plants. Copper, LMW PAHs, HMW PAHs, and bis(2-ethylhexl)phthalate may pose risks to benthic invertebrates. Copper may pose risks to aquatic organisms. With the exception of manganese and vanadium, concentrations are not consistent with background.

Risks to threatened and endangered species were considered separately based on 95UCLM case scenario exceedance of NOAELs for wildlife, TEL exceedances for benthos, and chronic criteria exceedance for surface water. COPCs in within Exposure Area 5: Lined Canals, Reservoirs, and Soil may pose risk to threatened and endangered species that may be present. The star cactus, Texas ayenia, and Walker's manioc may be adversely affected by chromium, manganese, and vanadium. The northern beardless-tyrannulet, rose-throated becard, Sprague's Pipit, Texas Botteri's sparrow, and tropical parula may be adversely affected by two metals (vanadium and zinc), DDTr, and butylbenzylphthalate. The common black-hawk, white-faced ibis, and wood stork may be adversely affected by two metals (copper and vanadium), DDTr, total HMW PAHs, bis(2-ethylhexl)phthalate, and butylbenzylphthalate. The interior least tern may be adversely affected by copper, DDTr, and bis(2-ethylhexl)phthalate. The reddish egret may be adversely affected by copper and DDTr. The southern yellow bat and the white-nosed coati may be adversely affected by vanadium. The Coues' rice rat may be adversely affected by copper, total PCB congeners, total PCB Aroclors, and total HMW PAHs. The false spike mussel, salina mucket, and Texas hornshell may be adversely affected by barium, copper, DDTr, delta-BHC, dieldrin, endosulfan II, heptachlor, methoxychlor, total LMW PAHs, total HMW PAHs, and bis(2-ethylhexl)phthalate. The Rio Grande silvery minnow and the river goby may be adversely affected by barium, copper, DDTr, and bis(2-ethylhexl)phthalate. Concentrations of barium are consistent with background, but concentrations of PCBs and pesticides are not.

Some of the detected chemicals are lacking a TRV and thus cannot be evaluated. The uncertainty associated with a lack of TRV is discussed in Section 10.

10. UNCERTAINTIES

This ERA incorporates a number of uncertainties associated with the estimates of ecological risk. As directed in the ERA guidance (EPA 1997), a conservative approach was utilized in the ERA to ensure that chemicals eliminated from consideration do not pose risks to ecological receptors. Accordingly, the risks are likely to be overestimated. The main areas of uncertainty associated with the ERA are grouped under the following categories, each of which is discussed in the following subsections:

- Environmental Sampling and Analysis
- Analysis of Chemical Data
- Analysis of Estimated Exposure and Toxicity Data
- Assessment of Risks
- Presence of Threatened and Endangered Species.

10.1 ENVIRONMENTAL SAMPLING AND ANALYSIS

Of the potential uncertainties associated with environmental sampling, the sample design is likely to have the greatest impact on the evaluation of risks to ecological resources. The sample design was developed based on the available historical information regarding the activities that took place at the site. Focusing the study design to provide analyses for certain chemicals to specific suspected source areas is a valid and accepted means of maintaining a practical and efficient limit on the field effort. However, there is always a possibility that the study design could miss samples where these chemicals are present, or miss other types of chemicals in a specific sample.

In an effort to address the uncertainties just discussed, and in accordance with the conservative nature of ERAs, samples were biased to areas of likely contamination in an effort to characterize the areas that were most impacted from historic activities. For example, the food webs assume that mammals and birds obtain all their food from within a grouping, clearly a highly conservative assumption. With the exception of fixed or limited mobility receptors (e.g., benthic organisms), ecological receptors are unlikely to utilize only those areas of highest contamination, and are more likely to forage over a larger area that includes areas of contamination as well as less contaminated outlying areas.

10.2 ANALYSIS OF CHEMICAL DATA

The maximum concentration of a pair of duplicate or split samples (taken from the same location on the same date) was used to represent the concentration for that location. Selecting the maximum concentration of a chemical detected in duplicate samples for use in the ERAs is a conservative measure and may overestimate risks. The 95UCLM was used as an upper estimate of mean exposures. This exposure scenario is conservative and may also overestimate risks presented in this report.

Chemicals that are not detected in any onsite samples are considered not to be present at the site, because, based on the analytical tools and capabilities at the time of investigation, there is no evidence indicating that these chemicals are present. Risks from chemicals below detection levels cannot be determined; therefore, the assessment of risk from chemicals below detection levels remains an uncertainty in this ERA.

10.3 DATA ANALYSIS OF ESTIMATED EXPOSURE AND TOXICITY DATA

A major source of uncertainty in the ERA is associated with the estimation of receptor exposure to COPCs. Generally, the models used to estimate exposures from soil and prey were created to represent a worst-case scenario of possible risks to the receptor groups, and thus, many conservative assumptions were incorporated into the models.

One specific uncertainty associated with exposure estimates is the use of fish and benthos tissue. As ecological receptors will consume fish whole, only whole body tissue concentrations were utilized in this ERA. Some of the fish fillet tissue concentrations were found to have much higher PCB concentrations than detected in whole body fish tissue. There is uncertainty to which (the fillet or the whole body tissue) is more representative of conditions that may be faced by ecological receptors. In addition, only tissue collected from within an exposure area was utilized in the food web based models for that grouping. There is some uncertainty with this method as fish are mobile and will move around the site and we cannot be sure where they spent time. An alternative method would be to take all of the tissue together for the site to for use in the models but there is also uncertainty associated with this method.

There is uncertainty associated with the lack of formal literature-based TRVs for certain chemicals. There were a number of chemicals detected for which TRVs could not be established or derived for certain receptors because adequate toxicity information could not be found in the scientific literature. Given the absence of methods for estimating risks from exposure to chemicals with no appropriate TRVs, it is not possible to estimate the uncertainty associated with the limitation. It is not possible to indicate if the impacts result in an underestimate or overestimate of potential ecological risks. Presumably, either scenario is possible. Consequently, risks to ecological receptors resulting from exposure to these chemicals without TRVs cannot be quantitatively assessed.

There are a number of uncertainties associated with background comparisons. It is important to note that the evaluation of background presented in this risk assessment for sediment and surface water is limited to comparison to upgradient reference values as represented by the two exposure groupings upstream of the siphon (Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado). This provides a useful comparison as the siphon is considered the most likely source of site-related chemicals. However, it does not provide a background context for the upstream areas (Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado). Also, it does not necessarily capture the full range of background. A number of the chemicals exceeding the upgradient reference concentrations are pesticides, phthalates, PAHs, and metals, all of which are commonly found in background sources such as road runoff, agricultural applications of pesticides, and atmospheric deposition. Risk management should consider the distribution of these chemicals in determining whether risk management is warranted.

There is also uncertainty associated with toxicological evaluation of essential nutrients including calcium, iron, magnesium, potassium, and sodium. These chemicals are necessary for metabolic processes in organisms and, thus, are considered essential nutrients for wildlife. At naturally occurring concentrations, receptors are able to regulate uptake and metabolism of these elements. However, as with all chemicals, it is possible that nutrients may produce toxic effects at very highly elevated concentrations. These five chemicals do not have screening level concentrations or TRVs, except iron which has screening level concentrations for surface soil. As these metals are essential nutrients, adverse effects on organisms can occur if concentrations are either too low (causing deficiency symptoms) or too high (causing toxic symptoms). However, organisms can adapt to different levels of these metals, although there is little information available regarding concentrations at which adverse effects of either type may be observed. Because screening-level concentrations and TRVs are not available for the essential nutrients, it is not possible to quantitatively assess the potential for risks to ecological receptors from them. However, because these nutrients are essential to flora and fauna, these essential nutrients are not maintained as COPCs.

10.4 ASSESSMENT OF RISKS

There are uncertainties associated with the assessment of risks in the ERA for the site. One apparent uncertainty results from the extrapolation of assumptions about the potential for adverse effects from individual organisms to populations. The intent of this ERA, as set forth in the assessment endpoints, is to ultimately evaluate risks to populations. Few methods are available to extrapolate the potential for adverse effects from the individual level to the population level. It is generally assumed that if there is no potential for direct adverse effects to individual organisms then it is also unlikely for there to be the potential for direct adverse effects to populations. Similarly, it is assumed that if there is the potential for adverse effects to individual organisms there is also the potential for adverse effects to populations. However, it is conservative to assume that potential damage at the individual level will impact the populations in the surrounding ecosystem.

This uncertainty is one of several limitations associated with the use of HQs to determine the potential for risk to ecological receptors. While the HQ is a standard tool in ERAs set forth in EPA guidance (EPA 1997), an article in the scientific literature points out a number of limitations to the use of this method (Tannenbaum et al. 2003). The use of the HQ identifies a potential for risk as opposed to an actual risk, because the HQ result is not a probability. Because the HQ identifies whether a dose or concentration exceeds a benchmark, it is not a linear or scalable metric. Also, the HQ cannot be used to quantitatively extrapolate between individual and population level effects. Because HQs are based on NOAELs and on the most sensitive species in a medium, HQs are often exceeded by concentrations normally found in the environment. All of these limitations should be considered before using HQ-based estimates of the potential for risk to draw conclusions or make decisions based on assessment results.

Another important uncertainty is the limited ability of risk assessment to assess combined and synergistic effects of chemicals. At the site, ecological receptors are exposed to a chemical mixture; however, comparison of individual chemicals to TRVs does not capture the potential for combined effects, with the exception of evaluating the risk of groups of chemicals such as PCBs, LMW PAHs, HMW PAHs, and DDT and its metabolites. Combined and synergistic effects are usually assessed by performing bioassays. As such, risk assessment conclusions have conservatively identified the potential for synergistic effects, and recommended in certain cases the consideration in risk management of all detected chemicals.

Another uncertainty affecting the relevance of the risk assessment is the relevance of risks associated with DDT and other pesticides to site-related sources. The site is located in an agricultural area that is likely to have experienced past use of pesticides via spraying. It is possible that concentrations of DDT and other pesticides and the risks associated with them are regionally elevated. As such, they are not related to site-specific sources and would be a poor candidate for risk management actions.

In addition, the assessment of risks was primarily based on the comparison of estimated doses to toxicity values from the literature. There are many uncertainties associated with these evaluation tools and thus, with the assessment of risks based upon them.

10.5 PRESENCE OF THREATENED AND ENDANGERED SPECIES

A major uncertainty in the ERA is the presence/absence of threatened and endangered species at the site. The threatened and endangered list was determined from a list of potentially present threatened endangered species within Hidalgo County, Texas and habitat type, although no survey has been performed at the site. Therefore, it is not known whether or not the protected species actually utilize the site.

11. ECOLOGICAL RISK ASSESSMENT SUMMARY

The ERA was initiated with development of a CSM and performance of media-specific screening as part of a SLERA. The SLERA concludes that there are COPCs in surface soil, sediment, and surface water that required further evaluation. The results of the SLERA represent maximum estimates of risk, and are not necessarily representative of population-wide risks; therefore, the ERA includes data evaluation and risk characterization which rely on receptor-specific risk estimates using more site-specific assumptions and information. This provides a more site-specific and realistic risk characterization for the site that are used to make conclusions.

A number of uncertainties are inherent in the assessment of risks and should be considered in interpretation of results. One of the greatest uncertainties inherent to the risk assessment is the assumption that effects on individuals, as indicated by benchmark exceedances, are indicative of population-level effects. Also, assumptions made in the screening level risk assessment are highly precautionary and may overestimate risk, while assumptions made throughout the assessment require generalizations that may result in over- or under-estimated risks.

For all of the groupings discussed below, risk management should consider uncertainties associated with site-specific background. Background comparison data are not available for the Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado. It is therefore uncertain whether metals in sediment and water in these areas that may be associated with naturally occurring background minerals. Also, DDTr, pesticide, and PAH concentrations in sediment which may be elevated regionally as opposed to site-related. Background comparisons for other areas were conducted against upgradient reference concentrations, which helps identify those chemicals specifically associated with the influence of the siphon and downstream sources. However, there is some uncertainty whether this captures the full range of background, and risk management should especially consider the possibility that pesticides and other compounds may be related to agricultural land use. There is also uncertainty associated with threatened and endangered species, for which little data is available regarding their actual presence onsite.

11.1 EXPOSURE AREA 1: UPSTREAM OF THE SIPHON

The following chemicals remain as COPC for **aquatic insectivorous birds**:

Vanadium DDTr

The following chemicals remain as COPC for **small piscivorous birds**:

DDTr

The following chemicals remain as COPC for **aquatic plants**:

Vanadium

Also, the following COPCs within Exposure Area 1: Upstream of the Siphon may pose risk to one or more threatened and endangered species that may be present: two metals (barium, and vanadium), total PCB congeners, DDTr, bis(2-ethylhexl)phthalate, and phenol.

11.2 EXPOSURE AREA 2: ARROYO COLORADO

The following chemicals remain as COPC for **aquatic insectivorous birds**:

Vanadium DDTr

The following chemicals remain as COPC for **small piscivorous birds**:

DDTr

The following chemicals remain as COPC for **large piscivorous birds**:

DDTr

The following chemicals remain as COPC for **aquatic plants**:

Manganese Vanadium

Also, the following COPCs within Exposure Area 2: Arroyo Colorado may pose risk to one or more threatened and endangered species that may be present: four metals (barium, manganese, selenium, and vanadium), total PCB congeners, and DDTr.

11.3 EXPOSURE AREA 3: LWMCU AT THE SIPHON EXIT

The following chemicals remain as COPC for **aquatic insectivorous birds** and chemicals that are not consistent with background concentrations are bolded:

Vanadium DDTr

The following chemicals remain as COPC for **small piscivorous birds** and chemicals that are not consistent with background concentrations are bolded:

Vanadium **Total PCB Congeners** DDTr

The following chemicals remain as COPC for **large piscivorous birds** and chemicals that are not consistent with background concentrations are bolded:

DDTr

The following chemicals remain as COPC for **piscivorous mammals** and chemicals that are not consistent with background concentrations are bolded:

Total PCB Congeners **Total PCB Aroclors**

The following chemicals remain as COPC for **aquatic plants** and chemicals that are not consistent with background concentrations are bolded:

Vanadium

The following chemicals remain as COPC for **benthic invertebrates** and chemicals that are not consistent with background concentrations are bolded:

Aroclor-1254 **Total PCB Congeners** **Total PCB Aroclors**

Also, the following COPCs within the Exposure Area 3: LWMCU at the Siphon Exit may pose risk to one or more threatened and endangered species that may be present, and chemicals that are not consistent with background concentrations are bolded: three metals (barium, manganese, and vanadium), **total PCB congeners, Aroclor-1242, Aroclor-1254, Aroclor-1260, total PCB Aroclors,** DDTr, **dieldrin, endosulfan I, endosulfan II, endrin, gamma-Chlordane, heptachlor epoxide, total HMW PAHs, bis(2-ethylhexl)phthalate,** and **di-n-butyl phthalate.**

11.4 EXPOSURE AREA 4: LWMCU DOWNSTREAM OF THE SIPHON

The following chemicals remain as COPC for **aquatic insectivorous birds** and chemicals that are not consistent with background concentrations are bolded:

Vanadium DDTr

The following chemicals remain as COPC for **small piscivorous birds** and chemicals that are not consistent with background concentrations are bolded:

Vanadium **Total PCB Congeners** DDTr

The following chemicals remain as COPC for **large piscivorous birds** and chemicals that are not consistent with background concentrations are bolded:

DDTr

The following chemicals remain as COPC for **piscivorous mammals** and chemicals that are not consistent with background concentrations are bolded:

Total PCB Congeners **Total PCB Aroclors**

The following chemicals remain as COPC for **aquatic plants** and chemicals that are not consistent with background concentrations are bolded:

Vanadium

Also, the following COPCs within the LWMCU Downstream of the Siphon Area may pose risk to one or more threatened and endangered species that may be present and chemicals that are not consistent with background concentrations are bolded: two metals (barium and vanadium), **Aroclor-1254, total PCB congeners, total PCB Aroclors**, and DDTr.

11.5 EXPOSURE AREA 5: LINED CANALS, RESERVOIRS, AND SOIL

The following chemicals remain as COPC for **terrestrial plants** and chemicals that are not consistent with background concentrations are bolded:

Vanadium

The following chemicals remain as COPC for **terrestrial omnivorous birds** and chemicals that are not consistent with background concentrations are bolded:

Vanadium

The following chemicals remain as COPC for **aquatic insectivorous birds** and chemicals that are not consistent with background concentrations are bolded:

Copper	Vanadium	**DDTr**
Butylbenzylphthalate		

The following chemicals remain as COPC for **small piscivorous birds** and chemicals that are not consistent with background concentrations are bolded:

Copper	**DDTr**

The following chemicals remain as COPC for **aquatic carnivorous mammals** and chemicals that are not consistent with background concentrations are bolded:

Copper	**HMW PAHs**

The following chemicals remain as COPC for **aquatic plants** and chemicals that are not consistent with background concentrations are bolded:

Copper	Manganese	Vanadium
HMW PAHs		

The following chemicals remain as COPC for **benthic invertebrates** and chemicals that are not consistent with background concentrations are bolded:

Copper **LMW PAHs** **HMW PAHs**
Bis(2-ethylhexl)phthalate

The following chemicals remain as COPC for **aquatic organisms** and chemicals that are not consistent with background concentrations are bolded:

Copper

Also, the following COPCs within Exposure Area 5: Lined Canals, Reservoirs, and Soil may pose risk to one or more terrestrial threatened and endangered species that may be present, and chemicals that are not consistent with background concentrations are bolded: **chromium, manganese**, vanadium, **zinc**, DDTr, **butylbenzylphthalate,** and **bis(2-ethylhexl)phthalate**. The following COPCs within Exposure Area 5: Lined Canals, Reservoirs, and Soil may pose risk to one or more aquatic threatened and endangered species that may be present: three metals (barium, **copper**, and vanadium), **total PCB congeners, total PCB Aroclors. DDTr, delta-BHC, dieldrin, endosulfan II, heptachlor, methoxychlor, total LMW PAHs, total HMW PAHs**, **bis(2-ethylhexl)phthalate,** and **butylbenzylphthalate**.

12. ECOLOGICAL RISK MANAGEMENT DECISIONS

As discussed in the *Remedial Investigation Report* (EA 2016), the inverted siphon located between the Main Canal and LWMCU, has been identified as the primary source of PCBs, which are the main chemicals driving site risks. However, the ERA identified a number of additional COPCs in site media located upstream and downstream of the Siphon with the potential to pose unacceptable risk to ecological receptors. Many of these additional COPCs are suspected to be ubiquitous regional contaminants related to historical activities and/or background concentrations rather than site-specific contaminant sources. For each chemical with an HQ greater than 1, further evaluation of the spatial extent, magnitude of exceedance, and additional fate and transport information was performed to determine the appropriate path forward within the context of risk management.

12.1 CHEMICALS OF POTENTIAL CONCERN IDENTIFIED IN REFERENCE AREAS

As discussed in Section 4.4.3, Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado are located beyond the direct influence of the Siphon. Contaminant concentrations detected in these areas are considered indicative of regional background concentrations and unrelated to site-specific sources. COPCs identified in Exposure Area 1 and Exposure Area 2 have therefore been dismissed from further consideration for future remedial action at the site.

12.2 CHEMICALS OF POTENTIAL CONCERN IDENTIFIED IN EXPOSURE AREAS 3 THROUGH 5

COPCs have been identified for ecological receptors in Exposure Areas 3 through 5. The subsections below evaluate COPCs for general populations of ecological receptors and for threatened and endangered species.

12.2.1 Chemicals of Potential Concern for General Populations of Ecological Receptors

COPCs for general populations of ecological receptors were evaluated for spatial extent, magnitude of exceedance/severity of effect, and additional fate and transport information.

12.2.1.1 Bis(2-ethylhexyl)phthalate

Bis(2-ethylhexyl)phthalate was identified as a COPC in sediment with the potential to pose unacceptable risk to benthic invertebrates in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Bis(2-ethylhexl)phthalate in sediment in Exposure Area 5 was also identified as having the potential to pose risk to the following threatened and endangered species: common black-hawk, white-faced ibis, wood stork, interior least tern, false spike mussel, Salina mucket, and Texas hornshell. Additional discussion of threatened and endangered species is included in Section 12.2.2. Bis(2-ethylhexl)phthalate was detected in 5 of 19 sediment samples; however, only 1 sample concentration (LEMC-106-SE-0-6) exceeded the benthic TRVs. There is some uncertainty associated with these TRVs as they are based upon marine exposure and the DRCS is a freshwater system. Due to the highly localized nature of the contamination, the potential for exposure to elevated levels of bis(2-ethylhexyl)phthalate at the site is minimal. Bis(2-ethylhexyl)phthalate in sediment has therefore been dismissed from further consideration for future remedial action at the site.

12.2.1.2 Butylbenzylphthalate

Butylbenzylphthalate was identified as a COPC in sediment with the potential to pose unacceptable risk to aquatic insectivorous birds in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Butylbenzylphthalate in sediment in Exposure Area 5 was also identified as having the potential to pose risk to the following threatened and endangered species: common black-hawk, white-faced ibis, and wood stork. Additional discussion of threatened and endangered species is included in Section 12.2.2. Butylbenzylphthalate was only detected in 1 of 19 sediment samples (RN3E-101-SE-0-6). There are no TRVs available for butylbenzylphthalate; therefore, in order to estimate potential risk, the TRVs for di-n-butyl phthalate (Sample et al. 1996) were utilized, introducing some uncertainty. Although the dose from the single detected concentration was more than 20 times greater than the NOAEL-based TRV, it was only two times greater than the LOAEL-based TRV. Due to the highly localized nature of the contamination, the potential for exposure to elevated levels of butylbenzylphthalate at the site is minimal. Butylbenzylphthalate in sediment has therefore been dismissed from further consideration for future remedial action at the site.

12.2.1.3 Copper

Copper was identified as a COPC in sediment and surface water with the potential to pose unacceptable risk to aquatic plants, aquatic insectivorous birds, aquatic carnivorous mammals, small piscivorous birds, benthic invertebrates, and aquatic organisms in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Copper in sediment and surface water in Exposure Area 5 has the potential to pose risk to the following threatened and endangered species: common black-hawk, white-faced ibis, wood stork, interior least tern, reddish egret, Coues' rice rat, false spike mussel, Salina mucket, Texas hornshell, Rio Grande silvery minnow, and the river goby. Additional discussion of threatened and endangered species is included in Section 12.2.2. Copper was detected in 18 of 18 sediment samples and 12 of 12 surface water samples collected within Exposure Area 5 but risk was driven by only 1 very high sediment sample concentration (DWP-101-SE-0-6). The concentration of copper detected in sample DWP-101-SE-0-6 (7,590 mg/kg) was more than 580 times greater than the next highest sediment sample detected in the exposure area (21.5 mg/kg) and exceeded the established background concentration. The sample was collected from within a settling pond at the City of Donna Water Treatment Facility, which is expected to have elevated metals concentrations by design, and was the only sample collected from the pond. The facility is surrounded by a chain-link fence and is not considered to represent viable habitat for receptors of concern at the site. Due to the highly localized nature of the contamination, the potential for exposure to elevated levels of copper at the site is minimal. Copper in sediment and surface water has therefore been dismissed from further consideration for future remedial action at the site.

12.2.1.4 Manganese

Manganese was identified as a COPC in sediment with the potential to pose unacceptable risk to aquatic plants in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Manganese was detected in 18 of 18 sediment samples collected from the exposure area. The maximum and 95UCLM concentrations exceeded the plant TRV; however, manganese concentrations detected in Exposure Area 5 sediment were below the 95UPL for the upgradient reference area and are therefore considered to be consistent with background sediment concentrations at the site. EPA policy does not support remediation of metals concentrations below background (EPA 2002b); therefore, manganese in sediment has been dismissed from further consideration for future remedial action at the site.

12.2.1.5 Vanadium

Vanadium was identified as a COPC in sediment, surface water, and surface soil with the potential to pose unacceptable risk to at least one of the following receptors in each of the exposure areas: terrestrial plants, omnivorous birds, aquatic plants, aquatic insectivorous birds, and small piscivorous birds. Vanadium in sediment, surface water, and surface soil in the exposure areas has the potential to pose risk to the following threatened and endangered species: common black-hawk, white-faced ibis, wood stork, interior least tern, star cactus, Texas ayenia, Walker’s manioc, northern beardless-tyrannulet, rose-throated becard, Sprague’s Pipit, Texas Botteri’s sparrow, tropical parula, southern yellow bat, and the white-nosed coati. Additional discussion of threatened and endangered species is included in Section 12.2.2. Vanadium concentrations in sediment and surface water in each of the downgradient exposure areas were found to be consistent with upgradient reference values. The 95UCLM of vanadium concentrations in soil is 1.05 times greater than the 95UCLM of vanadium concentrations in background soil. The maximum detected vanadium concentration in soil (31.4 mg/kg) exceeded the maximum reference concentration (26.5 mg/kg) by less than 20 percent and was below the established Texas-Specific Soil Background Concentration (50 mg/kg) (TCEQ 2007). Concentrations of vanadium in site media are therefore considered to be consistent with background. EPA policy does not support remediation of metals below background concentrations (EPA 2002b); therefore, vanadium in sediment, surface water, and surface soil has been dismissed from further consideration for future remedial action at the site.

12.2.1.6 DDTr

DDTr was identified as a COPC in sediment and fish tissue with the potential to pose unacceptable risk to aquatic insectivorous birds, small piscivorous birds, and large piscivorous birds in Exposure Areas 3, 4, and 5. DDTr in sediment and fish tissue in the exposure areas has the potential to pose risk to the following threatened and endangered species: common black-hawk, white-faced ibis, wood stork, interior least tern, reddish egret, false spike mussel, Salina mucket, and Texas hornshell. Additional discussion of threatened and endangered species is included in Section 12.2.2. DDTr sediment concentrations in Exposure Area 3: LWMCU at the Siphon Exit and Exposure Area 4: LWMCU Downstream of the Siphon were found to be consistent with upgradient reference values, but sediment concentrations of DDTr detected in

Exposure Area 5: Lined Canals, Reservoirs, and Soil exceeded the 95UPL for upgradient reference values.

For purposes of the ERA, Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado were selected as upstream reference areas. However, due to a number of natural and anthropogenic factors, contaminant concentrations in these areas may be lower than ambient background concentrations. The Main Canal, where most of the samples in Exposure Area 1 were collected, is an unlined earthen canal that requires periodic dredging in order for the irrigation district to maintain the canal capacity. As such, chemicals that were historically allowed for agricultural use but are no longer used in the U.S. (e.g., DDT) may have been partially removed from this canal segment. Although Exposure Area 2 is not known to have been historically dredged, the canal of the Arroyo Colorado is located hundreds of feet from nearby agricultural fields, and therefore may have been somewhat removed from direct pesticide overspray. The Arroyo Colorado is also subject to flood episodes and reworking of sediments; therefore, historical contaminants may have become buried under more recently deposited sediment.

The lined canals and reservoirs of Exposure Area 5 are not known to have ever undergone dredging or other sediment removal activities and are not subject to forces responsible for substantial reworking of sediments. In order to provide a more representative comparison to regional background concentrations of DDTr, sediment concentrations detected in Exposure Area 5 were compared to background surface soil concentrations from the reference area, as the surface soil has undergone similar depositional conditions as Exposure Area 5. The maximum DDTr sediment concentration from Exposure Area 5 was below the UPL for surface soil, indicating that sediment concentrations in Exposure Area 5 are consistent with regional background conditions.

Because the site is located in an agricultural area that is likely to have experienced historical use of pesticides via spraying, and because detected concentrations in sediment are consistent with upgradient concentrations in sediment or soil, it is likely that concentrations of DDT and other associated pesticides are regionally elevated. As such, they are not related to site-specific sources and DDTr in sediment has therefore been dismissed from further consideration for future remedial action at the site.

12.2.1.7 Low Molecular Weight and High Molecular Weight Polycyclic Aromatic Hydrocarbons

Total LMW PAHs were identified as a COPC with the potential to pose unacceptable risk to benthic invertebrates in Exposure Area 5: Lined Canals, Reservoirs, and Soil. LMW PAHs in sediment in Exposure Area 5 has the potential to pose risk to the following threatened and endangered species: false spike mussel, Salina mucket, and Texas hornshell. LMW PAHs were only detected in 2 of 19 sediment samples and risk was driven by one very high concentration detected in sample COMC-101-SE-0-6, which was nearly 400 times greater than the other detection in Exposure Area 5. Due to the highly localized nature of the contamination, the potential for the exposure to elevated levels of LMW PAHs at the site is minimal. Total LMW

PAHs have therefore been dismissed from further consideration for future remedial action at the site.

Total HMW PAHs were identified as a COPC with the potential to pose unacceptable risk to aquatic carnivorous mammals, aquatic plants, and benthic invertebrates in Exposure Area 5: Lined Canals, Reservoirs, and Soil. HMW PAHs in sediment in Exposure Area 5 has the potential to pose risk to the following threatened and endangered species: common black-hawk, white-faced ibis, wood stork , Coues' rice rat, false spike mussel, Salina mucket, and Texas hornshell. Total HMW PAHs were only detected in 3 of 19 sediment samples and risk was driven by one very high concentration detected in sample COMC-101-SE-0-6, which was about 650 times greater than the next highest detection in Exposure Area 5. Due to the highly localized nature of the contamination, the potential for exposure to elevated levels of Total HMW PAHs at the site is minimal. Total HMW PAHs have therefore been dismissed from further consideration for remedial action at the site.

12.2.1.8 Polychlorinated Biphenyls

Total PCBs, both as Aroclors and PCB congeners, were identified as COPC in sediment and fish tissue with the potential to pose risk to small piscivorous birds (PCB congeners only), piscivorous mammals, and benthic invertebrates in Exposure Area 3: LWMCU at the Siphon Exit and small piscivorous birds (PCB congeners only) and piscivorous mammals in Exposure Area 4: LWMCU Downstream of the Siphon. PCBs in sediment, surface water, fish tissue, or benthos tissue from Exposure Areas 3 through 5 have the potential to pose risk to the following threatened and endangered species: interior least tern, reddish egret, Coues' rice rat, false spike mussel, Salina mucket, and Texas hornshell, Rio Grande silvery minnow, and the river goby. Additional discussion of PCBs with regard to threatened and endangered species is included in Section 12.2.2. PCB Aroclors and congeners were detected in all or nearly all sediment samples in Exposure Areas 3 and 4. Due to the high frequency of detection and high magnitude of exceedances of the TRVs, PCBs have been retained as a site-related COPC.

12.2.2 Chemicals of Potential Concern for Threatened and Endangered Species

As previously described, potential risks to threatened and endangered species were estimated based on 95UCLM case scenario exceedances of NOAELs for wildlife, TEL exceedances for benthos, and chronic criteria exceedances for surface water. COPCs for threatened and endangered species were evaluated for spatial extent, magnitude of exceedance/severity of effect, and additional fate and transport information.

12.2.2.1 Barium

Barium was identified as a COPC in sediment and surface water with the potential to pose unacceptable risk to the following threatened and endangered receptors in each of the exposure areas: false spike mussel, Salina mucket, Texas hornshell, Rio Grande silvery minnow, and the river goby. Barium concentrations in sediment and surface water in each of the downgradient exposure areas were found to be consistent with upgradient reference values and are therefore considered to be consistent with background sediment concentrations at the site. EPA policy does not support remediation of metals below background concentrations (EPA 2002b); therefore, barium in sediment and surface water has been dismissed from further consideration for future remedial action at the site.

12.2.2.2 Chromium

Chromium was identified as a COPC in surface soil with the potential to pose unacceptable risk to star cactus, Texas ayenia, and Walker's manioc in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Chromium was detected in 58 of 58 surface soil samples. The maximum surface soil concentration (16.1 mg/kg) exceeds the maximum background soil concentration (14.6 mg/kg), but the 95UCLM concentration falls below the background 95UCLM, indicating chromium concentrations are generally consistent with background concentrations. EPA policy does not support remediation of metals below background concentrations (EPA 2002b); therefore, chromium in surface soil has been dismissed from further consideration for future remedial action at the site.

12.2.2.3 Copper

Copper was identified as a COPC in sediment and surface water with a potential to pose unacceptable risk to common black-hawk, white-faced ibis, wood stork, interior least tern, reddish egret, Coues' rice rat, false spike mussel, salina mucket, Texas hornshell, Rio Grande silvery minnow, and the river goby in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Copper was detected in 18 of 18 sediment samples and 12 of 12 surface water samples collected within Exposure Area 5 but risk was driven by only 1 very high sediment sample concentration (DWP-101-SE-0-6). The concentration of copper detected in sample DWP-101-SE-0-6 (7,590 mg/kg) was more than 580 times greater than the next highest sediment sample detected in the exposure area (21.5 mg/kg) and exceeded the established background concentration. The sample was collected from within a settling pond at the City of Donna Water Treatment Facility, which is expected to have elevated metals concentrations by design, and was the only sample collected from the pond. The facility is surrounded by a chain-link fence and is not considered to represent viable habitat for receptors of concern at the site. Due to the highly localized nature of the contamination, the potential for exposure to elevated levels of copper at the site is minimal. Copper in sediment and surface water has therefore been dismissed from further consideration for future remedial action at the site.

12.2.2.4 Manganese

Manganese was identified as a COPC in surface water with the potential to pose unacceptable risk to Rio Grande silvery minnow and the river goby in Exposure Area 3: LWMCU at the Siphon Exit. The maximum surface water concentration (126 µg/L) exceeded the chronic surface water criteria (120µg/L) with an HQ of 1.05. Concentrations in surface water in Exposure Area 3 were found to be consistent with upgradient reference values and are therefore considered to be consistent with background surface water concentrations at the site. EPA policy does not support remediation of metals below background concentrations (EPA 2002b); therefore, manganese in surface water has been dismissed from further consideration for future remedial action at the site.

Manganese was identified as a COPC in surface soil with the potential to pose unacceptable risk to star cactus, Texas ayenia, and Walker's manioc in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Manganese was detected in 58 of 58 surface soil samples. The maximum surface soil concentration (779 mg/kg) exceeds the maximum background soil concentration (567 mg/kg), but the 95UCLM concentration falls below the background 95UCLM, indicating manganese concentrations are generally consistent with background concentrations. EPA policy does not support remediation of metals below background concentrations (EPA 2002b); therefore, manganese in surface soil has been dismissed from further consideration for future remedial action at the site.

12.2.2.5 Vanadium

Vanadium was identified as a COPC in sediment, surface water, and surface soil with the potential to pose unacceptable risk to common black-hawk, white-faced ibis, wood stork, interior least tern, star cactus, Texas ayenia, Walker's manioc, northern beardless-tyrannulet, rose-throated becard, Sprague's Pipit, Texas Botteri's sparrow, tropical parula, southern yellow bat, and the white-nosed coati. Vanadium concentrations in sediment and surface water in each of the downgradient exposure areas were found to be consistent with upgradient reference values. The 95UCLM of vanadium concentrations in soil is 1.05 times greater than the 95UCLM of vanadium concentrations in background soil. The maximum detected vanadium concentration in soil (31.4 mg/kg) exceeded the maximum reference concentration (26.5 mg/kg) by less than 20 percent and was below the established Texas-Specific Soil Background Concentration (50 mg/kg) (TCEQ 2007). Concentrations of vanadium in site media are therefore considered to be consistent with background. EPA policy does not support remediation of metals below background concentrations (EPA 2002b); therefore, vanadium in sediment, surface water, and soil has been dismissed from further consideration for future remedial action at the site.

12.2.2.6 Zinc

Zinc was identified as a COPC in surface soil with the potential to pose unacceptable risk to northern beardless-tyrannulet, rose-throated becard, Sprague's Pipit, Texas Botteri's sparrow, and tropical parula in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Zinc was detected in 58 of 58 surface soil samples. The maximum surface soil concentration (160 mg/kg) exceeds the maximum background soil concentration (87.4 mg/kg), but the 95UCLM concentration falls below the background 95UCLM, indicating zinc concentrations are generally consistent with background concentrations. EPA policy does not support remediation of metals below background concentrations (EPA 2002b); therefore, zinc in surface soil has been dismissed from further consideration for future remedial action at the site.

12.2.2.7 Bis(2-ethylhexyl)phthalate

Bis(2-ethylhexyl)phthalate was identified as a COPC in sediment with the potential to pose unacceptable risk to common black-hawk, white-faced ibis, and wood stork, false spike mussel, Salina mucket, and Texas hornshell in Exposure Area 3: LWMCU at the Siphon Exit. Bis(2-ethylhexl)phthalate was detected in 2 of 11 sediment samples. The maximum sediment concentration (0.67 mg/kg) exceeds the threshold effects TRV (0.182 mg/kg) with an HQ of 3.7.

When compared to the probable effects TRV and the midpoint between the TRVs, the HQs are less than 1. The maximum concentration is less than 2 times the upgradient reference values. There is some uncertainty associated with the TRV as they are based upon marine exposure and the DRCS is a freshwater system. Due to the low frequency of detection and low magnitudes of exceedance of the threshold effects TRV and upgradient reference values, bis(2-ethylhexyl)phthalate in sediment from Exposure Area 3 has been dismissed from further consideration for future remedial action at the site.

Bis(2-ethylhexyl)phthalate was identified as a COPC in surface water with the potential to pose unacceptable risk to Rio Grande silvery minnow and the river goby in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Bis(2-ethylhexyl)phthalate was detected in only 1 of 12 surface water samples with a concentration of 3.1 μg/L which exceeded the chronic surface water criteria (3 μg/L) with an HQ of 1.03. Concentrations in surface water in Exposure Area 5 were found to be consistent with upgradient reference values and are therefore considered to be consistent with background surface water concentrations at the site. Therefore, bis(2-ethylhexyl)phthalate in surface water has been dismissed from further consideration for future remedial action at the site.

12.2.2.8 Butylbenzylphthalate

Butylbenzylphthalate was identified as a COPC in surface soil with the potential to pose unacceptable risk to northern beardless-tyrannulet, rose-throated becard, Sprague's Pipit, Texas Botteri's sparrow, and tropical parula in Exposure Area 5: Lined Canals, Reservoirs, and Soil. Butylbenzylphthalate was detected in only 1 of 58 surface soil samples. The HQ for the 95UCLM dose compared to the NOAEL was 1.05. Due to the low frequency of detection and low magnitude of exceedance, in butylbenzylphthalate surface soil has been dismissed from further consideration for future remedial action at the site.

12.2.2.9 Di-n-butyl phthalate

Di-n-butyl phthalate is an SVOC that was identified as a COPC with the potential to pose risk to common black-hawk, white-faced ibis, or wood stork in Exposure Area 3: LWMCU at the Siphon Exit, indicating that if they were onsite, these species may be adversely affected. However, di-n-butyl phthalate was only detected in 1 of 11 sediment samples collected within Exposure Area 3 (LWMCU-110-SE-0-6) and was not detected in any other site media or exposure area. The estimated potential risk was driven almost entirely by the modeled dose from consumption of impacted benthic food items, which was estimated using a BASF of 4. Given that the COPC was only detected in sediment at one location, the potential for consumption of impacted food items containing elevated concentrations of di-n-butyl phthalate is negligible and the potential risk is overestimated. Di-n-butyl phthalate has therefore been dismissed from further consideration for remedial action at the site.

12.2.2.10 Low Molecular Weight and High Molecular Weight Polycyclic Aromatic Hydrocarbons

Total LMW PAHs were identified as a COPC with the potential to pose unacceptable risk to benthic invertebrates in Exposure Area 5: Lined Canals, Reservoirs, and Soil. LMW PAHs in sediment in Exposure Area 5 was also identified as having the potential to pose risk to the following threatened and endangered species: false spike mussel, salina mucket, and Texas hornshell. LMW PAHs were only detected in 2 of 19 sediment samples and risk was driven by one very high concentration detected in sample COMC-101-SE-0-6, which was nearly 400 times greater than the other detection in Exposure Area 5. Due to the highly localized nature of the contamination, the potential for the exposure to elevated levels of LMW PAHs at the site is minimal. Total LMW PAHs have therefore been dismissed from further consideration for future remedial action at the site.

HMW PAHS were identified as a COPC in sediment with the potential to pose unacceptable risk to false spike mussel, salina mucket, and Texas hornshell in Exposure Area 3: LWMCU at the Siphon Exit. HMW PAHs were detected in 3 of 11 sediment samples. The maximum sediment concentration (2.74 mg/kg) exceeds the threshold effects TRV (1.61 mg/kg) with an HQ of 1.7. When compared to the probable effects TRV and the midpoint between the TRVs, the HQs are less than 1. Due to the low frequency of detection and low magnitudes of exceedance of the threshold effects TRV, HMW PAHs in sediment from Exposure Area 3 have been dismissed from further consideration for future remedial action at the site.

12.2.2.11 Phenol

Phenol was identified as a COPC in sediment with the potential to pose unacceptable risk to false spike mussel, salina mucket, and Texas hornshell in Exposure Area 3: LWMCU at the Siphon Exit. Phenol was detected in 3 of 11 sediment samples. The maximum sediment concentration (0.083 mg/kg) exceeds the threshold effects TRV (0.05 mg/kg) with an HQ of 1.7. When compared to the probable effects TRV and the midpoint between the TRVs, the HQs are less than 1. The maximum concentration is less than 1.5 times the upgradient reference values. Due to the low frequency of detection and low magnitudes of exceedance of the threshold effects TRV and upgradient reference values, phenol in sediment from Exposure Area 3 has been dismissed from further consideration for future remedial action at the site.

12.2.2.12 DDTr

DDTr was identified as a COPC in surface soil with the potential to pose unacceptable risk to northern beardless-tyrannulet, rose-throated becard, Sprague’s Pipit, Texas Botteri’s sparrow, and tropical parula in Exposure Area 5: Lined Canals, Reservoirs, and Soil. The maximum DDTr surface soil concentrations fall below the 95UCLM background soil concentration indicating that DDTr surface soil concentrations are consistent with background. Therefore, DDTr in surface soil has been dismissed from further consideration for future remedial action at the site.

DDTr was identified as a COPC in surface water with the potential to pose unacceptable risk to Rio Grande silvery minnow and the river goby in Exposure Area 4: LWMCU Downstream of the Siphon and Exposure Area 5: Lined Canals, Reservoirs, and Soil. DDTr was only detected in one surface water sample from Exposure Area 4 (0.074 µg/L) and from Exposure Area 5 (0.031 µg/L). In each case, only DDT (neither DDD nor DDE) was detected. DDTr was not detected in surface water in the upgradient areas. The logarithm of the octanol/water partition coefficient for DDT is 6.79 (estimated using EPA's EPI Suite KOWWIN program) indicating it is hydrophobic and the detections in surface water are most likely associated with suspended sediment. In addition, the DDT criteria document (EPA 1980a) on which the chronic and acute surface water criteria (EPA 2015) are based, did not determine a final chronic value since the available data did not meet the minimum database requirement. The DDT water concentration to protect aquatic life was determined to be 0.0010 µg/L as a 24-hour average and the not to exceed concentration was 1.1 µg/L (EPA 1980a). However, there were chronic toxicity data for one freshwater fish, the fathead minnow, with a chronic value of 0.74 µg/L (Jarvinen et al. 1977). Since the criteria document did not determine a final chronic value (EPA 1980a), use of 0.001 µg/L as a chronic value to compare to discrete water samples may be overly conservative as the intent was to compare it to 24-hour average concentrations. The surface water detections in the exposure areas are at least 10 times less than the only chronic toxicity data in the criteria document (EPA 1980a). Given the low frequency of detection, the fact that DDT water concentrations are most likely associated with suspended sediment, and the fact that the surface water detections fall below the only chronic toxicity value available; DDTr in surface water is not expected to pose risk to the Rio Grande silvery minnow or the river goby. Therefore, DDTr in surface water has been dismissed from further consideration for future remedial action at the site.

12.2.2.13Pesticides

The following nine pesticides, in addition to DDTr, were identified as COPCs with the potential to pose risk to threatened and endangered species in one or more exposure area:

Dieldrin	Endrin	Heptachlor epoxide
Endosulfan I	gamma-Chlordane	Methoxychlor
Endosulfan II	Heptachlor	delta-BHC

As previously discussed, concentrations of pesticides detected in site media are associated with historical use in the agricultural industry and are considered to be regionally elevated. Because these pesticides are not related to site-specific sources and are instead a regional concern to potential receptors, they have been dismissed from further consideration for remedial action at the site.

12.2.2.14Polychlorinated Biphenyls

PCBs in sediment, surface water, fish tissue, or benthos tissue from Exposure Areas 3 through 5 have the potential to pose risk to the following threatened and endangered species: interior least tern, reddish egret, Coues' rice rat, false spike mussel, Salina mucket, Texas hornshell, Rio Grande silvery minnow, and the river goby. However, potential risks identified for the Rio Grande silvery minnow and river goby were driven entirely by one sample location collected from the bottom of the siphon exit, which was highly turbid. This sample likely represents a concentration of Aroclors bound to particulates in the bed load and is not representative of true surface water exposure and overestimates potential risks to these receptors. Therefore PCBs as Aroclors in surface water have been dismissed from further consideration for remedial action at the site. PCB Aroclors and congeners were detected in all or nearly all sediment samples in Exposure Areas 3 and 4. Due to the high frequency of detection and high magnitude of exceedances of the TRVs, PCBs in sediment, fish tissue, and benthos tissue have been retained as a site-related COPC.

13. ECOLOGICAL RISK ASSESSEMENT CONCLUSIONS

The ERA identified potential risks for ecological receptors from media at the site. COPCs initially identified during the ERA were further evaluated using information regarding spatial extent, magnitude of exceedance, and fate and transport information to determine if further action was required to mitigate potential ecological risks. Based on the results of this analysis, PCBs have been retained as the only site-related COPC that will be addressed in the FS because of potential risks to ecological receptors from exposure to site media identified in the table below.

Ecological Risk Assessment Summary of Conclusions

Exposure Area	Receptor	Media	Chemical of Concern
3: LWMCU at Siphon Exit	Small Piscivorous Birds	Fish Tissue	Total PCB Congeners
	Piscivorous Mammals	Fish Tissue	Total PCB Congeners Total PCB Aroclors
	Benthic Invertebrates	Sediment	Aroclor-1254 Total PCB Congeners Total PCB Aroclors
	Threatened and Endangered Species		
	Interior Least Tern	Fish Tissue	Aroclor-1254 Total PCB Congeners Total PCB Aroclors
	Reddish Egret	Fish Tissue	Total PCB Congeners
	Coues' Rice Rat	Benthos Tissue (via modeled sediment uptake)	Aroclor-1242 Aroclor-1254 Aroclor-1260 Total PCB Congeners Total PCB Aroclors
4: LWMCU Downstream of the Siphon	Small Piscivorous Birds	Fish Tissue	Total PCB Congeners
	Piscivorous Mammals	Fish Tissue	Total PCB Congeners Total PCB Aroclors
	Threatened and Endangered Species		
	Interior Least Tern	Fish Tissue	Aroclor-1254 Total PCB Congeners Total PCB Aroclors
	Reddish Egret	Fish Tissue	Total PCB Congeners
	Coues' Rice Rat	Benthos Tissue	Total PCB Congeners Total PCB Aroclors
5: Lined Canals, Reservoirs, and Soil	Threatened and Endangered Species		
	Coues' Rice Rat	Benthos Tissue (via modeled sediment uptake)	Total PCB Congeners Total PCB Aroclors

Note:
There is uncertainty associated with threatened and endangered species, for which little data is available regarding their actual presence on-site.

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Figures

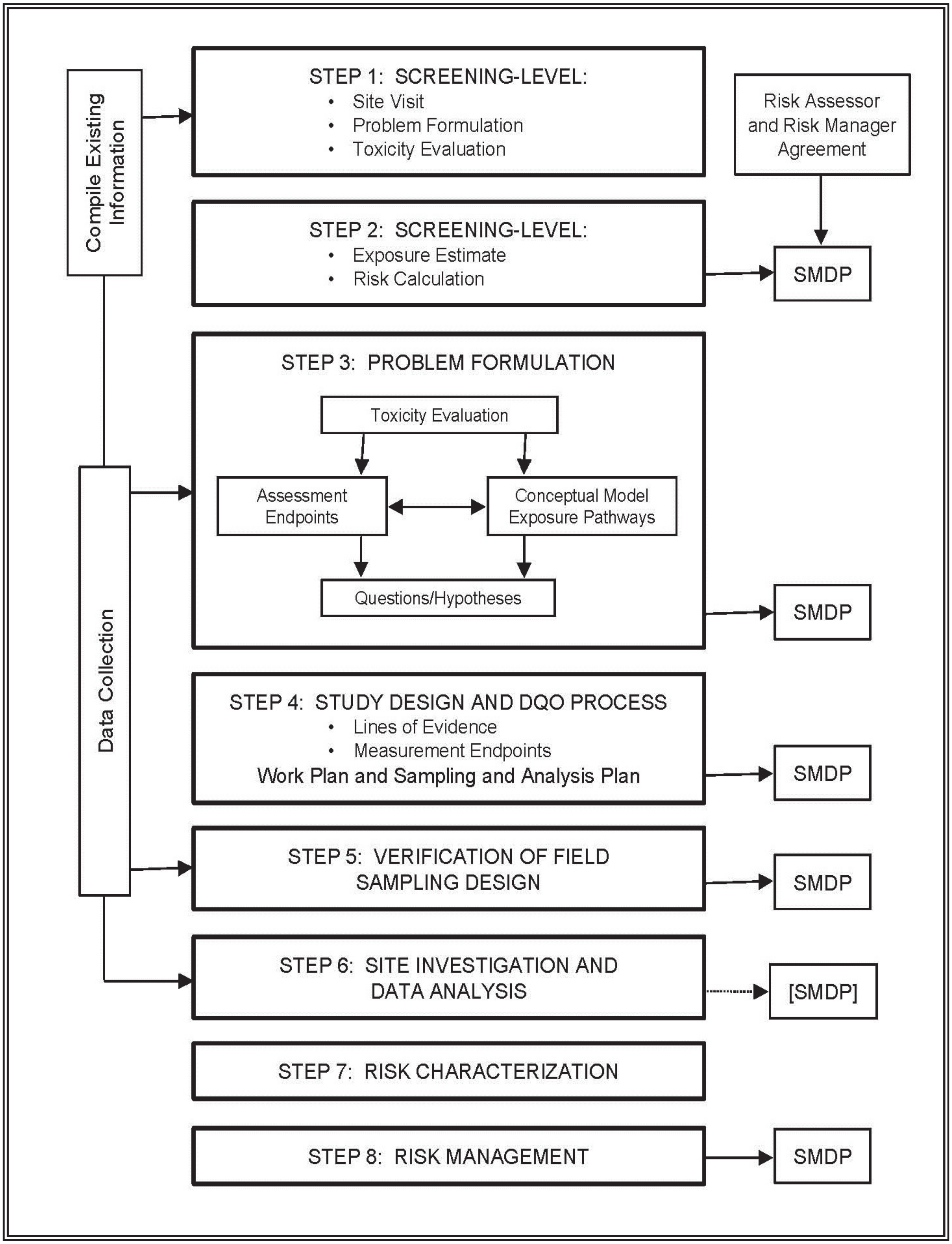
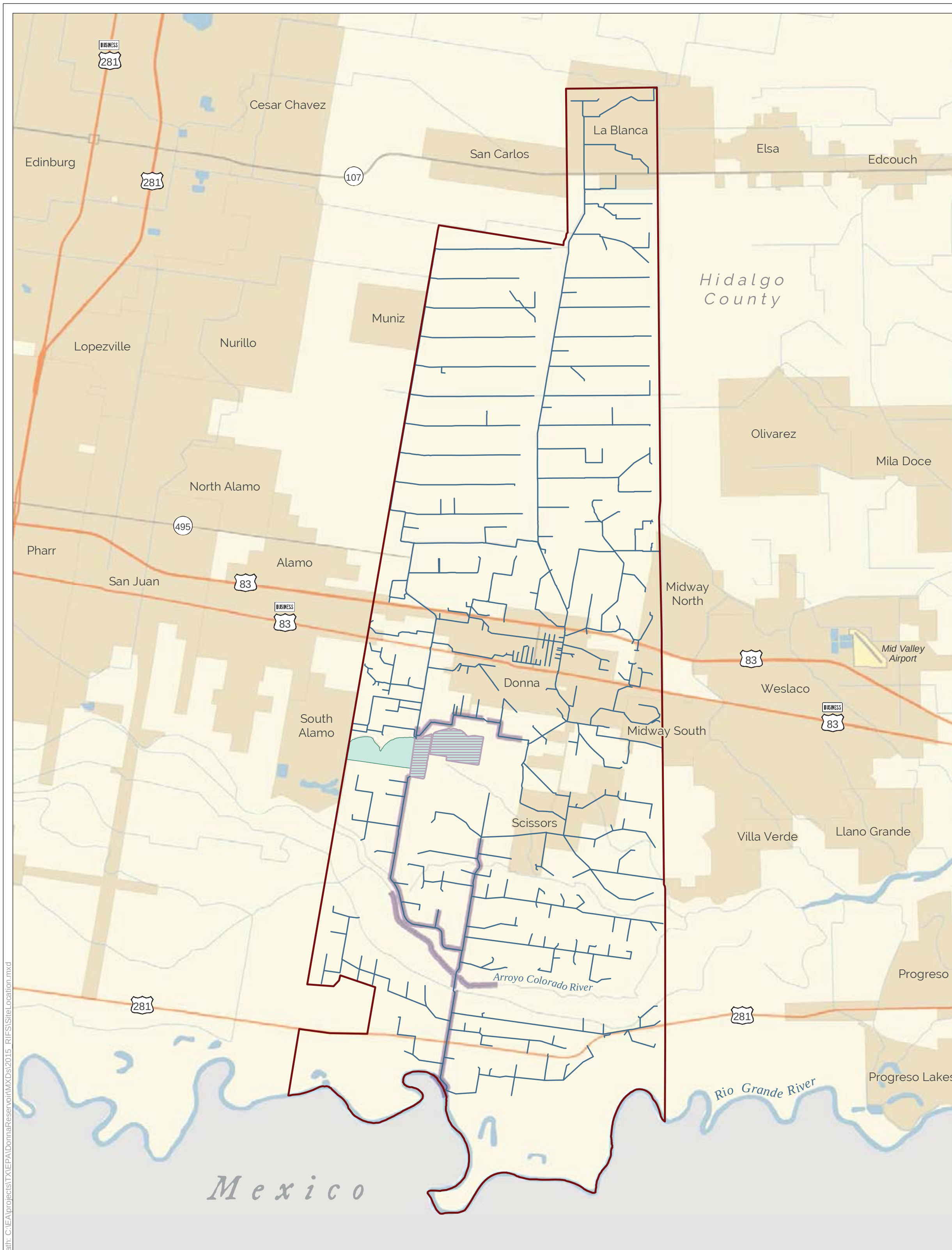


Figure 1-1. Eight-step Ecological Risk Assessment Process for Superfund (from EPA 1997).



Legend

- Canal/River Area Under Investigation
- Portion of Donna Reservoir Under Investigation
- Irrigation Network
- Donna Irrigation District - Hidalgo County No. 1
- Donna Reservoir

Data Sources: Esri 2006,
Texas A&M AgriLife Extension Service 2015, USGS 2014

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Remedial Investigation/Feasibility Study
Donna Reservoir and Canal System
Donna, Hidalgo County, Texas

Figure 1-2.
Site Location

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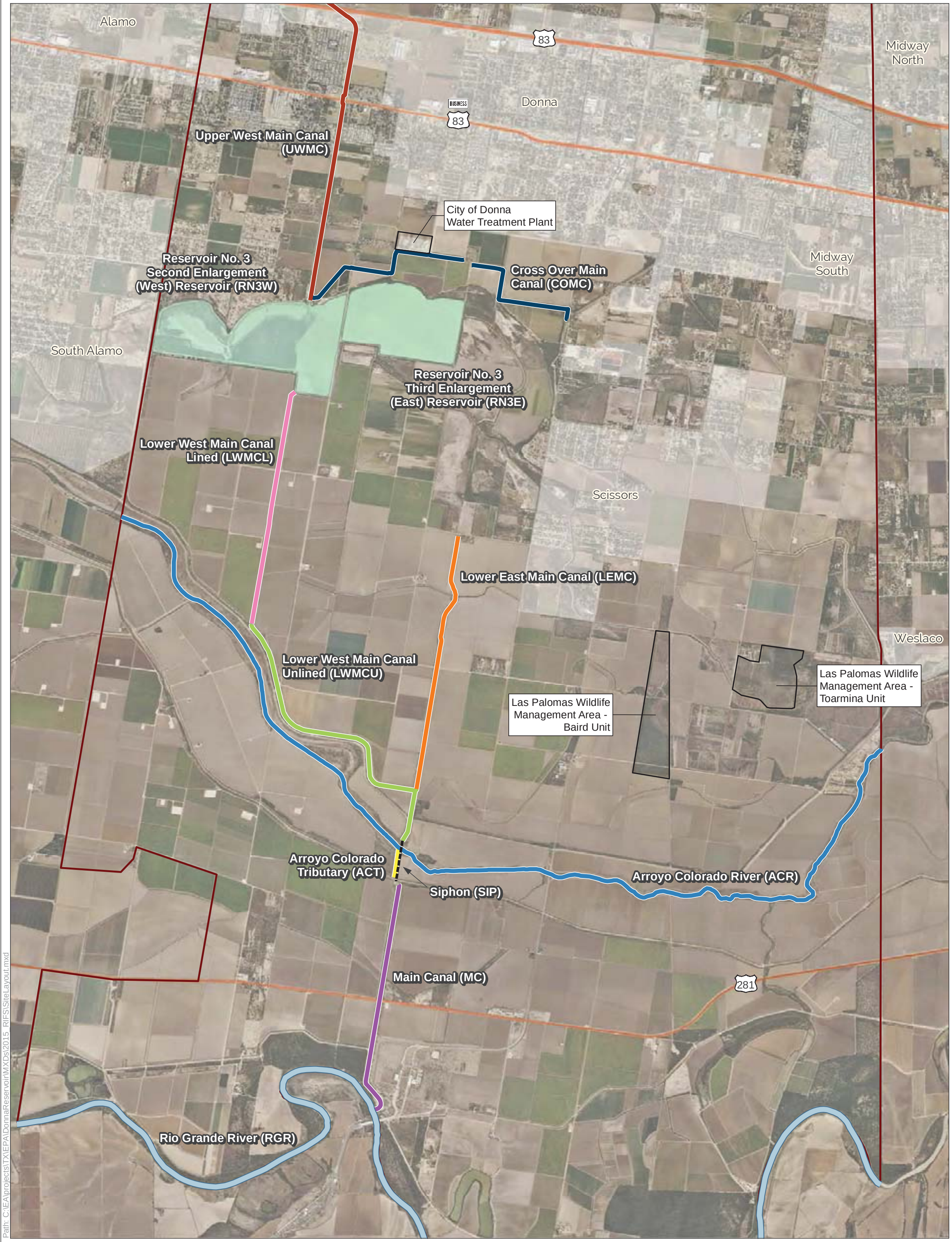

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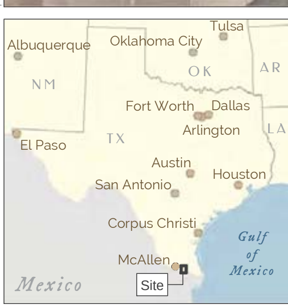

Legend

- Donna Irrigation District - Hidalgo County No. 1
- Donna Reservoir
- Upper West Main Canal
- Cross Over Main Canal
- Lower West Main Canal Lined
- Lower West Main Canal Unlined
- Lower East Main Canal
- Arroyo Colorado River
- Arroyo Colorado Tributary
- Siphon (Underground)
- Main Canal
- Rio Grande River

Data Sources: Esri 2006, Texas A&M AgriLife Extension Service 2015, USGS 2014

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Remedial Investigation/Feasibility Study
Donna Reservoir and Canal System
Donna, Hidalgo County, Texas

Figure 1-3.
Site Layout

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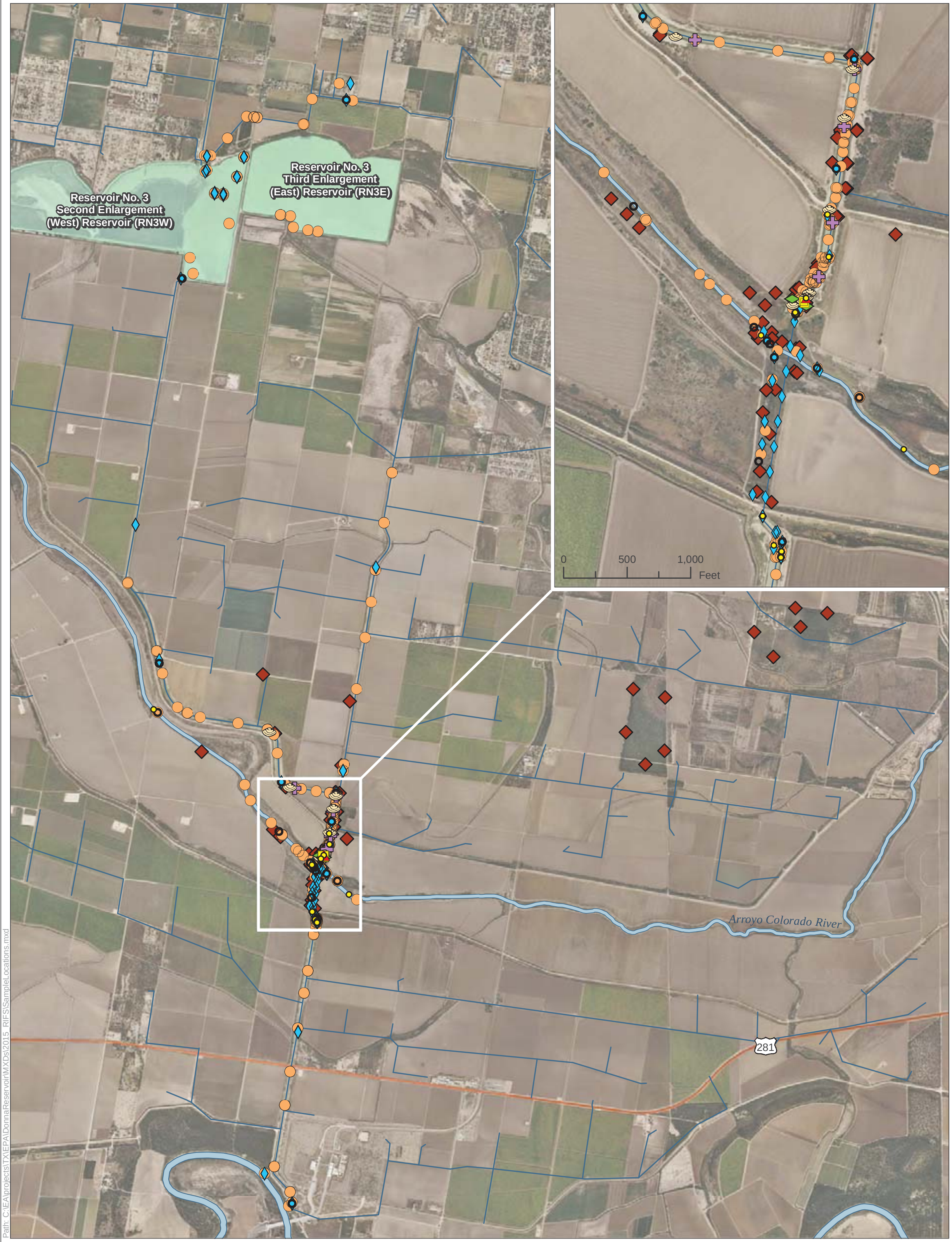

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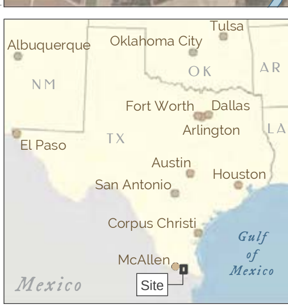

Legend

- Irrigation Network
- Donna Reservoir

Sample Locations by Matrix

- Asphalt (1)
- Concrete (2)
- Ground Water (4)
- Mollusks (9)
- Polyoxymethylene (10)
- Sediment (176)
- Semi-permeable Membrane Device (14)
- Soil (69)
- Surface Water (99)
- Suspended Sediment (20)

Data Sources: Esri 2006, Texas A&M AgriLife Extension Service 2015, USGS 2014

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Remedial Investigation/Feasibility Study
Donna Reservoir and Canal System
Donna, Hidalgo County, Texas

Figure 1-4.
Sample Locations

097808

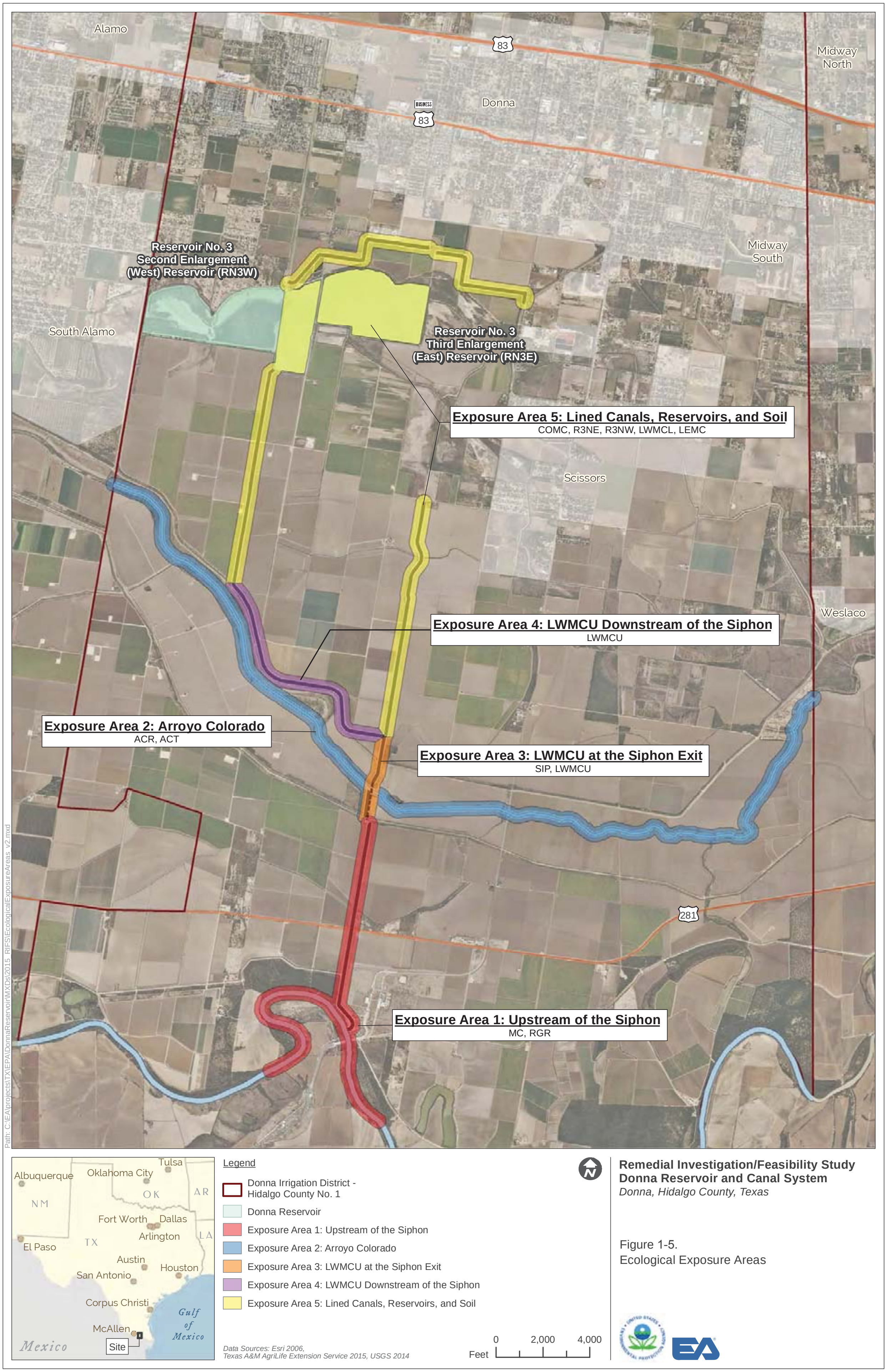

Figure 1-5.
Ecological Exposure Areas

097809

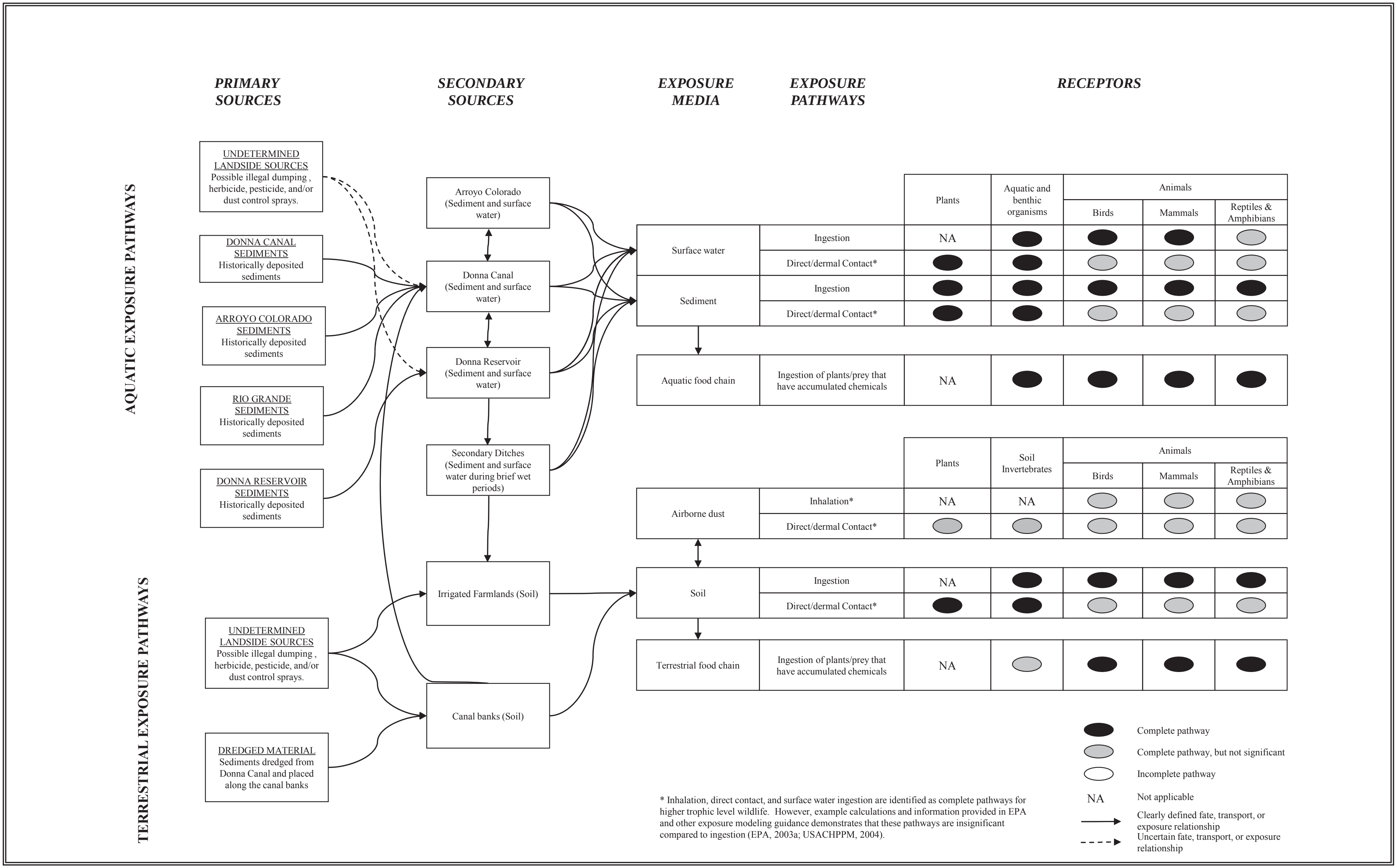

Figure 2-1 Ecological Conceptual Site Model

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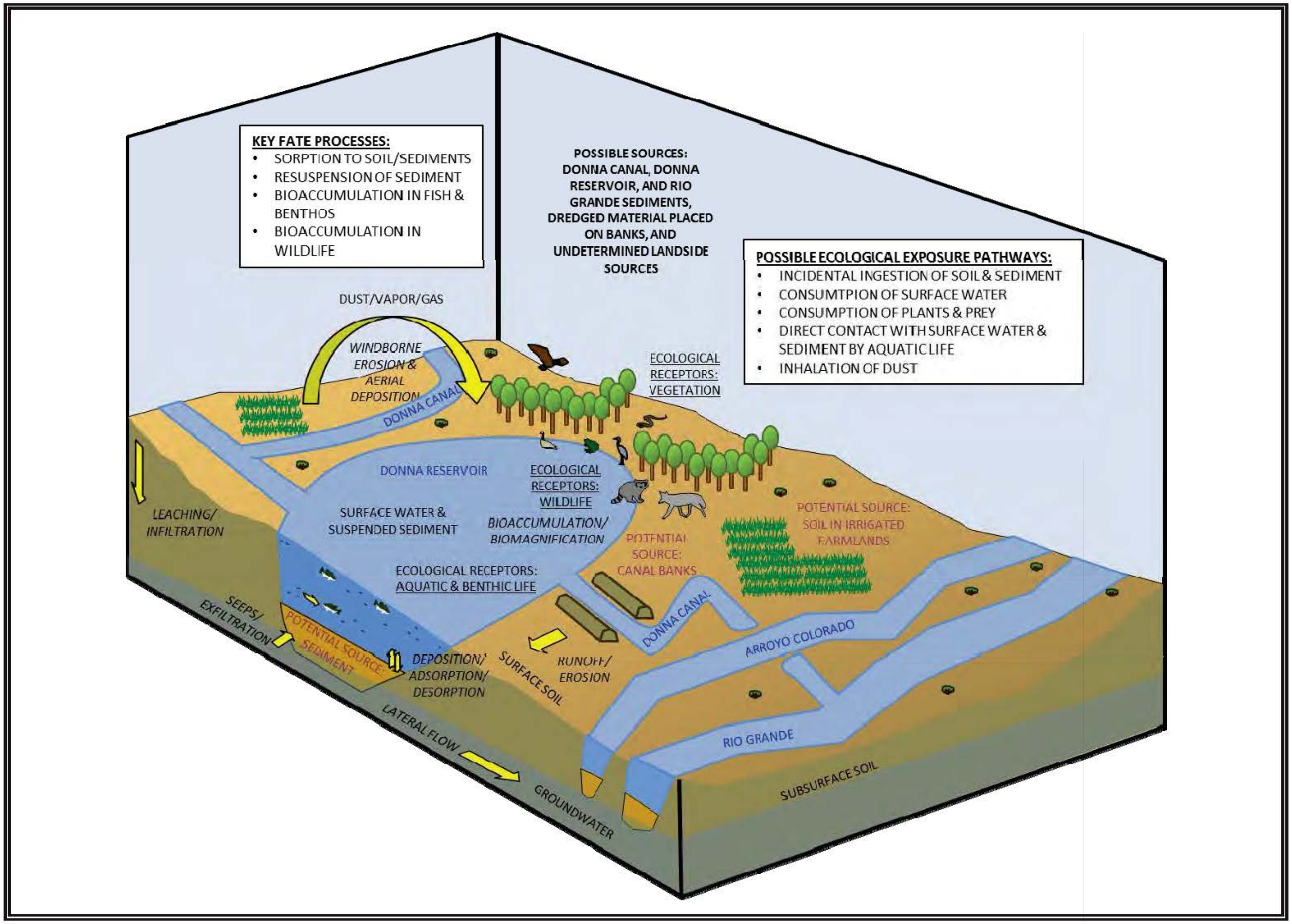

Figure 2-2. Graphical Presentation of Conceptual Site Model for Ecological Exposures

Tables

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Exposure Area 1: Upstream of the Siphon			
Sediment	Main Canal	MC-101-SE-0-6	11/4/2014
Sediment	Main Canal	MC-102-SE-0-6	11/3/2014
Sediment	Main Canal	MC-103-SE-0-6	11/3/2014
Sediment	Main Canal	MC-104-SE-0-6	11/4/2014
Sediment	Main Canal	MC-105-SE-0-6	11/4/2014
Sediment	Main Canal	MC-106-SE-0-6	11/4/2014
Sediment	Main Canal	MC-106-SE-6-12	9/25/2012
Sediment	Main Canal	MC-107-SE-0-6	11/3/2014
Sediment	Main Canal	MC-108-SE-0-6	9/24/2012
Sediment	Main Canal	MC-108-SE-14-24	11/3/2014
Sediment	Main Canal	MC-108-SE-6-14	11/3/2014
Sediment	Main Canal	MC-109-SE-0-6	11/3/2014
Sediment	Main Canal	MC-110-SE-0-6	11/4/2014
Sediment	Main Canal	MC-112-SE-0-2	2/26/2014
Sediment	Main Canal	MC-113-SE-0-1	2/26/2014
Sediment	Main Canal	MC-114-SE-0-5	2/26/2014
Sediment	Main Canal	MC-116-SE-0-1	2/26/2014
Sediment	Main Canal	MC-116-SE-1-5	2/26/2014
Sediment	Main Canal	MC-117-SE-0-5	2/26/2014
Sediment	Main Canal	MC-117-SE-5-7	2/26/2014
Sediment	Main Canal	MC-118-SE-0-3	2/26/2014
Sediment	Rio Grande River	RGR-101-SE-0-6	9/26/2012
Surface Water	Main Canal	DCSW-SG1-01	--
Surface Water	Main Canal	DCSW-SG1-02	--
Surface Water	Main Canal	MC-101-SW	11/3/2014
Surface Water	Main Canal	MC-101-SWF	9/17/2012
Surface Water	Main Canal	MC-102-SW	11/1/2014
Surface Water	Main Canal	MC-102-SWF	9/19/2012
Surface Water	Main Canal	MC-103-SW	11/3/2014
Surface Water	Main Canal	MC-103-SWF	9/21/2012
Surface Water	Main Canal	MC-112-SW	2/24/2014
Surface Water	Main Canal	MC-113-SW	2/24/2014
Surface Water	Main Canal	MC-114-SW	2/24/2014
Surface Water	Main Canal	MC-115-SW	2/24/2014
Surface Water	Main Canal	MC-119-SW	4/1/2014
Surface Water	Main Canal	WEIR-101-SW	4/1/2014
Surface Water	Rio Grande River	RGR-101-SW	9/26/2012
Surface Water	Rio Grande River	RGR-101-SWF	9/26/2012
Fish Tissue - Whole Body	Main Canal	BF-BUF-SG1-W1	--
Fish Tissue - Whole Body	Main Canal	BF-BUF-SG1-W2	--
Fish Tissue - Whole Body	Main Canal	BF-CARP-SG1-W1	--
Fish Tissue - Whole Body	Main Canal	BF-CARP-SG1-W2	--
Fish Tissue - Whole Body	Main Canal	BF-CARP-SG1-W3	--
Fish Tissue - Whole Body	Main Canal	BF-CARP-SG1-W4	--
Fish Tissue - Whole Body	Main Canal	GAR-104-W	10/15/2012
Fish Tissue - Whole Body	Main Canal	LMB-101-W	10/15/2012
Fish Tissue - Whole Body	Main Canal	P-DRUM-SG1-W1	--
Fish Tissue - Whole Body	Main Canal	P-LMB-SG1-W2	--
Fish Tissue - Whole Body	Main Canal	SC-CAT-SG1-W2	--
Fish Tissue - Whole Body	Main Canal	SC-CAT-SG1-W3	--

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Exposure Area 2: Arroyo Colorado			
Sediment	Arroyo Colorado	ACR-101-SE-0-6	9/26/2012
Sediment	Arroyo Colorado	ACR-102-SE-0-6	9/26/2012
Sediment	Arroyo Colorado	ACR-103-SE-0-6	9/26/2012
Sediment	Arroyo Colorado	ACR-103-SE-6-12	9/26/2012
Sediment	Arroyo Colorado	ACR-104-SE-0-6	9/26/2012
Sediment	Arroyo Colorado	ACR-104-SE-6-12	9/26/2012
Sediment	Arroyo Colorado	ACR-105-SE-0-6	9/26/2012
Sediment	Arroyo Colorado	ACR-106-SE-0-6	9/26/2012
Sediment	Arroyo Colorado	ACR-107-SE-0-6	9/26/2012
Sediment	Arroyo Colorado	ACR-108-SE-0-6	9/27/2012
Sediment	Arroyo Colorado	ACR-109-SE-0-6	12/10/2012
Sediment	Arroyo Colorado	ACR-110-SE-0-6	12/10/2012
Sediment	Arroyo Colorado	ACR-111-SE-0-6	12/10/2012
Sediment	Arroyo Colorado	ACR-112-SE-0-6	12/10/2012
Sediment	Arroyo Colorado	ACR-117-SE-0-6	2/21/2013
Sediment	Arroyo Colorado	ACR-118-SE-0-6	2/21/2013
Sediment	Arroyo Colorado	ACR-119-SE-0-6	2/21/2013
Sediment	Arroyo Colorado	ACR-120-SE-0-6	2/21/2013
Sediment	Arroyo Colorado	ACT-102-SE-0-6	9/27/2012
Sediment	Arroyo Colorado	ACT-103-SE-0-6	9/27/2012
Sediment	Arroyo Colorado	ACT-104-SE-0-6	9/27/2012
Sediment	Arroyo Colorado	ACT-105-SE-0-6	9/27/2012
Surface Water	Arroyo Colorado	ACT-102-SW	9/26/2012
Surface Water	Arroyo Colorado	ACT-105-SWF	9/26/2012
Surface Water	Arroyo Colorado	ACT-105-SW	9/26/2012
Surface Water	Arroyo Colorado	ACT-104-SWF	9/26/2012
Surface Water	Arroyo Colorado	ACT-104-SW	9/26/2012
Surface Water	Arroyo Colorado	ACT-103-SWF	9/26/2012
Surface Water	Arroyo Colorado	ACT-102-SWF	9/26/2012
Surface Water	Arroyo Colorado	ACT-101-SWF	9/25/2012
Surface Water	Arroyo Colorado	ACT-101-SW	9/25/2012
Surface Water	Arroyo Colorado	ACR-126-SW	4/1/2014
Surface Water	Arroyo Colorado	ACR-125-SW	4/1/2014
Surface Water	Arroyo Colorado	ACR-102-SWF	9/25/2012
Surface Water	Arroyo Colorado	ACR-102-SW	9/25/2012
Surface Water	Arroyo Colorado	ACR-101-SWF	9/24/2012
Surface Water	Arroyo Colorado	ACR-101-SW	11/1/2014
Surface Water	Arroyo Colorado	ACT-103-SW	9/26/2012
Fish Tissue - Whole Body	Arroyo Colorado	CAT-116-W	2/21/2013
Fish Tissue - Whole Body	Arroyo Colorado	CAR-115-W	2/20/2013
Exposure Area 3: LWMCU at the Siphon Exit			
Sediment	Lower West Main Canal Unlined	LWMCU-101-SE-0-6	11/3/2014
Sediment	Lower West Main Canal Unlined	LWMCU-101-SE-6-12	9/22/2012
Sediment	Lower West Main Canal Unlined	LWMCU-102-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-102-SE-6-12	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-103-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-103-SE-6-12	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-110-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-111-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-112-SE-0-6	10/30/2014

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Sediment	Lower West Main Canal Unlined	LWMCU-113-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-114-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-115-SE-0-6	11/3/2014
Sediment	Lower West Main Canal Unlined	LWMCU-123-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-123-SE-6-12	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-124-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-125-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-126-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-127-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-128-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-129-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-130-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-130-SE-6-12	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-131-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-132-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-133-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-134-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-135-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-135-SE-6-12	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-136-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-137-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-138-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-139-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-140-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-141-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-141-SE-6-12	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-142-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-143-SE-0-6	2/20/2013
Sediment	Lower West Main Canal Unlined	LWMCU-144-SE-0-6	2/19/2013
Sediment	Lower West Main Canal Unlined	LWMCU-145-SE-0-6	2/20/2013
Sediment	Lower West Main Canal Unlined	LWMCU-146-SE-0-6	2/20/2013
Sediment	Lower West Main Canal Unlined	LWMCU-147-SE-0-6	2/20/2013
Sediment	Lower West Main Canal Unlined	LWMCU-148-SE-0-6	2/20/2013
Sediment	Lower West Main Canal Unlined	LWMCU-150-SE-0-6	2/20/2013
Sediment	Lower West Main Canal Unlined	LWMCU-154-SE-0-6	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-154-SE-12-18	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-154-SE-18-19	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-154-SE-6-12	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-155-SE-0-6	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-155-SE-12-18	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-155-SE-6-12	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-156-SE-0-6	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-156-SE-6-9	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-156-SE-9-11	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-157-SE-0-2	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-157-SE-2-6	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-158-SE-0-6	7/16/2013
Sediment	Lower West Main Canal Unlined	LWMCU-158-SE-12-15	7/16/2013
Sediment	Lower West Main Canal Unlined	LWMCU-158-SE-6-12	7/16/2013
Sediment	Lower West Main Canal Unlined	LWMCU-159-SE-0-3	7/16/2013
Sediment	Lower West Main Canal Unlined	LWMCU-159-SE-3-6	7/16/2013

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Sediment	Lower West Main Canal Unlined	LWMCU-159-SE-6-7	7/16/2013
Sediment	Lower West Main Canal Unlined	LWMCU-160-SE-0-6	7/16/2013
Sediment	Lower West Main Canal Unlined	LWMCU-160-SE-6-9	7/16/2013
Sediment	Lower West Main Canal Unlined	LWMCU-160-SE-9-10	7/16/2013
Sediment	Lower West Main Canal Unlined	LWMCU-167-SE-0-5	2/25/2014
Sediment	Lower West Main Canal Unlined	LWMCU-168-SE-0-3	2/25/2014
Sediment	Lower West Main Canal Unlined	LWMCU-170-SE-0-1	2/25/2014
Sediment	Lower West Main Canal Unlined	LWMCU-170-SE-1-1.5	2/25/2014
Sediment	Lower West Main Canal Unlined	LWMCU-171-SE-0-6	4/1/2014
Sediment	Lower West Main Canal Unlined	LWMCU-172-SE-0-6	4/1/2014
Surface Water	Lower West Main Canal Unlined	DCSW-SG2-01	--
Surface Water	Lower West Main Canal Unlined	DCSW-SG2-02	--
Surface Water	Lower West Main Canal Unlined	LWMCU-101-SW	11/1/2014
Surface Water	Lower West Main Canal Unlined	LWMCU-101-SWF	9/18/2012
Surface Water	Lower West Main Canal Unlined	LWMCU-102-SW	10/29/2014
Surface Water	Lower West Main Canal Unlined	LWMCU-102-SWF	9/20/2012
Surface Water	Lower West Main Canal Unlined	LWMCU-103-SW	10/29/2014
Surface Water	Lower West Main Canal Unlined	LWMCU-103-SWF	9/21/2012
Surface Water	Lower West Main Canal Unlined	LWMCU-167-SW	2/24/2014
Surface Water	Lower West Main Canal Unlined	LWMCU-168-SW	2/24/2014
Surface Water	Lower West Main Canal Unlined	LWMCU-169-SW	2/24/2014
Surface Water	Siphon	NSIP-102-SW	2/24/2014
Surface Water	Siphon	NSIP-103-SW	4/1/2014
Surface Water	Siphon	SIP1150-101-SW	3/27/2014
Surface Water	Siphon	SIP1350-101-SW	3/27/2014
Surface Water	Siphon	SIP150-101-SW	3/26/2014
Surface Water	Siphon	SIP1550-101-SW	3/31/2014
Surface Water	Siphon	SIP350-101-SW	3/26/2014
Surface Water	Siphon	SIP550-101-SW	3/26/2014
Surface Water	Siphon	SIP750-101-SW	3/27/2014
Surface Water	Siphon	SIP950-101-SW	3/27/2014
Surface Water	Siphon	SSIP-101-SW	2/24/2014
Surface Water	Siphon	SSIP-103-SW	3/24/2014
Fish Tissue - Whole Body	Lower West Main Canal Unlined	BF-BUF-SG2-W1	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	BF-BUF-SG2-W2	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	BF-CARP-SG2-W1	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	BF-CARP-SG2-W2	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	BF-CARP-SG2-W3	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	BF-CARP-SG2-W4	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	BF-EEL-SG2-W1	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	CAR-111-W	10/17/2012
Fish Tissue - Whole Body	Lower West Main Canal Unlined	CAT-113-W	10/17/2012
Fish Tissue - Whole Body	Lower West Main Canal Unlined	LMB-112-W	10/17/2012
Fish Tissue - Whole Body	Lower West Main Canal Unlined	P-DRUM-SG2-W2	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	P-LMB-SG2-W2	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	SC-CAT-SG2-W3	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	SC-CAT-SG2-W4	--
Fish Tissue - Whole Body	Lower West Main Canal Unlined	TIL-114-W	10/17/2012
Mollusk Tissue	Lower West Main Canal Unlined	MOL-101-TTP-A	4/2/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-102-TTP-A	4/2/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-102-TTP-B	4/2/2014

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Mollusk Tissue	Lower West Main Canal Unlined	MOL-103-TSM-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-103-TTP-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-104-TSM-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-104-TSM-B	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-104-TTP-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-105-TSM-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-105-TTP-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-105-TTP-B	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-105-TTP-C	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-106-TSM-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-106-TTP-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-106-TTP-B	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-107-TSM-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-107-TSM-B	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-107-TTP-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-107-TTP-B	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-108-TST	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-108-TTP-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-109-TTP-A	4/3/2014
Mollusk Tissue	Lower West Main Canal Unlined	MOL-109-TTP-B	4/3/2014
Exposure Area 4: LWMCU Downstream of the Siphon			
Sediment	Lower West Main Canal Unlined	LWMCU-104-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-104-SE-6-12	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-105-SE-0-6	10/29/2014
Sediment	Lower West Main Canal Unlined	LWMCU-105-SE-6-12	10/29/2014
Sediment	Lower West Main Canal Unlined	LWMCU-106-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-106-SE-12-20	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-106-SE-6-12	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-107-SE-0-6	10/30/2014
Sediment	Lower West Main Canal Unlined	LWMCU-108-SE-0-6	10/29/2014
Sediment	Lower West Main Canal Unlined	LWMCU-109-SE-0-6	10/29/2014
Sediment	Lower West Main Canal Unlined	LWMCU-117-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-118-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-119-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-120-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-121-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-122-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-149-SE-0-6	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-149-SE-12-18	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-149-SE-6-12	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-151-SE-0-6	2/18/2013
Sediment	Lower West Main Canal Unlined	LWMCU-153-SE-0-6	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-153-SE-12-18	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-153-SE-18-23	7/15/2013
Sediment	Lower West Main Canal Unlined	LWMCU-153-SE-6-12	7/15/2013
Surface Water	Lower West Main Canal Unlined	DCSW-SG2-01	--
Surface Water	Lower West Main Canal Unlined	DCSW-SG2-02	--
Surface Water	Lower West Main Canal Unlined	LWMCU-104-SW	10/29/2014
Surface Water	Lower West Main Canal Unlined	LWMCU-104-SWF	9/22/2012
Surface Water	Lower West Main Canal Unlined	LWMCU-105-SW	10/29/2014
Surface Water	Lower West Main Canal Unlined	LWMCU-105-SWF	9/19/2012

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Fish Tissue - Whole Body	Lower West Main Canal	BF-BUF-SG2-W1	--
Fish Tissue - Whole Body	Lower West Main Canal	BF-BUF-SG2-W2	--
Fish Tissue - Whole Body	Lower West Main Canal	BF-CARP-SG2-W1	--
Fish Tissue - Whole Body	Lower West Main Canal	BF-CARP-SG2-W2	--
Fish Tissue - Whole Body	Lower West Main Canal	BF-CARP-SG2-W3	--
Fish Tissue - Whole Body	Lower West Main Canal	BF-CARP-SG2-W4	--
Fish Tissue - Whole Body	Lower West Main Canal	BF-EEL-SG2-W1	--
Fish Tissue - Whole Body	Lower West Main Canal	CAR-111-W	10/17/2012
Fish Tissue - Whole Body	Lower West Main Canal	CAT-113-W	10/17/2012
Fish Tissue - Whole Body	Lower West Main Canal	LMB-112-W	10/17/2012
Fish Tissue - Whole Body	Lower West Main Canal	P-DRUM-SG2-W2	--
Fish Tissue - Whole Body	Lower West Main Canal	P-LMB-SG2-W2	--
Fish Tissue - Whole Body	Lower West Main Canal	SC-CAT-SG2-W3	--
Fish Tissue - Whole Body	Lower West Main Canal	SC-CAT-SG2-W4	--
Fish Tissue - Whole Body	Lower West Main Canal	TIL-114-W	10/17/2012
Exposure Area 5: Lined Canals, Reservoirs, and Soil			
Sediment	Cross Over Main Canal	COMC-101-SE-0-6	10/28/2014
Sediment	Cross Over Main Canal	COMC-103-SE-0-6	10/28/2014
Sediment	Cross Over Main Canal	COMC-104-SE-0-6	10/28/2014
Sediment	Cross Over Main Canal	COMC-105-SE-0-6	10/28/2014
Sediment	Cross Over Main Canal	COMC-106-SE-0-6	9/17/2012
Sediment	Cross Over Main Canal	COMC-107-SE-0-6	9/17/2012
Sediment	Cross Over Main Canal	COMC-108-SE-0-6	9/18/2012
Sediment	Cross Over Main Canal	COMC-109-SE-0-6	10/28/2014
Sediment	East Reservoir	RN3E-101-SE-0-6	10/28/2014
Sediment	East Reservoir	RN3E-102-SE-0-6	9/19/2012
Sediment	East Reservoir	RN3E-103-SE-0-6	9/19/2012
Sediment	East Reservoir	RN3E-104-SE-0-6	9/19/2012
Sediment	East Reservoir	RN3E-105-SE-0-6	9/19/2012
Sediment	Lower East Main Canal	LEMC-101-SE-0-6	9/22/2012
Sediment	Lower East Main Canal	LEMC-102-SE-0-6	10/30/2014
Sediment	Lower East Main Canal	LEMC-103-SE-0-6	11/1/2014
Sediment	Lower East Main Canal	LEMC-104-SE-0-6	9/22/2012
Sediment	Lower East Main Canal	LEMC-105-SE-0-6	10/30/2014
Sediment	Lower East Main Canal	LEMC-106-SE-0-6	10/30/2014
Sediment	Lower East Main Canal	LEMC-107-SE-0-6	9/22/2012
Sediment	Lower East Main Canal	LEMC-108-SE-0-6	9/22/2012
Sediment	Water Treatment Plant	DWP-101-SE-0-6	9/25/2012
Sediment	West Reservoir	RN3W-101-SE-0-6	10/28/2014
Sediment	West Reservoir	RN3W-101-SE-6-12	10/28/2014
Sediment	West Reservoir	RN3W-102-SE-0-6	10/28/2014
Sediment	West Reservoir	RN3W-102-SE-6-12	9/19/2012
Sediment	West Reservoir	RN3W-103-SE-0-6	10/29/2014
Sediment	West Reservoir	RN3W-103-SE-6-12	10/29/2014
Sediment	West Reservoir	RN3W-104-SE-0-6	10/29/2014
Sediment	West Reservoir	RN3W-105-SE-0-6	10/29/2014
Sediment	West Reservoir	RN3W-106-SE-0-6	9/18/2012
Sediment	West Reservoir	RN3W-107-SE-0-6	9/18/2012
Sediment	West Reservoir	RN3W-108-SE-0-6	9/18/2012
Surface Water	Cross Over Main Canal	COMC-101-SW	10/28/2014
Surface Water	Cross Over Main Canal	COMC-101-SWF	9/18/2012

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Surface Water	Cross Over Main Canal	COMC-102-SW	10/28/2014
Surface Water	Cross Over Main Canal	COMC-102-SWF	9/16/2012
Surface Water	Lower East Main Canal	LEMC-101-SW	11/1/2014
Surface Water	Lower East Main Canal	LEMC-101-SWF	9/22/2012
Surface Water	Lower East Main Canal	LEMC-102-SW	10/30/2014
Surface Water	Lower East Main Canal	LEMC-102-SWF	9/22/2012
Surface Water	Lower West Main Canal Lined	DCDW-01	--
Surface Water	Lower West Main Canal Lined	DCDW-02	--
Surface Water	Lower West Main Canal Lined	DCDW-03	--
Surface Water	Lower West Main Canal Lined	DCDW-04	--
Surface Water	Lower West Main Canal Lined	DCSW-SG3-02	--
Surface Water	Lower West Main Canal Lined	DCSW-SG3-04	--
Surface Water	Lower West Main Canal Lined	LWMCL-101-SW	10/28/2014
Surface Water	Lower West Main Canal Lined	LWMCL-101-SWF	9/19/2012
Surface Water	Lower West Main Canal Lined	LWMCL-102-SW	10/28/2014
Surface Water	Lower West Main Canal Lined	LWMCL-102-SWF	9/19/2012
Surface Water	Reservoirs	DRSW-RSG1-01	--
Surface Water	Reservoirs	DRSW-RSG1-02	--
Surface Water	Reservoirs	DRSW-RSG1-03	--
Surface Water	Reservoirs	DRSW-RSG2-01	--
Surface Water	Water Treatment Plant	DWP-101-SW	9/25/2012
Surface Water	Water Treatment Plant	DWP-101-SWF	9/25/2012
Surface Water	West Reservoir	RN3W-101-SW	10/28/2014
Surface Water	West Reservoir	RN3W-101-SWF	9/17/2012
Surface Water	West Reservoir	RN3W-102-SW	10/28/2014
Surface Water	West Reservoir	RN3W-102-SWF	9/18/2012
Surface Water	West Reservoir	RN3W-103-SW	10/29/2014
Surface Water	West Reservoir	RN3W-103-SWF	9/18/2012
Surface Water	West Reservoir	RN3W-104-SW	10/29/2014
Surface Water	West Reservoir	RN3W-104-SWF	9/17/2012
Surface Water	West Reservoir	RN3W-105-SW	10/29/2014
Surface Water	West Reservoir	RN3W-105-SWF	9/17/2012
Fish Tissue - Whole Body	Lower West Main Canal Lined	BF-BUF-SG3-W1	--
Fish Tissue - Whole Body	Lower West Main Canal Lined	BF-CARP-SG3-W1	--
Fish Tissue - Whole Body	Lower West Main Canal Lined	BF-CARP-SG3-W2	--
Fish Tissue - Whole Body	Lower West Main Canal Lined	BF-CARP-SG3-W3	--
Fish Tissue - Whole Body	Lower West Main Canal Lined	BF-CARP-SG3-W4	--
Fish Tissue - Whole Body	Lower West Main Canal Lined	BUF-105-W	10/16/2012
Fish Tissue - Whole Body	Lower West Main Canal Lined	CAR-106-W	10/16/2012
Fish Tissue - Whole Body	Lower West Main Canal Lined	P-GAR-SG3-W1	--
Fish Tissue - Whole Body	Lower West Main Canal Lined	P-LMB-SG3-W2	--
Fish Tissue - Whole Body	Lower West Main Canal Lined	SC-CAT-SG3-W4	--
Fish Tissue - Whole Body	Lower West Main Canal Lined	SC-PRA-SG3-W1	--
Fish Tissue - Whole Body	West Reservoir	BF-CARP-RSG1-W1	--
Fish Tissue - Whole Body	West Reservoir	BF-CARP-RSG1-W2	--
Fish Tissue - Whole Body	West Reservoir	BF-CARP-RSG2-W1	--
Fish Tissue - Whole Body	West Reservoir	BF-CARP-RSG2-W2	--
Fish Tissue - Whole Body	West Reservoir	BF-CARP-RSG4-W1	--
Fish Tissue - Whole Body	West Reservoir	BF-CARP-RSG5-W1	--
Fish Tissue - Whole Body	West Reservoir	P-DRUM-RSG4-W1	--
Fish Tissue - Whole Body	West Reservoir	P-LMB-RSG1-W1	--

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Fish Tissue - Whole Body	West Reservoir	P-LMB-RSG1-W2	--
Fish Tissue - Whole Body	West Reservoir	P-LMB-RSG2-W1	--
Fish Tissue - Whole Body	West Reservoir	P-LMB-RSG2-W2	--
Fish Tissue - Whole Body	West Reservoir	SC-CAT-RSG1-W1	--
Fish Tissue - Whole Body	West Reservoir	SC-CAT-RSG1-W2	--
Fish Tissue - Whole Body	West Reservoir	SC-CAT-RSG2-W1	--
Fish Tissue - Whole Body	West Reservoir	SC-CAT-RSG2-W2	--
Fish Tissue - Whole Body	West Reservoir	SC-CAT-RSG4-W1	--
Fish Tissue - Whole Body	West Reservoir	SC-CAT-RSG5-W1	--
Total Soil	Arroyo Colorado	ACR-101-SO-0-6	10/30/2014
Total Soil	Arroyo Colorado	ACR-101-SO-6-12	10/30/2014
Total Soil	Arroyo Colorado	ACR-102-SO-0-6	10/30/2014
Total Soil	Arroyo Colorado	ACR-102-SO-6-12	10/30/2014
Total Soil	Arroyo Colorado	ACR-103-SO-0-6	9/25/2012
Total Soil	Arroyo Colorado	ACR-103-SO-6-12	9/25/2012
Total Soil	Arroyo Colorado	ACR-104-SO-0-6	9/26/2012
Total Soil	Arroyo Colorado	ACR-104-SO-6-12	9/26/2012
Total Soil	Arroyo Colorado	ACR-105-SO-0-6	9/26/2012
Total Soil	Arroyo Colorado	ACR-105-SO-6-12	9/26/2012
Total Soil	Arroyo Colorado	ACR-106-SO-0-6	9/26/2012
Total Soil	Arroyo Colorado	ACR-106-SO-6-12	9/26/2012
Total Soil	Arroyo Colorado	ACR-107-SO-0-6	9/26/2012
Total Soil	Arroyo Colorado	ACR-107-SO-6-12	9/26/2012
Total Soil	Arroyo Colorado	ACR-108-SO-0-6	9/26/2012
Total Soil	Arroyo Colorado	ACR-108-SO-6-12	9/26/2012
Total Soil	Arroyo Colorado	ACR-109-S0-0-12	12/10/2012
Total Soil	Arroyo Colorado	ACR-110-SO-0-12	12/10/2012
Total Soil	Arroyo Colorado	ACR-111-SO-0-12	12/10/2012
Total Soil	Arroyo Colorado	ACR-112-SO-0-6	12/11/2012
Total Soil	Arroyo Colorado	ACR-113-SO-0-6	12/11/2012
Total Soil	Arroyo Colorado	ACR-114-SO-0-12	12/11/2012
Total Soil	Arroyo Colorado	ACR-115-SO-0-12	12/11/2012
Total Soil	Arroyo Colorado	ACR-116-SO-0-12	12/11/2012
Total Soil	Arroyo Colorado	ACR-117-SO-0-12	12/11/2012
Total Soil	Arroyo Colorado	ACR-118-SO-0-12	12/11/2012
Total Soil	Arroyo Colorado	ACR-119-SO-0-12	12/11/2012
Total Soil	Arroyo Colorado	ACR-120-SO-0-6	2/21/2013
Total Soil	Irrigation Risers	IR-101-SO-0-6	9/27/2012
Total Soil	Irrigation Risers	IR-101-SO-6-12	9/27/2012
Total Soil	Irrigation Risers	IR-102-SO-0-6	9/27/2012
Total Soil	Irrigation Risers	IR-102-SO-6-12	9/27/2012
Total Soil	Irrigation Risers	IR-103-SO-0-6	9/27/2012
Total Soil	Irrigation Risers	IR-103-SO-6-12	9/27/2012
Total Soil	Irrigation Risers	IR-104-SO-0-6	9/27/2012
Total Soil	Irrigation Risers	IR-104-SO-6-12	9/27/2012
Total Soil	Irrigation Risers	IR-105-SO-0-6	9/27/2012
Total Soil	Irrigation Risers	IR-105-SO-6-12	9/27/2012
Total Soil	Irrigation Risers	IR-106-SO-0-6	9/27/2012
Total Soil	Irrigation Risers	IR-106-SO-6-12	9/27/2012
Total Soil	Irrigation Risers	IR-107-SO-0-6	9/27/2012
Total Soil	Irrigation Risers	IR-107-SO-6-12	9/27/2012

Table 1-1
Samples Used in the Ecological Risk Assessment

Media	Sample Collection Area	Sample Identification	Sample Date
Total Soil	Lower West Main Canal Unlined	LWMCU-101-SO-0-6	10/29/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-101-SO-6-12	10/29/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-102-SO-0-6	10/29/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-102-SO-6-12	10/29/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-103-SO-0-6	10/29/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-103-SO-6-12	10/29/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-104-SO-0-6	10/29/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-104-SO-6-12	10/29/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-105-SO-0-6	10/30/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-105-SO-6-12	10/30/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-106-SO-0-6	9/21/2012
Total Soil	Lower West Main Canal Unlined	LWMCU-106-SO-6-12	9/21/2012
Total Soil	Lower West Main Canal Unlined	LWMCU-107-SO-0-6	11/1/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-107-SO-6-12	11/1/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-108-SO-0-6	11/3/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-108-SO-6-12	11/3/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-109-SO-0-6	10/31/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-109-SO-6-12	10/31/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-110-SO-0-6	11/3/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-110-SO-6-12	11/3/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-111-SO-0-6	11/3/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-111-SO-6-12	11/3/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-112-SO-0-6	10/31/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-112-SO-6-12	10/31/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-113-SO-0-6	10/31/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-113-SO-6-12	10/31/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-114-SO-0-6	11/1/2014
Total Soil	Lower West Main Canal Unlined	LWMCU-114-SO-6-12	11/1/2014
Background Soil			
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-101-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-102-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-103-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-104-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-105-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-106-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-107-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-108-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-109-SO-0-12	2/25/2013
Subsurface Soil	Las Palomas Wildlife Management Area	AMB-110-SO-0-12	2/25/2013

Table 2-1

Common Wildlife and Vegetation found in the South Texas Plains

Wildlife		**Vegetation**	
Caracara	Swallowtail butterfly	Sugarberry	Common cattail
Road runner	Leopard frog	Brasil	Smartweed
Ferruginous pygmy-owl	Catfish	Anaqua	Southern live oak
Green jay	Sunfish	Fresno	Wax myrtle
Elf owl		Great leadtree	Plantain
Texas tortoise		Retama	Silverleaf sunflower
Indigo snake		Texas ebony	Panic grass
Texas longnose snake		Saffron plum	Desert yaupon
Mexican Burrowing toad		Texas kidneywood	Fiddlewood
Grooved-billed Ani		Honey mesquite	Duckweed
Redwing blackbird		Texas wild olive	Saltmarsh spikerush

Note:
Information from the Texas Parks and Wildlife Department

Table 2-2

Threatened and Endangered Species that may be found in Hidalgo County

Common Name	Scientific Name	Federal Status	State Status	Surrogate Species
Birds				
American Peregrine Falcon	*Falco peregrinus anatum*	Delisted	Threatened	red-tailed hawk
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	Delisted		red-tailed hawk
Cactus Ferruginous Pygmy-Owl	*Glaucidium brasilianum cactorum*		Threatened	red-tailed hawk
Common Black-Hawk	*Buteogallus anthracinus*		Threatened	laughing gull
Gray Hawk	*Asturina nitid/Buteo nitidus*		Threatened	red-tailed hawk
Interior Least Tern	*Sterna antillarum athalassos*	Endangered	Endangered	belted kingfisher
Northern Aplomado Falcon	*Falco femoralis septentrionalis*	Endangered	Endangered	red-tailed hawk
Northern Beardless-Tyrannulet	*Camptostoma imberbe*		Threatened	American robin
Peregrine Falcon	*Falco peregrinus*	Delisted	Threatened	red-tailed hawk
Reddish Egret	*Egretta rufescens*		Threatened	great blue heron
Rose-throated Becard	*Pachyramphus aglaiae*		Threatened	American robin
Sprague's Pipit	*Anthus spragueii*	Candidate for listing		American robin
Texas Botteri's Sparrow	*Aimophila botterii texana*		Threatened	American robin
Tropical Parula	*Parula pitiayumi*		Threatened	American robin
White-faced Ibis	*Plegadis chihi*		Threatened	laughing gull
White-tailed Hawk	*Buteo albicaudatus*		Threatened	red-tailed hawk
Wood Stork	*Mycteria americana*		Threatened	laughing gull
Zone-tailed Hawk	*Buteo albonotatus*		Threatened	red-tailed hawk

Table 2-2

Threatened and Endangered Species that may be found in Hidalgo County

Common Name	Scientific Name	Federal Status	State Status	Surrogate Species
Mammals				
Coues' rice rat	*Oryzomys couesi*		Threatened	raccoon
Jaguar	*Panthera onca*	Endangered	Endangered	coyote
Jaguarundi	*Herpailurus yaguarondi*	Endangered	Endangered	coyote
Ocelot	*Leopardus pardalis*	Endangered	Endangered	coyote
Southern yellow bat	*Lasiurus ega*		Threatened	least shrew
White-nosed coati	*Nasua narica*		Threatened	least shrew
Reptiles				
Black-striped snake	*Coniophanes imperialis*		Threatened	diamondback water snake
Northern cat-eyed snake	*Leptodeira septentrionalis septentrionalis*		Threatened	diamondback water snake
Reticulate collared lizard	*Crotaphytus reticulatus*		Threatened	diamondback water snake
Speckled racer	*Drymobius margaritiferus*		Threatened	diamondback water snake
Texas horned lizard	*Phrynosoma cornutum*		Threatened	diamondback water snake
Texas indigo snake	*Drymarchon melanurus erebennus*		Threatened	diamondback water snake
Texas tortoise	*Gopherus berlandieri*		Threatened	diamondback water snake

Table 2-2

Threatened and Endangered Species that may be found in Hidalgo County

Common Name	Scientific Name	Federal Status	State Status	Surrogate Species
Amphibians				
Black-spotted newt	*Notophthalmus meridionalis*		Threatened	American Bullfrog
Mexican Treefrog	*Smilisca baudinii*		Threatened	American Bullfrog
Sheep frog	*Hypopachus variolosus*		Threatened	American Bullfrog
South Texas siren (large form)	*Siren sp 1*		Threatened	American Bullfrog
White-lipped frog	*Leptodactylus fragilis*		Threatened	American Bullfrog
Plants				
Star cactus	*Astrophytum asterias*	Endangered	Endangered	multiple species of terrestrial plants
Texas ayenia	*Ayenia limitaris*	Endangered	Endangered	
Walker's manioc	*Manihot walkerae*	Endangered	Endangered	
Fish				
Rio Grande silvery minnow	*Hybognathus amarus*	Endangered	Endangered	aquatic life criteria protective of sensitive species will be utilized
River goby	*Awaous banana*		Threatened	
Mollusks				
False spike mussel	*Quadrula mitchelli*		Threatened	sediment quality criteria protective of sensitive species will be utilized
Salina mucket	*Potamilus metnecktayi*		Threatened	
Texas hornshell	*Popenaias popeii*	Candidate for listing	Threatened	

Table 3-1

Measurement Endpoints for Ecological Risk Assessment

Assessment Endpoint	Measurement Endpoint	On Site-Measurements/Exposure Point Concentrations (EPC)	Evaluation Method	Risk Indicators
Protection of terrestrial plant viability from impacts of COPCs in surface soil	Initial screening.	• Maximum surface soil concentrations measured at site in past and more recent sampling.	• Direct comparison to the TCEQ ecological screening levels (2014) to define COPCs.	• Chemicals defined as COPCs indicate the potential for risk.
	Comparison of surface soil concentrations to benchmarks.	• Maximum and 95% UCL mean surface soil concentrations measured at site in past and more recent sampling.	• Direct comparison of maximum surface soil concentrations to plant benchmarks (TRVs). • Direct comparison of mean surface soil concentrations and individual concentrations against TRVs. • Plant benchmarks from 1) USEPA EcoSSLs 2) ORNL benchmarks (Efroymson et al. 1997a).	• Exceedance of benchmarks indicates potential for risks.
	Comparison of surface soil concentrations to background surface soil concentrations.	• Maximum and 95% UCL mean surface soil concentrations measured at site in past and more recent sampling.	• Direct comparison to background concentrations.	• Exceedance of background indicates a potential for risk. • Exceedance of benchmarks and background indicates a more certain potential for risk.
Protection of soil invertebrates exposed to COPCs in surface soil from adverse survival, growth and reproductive effects	Initial screening.	• Maximum surface soil concentrations measured at site in past and more recent sampling.	• Direct comparison to the TCEQ ecological screening levels (2014) to define COPCs.	• Chemicals defined as COPCs indicate the potential for risk.
	Comparison of surface soil concentrations to benchmarks.	• Maximum and 95% UCL mean surface soil concentrations measured at site in past and more recent sampling.	• Direct comparison of maximum surface soil concentrations to invertebrate benchmarks. • Direct comparison of mean surface soil concentrations and individual concentrations to invertebrate benchmarks. • Invertebrate benchmarks from 1) USEPA EcoSSLs 2) ORNL benchmarks (Efroymson et al. 1997b).	• Exceedance of benchmarks indicates potential for risks.
	Comparison of surface soil concentrations to background surface soil concentrations.	• Maximum and 95% UCL mean surface soil concentrations measured at site in past and more recent sampling.	• Direct comparison to background concentrations.	• Exceedance of background indicates a potential for risk. • Exceedance of benchmarks and background indicates a more certain potential for risk.

Table 3-1

Measurement Endpoints for Ecological Risk Assessment

Assessment Endpoint	Measurement Endpoint	On Site-Measurements/Exposure Point Concentrations (EPC)	Evaluation Method	Risk Indicators
Protection of benthic invertebrates and aquatic organisms exposed to COPCs in sediment and surface water from adverse survival, growth and reproductive effects	Initial screening.	• Maximum sediment and surface water concentrations measured at site in past and more recent sampling.	• Direct comparison to the TCEQ ecological screening levels (2014) to define COPCs.	• Chemicals defined as COPCs indicate the potential for risk.
	Comparison of sediment and surface water concentrations to benchmarks.	• Maximum and 95% UCL mean sediment and surface water concentrations measured at site in past and more recent sampling.	• Compare maximum, mean, and individual sediment concentrations against benthic TRVs (consensus based benchmarks from literature-based studies). • Compare maximum, mean, and individual surface water concentrations against aquatic TRVs (consensus based benchmarks from literature-based studies).	• Exceedance of benchmarks indicates potential for risks.
	Comparison of surface water and sediment concentrations to background surface water and sediment concentrations.	• Maximum and 95% UCL mean surface water and sediment concentrations measured at site in past and more recent sampling.	• Direct comparison to background concentrations.	• Exceedance of background indicates a potential for risk. • Exceedance of benchmarks and background indicates a more certain potential for risk.
Protection of terrestrial mammals and birds to ensure that ingestion of COPCs in surface soil, surface water, and plants/prey do not have unacceptable impacts on survival, growth, and reproduction	Initial screening.	• Surface soil and surface water concentrations measured at site in past and more recent sampling.	• Direct comparison to the TCEQ ecological screening levels (2014) to define COPCs.	• Chemicals defined as COPCs indicate the potential for risk.
	Comparison of modeled food web doses to benchmarks.	• Maximum and 95% UCL mean surface soil and surface water concentrations measured at site in past and more recent sampling. • Maximum and 95% UCL mean food item tissue concentrations modeled using literature-based equations. • Maximum and 95% UCL mean ingested dose based on literature-based exposure factors and uptake equations.	• Calculate maximum case scenario doses using food web models and compare to no- and low-effects benchmarks. • Calculate mean case scenario doses and compare to no- and low-effects benchmarks. • Mammal and bird dose-based benchmarks from 1) USEPA EcoSSL 2) ORNL benchmarks (Sample et al. 1998) 3) Additional literature-based sources as relevant.	• Exceedance of benchmarks indicates a potential for risks. • Exceedance of low-effects benchmarks indicates a more certain potential for risks.
	Comparison of surface soil and surface water concentrations to background surface soil and surface water concentrations.	• Maximum and 95% UCL mean surface soil and surface water concentrations measured at site in past and more recent sampling	• Direct comparison to background concentrations.	• Exceedance of both benchmarks and background indicates a more certain potential for risks.

Table 3-1

Measurement Endpoints for Ecological Risk Assessment

Assessment Endpoint	Measurement Endpoint	On Site-Measurements/Exposure Point Concentrations (EPC)	Evaluation Method	Risk Indicators
Protection of aquatic-feeding mammals and birds, to ensure that ingestion of COPCs in sediment, surface water, and food do not have adverse impacts on survival, growth, and reproduction	Initial screening.	• Maximum sediment and surface water concentrations measured at site in past and more recent sampling.	• Direct comparison to the TCEQ ecological screening levels (2014) to define COPCs.	• Chemicals defined as COPCs indicate the potential for risk.
	Comparison of modeled food web doses to benchmarks.	• Sediment and surface water concentrations measured at site in past and more recent sampling - SLERA: Maximum Concentrations - Refined SLERA & BRAPF: Mean Concentrations • Aquatic food item tissue concentrations modeled using literature-based equations - SLERA: Maximum Concentrations - Refined SLERA & BRAPF: Mean Concentrations • Ingested dose based on literature-based exposure factors and uptake equations - SLERA: Maximum Dose - Refined SLERA & BRAPF: Mean Dose	• Calculate maximum case scenario doses using food web models and compare to no-effects benchmarks. • Calculate mean case scenario doses and compare to no- and low-effects benchmarks. • Bird dose-based benchmarks from 1) USEPA EcoSSL 2) ORNL benchmarks (Sample et al. 1998) 3) Additional literature-based sources as relevant.	• Exceedance of benchmarks indicates a potential for risks. • Exceedance of low-effects benchmarks indicates a more certain potential for risks.
	Comparison of surface water and sediment concentrations to background surface water and sediment concentrations.	• Sediment and surface water concentrations measured at site and in background areas - Refined SLERA & BRAPF: Maximum and Mean Concentrations • Plant food item tissue concentrations modeled using literature-based equations - Refined SLERA & BRAPF: Maximum and Mean Concentrations • Ingested dose based on literature-based exposure factors and uptake equations - Refined SLERA & BRAPF: Maximum and Mean Dose	• Compare maximum and mean case scenario doses on-site to doses calculated for background areas.	• Exceedance of both benchmarks and background indicates a more certain potential for risks.
Protection of reptiles and amphibians to ensure that ingestion of COPCs in surface soil, sediment, surface water, and prey do not have unacceptable impacts on survival, growth, and reproduction	Comparison of modeled food web doses to benchmarks.	• EPCs evaluated for other receptors.	• Evaluate whether other wildlife receptors are at risk and consider results as surrogate for reptiles.	• Risks from COPCs to other receptors indicate that there may be a risk to reptiles and amphibians from the same COPCs.

Table 3-2
Surface Soil, Sediment, and Surface Water Ecological Screening Levels

Chemical	TCEQ Soil Criteria (mg/kg)	Soil Criteria Notes	TCEQ Freshwater Sediment Criteria (mg/kg)	Sediment Criteria Notes	TCEQ Freshwater Surface Water Criteria (µg/L)	Freshwater Surface Water Criteria Notes
Metals						
Aluminum	3.00E+04	median background value, if pH is greater than 5.5 aluminum is not a COPC	NA	--	8.70E+01	--
Antimony	5.00E+00	value for plants	2.00E+00	--	1.60E+02	--
Arsenic	1.80E+01	value for plants	9.79E+00	--	1.50E+02	--
Barium	3.30E+02	value for earthworms	NA	--	1.60E+04	--
Beryllium	1.00E+01	value for plants	NA	--	5.30E+00	--
Cadmium	3.20E+01	value for plants	9.90E-01	--	1.50E-01	--
Calcium	NA	--	NA	--	NA	--
Chromium	4.00E-01	value for earthworms	4.34E+01	--	4.20E+01	value for trivalent, hexavalent value is 10.6 ug/L
Cobalt	1.30E+01	value for plants	5.00E+01	--	1.50E+03	--
Copper	7.00E+01	value for plants	3.16E+01	--	5.24E+00	--
Iron	1.50E+04	median background value, if pH is between 5 and 8, iron is not a	2.00E+04	--	1.00E+03	--
Lead	1.20E+02	value for plants	3.58E+01	--	1.17E+00	--
Magnesium	NA	--	NA	--	3.24E+03	--
Manganese	2.20E+02	value for plants	4.60E+02	--	1.20E+02	--
Mercury	1.00E-01	value for earthworms	1.80E-01	--	1.30E+00	--
Nickel	3.80E+01	value for plants	2.27E+01	--	2.89E+01	--
Potassium	NA	--	NA	--	NA	--
Selenium	5.20E-01	value for plants	NA	--	5.00E+00	--
Silver	5.60E+02	value for plants	1.00E+00	--	1.00E-01	--
Sodium	NA	--	NA	--	NA	--
Thallium	1.00E+00	value for plants	NA	--	4.00E+00	--
Vanadium	2.00E+00	value for plants	NA	--	2.00E+01	--
Zinc	1.20E+02	value for earthworms	1.21E+02	--	6.57E+01	--

Table 3-2
Surface Soil, Sediment, and Surface Water Ecological Screening Levels

Chemical	TCEQ Soil Criteria (mg/kg)	Soil Criteria Notes	TCEQ Freshwater Sediment Criteria (mg/kg)	Sediment Criteria Notes	TCEQ Freshwater Surface Water Criteria (µg/L)	Freshwater Surface Water Criteria Notes
PCBS						
Aroclor-1016	4.00E+01	value for plants	7.00E-03	--	1.40E-02	value for PCBs
Aroclor-1221	4.00E+01	value for plants	3.00E-02	value for Aroclor-1248	1.40E-02	value for PCBs
Aroclor-1242	4.00E+01	value for plants	3.00E-02	value for Aroclor-1248	1.40E-02	value for PCBs
Aroclor-1248	4.00E+01	value for plants	3.00E-02	--	1.40E-02	value for PCBs
Aroclor-1254	4.00E+01	value for plants	6.00E-02	--	1.40E-02	value for PCBs
Aroclor-1260	4.00E+01	value for plants	5.00E-03	--	1.40E-02	value for PCBs
Total PCB Congeners	4.00E+01	value for plants	5.98E-02	value for PCBs	1.40E-02	value for PCBs
Total PCB Aroclors	4.00E+01	value for plants	5.98E-02	value for PCBs	1.40E-02	value for PCBs
PESTICIDES						
DDTr	NA	--	5.28E-03	--	NA	--
Aldrin	NA	--	2.00E-03	--	3.00E-01	--
alpha-BHC	NA	--	6.00E-03	--	7.40E+01	--
alpha-Chlordane	NA	--	3.24E-03	value for total chlordane	4.00E-03	value for total chlordane
beta-BHC	NA	--	5.00E-03	--	8.30E+01	--
delta-BHC	NA	--	3.00E-03	value for BHC	1.41E+02	--
Dieldrin	NA	--	1.90E-03	--	2.00E-03	--
Endosulfan I	NA	--	NA	--	5.60E-02	--
Endosulfan II	NA	--	NA	--	5.60E-02	--
Endosulfan sulfate	NA	--	NA	--	5.60E-02	--
Endrin	NA	--	2.22E-03	--	2.00E-03	--
Endrin aldehyde	NA	--	NA	--	1.21E+03	--
Endrin ketone	NA	--	NA	--	NA	--
gamma-BHC (Lindane)	NA	--	2.37E-03	--	8.00E-02	--
gamma-Chlordane	NA	--	3.24E-03	value for total chlordane	4.00E-03	value for total chlordane
Heptachlor	NA	--	NA	--	4.00E-03	--
Heptachlor epoxide	NA	--	2.47E-03	--	3.80E-03	--
Methoxychlor	NA	--	NA	--	3.00E-02	--
Toxaphene	NA	--	1.00E-04	--	2.00E-04	--

Table 3-2
Surface Soil, Sediment, and Surface Water Ecological Screening Levels

Chemical	TCEQ Soil Criteria (mg/kg)	Soil Criteria Notes	TCEQ Freshwater Sediment Criteria (mg/kg)	Sediment Criteria Notes	TCEQ Freshwater Surface Water Criteria (µg/L)	Freshwater Surface Water Criteria Notes
PAHs						
Total LMW PAHs	2.90E+01	value for earthworms	5.52E-01	value for marine sediment	NA	--
Total HMW PAHs	1.80E+01	value for earthworms	1.70E+00	value for marine sediment	NA	--
SVOCS						
2-Methylphenol	NA	--	NA	--	5.60E+02	--
3-&4-Methylphenols	NA	--	NA	--	2.72E+02	value for 4-methylphenol
Benzaldehyde	NA	--	NA	--	NA	--
Bis(2-ethylhexyl)phthalate	NA	--	1.80E-01	value for marine sediment	3.00E+02	--
Butylbenzylphthalate	NA	--	NA	--	9.30E+01	--
Caprolactam	NA	--	NA	--	NA	--
Carbazole	NA	--	NA	--	NA	--
Dibenzofuran	NA	--	NA	--	9.40E+01	--
Diethyl phthalate	1.00E+02	value for plants	6.30E-01	--	1.04E+03	--
Di-n-butyl phthalate	2.00E+02	value for plants	NA	--	7.00E+00	--
Phenol	3.00E+01	value for earthworms	NA	--	1.10E+02	--
VOCS						
Acetone	NA	--	6.00E+01	--	1.01E+05	--
Acetophenone	NA	--	NA	--	NA	--
Bromodichloromethane	NA	--	2.46E+00	--	2.16E+03	--
Bromoform	NA	--	NA	--	1.49E+02	--
Chloroform	NA	--	9.40E-01	--	8.90E+02	--
Dibromochloromethane	NA	--	1.60E-01	--	1.29E+02	--
Methylene chloride	NA	--	7.75E+00	--	1.10E+04	--
Toluene	2.00E+02	value for plants	2.88E+00	--	1.45E+03	--

Note:
COPC: Chemical of potential concern
HMW: High molecular weight
LMW: Low molecular weight
NA: Criteria not available
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
TCEQ: Texas Commission on Environmental Quality
µg/L: micrograms per liter
mg/kg: milligrams per kilogram

Table 3-3
Detection Comparison to Screening Levels
for Exposure Area 1: Upstream of the Siphon

Analyte	Benthos Tissue			Fish Tissue					Surface Soil				Sediment				Surface Water (Total)				Surface Water (Dissolved)				Selection of Chemicals of Potential Concern
	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (mg/kg dry wt)	95UCLM (mg/kg dry wt)	Maximum (mg/kg wet wt)	95UCLM (mg/kg wet wt)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Aquatic Habitats
Metals																									
Aluminum	--	--	--	2/2	2.16E+01	2.16E+01	5.40E+00	5.40E+00	--	--	--	3.00E+04	11/11	1.41E+04	1.03E+04	NA	4/4	1.38E+03	1.38E+03	8.70E+01	--	--	--	8.70E+01	YES
Arsenic	--	--	--	--	--	--	--	--	--	--	--	1.80E+01	11/11	5.30E+00	4.24E+00	9.79E+00	4/4	4.70E+00	4.70E+00	1.50E+02	4/4	4.30E+00	4.30E+00	1.50E+02	NO
Barium	--	--	--	2/2	7.20E+00	7.20E+00	1.80E+00	1.80E+00	--	--	--	3.30E+02	11/11	1.66E+02	1.66E+02	NA	4/4	1.40E+02	1.40E+02	1.60E+04	4/4	1.25E+02	1.25E+02	1.60E+04	YES
Beryllium	--	--	--	--	--	--	--	--	--	--	--	1.00E+01	1/11	7.10E-01	7.10E-01	NA	--	--	--	5.30E+00	--	--	--	5.30E+00	YES
Cadmium	--	--	--	--	--	--	--	--	--	--	--	3.20E+01	2/11	3.30E-01	3.30E-01	9.90E-01	--	--	--	1.50E-01	--	--	--	1.50E-01	NO
Calcium	--	--	--	2/2	7.20E+04	7.20E+04	1.80E+04	1.80E+04	--	--	--	NA	11/11	8.07E+04	6.37E+04	NA	4/4	8.55E+04	8.55E+04	NA	4/4	8.27E+04	8.27E+04	NA	NO, Essential Nutrient
Chromium	--	--	--	2/2	1.12E+01	1.12E+01	2.80E+00	2.80E+00	--	--	--	4.00E-01	11/11	9.90E+00	8.03E+00	4.34E+01	1/4	6.30E-01	6.30E-01	4.20E+01	1/4	3.40E-01	3.40E-01	4.20E+01	NO
Cobalt	--	--	--	1/2	1.76E-01	1.76E-01	4.40E-02	4.40E-02	--	--	--	1.30E+01	11/11	6.00E+00	5.35E+00	5.00E+01	--	--	--	1.50E+03	--	--	--	1.50E+03	NO
Copper	--	--	--	2/2	8.40E+00	8.40E+00	2.10E+00	2.10E+00	--	--	--	7.00E+01	9/11	8.80E+00	6.97E+00	3.16E+01	3/4	3.00E+00	3.00E+00	5.24E+00	2/4	2.40E+00	2.40E+00	5.24E+00	NO
Iron	--	--	--	2/2	2.08E+02	2.08E+02	5.20E+01	5.20E+01	--	--	--	1.50E+04	11/11	1.67E+04	1.33E+04	2.00E+04	4/4	1.16E+03	1.16E+03	1.00E+03	1/4	1.37E+02	1.37E+02	1.00E+03	NO, Essential Nutrient
Lead	--	--	--	1/2	1.48E-01	1.48E-01	3.70E-02	3.70E-02	--	--	--	1.20E+02	11/11	9.00E+00	7.80E+00	3.58E+01	4/4	1.40E+00	1.40E+00	1.17E+00	--	--	--	1.17E+00	YES
Magnesium	--	--	--	2/2	4.80E+03	4.80E+03	1.20E+03	1.20E+03	--	--	--	NA	11/11	6.26E+03	4.21E+03	NA	4/4	3.20E+04	3.20E+04	3.24E+03	4/4	3.18E+04	3.18E+04	3.24E+03	NO, Essential Nutrient
Manganese	--	--	--	2/2	1.12E+01	1.12E+01	2.80E+00	2.80E+00	--	--	--	2.20E+02	11/11	3.54E+02	2.89E+02	4.60E+02	4/4	1.06E+02	1.06E+02	1.20E+02	4/4	8.40E+00	8.40E+00	1.20E+02	NO
Mercury	--	--	--	2/2	1.88E+00	1.88E+00	4.70E-01	4.70E-01	--	--	--	1.00E-01	11/11	1.50E-01	6.30E-02	1.80E-01	--	--	--	1.30E+00	--	--	--	1.30E+00	NO
Nickel	--	--	--	2/2	1.04E+00	1.04E+00	2.60E-01	2.60E-01	--	--	--	3.80E+01	11/11	1.08E+01	8.28E+00	2.27E+01	4/4	1.60E+00	1.60E+00	2.89E+01	1/4	1.10E+00	1.10E+00	2.89E+01	NO
Potassium	--	--	--	2/2	1.16E+04	1.16E+04	2.90E+03	2.90E+03	--	--	--	NA	9/11	2.98E+03	2.31E+03	NA	4/4	7.17E+03	7.17E+03	NA	4/4	6.90E+03	6.90E+03	NA	NO, Essential Nutrient
Selenium	--	--	--	2/2	1.40E+00	1.40E+00	3.50E-01	3.50E-01	--	--	--	5.20E-01	--	--	--	NA	3/4	1.60E+00	1.60E+00	5.00E+00	3/4	1.50E+00	1.50E+00	5.00E+00	NO
Sodium	--	--	--	2/2	5.20E+03	5.20E+03	1.30E+03	1.30E+03	--	--	--	NA	1/11	7.72E+02	7.72E+02	NA	4/4	1.70E+05	1.70E+05	NA	4/4	1.74E+05	1.74E+05	NA	NO, Essential Nutrient
Vanadium	--	--	--	2/2	2.24E+00	2.24E+00	5.60E-01	5.60E-01	--	--	--	2.00E+00	11/11	1.98E+01	1.71E+01	NA	4/4	9.60E+00	9.60E+00	2.00E+01	4/4	9.00E+00	9.00E+00	2.00E+01	YES
Zinc	--	--	--	2/2	8.00E+01	8.00E+01	2.00E+01	2.00E+01	--	--	--	1.20E+02	11/11	3.90E+01	3.73E+01	1.21E+02	4/4	4.10E+00	4.10E+00	6.57E+01	3/4	2.30E+00	2.30E+00	6.57E+01	NO
PCBS																									
Aroclor-1260	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	1/22	7.40E-04	7.40E-04	5.00E-03	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC
Total PCB Congeners	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	10/10	7.70E-03	3.27E-03	5.98E-02	9/9	4.40E-04	3.45E-04	1.40E-02	--	--	--	1.40E-02	YES, main COPC
Total PCB Aroclors	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	1/1	7.40E-04	7.40E-04	5.98E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC
PESTICIDES																									
DDTr	--	--	--	2/2	3.98E-01	3.98E-01	9.94E-02	9.94E-02	--	--	--	NA	9/13	5.40E-02	5.40E-02	5.28E-03	--	--	--	NA	--	--	--	NA	YES
delta-BHC	--	--	--	--	--	--	--	--	--	--	--	NA	1/13	9.10E-04	9.10E-04	3.00E-03	--	--	--	1.41E+02	--	--	--	1.41E+02	NO
PAHs																									
Total HMW PAHs	--	--	--	--	--	--	--	--	--	--	--	1.80E+01	1/1	7.19E-01	7.19E-01	1.70E+00	--	--	--	NA	--	--	--	NA	NO
SVOCS																									
Bis(2-ethylhexyl)phthalate	--	--	--	--	--	--	--	--	--	--	--	NA	6/13	6.10E-01	3.00E-01	1.80E-01	--	--	--	3.00E+02	--	--	--	3.00E+02	YES
Diethyl phthalate	--	--	--	1/2	3.04E-01	3.04E-01	7.60E-02	7.60E-02	--	--	--	1.00E+02	--	--	--	6.30E-01	1/4	1.10E+00	1.10E+00	1.04E+03	--	--	--	1.04E+03	NO
Phenol	--	--	--	1/2	4.80E-02	4.80E-02	1.20E-02	1.20E-02	--	--	--	3.00E+01	4/13	6.70E-02	6.70E-02	NA	--	--	--	1.10E+02	--	--	--	1.10E+02	YES
VOCS																									
Acetone	--	--	--	--	--	--	--	--	--	--	--	NA	1/4	5.20E-02	5.20E-02	6.00E+01	--	--	--	1.01E+05	--	--	--	1.01E+05	NO
Acetophenone	--	--	--	--	--	--	--	--	--	--	--	NA	6/13	8.30E-02	7.41E-02	NA	--	--	--	NA	--	--	--	NA	YES
Methylene chloride	--	--	--	--	--	--	--	--	--	--	--	NA	1/4	4.40E-03	4.40E-03	7.75E+00	--	--	--	1.10E+04	--	--	--	1.10E+04	NO
Toluene	--	--	--	--	--	--	--	--	--	--	--	2.00E+02	1/4	2.70E-03	2.70E-03	2.88E+00	--	--	--	1.45E+03	--	--	--	1.45E+03	NO

Note:
95UCLM: 95 percent upper confidence limit on the mean
--: No data available
COPC: Chemical of potential concern
Selection of Chemicals of Potential Concern: if an analyte exceeds the screening criteria in any media or no screening is available, the analyte is retained as a COPC

Table 3-4
Detection Comparison to Screening Levels
for Exposure Area 2: Arroyo Colorado

Analyte	Benthos Tissue			Fish Tissue					Surface Soil				Sediment				Surface Water (Total)				Surface Water (Dissolved)				Selection of Chemicals of Potential Concern
	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (mg/kg dry wt)	95UCLM (mg/kg dry wt)	Maximum (mg/kg wet wt)	95UCLM (mg/kg wet wt)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Aquatic Habitats
Metals																									
Aluminum	--	--	--	2/2	2.28E+02	2.28E+02	5.70E+01	5.70E+01	--	--	--	3.00E+04	14/14	2.40E+03	2.40E+03	NA	7/7	2.21E+03	1.37E+03	8.70E+01	--	--	--	8.70E+01	YES
Arsenic	--	--	--	2/2	3.68E-01	3.68E-01	9.20E-02	9.20E-02	--	--	--	1.80E+01	14/14	6.60E+00	5.07E+00	9.79E+00	7/7	1.51E+01	1.39E+01	1.50E+02	7/7	1.27E+01	1.27E+01	1.50E+02	NO
Barium	--	--	--	2/2	1.56E+01	1.56E+01	3.90E+00	3.90E+00	--	--	--	3.30E+02	14/14	2.55E+02	1.98E+02	NA	7/7	1.64E+02	1.41E+02	1.60E+04	7/7	1.52E+02	1.20E+02	1.60E+04	YES
Beryllium	--	--	--	--	--	--	--	--	--	--	--	1.00E+01	8/14	9.80E-01	7.85E-01	NA	--	--	--	5.30E+00	--	--	--	5.30E+00	YES
Cadmium	--	--	--	--	--	--	--	--	--	--	--	3.20E+01	14/14	4.90E-01	4.14E-01	9.90E-01	1/7	1.70E-01	1.70E-01	1.50E-01	--	--	--	1.50E-01	YES
Calcium	--	--	--	2/2	4.80E+04	4.80E+04	1.20E+04	1.20E+04	--	--	--	NA	14/14	1.00E+05	8.83E+04	NA	7/7	2.19E+05	1.85E+05	NA	7/7	2.02E+05	1.83E+05	NA	NO, essential nutrient
Chromium	--	--	--	1/2	1.84E-01	1.84E-01	4.60E-02	4.60E-02	--	--	--	4.00E-01	14/14	1.67E+01	1.29E+01	4.34E+01	2/7	2.70E+00	2.70E+00	4.20E+01	--	--	--	4.20E+01	NO
Cobalt	--	--	--	2/2	2.88E-01	2.88E-01	7.20E-02	7.20E-02	--	--	--	1.30E+01	14/14	7.20E+00	6.01E+00	5.00E+01	3/7	2.00E+00	2.00E+00	1.50E+03	--	--	--	1.50E+03	NO
Copper	--	--	--	2/2	3.52E+00	3.52E+00	8.80E-01	8.80E-01	--	--	--	7.00E+01	14/14	1.69E+01	1.26E+01	3.16E+01	7/7	9.20E+00	7.47E+00	5.24E+00	7/7	7.10E+00	5.71E+00	5.24E+00	YES
Iron	--	--	--	2/2	3.00E+02	3.00E+02	7.50E+01	7.50E+01	--	--	--	1.50E+04	14/14	2.19E+04	1.82E+04	2.00E+04	6/7	1.80E+03	1.16E+03	1.00E+03	1/7	8.54E+02	8.54E+02	1.00E+03	NO, essential nutrient
Lead	--	--	--	2/2	5.20E-01	5.20E-01	1.30E-01	1.30E-01	--	--	--	1.20E+02	14/14	1.37E+01	1.07E+01	3.58E+01	7/7	4.30E+00	2.82E+00	1.17E+00	1/7	2.50E-01	2.50E-01	1.17E+00	YES
Magnesium	--	--	--	2/2	1.52E+03	1.52E+03	3.80E+02	3.80E+02	--	--	--	NA	14/14	8.35E+03	6.72E+03	NA	7/7	7.61E+04	6.22E+04	3.24E+03	7/7	7.62E+04	6.51E+04	3.24E+03	NO, essential nutrient
Manganese	--	--	--	2/2	9.20E+01	9.20E+01	2.30E+01	2.30E+01	--	--	--	2.20E+02	14/14	1.18E+03	6.82E+02	4.60E+02	7/7	3.42E+02	2.52E+02	1.20E+02	7/7	1.38E+02	8.93E+01	1.20E+02	YES
Mercury	--	--	--	2/2	1.68E-01	1.68E-01	4.20E-02	4.20E-02	--	--	--	1.00E-01	13/14	2.20E-01	1.12E-01	1.80E-01	1/7	6.00E-02	6.00E-02	1.30E+00	--	--	--	1.30E+00	YES
Nickel	--	--	--	1/2	1.52E-01	1.52E-01	3.80E-02	3.80E-02	--	--	--	3.80E+01	14/14	1.49E+01	1.23E+01	2.27E+01	7/7	4.30E+00	3.78E+00	2.89E+01	7/7	2.30E+00	2.08E+00	2.89E+01	NO
Potassium	--	--	--	2/2	1.04E+04	1.04E+04	2.60E+03	2.60E+03	--	--	--	NA	14/14	5.62E+03	4.33E+03	NA	7/7	1.38E+04	1.20E+04	NA	7/7	1.36E+04	1.24E+04	NA	NO, essential nutrient
Selenium	--	--	--	2/2	1.48E+00	1.48E+00	3.70E-01	3.70E-01	--	--	--	5.20E-01	--	--	--	NA	2/7	5.60E+00	5.60E+00	5.00E+00	7/7	6.00E+00	6.00E+00	5.00E+00	YES
Sodium	--	--	--	2/2	4.80E+03	4.80E+03	1.20E+03	1.20E+03	--	--	--	NA	14/14	2.12E+03	1.54E+03	NA	7/7	5.62E+05	4.37E+05	NA	7/7	5.49E+05	4.49E+05	NA	NO, essential nutrient
Vanadium	--	--	--	--	--	--	--	--	--	--	--	2.00E+00	14/14	2.85E+01	2.37E+01	NA	7/7	1.58E+01	1.43E+01	2.00E+01	7/7	1.18E+01	1.09E+01	2.00E+01	YES
Zinc	--	--	--	2/2	1.92E+02	1.92E+02	4.80E+01	4.80E+01	--	--	--	1.20E+02	14/14	7.45E+01	5.54E+01	1.21E+02	7/7	1.86E+01	1.49E+01	6.57E+01	7/7	6.40E+00	5.50E+00	6.57E+01	NO
PCBS																									
Aroclor-1260	--	--	--	1/2	3.04E-02	3.04E-02	7.60E-03	7.60E-03	--	--	--	4.00E+01	5/22	5.60E-03	4.58E-03	5.00E-03	--	--	--	1.40E-02	--	--	--	1.40E-02	YES
Total PCB Congeners	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	4/4	1.20E-02	1.20E-02	5.98E-02	4/4	1.20E-03	1.20E-03	1.40E-02	--	--	--	1.40E-02	YES, main COPC
Total PCB Aroclors	--	--	--	1/2	3.04E-02	3.04E-02	7.60E-03	7.60E-03	--	--	--	4.00E+01	5/22	5.60E-03	4.58E-03	5.98E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC
PESTICIDES																									
DDTr	--	--	--	2/2	1.57E+00	1.57E+00	3.92E-01	3.92E-01	--	--	--	NA	3/14	1.30E-02	1.30E-02	5.28E-03	--	--	--	NA	--	--	--	NA	YES
gamma-BHC (Lindane)	--	--	--	2/2	6.00E-04	6.00E-04	1.50E-04	1.50E-04	--	--	--	NA	--	--	--	2.37E-03	1/7	1.70E-02	1.70E-02	8.00E-02	--	--	--	8.00E-02	NO
SVOCS																									
Bis(2-ethylhexyl)phthalate	--	--	--	--	--	--	--	--	--	--	--	NA	3/14	1.20E-01	1.20E-01	1.80E-01	3/7	1.40E+02	1.40E+02	3.00E+02	--	--	--	3.00E+02	NO
VOCS																									
Acetone	--	--	--	--	--	--	--	--	--	--	--	NA	1/3	4.80E-02	4.80E-02	6.00E+01	--	--	--	1.01E+05	--	--	--	1.01E+05	NO
Acetophenone	--	--	--	1/2	2.32E-02	2.32E-02	5.80E-03	5.80E-03	--	--	--	NA	--	--	--	NA	1/7	2.10E+00	2.10E+00	NA	--	--	--	NA	YES

Note:
95UCLM: 95 percent upper confidence limit on the mean
--: No data available
COPC: Chemical of potential concern
Selection of Chemicals of Potential Concern: if an analyte exceeds the screening criteria in any media or no screening is available, the analyte is retained as a COP

Table 3-5
Detection Comparison to Screening Levels
for Exposure Area 3: LWMCU at the Siphon Exit

Analyte	Benthos Tissue					Fish Tissue					Surface Soil				Sediment				Surface Water (Total)				Surface Water (Dissolved)				Selection of Chemicals of Potential Concern
	Frequency	Maximum (mg/kg dry wt)	95UCLM (mg/kg dry wt)	Maximum (mg/kg wet wt)	95UCLM (mg/kg wet wt)	Frequency	Maximum (mg/kg dry wt)	95UCLM (mg/kg dry wt)	Maximum (mg/kg wet wt)	95UCLM (mg/kg wet wt)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Aquatic Habitats
Metals																											
Aluminum	--	--	--	--	--	4/4	2.00E+03	2.00E+03	5.00E+02	5.00E+02	--	--	--	3.00E+04	11/11	1.40E+04	1.17E+04	NA	3/3	1.94E+03	1.94E+03	8.70E+01	--	--	--	8.70E+01	YES
Antimony	--	--	--	--	--	2/4	1.88E-01	1.88E-01	4.70E-02	4.70E-02	--	--	--	5.00E+00	--	--	--	2.00E+00	--	--	--	1.60E+02	--	--	--	1.60E+02	NO
Arsenic	--	--	--	--	--	2/4	1.12E+00	1.12E+00	2.80E-01	2.80E-01	--	--	--	1.80E+01	11/11	4.70E+00	4.24E+00	9.79E+00	3/3	4.70E+00	4.70E+00	1.50E+02	3/3	4.10E+00	4.10E+00	1.50E+02	NO
Barium	--	--	--	--	--	4/4	2.64E+01	2.64E+01	6.60E+00	6.60E+00	--	--	--	3.30E+02	11/11	2.72E+02	1.86E+02	NA	3/3	1.52E+02	1.52E+02	1.60E+04	3/3	1.24E+02	1.24E+02	1.60E+04	YES
Beryllium	--	--	--	--	--	1/4	8.40E-02	8.40E-02	2.10E-02	2.10E-02	--	--	--	1.00E+01	1/11	6.00E-01	6.00E-01	NA	--	--	--	5.30E+00	--	--	--	5.30E+00	YES
Cadmium	--	--	--	--	--	1/4	5.20E-02	5.20E-02	1.30E-02	1.30E-02	--	--	--	3.20E+01	11/11	3.80E-01	3.05E-01	9.90E-01	--	--	--	1.50E-01	--	--	--	1.50E-01	NO
Calcium	--	--	--	--	--	4/4	4.80E+04	4.80E+04	1.20E+04	1.20E+04	--	--	--	NA	11/11	1.68E+05	1.17E+05	NA	3/3	8.60E+04	8.60E+04	NA	3/3	8.20E+04	8.20E+04	NA	NO, essential nutrient
Chromium	--	--	--	--	--	4/4	3.00E+00	3.00E+00	7.50E-01	7.50E-01	--	--	--	4.00E-01	11/11	1.08E+01	8.54E+00	4.34E+01	--	--	--	4.20E+01	1/3	2.90E-01	2.90E-01	4.20E+01	NO
Cobalt	--	--	--	--	--	3/4	1.04E+00	1.04E+00	2.60E-01	2.60E-01	--	--	--	1.30E+01	11/11	7.70E+00	6.62E+00	5.00E+01	--	--	--	1.50E+03	--	--	--	1.50E+03	NO
Copper	--	--	--	--	--	4/4	1.24E+01	1.24E+01	3.10E+00	3.10E+00	--	--	--	7.00E+01	11/11	2.15E+01	1.17E+01	3.16E+01	3/3	2.80E+00	2.80E+00	5.24E+00	1/3	2.20E+00	2.20E+00	5.24E+00	NO
Iron	--	--	--	--	--	4/4	2.28E+03	2.28E+03	5.70E+02	5.70E+02	--	--	--	1.50E+04	11/11	1.65E+04	1.42E+04	2.00E+04	3/3	1.67E+03	1.67E+03	1.00E+03	--	--	--	1.00E+03	NO, essential nutrient
Lead	--	--	--	--	--	3/4	2.20E+00	2.20E+00	5.50E-01	5.50E-01	--	--	--	1.20E+02	11/11	1.27E+01	9.84E+00	3.58E+01	3/3	1.80E+00	1.80E+00	1.17E+00	--	--	--	1.17E+00	YES
Magnesium	--	--	--	--	--	4/4	1.76E+03	1.76E+03	4.40E+02	4.40E+02	--	--	--	NA	11/11	5.45E+03	4.49E+03	NA	3/3	3.11E+04	3.11E+04	3.24E+03	3/3	3.14E+04	3.14E+04	3.24E+03	NO, essential nutrient
Manganese	--	--	--	--	--	4/4	1.24E+02	1.24E+02	3.10E+01	3.10E+01	--	--	--	2.20E+02	11/11	6.95E+02	4.34E+02	4.60E+02	3/3	1.26E+02	1.26E+02	1.20E+02	3/3	9.50E+00	9.50E+00	1.20E+02	YES
Mercury	--	--	--	--	--	4/4	9.20E-01	9.20E-01	2.30E-01	2.30E-01	--	--	--	1.00E-01	11/11	7.70E-02	5.39E-02	1.80E-01	--	--	--	1.30E+00	--	--	--	1.30E+00	NO
Nickel	--	--	--	--	--	4/4	2.00E+00	2.00E+00	5.00E-01	5.00E-01	--	--	--	3.80E+01	11/11	1.01E+01	8.34E+00	2.27E+01	3/3	2.00E+00	2.00E+00	2.89E+01	--	--	--	2.89E+01	NO
Potassium	--	--	--	--	--	4/4	1.28E+04	1.28E+04	3.20E+03	3.20E+03	--	--	--	NA	11/11	3.25E+03	2.66E+03	NA	3/3	7.10E+03	7.10E+03	NA	3/3	6.94E+03	6.94E+03	NA	NO, essential nutrient
Selenium	--	--	--	--	--	4/4	9.20E-01	9.20E-01	2.30E-01	2.30E-01	--	--	--	5.20E-01	4/11	2.10E-01	2.10E-01	NA	3/3	7.70E-01	7.70E-01	5.00E+00	2/3	1.60E+00	1.60E+00	5.00E+00	YES
Silver	--	--	--	--	--	1/4	2.68E-01	2.68E-01	6.70E-02	6.70E-02	--	--	--	5.60E+02	--	--	--	1.00E+00	--	--	--	1.00E-01	--	--	--	1.00E-01	NO
Sodium	--	--	--	--	--	4/4	5.60E+03	5.60E+03	1.40E+03	1.40E+03	--	--	--	NA	5/11	1.17E+03	8.57E+02	NA	3/3	1.62E+05	1.62E+05	NA	3/3	1.63E+05	1.63E+05	NA	NO, essential nutrient
Thallium	--	--	--	--	--	1/4	5.60E-02	5.60E-02	1.40E-02	1.40E-02	--	--	--	1.00E+00	--	--	--	NA	--	--	--	4.00E+00	--	--	--	4.00E+00	NO
Vanadium	--	--	--	--	--	4/4	6.40E+00	6.40E+00	1.60E+00	1.60E+00	--	--	--	2.00E+00	11/11	2.17E+01	1.80E+01	NA	3/3	1.11E+01	1.11E+01	2.00E+01	3/3	9.00E+00	9.00E+00	2.00E+01	YES
Zinc	--	--	--	--	--	4/4	4.00E+02	4.00E+02	1.00E+02	1.00E+02	--	--	--	1.20E+02	11/11	5.11E+01	4.10E+01	1.21E+02	3/3	6.20E+00	6.20E+00	6.57E+01	2/3	1.60E+00	1.60E+00	6.57E+01	NO
PCBS																											
Aroclor-1016	--	--	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	--	--	--	7.00E-03	--	--	--	1.40E-02	--	--	--	1.40E-02	NO
Aroclor-1221	--	--	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	1/70	2.10E-03	2.10E-03	3.00E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC
Aroclor-1242	--	--	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	1/70	1.70E-01	1.70E-01	3.00E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES
Aroclor-1248	--	--	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	1/70	1.00E-03	1.00E-03	3.00E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC
Aroclor-1254	16/16	7.60E-01	3.38E-01	1.90E-01	8.45E-02	11/12	4.40E+00	3.03E+00	1.10E+00	7.58E-01	--	--	--	4.00E+01	56/70	1.10E+01	1.37E+00	6.00E-02	1/20	1.50E-02	1.50E-02	1.40E-02	--	--	--	1.40E-02	YES
Aroclor-1260	--	--	--	--	--	--	--	--	--	--	--	--	--	4.00E+01	10/70	1.80E-01	1.17E-02	5.00E-03	--	--	--	1.40E-02	--	--	--	1.40E-02	YES
Total PCB Congeners	7/7	2.80E+00	1.79E+00	7.00E-01	4.47E-01	3/3	2.04E+01	2.04E+01	5.10E+00	5.10E+00	--	--	--	4.00E+01	17/17	6.10E+00	2.71E+00	5.98E-02	19/19	2.60E-02	5.81E-03	1.40E-02	--	--	--	1.40E-02	YES
Total PCB Aroclors	16/16	7.60E-01	3.38E-01	1.90E-01	8.45E-02	11/11	4.40E+00	2.80E+00	1.10E+00	6.99E-01	--	--	--	4.00E+01	58/58	1.10E+01	1.05E+00	5.98E-02	1/1	1.50E-02	1.50E-02	1.40E-02	--	--	--	1.40E-02	YES
PESTICIDES																											
DDTr	--	--	--	--	--	4/4	7.68E-01	7.68E-01	1.92E-01	1.92E-01	--	--	--	NA	11/11	7.80E-02	4.02E-02	5.28E-03	--	--	--	NA	--	--	--	NA	YES
Aldrin	--	--	--	--	--	2/4	8.00E-03	8.00E-03	2.00E-03	2.00E-03	--	--	--	NA	--	--	--	2.00E-03	--	--	--	3.00E-01	--	--	--	3.00E-01	NO
alpha-BHC	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	6.00E-03	--	--	--	7.40E+01	--	--	--	7.40E+01	NO
alpha-Chlordane	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	3/11	2.40E-03	2.40E-03	3.24E-03	--	--	--	4.00E-03	--	--	--	4.00E-03	NO
beta-BHC	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	1/11	2.10E-03	2.10E-03	5.00E-03	--	--	--	8.30E+01	--	--	--	8.30E+01	NO
delta-BHC	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	1/11	9.90E-04	9.90E-04	3.00E-03	--	--	--	1.41E+02	--	--	--	1.41E+02	NO
Dieldrin	--	--	--	--	--	4/4	1.96E-02	1.96E-02	4.90E-03	4.90E-03	--	--	--	NA	6/11	1.90E-02	7.90E-03	1.90E-03	--	--	--	2.00E-03	--	--	--	2.00E-03	YES
Endosulfan I	--	--	--	--	--	2/4	1.08E-02	1.08E-02	2.70E-03	2.70E-03	--	--	--	NA	3/11	2.10E-03	2.10E-03	NA	--	--	--	5.60E-02	--	--	--	5.60E-02	YES
Endosulfan II	--	--	--	--	--	3/4	4.80E-03	4.80E-03	1.20E-03	1.20E-03	--	--	--	NA	6/11	6.10E-03	3.02E-03	NA	--	--	--	5.60E-02	--	--	--	5.60E-02	YES
Endosulfan sulfate	--	--	--	--	--	4/4	2.36E-02	2.36E-02	5.90E-03	5.90E-03	--	--	--	NA	--	--	--	NA	--	--	--	5.60E-02	--	--	--	5.60E-02	NO
Endrin	--	--	--	--	--	4/4	3.16E-01	3.16E-01	7.90E-02	7.90E-02	--	--	--	NA	6/11	8.60E-03	5.20E-03	2.22E-03	--	--	--	2.00E-03	--	--	--	2.00E-03	YES
Endrin aldehyde	--	--	--	--	--	3/4	2.76E-02	2.76E-02	6.90E-03	6.90E-03	--	--	--	NA	5/11	6.50E-03	4.18E-03	NA	--	--	--	1.21E+03	--	--	--	1.21E+03	YES
Endrin ketone	--	--	--	--	--	2/4	9.60E-02	9.60E-02	2.40E-02	2.40E-02	--	--	--	NA	--	--	--	NA	--	--	--	NA	--	--	--	NA	NO
gamma-BHC (Lindane)	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	1/11	5.80E-04	5.80E-04	2.37E-03	--	--	--	8.00E-02	--	--	--	8.00E-02	NO
gamma-Chlordane	--	--	--	--	--	4/4	1.00E-01	1.00E-01	2.50E-02	2.50E-02	--	--	--	NA	11/11	1.80E-02	1.14E-02	3.24E-03	--	--	--	4.00E-03	--	--	--	4.00E-03	YES
Heptachlor	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	NA	--	--	--	4.00E-03	--	--	--	4.00E-03	NO
Heptachlor epoxide	--	--	--	--	--	4/4	1.08E-02	1.08E-02	2.70E-03	2.70E-03	--	--	--	NA	11/11	8.60E-03	4.24E-03	2.47E-03	--	--	--	3.80E-03	--	--	--	3.80E-03	YES
Methoxychlor	--	--	--	--	--	4/4	2.04E-01	2.04E-01	5.10E-02	5.10E-02	--	--	--	NA	--	--	--	NA	--	--	--	3.00E-02	--	--	--	3.00E-02	NO
Toxaphene	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	1.00E-04	--	--	--	2.00E-04	--	--	--	2.00E-04	NO
PAHs																											
Total LMW PAHs	--	--	--	--	--	--	--	--	--	--	--	--	--	2.90E+01	1/11	9.36E-01	9.36E-01	5.52E-01	--	--	--	NA	--	--	--	NA	YES
Total HMW PAHs	--	--	--	--	--	--	--	--	--	--	--	--	--	1.80E+01	3/11	2.74E+00	2.74E+00	1.70E+00	--	--	--	NA	--	--	--	NA	YES
SVOCS																											
2-Methylphenol	--	--	--	--	--	1/4	6.40E-02	6.40E-02	1.60E-02	1.60E-02	--	--	--	NA	--	--	--	NA	--	--	--	5.60E+02	--	--	--	5.60E+02	NO
3-&4-Methylphenols	--	--	--	--	--	2/4	3.36E-01	3.36E-01	8.40E-02	8.40E-02	--	--	--	NA	--	--	--	NA	--	--	--	2.72E+02	--	--	--	2.72E+02	NO
Benzaldehyde	--	--	--	--	--	4/4	1.84E+00	1.84E+00	4.60E-01	4.60E-01	--	--	--	NA	--	--	--	NA	--	--	--	NA	--	--	--	NA	NO
Bis(2-ethylhexyl)phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	2/11	6.70E-01	6.70E-01	1.80E-01	--	--	--	3.00E+02	--	--	--	3.00E+02	YES
Butylbenzylphthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	NA	--	--	--	9.30E+01	--	--	--	9.30E+01	NO
Caprolactam	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	NA	--	--	--	NA	--	--	--	NA	NO
Carbazole	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	1/11	8.60E-02	8.60E-02	NA	--	--	--	NA	--	--	--	NA	YES
Dibenzofuran	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	NA	--	--	--	9.40E+01	--	--	--	9.40E+01	NO
Diethyl phthalate	--	--	--	--	--	1/4	1.60E-01	1.60E-01	4.00E-02	4.00E-02	--	--	--	1.00E+02	--	--	--	6.30E-01	--	--	--	1.04E+03	--	--	--	1.04E+03	NO
Di-n-butyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	2.00E+02	1/11	2.00E-01	2.00E-01	NA	--	--	--	7.00E+00	--	--	--	7.00E+00	YES
Phenol	--	--	--	--	--	3/4	4.40E-01	4.40E-01	1.10E-01	1.10E-01	--	--	--	3.00E+01	3/11	8.30E-02	8.30E-02	NA	--	--	--	1.10E+02	--	--	--	1.10E+02	YES
VOCS																											
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	6.00E+01	--	--	--	1.01E+05	--	--	--	1.01E+05	NO
Acetophenone	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	3/11	1.20E-01	1.20E-01	NA	--	--	--	NA	--	--	--	NA	YES
Bromodichloromethane	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	2.46E+00	--	--	--	2.16E+03	--	--	--	2.16E+03	NO
Bromoform	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	NA	--	--	--	1.49E+02	--	--	--	1.49E+02	NO
Chloroform	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	9.40E-01	--	--	--	8.90E+02	--	--	--	8.90E+02	NO
Dibromochloromethane	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	1.60E-01	--	--	--	1.29E+02	--	--	--	1.29E+02	NO
Methylene chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	7.75E+00	--	--	--	1.10E+04	--	--	--	1.10E+04	NO
Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	2.00E+02	--	--	--	2.88E+00	--	--	--	1.45E+03	--	--	--	1.45E+03	NO

Note:
95UCLM: 95 percent upper confidence limit on the mean
--: No data available
COPC: Chemical of potential concern
Selection of Chemicals of Potential Concern: if an analyte exceeds the screening criteria in any media or no screening is available, the analyte is retained as a COPC

Table 3-6
Detection Comparison to Screening Levels
for Exposure Area 4: LWMCU Downstream of the Siphon

	Benthos Tissue					Fish Tissue					Surface Soil				Sediment				Surface Water (Total)				Surface Water (Dissolved)				Selection of Chemicals of Potential Concern
Analyte	Frequency	Maximum (mg/kg dry wt)	95UCLM (mg/kg dry wt)	Maximum (mg/kg wet wt)	95UCLM (mg/kg wet wt)	Frequency	Maximum (mg/kg dry wt)	95UCLM (mg/kg dry wt)	Maximum (mg/kg wet wt)	95UCLM (mg/kg wet wt)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Aquatic Habitats
Metals																											
Aluminum	--	--	--	--	--	4/4	2.00E+03	2.00E+03	5.00E+02	5.00E+02	--	--	--	3.00E+04	8/8	2.19E+04	1.74E+04	NA	2/2	1.60E+03	1.60E+03	8.70E+01	--	--	--	8.70E+01	YES
Arsenic	--	--	--	--	--	2/4	1.12E+00	1.12E+00	2.80E-01	2.80E-01	--	--	--	1.80E+01	8/8	4.90E+00	4.45E+00	9.79E+00	2/2	4.90E+00	4.90E+00	1.50E+02	2/2	4.20E+00	4.20E+00	1.50E+02	NO
Barium	--	--	--	--	--	4/4	2.64E+01	2.64E+01	6.60E+00	6.60E+00	--	--	--	3.30E+02	8/8	2.10E+02	1.81E+02	NA	2/2	1.46E+02	1.46E+02	1.60E+04	2/2	1.28E+02	1.28E+02	1.60E+04	YES
Cadmium	--	--	--	--	--	1/4	5.20E-02	5.20E-02	1.30E-02	1.30E-02	--	--	--	3.20E+01	8/8	4.90E-01	3.98E-01	9.90E-01	--	--	--	1.50E-01	--	--	--	1.50E-01	NO
Calcium	--	--	--	--	--	4/4	4.80E+04	4.80E+04	1.20E+04	1.20E+04	--	--	--	NA	8/8	1.13E+05	9.39E+04	NA	2/2	8.76E+04	8.76E+04	NA	2/2	8.44E+04	8.44E+04	NA	NO, essential nutrient
Chromium	--	--	--	--	--	4/4	3.00E+00	3.00E+00	7.50E-01	7.50E-01	--	--	--	4.00E-01	8/8	1.51E+01	1.16E+01	4.34E+01	--	--	--	4.20E+01	1/2	3.90E-01	3.90E-01	4.20E+01	NO
Cobalt	--	--	--	--	--	3/4	1.04E+00	1.04E+00	2.60E-01	2.60E-01	--	--	--	1.30E+01	8//8	6.40E+00	6.03E+00	5.00E+01	--	--	--	1.50E+03	--	--	--	1.50E+03	NO
Copper	--	--	--	--	--	4/4	1.24E+01	1.24E+01	3.10E+00	3.10E+00	--	--	--	7.00E+01	8/8	1.42E+01	1.07E+01	3.16E+01	2/2	3.10E+00	3.10E+00	5.24E+00	1/2	2.20E+00	2.20E+00	5.24E+00	NO
Iron	--	--	--	--	--	4/4	2.28E+03	2.28E+03	5.70E+02	5.70E+02	--	--	--	1.50E+04	8/8	2.21E+04	1.82E+04	2.00E+04	2/2	1.34E+03	1.34E+03	1.00E+03	--	--	--	1.00E+03	NO, essential nutrient
Lead	--	--	--	--	--	3/4	2.20E+00	2.20E+00	5.50E-01	5.50E-01	--	--	--	1.20E+02	8/8	1.56E+01	1.26E+01	3.58E+01	2/2	1.60E+00	1.60E+00	1.17E+00	--	--	--	1.17E+00	YES
Magnesium	--	--	--	--	--	4/4	1.76E+03	1.76E+03	4.40E+02	4.40E+02	--	--	--	NA	8/8	7.19E+03	6.05E+03	NA	2/2	3.22E+04	3.22E+04	3.24E+03	2/2	3.21E+04	3.21E+04	3.24E+03	NO, essential nutrient
Manganese	--	--	--	--	--	4/4	1.24E+02	1.24E+02	3.10E+01	3.10E+01	--	--	--	2.20E+02	8/8	5.42E+02	4.37E+02	4.60E+02	2/2	1.14E+02	1.14E+02	1.20E+02	2/2	5.40E+00	5.40E+00	1.20E+02	YES
Mercury	--	--	--	--	--	4/4	9.20E-01	9.20E-01	2.30E-01	2.30E-01	--	--	--	1.00E-01	8/8	1.00E-01	7.47E-02	1.80E-01	--	--	--	1.30E+00	--	--	--	1.30E+00	NO
Nickel	--	--	--	--	--	4/4	2.00E+00	2.00E+00	5.00E-01	5.00E-01	--	--	--	3.80E+01	8/8	1.35E+01	1.09E+01	2.27E+01	2/2	1.80E+00	1.80E+00	2.89E+01	1/2	1.10E+00	1.10E+00	2.89E+01	NO
Potassium	--	--	--	--	--	4/4	1.28E+04	1.28E+04	3.20E+03	3.20E+03	--	--	--	NA	8/8	4.90E+03	3.91E+03	NA	2/2	7.02E+03	7.02E+03	NA	2/2	6.99E+03	6.99E+03	NA	NO, essential nutrient
Selenium	--	--	--	--	--	4/4	9.20E-01	9.20E-01	2.30E-01	2.30E-01	--	--	--	5.20E-01	--	--	--	NA	2/2	1.70E+00	1.70E+00	5.00E+00	2/2	1.70E+00	1.70E+00	5.00E+00	NO
Sodium	--	--	--	--	--	4/4	5.60E+03	5.60E+03	1.40E+03	1.40E+03	--	--	--	NA	5/8	6.80E+02	5.61E+02	NA	2/2	1.67E+05	1.67E+05	NA	2/2	1.65E+05	1.65E+05	NA	NO, essential nutrient
Vanadium	--	--	--	--	--	4/4	6.40E+00	6.40E+00	1.60E+00	1.60E+00	--	--	--	2.00E+00	8/8	2.57E+01	2.15E+01	NA	2/2	1.06E+01	1.06E+01	2.00E+01	2/2	9.40E+00	9.40E+00	2.00E+01	YES
Zinc	--	--	--	--	--	4/4	4.00E+02	4.00E+02	1.00E+02	1.00E+02	--	--	--	1.20E+02	8/8	6.20E+01	4.96E+01	1.21E+02	2/2	5.60E+00	5.60E+00	6.57E+01	2/2	1.40E+00	1.40E+00	6.57E+01	NO
PCBS																											
Aroclor-1254	7/7	2.64E-01	2.64E-01	6.60E-02	6.60E-02	11/12	4.40E+00	3.03E+00	1.10E+00	7.58E-01	--	--	--	4.00E+01	21/24	1.10E-01	5.10E-02	6.00E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES
Total PCB Congeners	2/2	6.40E-01	6.40E-01	1.60E-01	1.60E-01	3/3	2.04E+01	2.04E+01	5.10E+00	5.10E+00	--	--	--	4.00E+01	2/2	3.50E-02	3.50E-02	5.98E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC
Total PCB Aroclors	7/7	2.64E-01	2.64E-01	6.60E-02	6.60E-02	11/11	4.40E+00	2.80E+00	1.10E+00	6.99E-01	--	--	--	4.00E+01	21/24	1.10E-01	5.68E-02	5.98E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES
PESTICIDES																											
DDTr	--	--	--	--	--	4/4	7.68E-01	7.68E-01	1.92E-01	1.92E-01	--	--	--	NA	10/10	1.87E-02	1.20E-02	5.28E-03	1/1	7.40E-02	7.40E-02	NA	--	--	--	NA	YES
delta-BHC	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	1/10	9.80E-04	9.80E-04	3.00E-03	--	--	--	1.41E+02	--	--	--	1.41E+02	NO
Endrin	--	--	--	--	--	4/4	3.16E-01	3.16E-01	7.90E-02	7.90E-02	--	--	--	NA	1/10	1.50E-03	1.50E-03	2.22E-03	--	--	--	2.00E-03	--	--	--	2.00E-03	NO
gamma-Chlordane	--	--	--	--	--	4/4	1.00E-01	1.00E-01	2.50E-02	2.50E-02	--	--	--	NA	9/10	4.40E-03	2.42E-03	3.24E-03	--	--	--	4.00E-03	--	--	--	4.00E-03	YES
Heptachlor epoxide	--	--	--	--	--	4/4	1.08E-02	1.08E-02	2.70E-03	2.70E-03	--	--	--	NA	3/10	1.50E-03	1.50E-03	2.47E-03	--	--	--	3.80E-03	--	--	--	3.80E-03	NO

Note:
95UCLM: 95 percent upper confidence limit on the mean
--: No data available
COPC: Chemical of potential concern
Selection of Chemicals of Potential Concern: if an analyte exceeds the screening criteria in any media or no screening is available, the analyte is retained as a COPC

Table 3-7
Detection Comparison to Screening Levels
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

	Benthos Tissue			Fish Tissue					Surface Soil				Sediment				Surface Water (Total)				Surface Water (Dissolved)				Selection of Chemicals of Potential Concern	Selection of Chemicals of Potential Concern
Analyte	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (mg/kg dry wt)	95UCLM (mg/kg dry wt)	Maximum (mg/kg wet wt)	95UCLM (mg/kg wet wt)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Screening Criteria (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Screening Criteria (µg/L)	Terrestrial Habitats	Aquatic Habitats
Metals																										
Aluminum	--	--	--	2/2	1.56E+01	1.56E+01	3.90E+00	3.90E+00	58/58	2.77E+04	2.08E+04	3.00E+04	18/18	6.74E+04	2.67E+04	NA	11/12	1.86E+03	1.16E+03	8.70E+01	2/12	2.02E+03	2.02E+03	8.70E+01	NO	YES
Arsenic	--	--	--	--	--	--	--	--	58/58	7.60E+00	5.62E+00	1.80E+01	18/18	2.51E+01	7.65E+00	9.79E+00	12/12	4.90E+00	4.90E+00	1.50E+02	12/12	4.80E+00	4.50E+00	1.50E+02	NO	YES
Barium	--	--	--	2/2	2.76E+01	2.76E+01	6.90E+00	6.90E+00	58/58	3.59E+02	1.91E+02	3.30E+02	18/18	2.14E+02	1.77E+02	NA	12/12	1.54E+02	1.39E+02	1.60E+04	12/12	1.47E+02	1.27E+02	1.60E+04	YES	YES
Beryllium	--	--	--	--	--	--	--	--	58/58	1.20E+00	9.00E-01	1.00E+01	6/18	1.00E+00	8.95E-01	NA	--	--	--	5.30E+00	--	--	--	5.30E+00	NO	YES
Cadmium	--	--	--	1/2	8.00E-02	8.00E-02	2.00E-02	2.00E-02	30/58	6.40E-01	4.88E-01	3.20E+01	18/18	5.10E-01	4.25E-01	9.90E-01	--	--	--	1.50E-01	--	--	--	1.50E-01	NO	NO
Calcium	--	--	--	2/2	7.60E+04	7.60E+04	1.90E+04	1.90E+04	58/58	1.34E+05	1.01E+05	NA	18/18	2.11E+05	1.24E+05	NA	12/12	1.90E+05	1.06E+05	NA	12/12	9.58E+04	8.01E+04	NA	NO, essential nutrient	NO, essential nutrient
Chromium	--	--	--	2/2	1.04E+00	1.04E+00	2.60E-01	2.60E-01	58/58	1.61E+01	1.21E+01	4.00E-01	18/18	1.52E+01	1.21E+01	4.34E+01	4/12	7.60E-01	7.60E-01	4.20E+01	4/12	3.50E-01	3.47E-01	4.20E+01	YES	NO
Cobalt	--	--	--	1/2	2.84E-01	2.84E-01	7.10E-02	7.10E-02	58/58	7.40E+00	6.20E+00	1.30E+01	18/18	6.60E+00	5.73E+00	5.00E+01	--	--	--	1.50E+03	--	--	--	1.50E+03	NO	NO
Copper	--	--	--	2/2	3.80E+00	3.80E+00	9.50E-01	9.50E-01	58/58	1.88E+01	1.20E+01	7.00E+01	18/18	7.59E+03	4.62E+03	3.16E+01	12/12	2.64E+02	1.19E+02	5.24E+00	3/12	2.50E+02	2.50E+02	5.24E+00	NO	YES
Iron	--	--	--	2/2	9.60E+01	9.60E+01	2.40E+01	2.40E+01	58/58	6.02E+04	2.18E+04	1.50E+04	18/18	2.34E+04	1.92E+04	2.00E+04	11/12	1.55E+03	1.01E+03	1.00E+03	2/12	1.83E+03	1.83E+03	1.00E+03	NO, essential nutrient	NO, essential nutrient
Lead	--	--	--	2/2	2.80E-01	2.80E-01	7.00E-02	7.00E-02	58/58	7.42E+01	1.88E+01	1.20E+02	18/18	4.09E+01	1.84E+01	3.58E+01	10/12	2.00E+00	1.35E+00	1.17E+00	1/12	2.20E+00	2.20E+00	1.17E+00	NO	YES
Magnesium	--	--	--	2/2	2.16E+03	2.16E+03	5.40E+02	5.40E+02	58/58	1.04E+04	7.14E+03	NA	18/18	9.00E+03	7.13E+03	NA	12/12	5.63E+04	3.73E+04	3.24E+03	12/12	3.34E+04	3.19E+04	3.24E+03	NO, essential nutrient	NO, essential nutrient
Manganese	--	--	--	2/2	3.16E+01	3.16E+01	7.90E+00	7.90E+00	58/58	7.79E+02	3.96E+02	2.20E+02	18/18	5.09E+02	4.40E+02	4.60E+02	12/12	1.15E+02	8.82E+01	1.20E+02	6/12	1.31E+02	4.99E+01	1.20E+02	YES	YES
Mercury	--	--	--	2/2	3.60E-01	3.60E-01	9.00E-02	9.00E-02	57/58	9.40E-02	5.29E-02	1.00E-01	17/18	6.00E-02	4.33E-02	1.80E-01	--	--	--	1.30E+00	--	--	--	1.30E+00	NO	NO
Nickel	--	--	--	2/2	5.20E-01	5.20E-01	1.30E-01	1.30E-01	58/58	1.70E+01	1.33E+01	3.80E+01	18/18	1.45E+01	1.18E+01	2.27E+01	11/12	2.30E+00	1.79E+00	2.89E+01	7/12	2.30E+00	1.42E+00	2.89E+01	NO	NO
Potassium	--	--	--	2/2	1.04E+04	1.04E+04	2.60E+03	2.60E+03	58/58	6.27E+03	5.19E+03	NA	18/18	6.03E+03	4.70E+03	NA	12/12	1.22E+04	8.28E+03	NA	12/12	7.63E+03	7.14E+03	NA	NO, essential nutrient	NO, essential nutrient
Selenium	--	--	--	2/2	1.12E+00	1.12E+00	2.80E-01	2.80E-01	12/58	2.60E-01	1.46E-01	5.20E-01	13/18	4.80E-01	3.57E-01	NA	12/12	1.80E+00	1.22E+00	5.00E+00	7/12	1.50E+00	1.51E+00	5.00E+00	NO	YES
Sodium	--	--	--	2/2	4.40E+03	4.40E+03	1.10E+03	1.10E+03	35/58	1.79E+04	3.20E+03	NA	16/18	1.18E+03	8.44E+02	NA	12/12	3.34E+05	2.05E+05	NA	12/12	1.77E+05	1.67E+05	NA	NO, essential nutrient	NO, essential nutrient
Vanadium	--	--	--	2/2	2.12E+00	2.12E+00	5.30E-01	5.30E-01	58/58	3.14E+01	2.33E+01	2.00E+00	18/18	3.58E+01	2.47E+01	NA	12/12	1.05E+01	1.00E+01	2.00E+01	12/12	1.10E+01	9.16E+00	2.00E+01	YES	YES
Zinc	--	--	--	2/2	3.20E+02	3.20E+02	8.00E+01	8.00E+01	58/58	1.60E+02	6.03E+01	1.20E+02	18/18	6.95E+01	5.33E+01	1.21E+02	12/12	8.10E+00	5.43E+00	6.57E+01	8/12	1.61E+01	5.73E+00	6.57E+01	YES	NO
PCBS																										
Aroclor-1016	--	--	--	--	--	--	--	--	1/70	3.40E-03	3.40E-03	4.00E+01	--	--	--	7.00E-03	--	--	--	1.40E-02	--	--	--	1.40E-02	YES , main COPC	NO
Aroclor-1254	--	--	--	8/28	1.16E+00	4.80E-01	2.90E-01	1.20E-01	3/70	1.10E-02	1.10E-02	4.00E+01	15/33	2.30E-02	6.08E-03	6.00E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC	YES, main COPC
Aroclor-1260	--	--	--	--	--	--	--	--	27/70	1.00E-02	2.67E-03	4.00E+01	4/33	2.80E-03	2.20E-03	5.00E-03	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC	YES, main COPC
Total PCB Congeners	--	--	--	3/3	4.79E-01	4.79E-01	1.20E-01	1.20E-01	24/24	4.50E-02	1.02E-02	4.00E+01	10/10	2.10E-02	1.32E-02	5.98E-02	6/6	1.10E-02	1.10E-02	1.40E-02	--	--	--	1.40E-02	YES, main COPC	YES, main COPC
Total PCB Aroclors	--	--	--	8/8	1.16E+00	9.56E-01	2.90E-01	2.39E-01	28/28	1.76E-02	6.23E-03	4.00E+01	18/33	2.30E-02	1.33E-02	5.98E-02	--	--	--	1.40E-02	--	--	--	1.40E-02	YES, main COPC	YES, main COPC
PESTICIDES																										
DDTr	--	--	--	2/2	2.27E-01	2.27E-01	5.67E-02	5.67E-02	47/58	8.14E-02	2.10E-02	NA	16/19	9.67E-02	4.51E-02	5.28E-03	1/12	3.10E-02	3.10E-02	NA	--	--	--	NA	YES	YES
Aldrin	--	--	--	1/2	4.00E-04	4.00E-04	1.00E-04	1.00E-04	--	--	--	NA	1/19	6.50E-04	6.50E-04	2.00E-03	--	--	--	3.00E-01	--	--	--	3.00E-01	NO	NO
alpha-BHC	--	--	--	--	--	--	--	--	--	--	--	NA	2/19	6.70E-04	6.70E-04	6.00E-03	--	--	--	7.40E+01	--	--	--	7.40E+01	NO	NO
alpha-Chlordane	--	--	--	2/2	6.80E-03	6.80E-03	1.70E-03	1.70E-03	1/58	2.30E-03	2.30E-03	NA	3/19	1.30E-03	1.30E-03	3.24E-03	--	--	--	4.00E-03	--	--	--	4.00E-03	YES	NO
delta-BHC	--	--	--	--	--	--	--	--	--	--	--	NA	2/19	3.00E-03	3.00E-03	3.00E-03	1/12	2.80E-02	2.80E-02	1.41E+02	--	--	--	1.41E+02	NO	YES
Dieldrin	--	--	--	--	--	--	--	--	2/58	1.40E-02	1.40E-02	NA	1/19	7.50E-03	7.50E-03	1.90E-03	--	--	--	2.00E-03	--	--	--	2.00E-03	YES	YES
Endosulfan I	--	--	--	--	--	--	--	--	1/58	7.50E-04	7.50E-04	NA	--	--	--	NA	--	--	--	5.60E-02	--	--	--	5.60E-02	YES	NO
Endosulfan II	--	--	--	--	--	--	--	--	5/58	1.70E-02	2.36E-03	NA	2/19	6.00E-03	6.00E-03	NA	--	--	--	5.60E-02	--	--	--	5.60E-02	YES	YES
Endosulfan sulfate	--	--	--	2/2	2.12E-03	2.12E-03	5.30E-04	5.30E-04	2/58	1.30E-02	1.30E-02	NA	1/19	1.70E-03	1.70E-03	NA	--	--	--	5.60E-02	--	--	--	5.60E-02	YES	YES
Endrin	--	--	--	2/2	3.64E-02	3.64E-02	9.10E-03	9.10E-03	3/58	6.90E-03	6.90E-03	NA	1/19	1.30E-03	1.30E-03	2.22E-03	--	--	--	2.00E-03	--	--	--	2.00E-03	YES	NO
Endrin aldehyde	--	--	--	2/2	3.56E-03	3.56E-03	8.90E-04	8.90E-04	10/58	3.50E-02	4.14E-03	NA	3/19	5.60E-03	5.60E-03	NA	--	--	--	1.21E+03	--	--	--	1.21E+03	YES	YES
Endrin ketone	--	--	--	2/2	8.00E-03	8.00E-03	2.00E-03	2.00E-03	1/58	2.10E-03	2.10E-03	NA	1/19	2.10E-02	2.10E-02	NA	--	--	--	NA	--	--	--	NA	YES	YES
gamma-BHC (Lindane)	--	--	--	1/2	3.00E-04	3.00E-04	7.50E-05	7.50E-05	--	--	--	NA	1/19	9.40E-04	9.40E-04	2.37E-03	--	--	--	8.00E-02	--	--	--	8.00E-02	NO	NO
gamma-Chlordane	--	--	--	1/2	2.36E-02	2.36E-02	5.90E-03	5.90E-03	3/58	1.40E-03	1.40E-03	NA	7/19	2.90E-03	1.98E-03	3.24E-03	--	--	--	4.00E-03	--	--	--	4.00E-03	YES	NO
Heptachlor	--	--	--	--	--	--	--	--	--	--	--	NA	1/19	3.90E-03	3.90E-03	NA	--	--	--	4.00E-03	--	--	--	4.00E-03	NO	YES
Heptachlor epoxide	--	--	--	2/2	1.48E-03	1.48E-03	3.70E-04	3.70E-04	2/58	1.10E-03	1.10E-03	NA	6/19	1.80E-03	1.53E-03	2.47E-03	--	--	--	3.80E-03	--	--	--	3.80E-03	YES	NO
Methoxychlor	--	--	--	2/2	2.36E-02	2.36E-02	5.90E-03	5.90E-03	2/58	1.10E-02	1.10E-02	NA	1/19	3.00E-02	3.00E-02	NA	--	--	--	3.00E-02	--	--	--	3.00E-02	YES	YES
Toxaphene	--	--	--	--	--	--	--	--	2/58	5.60E-01	5.60E-01	NA	--	--	--	1.00E-04	--	--	--	2.00E-04	--	--	--	2.00E-04	YES	NO
PAHs																										
Total LMW PAHs	--	--	--	--	--	--	--	--	3/58	1.30E-01	1.30E-01	2.90E+01	2/19	2.77E+01	2.77E+01	5.52E-01	--	--	--	NA	--	--	--	NA	NO	YES
Total HMW PAHs	--	--	--	--	--	--	--	--	3/58	1.30E+00	1.30E+00	1.80E+01	3/19	2.38E+02	2.38E+02	1.70E+00	--	--	--	NA	--	--	--	NA	NO	YES
SVOCS																										
Benzaldehyde	--	--	--	2/2	2.48E-01	2.48E-01	6.20E-02	6.20E-02	--	--	--	NA	--	--	--	NA	1/12	2.00E+00	2.00E+00	NA	--	--	--	NA	NO	YES
Bis(2-ethylhexyl)phthalate	--	--	--	--	--	--	--	--	22/58	5.20E+00	4.75E-01	NA	5/19	8.10E+00	3.41E+00	1.80E-01	1/12	3.10E+00	3.10E+00	3.00E+02	--	--	--	3.00E+02	YES	YES
Butylbenzylphthalate	--	--	--	--	--	--	--	--	1/58	4.70E-01	4.70E-01	NA	1/19	9.90E-01	9.90E-01	NA	--	--	--	9.30E+01	--	--	--	9.30E+01	YES	YES
Caprolactam	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	NA	1/12	3.10E+00	3.10E+00	NA	--	--	--	NA	NO	YES
Carbazole	--	--	--	--	--	--	--	--	--	--	--	NA	1/19	2.40E+00	2.40E+00	NA	--	--	--	NA	--	--	--	NA	NO	YES
Dibenzofuran	--	--	--	--	--	--	--	--	--	--	--	NA	1/19	3.50E-01	3.50E-01	NA	--	--	--	9.40E+01	--	--	--	9.40E+01	NO	YES
Di-n-butyl phthalate	--	--	--	--	--	--	--	--	3/58	1.00E-01	1.00E-01	2.00E+02	--	--	--	NA	--	--	--	7.00E+00	--	--	--	7.00E+00	NO	NO
VOCS																										
Acetone	--	--	--	--	--	--	--	--	7/19	1.71E-02	1.35E-02	NA	--	--	--	6.00E+01	1/6	4.80E+00	4.80E+00	1.01E+05	--	--	--	1.01E+05	YES	NO
Bromodichloromethane	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	2.46E+00	1/6	3.40E+00	3.40E+00	2.16E+03	--	--	--	2.16E+03	NO	NO
Bromoform	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	NA	1/6	3.60E+00	3.60E+00	1.49E+02	--	--	--	1.49E+02	NO	NO
Chloroform	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	9.40E-01	1/6	2.10E+00	2.10E+00	8.90E+02	--	--	--	8.90E+02	NO	NO
Dibromochloromethane	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	1.60E-01	1/6	4.20E+00	4.20E+00	1.29E+02	--	--	--	1.29E+02	NO	NO
Methylene chloride	--	--	--	--	--	--	--	--	4/19	3.60E-03	3.52E-03	NA	--	--	--	7.75E+00	--	--	--	1.10E+04	--	--	--	1.10E+04	YES	NO
Toluene	--	--	--	--	--	--	--	--	--	--	--	2.00E+02	1/9	4.70E-03	4.70E-03	2.88E+00	--	--	--	1.45E+03	--	--	--	1.45E+03	NO	NO

Note:
95UCLM: 95 percent upper confidence limit on the mean
--: No data available
COPC: Chemical of potential concern
Selection of Chemicals of Potential Concern: if an analyte exceeds the screening criteria in any media or no screening is available, the analyte is retained as a COPC

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Table 4-1
Uptake Models Relating Concentrations in Soil to Concentrations in Plants

Chemical	Food Item (Plant) Uptake			
	Uptake Model[A, B, C]	BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Log K_{ow}	Source
Metals				
Aluminum	Uptake Factor	4.00E-03	--	Baes et al. 1984
Antimony	Uptake Factor	2.00E-01	--	Baes et al. 1984
Arsenic	Log Linear	ln(dry plant conc, mg/kg) = (-1.992+0.564*ln(soil	--	Bechtel Jacobs 1998
Barium	Uptake Factor	1.50E-01	--	Baes et al. 1984
Beryllium	Uptake Factor	1.00E-02	--	Baes et al. 1984
Cadmium	Log Linear	ln(dry plant conc, mg/kg) = (-0.476+0.546*ln(soil	--	Bechtel Jacobs 1998
Calcium	Uptake Factor	3.50E+00	--	Baes et al. 1984
Chromium	Uptake Factor	7.50E-03	--	Baes et al. 1984
Cobalt	Uptake Factor	2.00E-02	--	Baes et al. 1984
Copper	Log Linear	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	--	Bechtel Jacobs 1998
Iron	Uptake Factor	4.00E-03	--	Baes et al. 1984
Lead	Log Linear	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil	--	Bechtel Jacobs 1998
Magnesium	Uptake Factor	1.00E+00	--	Baes et al. 1984
Manganese	Uptake Factor	2.50E-01	--	Baes et al. 1984
Mercury	Log Linear	ln(dry plant conc, mg/kg) = (-0.996+0.544*ln(soil	--	Bechtel Jacobs 1998
Nickel	Log Linear	ln(dry plant conc, mg/kg) = (-2.224+0.748*ln(soil	--	Bechtel Jacobs 1998
Potassium	Uptake Factor	1.00E+00	--	Baes et al. 1984
Selenium	Log Linear	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil	--	Bechtel Jacobs 1998
Silver	Uptake Factor	4.00E-01	--	Baes et al. 1984
Sodium	Uptake Factor	7.50E-02	--	Baes et al. 1984
Thallium	Uptake Factor	4.00E-03	--	Baes et al. 1984
Vanadium	Uptake Factor	5.50E-03	--	Baes et al. 1984
Zinc	Log Linear	ln(dry plant conc, mg/kg) = (1.575+0.555*ln(soil conc))	--	Bechtel Jacobs 1998
PCBS				
Aroclor-1016	Uptake Factor	1.99E-02	5.69E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1221	Uptake Factor	1.11E-01	4.40E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1242	Uptake Factor	8.44E-03	6.34E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1248	Uptake Factor	8.44E-03	6.34E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1254	Uptake Factor	3.58E-03	6.98E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1260	Uptake Factor	6.44E-04	8.27E+00	BAF calculated via regression from Travis and Arms 1988
Total PCB Congeners	Uptake Factor	8.44E-03	6.34E+00	BAF calculated via regression from Travis and Arms 1988
Total PCB Aroclors	Uptake Factor	8.44E-03	6.34E+00	BAF calculated via regression from Travis and Arms 1988
PESTICIDES				
DDTr	Uptake Factor	1.97E-02	--	BAF calculated via regression from Travis and Arms 1988 for DDT metabolite with greatest uptake
Aldrin	Uptake Factor	4.87E-03	6.75E+00	BAF calculated via regression from Travis and Arms 1988
alpha-BHC	Uptake Factor	1.34E-01	4.26E+00	BAF calculated via regression from Travis and Arms 1988
alpha-Chlordane	Uptake Factor	9.33E-03	6.26E+00	BAF calculated via regression from Travis and Arms 1988
beta-BHC	Uptake Factor	1.34E-01	4.26E+00	BAF calculated via regression from Travis and Arms 1988
delta-BHC	Uptake Factor	1.34E-01	4.26E+00	BAF calculated via regression from Travis and Arms 1988
Dieldrin	Uptake Factor	2.75E-02	5.45E+00	BAF calculated via regression from Travis and Arms 1988
Endosulfan I	Uptake Factor	3.69E-01	3.50E+00	BAF calculated via regression from Travis and Arms 1988
Endosulfan II	Uptake Factor	3.69E-01	3.50E+00	BAF calculated via regression from Travis and Arms 1988
Endosulfan sulfate	Uptake Factor	3.06E-01	3.64E+00	BAF calculated via regression from Travis and Arms 1988
Endrin	Uptake Factor	2.75E-02	5.45E+00	BAF calculated via regression from Travis and Arms 1988
Endrin aldehyde	Uptake Factor	6.47E-02	4.80E+00	BAF calculated via regression from Travis and Arms 1988
Endrin ketone	Uptake Factor	5.08E-02	4.99E+00	BAF calculated via regression from Travis and Arms 1988
gamma-BHC (Lindane)	Uptake Factor	1.34E-01	4.26E+00	BAF calculated via regression from Travis and Arms 1988
gamma-Chlordane	Uptake Factor	3.48E-03	7.00E+00	BAF calculated via regression from Travis and Arms 1988

Table 4-1
Uptake Models Relating Concentrations in Soil to Concentrations in Plants

Chemical	Food Item (Plant) Uptake			
	Uptake Model[A, B, C]	BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Log K_{ow}	Source
Heptachlor	Uptake Factor	1.58E-02	5.86E+00	BAF calculated via regression from Travis and Arms 1988
Heptachlor epoxide	Uptake Factor	8.92E-02	4.56E+00	BAF calculated via regression from Travis and Arms 1988
Methoxychlor	Uptake Factor	2.05E-02	5.67E+00	BAF calculated via regression from Travis and Arms 1988
Toxaphene	Uptake Factor	4.58E-03	6.79E+00	BAF calculated via regression from Travis and Arms 1988
PAHs				
Total LMW PAHs	Uptake Factor	1.01E-01	--	Average of individual PAH biotransfer factors calculated via regression from Travis and Arms 1988
Total HMW PAHs	Uptake Factor	1.01E-01	--	Average of individual PAH biotransfer factors calculated via regression from Travis and Arms 1988
SVOCS				
2-Methylphenol	Uptake Factor	2.50E+00	2.06E+00	BAF calculated via regression from Travis and Arms 1988
3-&4-Methylphenols	Uptake Factor	2.50E+00	2.06E+00	BAF calculated via regression from Travis and Arms 1988
Benzaldehyde	Uptake Factor	3.98E+00	1.71E+00	BAF calculated via regression from Travis and Arms 1988
Bis(2-ethylhexyl)phthalate	Uptake Factor	5.48E-04	8.39E+00	BAF calculated via regression from Travis and Arms 1988
Butylbenzylphthalate	Uptake Factor	6.17E-02	4.84E+00	BAF calculated via regression from Travis and Arms 1988
Caprolactam	Uptake Factor	1.61E+01	6.60E-01	BAF calculated via regression from Travis and Arms 1988
Carbazole	Uptake Factor	5.26E-01	3.23E+00	BAF calculated via regression from Travis and Arms 1988
Dibenzofuran	Uptake Factor	2.76E-01	3.71E+00	BAF calculated via regression from Travis and Arms 1988
Diethyl phthalate	Uptake Factor	1.14E+00	2.65E+00	BAF calculated via regression from Travis and Arms 1988
Di-n-butyl phthalate	Uptake Factor	8.38E-02	4.61E+00	BAF calculated via regression from Travis and Arms 1988
Phenol	Uptake Factor	5.19E+00	1.51E+00	BAF calculated via regression from Travis and Arms 1988
VOCS				
Acetone	Uptake Factor	5.29E+01	-2.35E-01	BAF calculated via regression from Travis and Arms 1988
Acetophenone	Uptake Factor	4.18E+00	1.67E+00	BAF calculated via regression from Travis and Arms 1988
Bromodichloromethane	Uptake Factor	4.54E+00	1.61E+00	BAF calculated via regression from Travis and Arms 1988
Bromoform	Uptake Factor	5.33E+00	1.49E+00	BAF calculated via regression from Travis and Arms 1988
Chloroform	Uptake Factor	5.12E+00	1.52E+00	BAF calculated via regression from Travis and Arms 1988
Dibromochloromethane	Uptake Factor	4.03E+00	1.70E+00	BAF calculated via regression from Travis and Arms 1988
Methylene chloride	Uptake Factor	6.51E+00	1.34E+00	BAF calculated via regression from Travis and Arms 1988
Toluene	Uptake Factor	1.32E+00	2.54E+00	BAF calculated via regression from Travis and Arms 1988

Table 4-1
Uptake Models Relating Concentrations in Soil to Concentrations in Plants

Chemical	Food Item (Plant) Uptake			
	Uptake Model[A, B, C]	BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Log K_{ow}	Source

Note:
A - Equation types:
Uptake Factor: [ConcBio] = m x [ConcSoil]
Log linear: [ConcBio] = 10b*[ConcSoil]m
B - Uptake factor for organics derived using the following equations from Travis & Arms 1988 (equation 5, pg 273): Log Upfp = 1.588 - (0.578)(Log Kow)
UpF_p = plant uptake factor
K_{ow} = octanol-water partitioning coefficient
Log K_{ow} values from KOWWIN program from EPI suite.
C - Uptake factor for inorganics derived using the following equations from Bechtel Jacobs 1998: ln(plant) = B0 + B1(ln(soil concentration))
B0 = Constituent-specific intercept based on tissue type
B1 = Constituent-specific slope based on tissue type
Data for B0 and B1 are presented in Bechtel Jacobs 1998, Table 7, pg. 22.
Log Kow for m, p-xylenes = average of m-xylene and p-xylene Log Kow
BAF: Bioaccumulation factor

Table 4-2
Uptake Models Relating Concentrations in Soil to Concentrations in Soil Invertebrates

Chemical	Food Item (Worm) Uptake		
	Uptake Model[A, B, C]	BAF/Equation (mg/kg dry wt. to mg/kg dry	Source
Metals			
Aluminum	Uptake Factor	1.18E-01	90% UF, Sample et al 1998a
Antimony	Uptake Factor	1.00E+00	Default
Arsenic	Log Linear	ln(dry worm conc, mg/kg) = (-1.421+0.706*ln(soil conc))	Sample et al. 1998a
Barium	Uptake Factor	1.60E-01	90% UF, Sample et al 1998a
Beryllium	Uptake Factor	1.18E+00	90% UF, Sample et al 1998a
Cadmium	Log Linear	ln(dry worm conc, mg/kg) = (2.114+0.795*ln(soil conc))	Sample et al. 1998a
Calcium	Uptake Factor	1.00E+00	Default
Chromium	Log Linear	ln(dry worm conc, mg/kg) = (2.481+-0.067*ln(soil conc))	Sample et al. 1998a
Cobalt	Uptake Factor	2.91E-01	90% UF, Sample et al 1998a
Copper	Log Linear	ln(dry worm conc, mg/kg) = (1.675+0.264*ln(soil conc))	Sample et al. 1998a
Iron	Uptake Factor	7.80E-02	90% UF, Sample et al 1998a
Lead	Log Linear	ln(dry worm conc, mg/kg) = (-0.218+0.807*ln(soil conc))	Sample et al. 1998a
Magnesium	Uptake Factor	5.30E-01	90% UF, Sample et al 1998a
Manganese	Log Linear	ln(dry worm conc, mg/kg) = (-0.809+0.682*ln(soil conc))	Default
Mercury	Log Linear	ln(dry worm conc, mg/kg) = (-0.684+0.118*ln(soil conc))	Sample et al. 1998a
Nickel	Log Linear	ln(dry worm conc, mg/kg) = (3.677-0.26*ln(soil conc))	Sample et al. 1998a
Potassium	Uptake Factor	1.00E+00	Default
Selenium	Log Linear	ln(dry worm conc, mg/kg) = (-0.075+0.733*ln(soil conc))	Sample et al. 1998a
Silver	Uptake Factor	1.53E+01	90% UF, Sample et al 1998a
Sodium	Uptake Factor	1.00E+00	Default
Thallium	Uptake Factor	1.00E+00	Default
Vanadium	Uptake Factor	8.80E-01	90% UF, Sample et al 1998a
Zinc	Log Linear	ln(dry worm conc, mg/kg) = (4.449+0.328*ln(soil conc))	Sample et al. 1998a
PCBS			
Aroclor-1016	Log Linear	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	Equation for PCB from Sample et al. 1998a
Aroclor-1221	Log Linear	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	Equation for PCB from Sample et al. 1998a
Aroclor-1242	Log Linear	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	Equation for PCB from Sample et al. 1998a
Aroclor-1248	Log Linear	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	Equation for PCB from Sample et al. 1998a
Aroclor-1254	Log Linear	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	Equation for PCB from Sample et al. 1998a
Aroclor-1260	Log Linear	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	Equation for PCB from Sample et al. 1998a
Total PCB Congeners	Log Linear	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	Equation for PCB from Sample et al. 1998a
Total PCB Aroclors	Log Linear	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	Equation for PCB from Sample et al. 1998a

Table 4-2
Uptake Models Relating Concentrations in Soil to Concentrations in Soil Invertebrates

Chemical	Food Item (Worm) Uptake		
	Uptake Model[A, B, C]	BAF/Equation (mg/kg dry wt. to mg/kg dry	Source
PESTICIDES			
DDTr	DDTr	9.00E+00	Beyer 1990
Aldrin	Uptake Factor	5.50E+00	Beyer 1990
alpha-BHC	Uptake Factor	1.00E+00	Default
alpha-Chlordane	Uptake Factor	1.00E+00	Default
beta-BHC	Uptake Factor	1.00E+00	Default
delta-BHC	Uptake Factor	1.00E+00	Default
Dieldrin	Uptake Factor	1.79E+00	Beyer and Gish 1980
Endosulfan I	Uptake Factor	1.00E+00	Default
Endosulfan II	Uptake Factor	1.00E+00	Default
Endosulfan sulfate	Uptake Factor	3.50E+00	Laird and Kroger 1981
Endrin	Uptake Factor	3.50E+00	Laird and Kroger 1981
Endrin aldehyde	Uptake Factor	3.50E+00	Laird and Kroger 1981
Endrin ketone	Uptake Factor	1.00E+00	Default
gamma-BHC (Lindane)	Uptake Factor	4.20E+00	Beyer 1990
gamma-Chlordane	Uptake Factor	1.00E+00	Default
Heptachlor	Uptake Factor	4.00E-02	Gish and Hughes 1982
Heptachlor epoxide	Uptake Factor	4.00E-02	Gish and Hughes 1982
Methoxychlor	Uptake Factor	1.00E+00	Default
Toxaphene	Uptake Factor	1.00E+00	Default
PAHs			
Total LMW PAHs	Uptake Factor	3.00E-01	Beyer and Stafford 1993, value for total PAHs
Total HMW PAHs	Uptake Factor	3.00E-01	Beyer and Stafford 1993, value for total PAHs
SVOCS			
2-Methylphenol	Uptake Factor	1.00E+00	Default
3-&4-Methylphenols	Uptake Factor	1.00E+00	Default
Benzaldehyde	Uptake Factor	1.00E+00	Default
Bis(2-ethylhexyl)phthalate	Uptake Factor	1.00E+00	Default
Butylbenzylphthalate	Uptake Factor	1.00E+00	Default
Caprolactam	Uptake Factor	1.00E+00	Default
Carbazole	Uptake Factor	1.00E+00	Default
Dibenzofuran	Uptake Factor	1.00E+00	Default
Diethyl phthalate	Uptake Factor	1.00E+00	Default
Di-n-butyl phthalate	Uptake Factor	1.00E+00	Default
Phenol	Uptake Factor	1.00E+00	Default
VOCS			
Acetone	Uptake Factor	1.00E+00	Default
Acetophenone	Uptake Factor	1.00E+00	Default
Bromodichloromethane	Uptake Factor	1.00E+00	Default
Bromoform	Uptake Factor	1.00E+00	Default
Chloroform	Uptake Factor	1.00E+00	Default
Dibromochloromethane	Uptake Factor	1.00E+00	Default
Methylene chloride	Uptake Factor	1.00E+00	Default
Toluene	Uptake Factor	1.00E+00	Default

Table 4-2
Uptake Models Relating Concentrations in Soil to Concentrations in Soil Invertebrates

Chemical	Food Item (Worm) Uptake		
	Uptake Model[A, B, C]	BAF/Equation (mg/kg dry wt. to mg/kg dry	Source

Note:
A - The default uptake factor for chemicals were no information was available was assumed to be 1.
B - Equation types:
Uptake Factor: [ConcBio] = m x [ConcSoil]
Log linear: [ConcBio] = 10b*[ConcSoil]m
C - Uptake factor derived using the following equations from Sample, et. al 1998a:
ln(earthworm) = B0 + B1(ln(soil concentration))
B0 = Constituent-specific intercept based on tissue type
B1 = Constituent-specific slope based on tissue type
Data for B0 and B1 are presented in Sample, et. al 1998a, Table 12, pg. 33.
BAF: Bioaccumulation factor

Table 4-3
Uptake Models Relating Doses Ingested by Small Mammals to Concentrations in Small Mammals

Chemical	Food Item (Small Mammal) Uptake			
	Uptake Model	UF/BTF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Log K_{ow}	Source
Metals				
Aluminum	Uptake Factor	7.32E-02	--	Sample et al. 1998b
Antimony	Uptake Factor	2.12E-04	--	90% UF from Sample et al. 1998b
Arsenic	Log Linear	ln(dry mammal conc, mg/kg) = (-4.8471+0.8188*ln(soil conc))	--	Sample et al. 1998b
Barium	Log Linear	ln(dry mammal conc, mg/kg) = (-1.412+0.7*ln(soil conc))	--	Sample et al. 1998b
Beryllium	Uptake Factor	2.12E-04	--	90%UF from Sample et al. 1998b
Cadmium	Log Linear	ln(dry mammal conc, mg/kg) = (-0.4306+0.4865*ln(soil conc))	--	Sample et al. 1998b
Calcium	Uptake Factor	1.48E-04	--	90%UF from Sample et al. 1998b
Chromium	Log Linear	ln(dry mammal conc, mg/kg) = (-1.4599+0.7338*ln(soil conc))	--	Sample et al. 1998b
Cobalt	Uptake Factor	1.00E-01	--	90%UF from Sample et al. 1998b
Copper	Log Linear	ln(dry mammal conc, mg/kg) = (2.042+0.1444*ln(soil conc))	--	Sample et al. 1998b
Iron	Uptake Factor	4.24E-03	--	90% UF, Sample et al 1998b
Lead	Log Linear	ln(dry mammal conc, mg/kg) = (0.0761+0.4422*ln(soil conc))	--	Sample et al. 1998b
Magnesium	Uptake Factor	1.06E-03	--	90% UF, Sample et al 1998b
Manganese	Uptake Factor	5.87E-02	--	Sample et al. 1998b
Mercury	Uptake Factor	1.06E-03	--	Sample et al. 1998b
Nickel	Log Linear	ln(dry mammal conc, mg/kg) = (-0.2462+0.4658*ln(soil conc))	--	Sample et al. 1998b
Potassium	Uptake Factor	4.24E-03	--	90%UF from Sample et al. 1998b
Selenium	Log Linear	ln(dry mammal conc, mg/kg) = (-0.4158+0.3764*ln(soil conc))	--	Sample et al. 1998b
Silver	Uptake Factor	1.48E-04	--	90% UF, Sample et al 1998b
Sodium	Uptake Factor	2.12E-04	--	90% UF, Sample et al 1998b
Thallium	Uptake Factor	2.12E-04	--	90%UF from Sample et al. 1998b
Vanadium	Uptake Factor	7.32E-02	--	Sample et al. 1998b
Zinc	Log Linear	ln(dry mammal conc, mg/kg) = (4.4713+0.0738*ln(soil conc))	--	Sample et al. 1998b
PCBS				
Aroclor-1016	Biotransfer Factor	4.93E-02	5.69E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1221	Biotransfer Factor	2.53E-03	4.40E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1242	Biotransfer Factor	2.17E-01	6.34E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1248	Biotransfer Factor	2.17E-01	6.34E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1254	Biotransfer Factor	9.58E-01	6.98E+00	BAF calculated via regression from Travis and Arms 1988
Aroclor-1260	Biotransfer Factor	1.86E+01	8.27E+00	BAF calculated via regression from Travis and Arms 1988
Total PCB Congeners	Biotransfer Factor	2.17E-01	6.34E+00	BAF calculated via regression from Travis and Arms 1988
Total PCB Aroclors	Biotransfer Factor	2.17E-01	6.34E+00	BAF calculated via regression from Travis and Arms 1988
PESTICIDES				
DDTr	Biotransfer Factor	6.20E-01	--	BAF calculated via regression from Travis and Arms 1988 for DDT metabolite with greatest uptake
Aldrin	Biotransfer Factor	5.63E-01	6.75E+00	BAF calculated via regression from Travis and Arms 1988
alpha-BHC	Biotransfer Factor	1.82E-03	4.26E+00	BAF calculated via regression from Travis and Arms 1988
alpha-Chlordane	Biotransfer Factor	1.83E-01	6.26E+00	BAF calculated via regression from Travis and Arms 1988
beta-BHC	Biotransfer Factor	1.82E-03	4.26E+00	BAF calculated via regression from Travis and Arms 1988
delta-BHC	Biotransfer Factor	1.82E-03	4.26E+00	BAF calculated via regression from Travis and Arms 1988
Dieldrin	Biotransfer Factor	2.82E-02	5.45E+00	BAF calculated via regression from Travis and Arms 1988
Endosulfan I	Biotransfer Factor	3.15E-04	3.50E+00	BAF calculated via regression from Travis and Arms 1988
Endosulfan II	Biotransfer Factor	3.15E-04	3.50E+00	BAF calculated via regression from Travis and Arms 1988
Endosulfan sulfate	Biotransfer Factor	4.35E-04	3.64E+00	BAF calculated via regression from Travis and Arms 1988
Endrin	Biotransfer Factor	2.82E-02	5.45E+00	BAF calculated via regression from Travis and Arms 1988
Endrin aldehyde	Biotransfer Factor	6.41E-03	4.80E+00	BAF calculated via regression from Travis and Arms 1988
Endrin ketone	Biotransfer Factor	9.74E-03	4.99E+00	BAF calculated via regression from Travis and Arms 1988
gamma-BHC (Lindane)	Biotransfer Factor	1.82E-03	4.26E+00	BAF calculated via regression from Travis and Arms 1988

Table 4-3
Uptake Models Relating Doses Ingested by Small Mammals to Concentrations in Small Mammals

Chemical	Food Item (Small Mammal) Uptake			
	Uptake Model	UF/BTF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Log K_{ow}	Source
gamma-Chlordane	Biotransfer Factor	1.01E+00	7.00E+00	BAF calculated via regression from Travis and Arms 1988
Heptachlor	Biotransfer Factor	7.35E-02	5.86E+00	BAF calculated via regression from Travis and Arms 1988
Heptachlor epoxide	Biotransfer Factor	3.68E-03	4.56E+00	BAF calculated via regression from Travis and Arms 1988
Methoxychlor	Biotransfer Factor	4.67E-02	5.67E+00	BAF calculated via regression from Travis and Arms 1988
Toxaphene	Biotransfer Factor	6.27E-01	6.79E+00	BAF calculated via regression from Travis and Arms 1988
PAHs				
Total LMW PAHs	Biotransfer Factor	1.26E-01	--	Average of individual PAH biotransfer factors calculated via regression from Travis and Arms 1988
Total HMW PAHs	Biotransfer Factor	1.26E-01	--	Average of individual PAH biotransfer factors calculated via regression from Travis and Arms 1988
SVOCS				
2-Methylphenol	Biotransfer Factor	1.15E-05	2.06E+00	BAF calculated via regression from Travis and Arms 1988
3-&4-Methylphenols	Biotransfer Factor	1.15E-05	2.06E+00	BAF calculated via regression from Travis and Arms 1988
Benzaldehyde	Biotransfer Factor	5.15E-06	1.71E+00	BAF calculated via regression from Travis and Arms 1988
Bis(2-ethylhexyl)phthalate	Biotransfer Factor	2.47E+01	8.39E+00	BAF calculated via regression from Travis and Arms 1988
Butylbenzylphthalate	Biotransfer Factor	6.95E-03	4.84E+00	BAF calculated via regression from Travis and Arms 1988
Caprolactam	Biotransfer Factor	4.59E-07	6.60E-01	BAF calculated via regression from Travis and Arms 1988
Carbazole	Biotransfer Factor	1.71E-04	3.23E+00	BAF calculated via regression from Travis and Arms 1988
Dibenzofuran	Biotransfer Factor	5.21E-04	3.71E+00	BAF calculated via regression from Travis and Arms 1988
Diethyl phthalate	Biotransfer Factor	4.49E-05	2.65E+00	BAF calculated via regression from Travis and Arms 1988
Di-n-butyl phthalate	Biotransfer Factor	4.09E-03	4.61E+00	BAF calculated via regression from Travis and Arms 1988
Phenol	Biotransfer Factor	3.25E-06	1.51E+00	BAF calculated via regression from Travis and Arms 1988
VOCS				
Acetone	Biotransfer Factor	5.85E-08	-2.35E-01	BAF calculated via regression from Travis and Arms 1988
Acetophenone	Biotransfer Factor	4.74E-06	1.67E+00	BAF calculated via regression from Travis and Arms 1988
Bromodichloromethane	Biotransfer Factor	4.10E-06	1.61E+00	BAF calculated via regression from Travis and Arms 1988
Bromoform	Biotransfer Factor	3.10E-06	1.49E+00	BAF calculated via regression from Travis and Arms 1988
Chloroform	Biotransfer Factor	3.33E-06	1.52E+00	BAF calculated via regression from Travis and Arms 1988
Dibromochloromethane	Biotransfer Factor	5.04E-06	1.70E+00	BAF calculated via regression from Travis and Arms 1988
Methylene chloride	Biotransfer Factor	2.20E-06	1.34E+00	BAF calculated via regression from Travis and Arms 1988
Toluene	Biotransfer Factor	3.48E-05	2.54E+00	BAF calculated via regression from Travis and Arms 1988

Note:

Biotransfer factor:

Derived using the following equations from Travis & Arms 1988 (equation 2, pg. 272): Log UpFsm = -7.6 + log Kow

UpF_{sm} = small mammal uptake factor

K_{ow} = octanol-water partitioning coefficient

Log K_{ow} values from KOWWIN program from EPI suite.

Biotransfer factors were divided by 0.25 to account for wet weight to dry weight conversion.

D - Log K_{ow} values based on 1-1' biphenyl with four chloride functional groups.

UF: Uptake factor

BTF: Biotransfer factor

Table 4-4
Uptake Models Relating Concentrations in Surface Water to Concentrations in Fish

Chemical	Food Item (Fish) Uptake			
	Uptake Model[A, B, C]	BCFBAF value (L/kg wet weight)	BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Source
Metals				
Aluminum	Uptake Factor	2.70E+00	1.08E+01	From Table C-5 - USEPA 1999
Antimony	Uptake Factor	1.00E+00	4.00E+00	Based on bluegill in Table 5 - USEPA 1980
Arsenic	Uptake Factor	4.00E+00	1.60E+01	Based on bluegill in Table 5 - USEPA 1985a
Barium	Uptake Factor	4.00E+00	1.60E+01	BCF from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=chem
Beryllium	Uptake Factor	6.20E+01	2.48E+02	From Table C-5 - USEPA 1999
Cadmium	Uptake Factor	5.90E+01	2.36E+02	Based on bluegill in Table 5 - USEPA 2001
Calcium	Uptake Factor	1.00E+00	4.00E+00	Default
Chromium	Uptake Factor	2.00E+02	8.00E+02	BCF from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=chem
Cobalt	Uptake Factor	1.00E+00	4.00E+00	Default
Copper	Uptake Factor	4.64E+02	1.86E+03	Based on fathead minnow in Table 5 - USEPA 2003
Iron	Uptake Factor	1.00E+00	4.00E+00	Default
Lead	Uptake Factor	4.50E+01	1.80E+02	Based on bluegill in Table 5 - USEPA 1985b
Magnesium	Uptake Factor	1.00E+00	4.00E+00	Default
Manganese	Uptake Factor	4.00E+02	1.60E+03	BCF from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=chem
Mercury	Uptake Factor	1.80E+03	7.20E+03	Based on rainbow trout in Table 5 - USEPA 1985c
Nickel	Uptake Factor	2.70E+01	1.08E+02	Based on rainbow trout/fathead minnow in Table 5 - USEPA 1986
Potassium	Uptake Factor	1.00E+00	4.00E+00	Default
Selenium	Uptake Factor	2.42E+02	9.68E+02	Based on bluegill in Table 5 - USEPA 1987a
Silver	Uptake Factor	8.77E+01	3.51E+02	From Table C-5 - USEPA 1999
Sodium	Uptake Factor	1.00E+00	4.00E+00	Default
Thallium	Uptake Factor	1.00E+03	4.00E+03	BCF from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=chem
Vanadium	Uptake Factor	1.00E+00	4.00E+00	Default
Zinc	Uptake Factor	1.30E+01	5.20E+01	Based on mummichog in Table 5 - USEPA 1987b
PCBS				
Aroclor-1016	Uptake Factor	9143	3.66E+04	BCF calculated via Regression from BCFBAF Program
Aroclor-1221	Uptake Factor	543.3	2.17E+03	BCF calculated via Regression from BCFBAF Program
Aroclor-1242	Uptake Factor	25300	1.01E+05	BCF calculated via Regression from BCFBAF Program
Aroclor-1248	Uptake Factor	22070	8.83E+04	BCF calculated via Regression from BCFBAF Program
Aroclor-1254	Uptake Factor	54080	2.16E+05	BCF calculated via Regression from BCFBAF Program
Aroclor-1260	Uptake Factor	27570	1.10E+05	BCF calculated via Regression from BCFBAF Program
Total PCB Congeners	Uptake Factor	25300	1.01E+05	BCF calculated via Regression from BCFBAF Program[D]
Total PCB Aroclors	Uptake Factor	25300	1.01E+05	BCF calculated via Regression from BCFBAF Program[D]
PESTICIDES				
DDTr	Uptake Factor	16840	6.74E+04	BCF calculated via Regression from BCFBAF Program for DDT metabolite with greatest uptake
Aldrin	Uptake Factor	9030	3.61E+04	BCF calculated via Regression from BCFBAF Program
alpha-BHC	Uptake Factor	250.4	1.00E+03	BCF calculated via Regression from BCFBAF Program
alpha-Chlordane	Uptake Factor	5901	2.36E+04	BCF calculated via Regression from BCFBAF Program
beta-BHC	Uptake Factor	250.4	1.00E+03	BCF calculated via Regression from BCFBAF Program
delta-BHC	Uptake Factor	250.4	1.00E+03	BCF calculated via Regression from BCFBAF Program
Dieldrin	Uptake Factor	1253	5.01E+03	BCF calculated via Regression from BCFBAF Program
Endosulfan I	Uptake Factor	156.3	6.25E+02	BCF calculated via Regression from BCFBAF Program
Endosulfan II	Uptake Factor	156.3	6.25E+02	BCF calculated via Regression from BCFBAF Program
Endosulfan sulfate	Uptake Factor	120.7	4.83E+02	BCF calculated via Regression from BCFBAF Program
Endrin	Uptake Factor	1253	5.01E+03	BCF calculated via Regression from BCFBAF Program
Endrin aldehyde	Uptake Factor	687.2	2.75E+03	BCF calculated via Regression from BCFBAF Program
Endrin ketone	Uptake Factor	905.8	3.62E+03	BCF calculated via Regression from BCFBAF Program
gamma-BHC (Lindane)	Uptake Factor	250.4	1.00E+03	BCF calculated via Regression from BCFBAF Program
gamma-Chlordane	Uptake Factor	13300	5.32E+04	BCF calculated via Regression from BCFBAF Program
Heptachlor	Uptake Factor	1888	7.55E+03	BCF calculated via Regression from BCFBAF Program
Heptachlor epoxide	Uptake Factor	897	3.59E+03	BCF calculated via Regression from BCFBAF Program
Methoxychlor	Uptake Factor	1044	4.18E+03	BCF calculated via Regression from BCFBAF Program
Toxaphene	Uptake Factor	3024	1.21E+04	BCF calculated via Regression from BCFBAF Program

Table 4-4
Uptake Models Relating Concentrations in Surface Water to Concentrations in Fish

Chemical	Food Item (Fish) Uptake			
	Uptake Model[A, B, C]	BCFBAF value (L/kg wet weight)	BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Source
PAHs				
Total LMW PAHs	Uptake Factor	--	1.43E+04	Average of BCFs of individual PAHs
Total HMW PAHs	Uptake Factor	--	1.43E+04	Average of BCFs of individual PAHs
SVOCS				
2-Methylphenol	Uptake Factor	8.99	3.59E+01	BCF calculated via Regression from BCFBAF Program
3-&4-Methylphenols	Uptake Factor	8.99	3.60E+01	BCF calculated via Regression from BCFBAF Program[D]
Benzaldehyde	Uptake Factor	4.4	1.76E+01	BCF calculated via Regression from BCFBAF Program
Bis(2-ethylhexyl)phthalate	Uptake Factor	1710	6.84E+03	BCF calculated via Regression from BCFBAF Program
Butylbenzylphthalate	Uptake Factor	614	2.46E+03	BCF calculated via Regression from BCFBAF Program
Caprolactam	Uptake Factor	3.16	1.26E+01	BCF calculated via Regression from BCFBAF Program
Carbazole	Uptake Factor	132	5.28E+02	BCF calculated via Regression from BCFBAF Program
Dibenzofuran	Uptake Factor	242.9	9.72E+02	BCF calculated via Regression from BCFBAF Program
Diethyl phthalate	Uptake Factor	18.4	7.36E+01	BCF calculated via Regression from BCFBAF Program
Di-n-butyl phthalate	Uptake Factor	432.6	1.73E+03	BCF calculated via Regression from BCFBAF Program
Phenol	Uptake Factor	4.27	1.71E+01	BCF calculated via Regression from BCFBAF Program
VOCS				
Acetone	Uptake Factor	3.16	1.26E+01	BCF calculated via Regression from BCFBAF Program
Acetophenone	Uptake Factor	1.332	5.33E+00	BCF calculated via Regression from BCFBAF Program
Bromodichloromethane	Uptake Factor	9.696	3.88E+01	BCF calculated via Regression from BCFBAF Program
Bromoform	Uptake Factor	17.8	7.12E+01	BCF calculated via Regression from BCFBAF Program
Chloroform	Uptake Factor	9.26	3.70E+01	BCF calculated via Regression from BCFBAF Program
Dibromochloromethane	Uptake Factor	12.36	4.94E+01	BCF calculated via Regression from BCFBAF Program
Methylene chloride	Uptake Factor	3.1	1.24E+01	BCF calculated via Regression from BCFBAF Program
Toluene	Uptake Factor	29.4	1.18E+02	BCF calculated via Regression from BCFBAF Program

Note:
A - Equation types:
Uptake Factor:
B -Uptake factor for organics derived using the BCFBAF Program from USEPA
http://www.epa.gov/oppt/exposure/pubs/episuitedl.htm
C - Uptake factor for inorganics from the following sources:
D - BCF values based on 1-1' biphenyl with four chloride functional groups.
E - Average of 3-methylphenol and 4-methylphenol BCFBAF value (L/kg wet weight)
ORNL 2009, BCF from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=chem
ORNL 2009, BCF from http://rais.ornl.gov/cgi-bin/tools/TOX_search
USEPA 1999, Table C-5
USEPA 1980, Table 5 (bluegill)
USEPA 1985a, Table 5
USEPA 1985b, Table 5
USEPA 1985c, Table 5
BAF: Bioaccumulation factor
BCFBAF: Biococentration factor/Bioaccumulation factor
Uptake factors from BCFBAF were divided by 0.25 to account for wet weight to dry weight conversion.

Table 4-5
Uptake Models Relating Concentrations in Sediment to Concentrations in Benthos

Chemical	Food Item (Benthos) Uptake		
	Uptake Model	UF/BSAF	Source
Metals			
Aluminum	Uptake Factor	1.00E+00	Default
Antimony	Uptake Factor	1.00E+00	Default
Arsenic	Uptake Factor	1.27E-01	Median BSAF (not normalized for TOC and lipids) from data of non-depurated organisms as advised for use (Bechtel Jacobs 1998)
Barium	Uptake Factor	1.00E+00	Default
Beryllium	Uptake Factor	1.00E+00	Default
Cadmium	Uptake Factor	3.07E+00	90th percentile BSAF (not normalized for TOC and lipids) from data of depurated organisms as advised for use (Bechtel Jacobs 1998)
Calcium	Uptake Factor	1.00E+00	Default
Chromium	Uptake Factor	4.68E-01	90th percentile BSAF (not normalized for TOC and lipids) from data for all organisms (Bechtel Jacobs 1998)
Cobalt	Uptake Factor	1.00E+00	Default
Copper	Uptake Factor	5.25E+00	90th percentile BSAF (not normalized for TOC and lipids) from data for all organisms as advised for use (Bechtel Jacobs 1998)
Iron	Uptake Factor	1.00E+00	Default
Lead	Uptake Factor	6.60E-02	Median BSAF (not normalized for TOC and lipids) from data of non-depurated organisms as advised for use (Bechtel Jacobs 1998)
Magnesium	Uptake Factor	1.00E+00	Default
Manganese	Uptake Factor	1.00E+00	Default
Mercury	Uptake Factor	2.87E+00	90th percentile BSAF (not normalized for TOC and lipids) from data for all organisms (Bechtel Jacobs 1998)
Nickel	Uptake Factor	2.32E+00	90th percentile BSAF (not normalized for TOC and lipids) from data for all organisms (Bechtel Jacobs 1998)
Potassium	Uptake Factor	1.00E+00	Default
Selenium	Uptake Factor	1.00E+00	Default
Silver	Uptake Factor	1.00E+00	Default
Sodium	Uptake Factor	1.00E+00	Default
Thallium	Uptake Factor	1.00E+00	Default
Vanadium	Uptake Factor	1.00E+00	Default
Zinc	Uptake Factor	4.76E+00	90th percentile BSAF (not normalized for TOC and lipids) from data of depurated organisms as advised for use (Bechtel Jacobs 1998)
PCBS			
Aroclor-1016	BSAF	3.38E+00	Average of whole body freshwater BSAF for Total PCBs from EPA data set (2009)
Aroclor-1221	BSAF	3.38E+00	Average of whole body freshwater BSAF for Total PCBs from EPA data set (2009)
Aroclor-1242	BSAF	3.38E+00	Average of whole body freshwater BSAF for Total PCBs from EPA data set (2009)
Aroclor-1248	BSAF	3.38E+00	Average of whole body freshwater BSAF for Total PCBs from EPA data set (2009)
Aroclor-1254	BSAF	3.38E+00	Average of whole body freshwater BSAF for Total PCBs from EPA data set (2009)
Aroclor-1260	BSAF	3.38E+00	Average of whole body freshwater BSAF for Total PCBs from EPA data set (2009)
Total PCB Congeners	BSAF	3.38E+00	Average of whole body freshwater BSAF from EPA data set (2009)
Total PCB Aroclors	BSAF	3.38E+00	Average of whole body freshwater BSAF for Total PCBs from EPA data set (2009)
PESTICIDES			
DDTr	BSAF	5.22E+00	Average of whole body freshwater BSAF from EPA data set (2009) for DDT metabolite with greatest uptake
Aldrin	BSAF	1.55E-01	Average of freshwater BSAF from EPA data set (2009)
alpha-BHC	BSAF	3.71E-01	Average of freshwater BSAF from EPA data set (2009)
alpha-Chlordane	BSAF	1.10E+00	Average of whole body freshwater BSAF from EPA data set (2009)
beta-BHC	BSAF	1.10E-01	Average of freshwater BSAF from EPA data set (2009)
delta-BHC	BSAF	4.00E+00	Default
Dieldrin	BSAF	2.06E+00	Average of whole body freshwater BSAF from EPA data set (2009)
Endosulfan I	BSAF	4.00E+00	Default
Endosulfan II	BSAF	4.00E+00	Default
Endosulfan sulfate	BSAF	4.00E+00	Default
Endrin	BSAF	2.83E-02	Average of freshwater BSAF from EPA data set (2009)
Endrin aldehyde	BSAF	4.00E+00	Default
Endrin ketone	BSAF	4.00E+00	Default
gamma-BHC (Lindane)	BSAF	2.97E+00	Average of freshwater BSAF from EPA data set (2009)
gamma-Chlordane	BSAF	1.08E+00	Average of whole body freshwater BSAF from EPA data set (2009)
Heptachlor	BSAF	1.26E+01	Average of freshwater BSAF from EPA data set (2009)
Heptachlor epoxide	BSAF	6.77E+00	Average of freshwater BSAF from EPA data set (2009)
Methoxychlor	BSAF	4.00E+00	Default

Table 4-5
Uptake Models Relating Concentrations in Sediment to Concentrations in Benthos

Chemical	Food Item (Benthos) Uptake		
	Uptake Model	UF/BSAF	Source
Toxaphene	BSAF	4.00E+00	Default
PAHs			
Total LMW PAHs	BSAF	5.66E-02	Average of BAFs of Individual LMW PAHs
Total HMW PAHs	BSAF	1.78E-02	Average of BAFs of Individual HMW PAHs
SVOCS			
2-Methylphenol	BSAF	4.00E+00	Default
3-&4-Methylphenols	BSAF	4.76E-01	Average of whole body freshwater BSAF for 4-methylphenol from EPA data set (2009)
Benzaldehyde	BSAF	4.00E+00	Default
Bis(2-ethylhexyl)phthalate	BSAF	4.00E+00	Default
Butylbenzylphthalate	BSAF	4.00E+00	Default
Caprolactam	BSAF	4.00E+00	Default
Carbazole	BSAF	4.00E+00	Default
Dibenzofuran	BSAF	2.59E-02	Average of whole body freshwater BSAF from EPA data set (2009)
Diethyl phthalate	BSAF	4.00E+00	Default
Di-n-butyl phthalate	BSAF	4.00E+00	Default
Phenol	BSAF	4.00E+00	Default
VOCS			
Acetone	BSAF	4.00E+00	Default
Acetophenone	BSAF	4.00E+00	Default
Bromodichloromethane	BSAF	4.00E+00	Default
Bromoform	BSAF	4.00E+00	Default
Chloroform	BSAF	4.00E+00	Default
Dibromochloromethane	BSAF	4.00E+00	Default
Methylene chloride	BSAF	4.00E+00	Default
Toluene	BSAF	4.00E+00	Default

Note:
A - Equation types:
Uptake Factor:
B -Uptake factor for organics derived using the BCFBAF Program from USEPA
http://www.epa.gov/oppt/exposure/pubs/episuitedl.htm
C - Uptake factor for inorganics from the following sources:
ORNL 2009, BCF from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=chem
ORNL 2009, BCF from http://rais.ornl.gov/cgi-bin/tools/TOX_search
USEPA 1999, Table C-5
USEPA 1980, Table 5 (bluegill)
USEPA 1985a, Table 5
USEPA 1985b, Table 5
USEPA 1985c, Table 5
BSAF: Biota-sediment accumulation factor
TOC: Total organic carbon

Table 4-6
Wildlife Exposure Factors for Ecological Risk Assessment

Exposure Parameter	Value	Units	Notes
NORTHERN BOBWHITE			
Body Weight	0.16	kg	EPA 1993, average of adult male and female weights given throughout year for west Rio Grande, Texas
Food Ingestion Rate	0.07	g dry wt./g-day	Converted assuming 10% moisture of commercial game food (EPA 1993)
Food Ingestion Rate	0.08	g wet wt./g-day	EPA 1993, average adult rates given throughout year from southern Texas, diet consisted of commercial game food with 5 to 10% moisture
Incidental Soil Ingestion Rate	9.30%	% of total mass of diet	Beyer et al. 1994 value for turkey, a receptor with similar feeding habits
Water Ingestion Rate	0.11	L/kg-day	EPA 1993, average of adult male and female rates
WHITE-FOOTED MOUSE			
Body Weight	0.022	kg	Green and Millar 1987 as cited in Sample and Suter 1994
Food Ingestion Rate	0.039	g dry wt./g-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Food Ingestion Rate	0.15	g wet wt./g-day	Green and Millar 1987 as cited in Sample and Suter 1994 ingestion rate (kg wet wt./day) divided by body weight (kg) for rate in terms of g wet wt./g-day
Incidental Soil Ingestion Rate	2.00%	% of total mass of diet	Beyer et al. 1994
Water Ingestion Rate	0.3	L/kg-day	Oswald et al. 1993
AMERICAN ROBIN			
Body Weight	0.077	kg	EPA 1993
Food Ingestion Rate	0.22	kg dry wt./kg-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Food Ingestion Rate	0.89	kg wet wt./kg-day	EPA 1993
Incidental Soil Ingestion Rate	10.50%	% of total mass of diet	Value base on woodcock (Sample and Suter 1994)
Water Ingestion Rate	0.14	L/kg-day	EPA 1993
LEAST SHREW			
Body Weight	0.0055	kg	EPA 1993, average of reported range
Food Ingestion Rate	0.196	kg dry wt./kg-day	Calculated using allometric equation for insectivorous mammals from Nagy 2001
Food Ingestion Rate	0.78	kg wet wt./kg-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Incidental Soil Ingestion Rate	13.00%	% of total mass of diet	Talmage and Walton 1993 as cited in Sample and Suter 1994, value for short-tailed shrew
Water Ingestion Rate	0.22	L/kg-day	EPA 1993, value for short-tailed shrew
RED-TAILED HAWK			
Body Weight	1.2	kg	USACHPPM 2004
Food Ingestion Rate	0.059	kg dry wt./kg-day	Calculated using allometric equation for carnivorous birds from Nagy 2001
Food Ingestion Rate	0.234485694	kg wet wt./kg-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Incidental Soil Ingestion Rate	0.0	% of total mass of diet	Sample and Suter 1994
Water Ingestion Rate	0.057	L/kg-day	USACHPPM 2004
COYOTE			
Body Weight	14.05	kg	Average of female and male average weights (Texas Tech University 1997)
Food Ingestion Rate	0.017	kg dry wt./kg-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Food Ingestion Rate	0.069	kg wet wt./kg-day	As cited in Sample and Suter 1994, food ingestion rate value for red fox (Sargeant 1978)
Incidental Soil Ingestion Rate	2.80%	% of total mass of diet	Value from Beyer et al. (1994), value for red fox
Water Ingestion Rate	0.085	L/kg-day	EPA 1993, value for red fox
CANADA GOOSE			
Body Weight	3.2367	kg	EPA 1993, average of adult male and female weights given throughout year
Food Ingestion Rate	0.0078	kg dry wt./kg-day	EPA 1993, converted assuming 75% food moisture (USACHPPM 2004)
Food Ingestion Rate	0.03	kg wet wt./kg-day	EPA 1993, average of male and female winter and spring rates
Incidental Soil Ingestion Rate	8.20%	% of total mass of diet	Beyer et al. 1994
Water Ingestion Rate	0.04425	L/kg-day	EPA 1993
NUTRIA			
Body Weight	9.00	kg	Texas Tech University 1997, average of range
Food Ingestion Rate	0.042	kg dry wt./kg-day	Calculated using allometric equation for rodents from Nagy 2001
Food Ingestion Rate	0.17	kg wet wt./kg-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Incidental Soil Ingestion Rate	2.00%	% of total mass of diet	Beyer et al. 1994, value for woodchuck
Water Ingestion Rate	0.975	L/kg-day	EPA 1993, average of muskrat male and female rates
LAUGHING GULL			
Body Weight	0.33	kg	Dunning 1993
Food Ingestion Rate	0.049	kg dry wt./kg-day	EPA 1993, converted assuming 75% food moisture (USACHPPM 2004)
Food Ingestion Rate	0.20	kg wet wt./kg-day	EPA 1993, average of adult male and female rates for herring gull
Incidental Soil Ingestion Rate	18.08%	% of total mass of diet	Beyer et al. 1994, average of four sandpiper species rates
Water Ingestion Rate	0.057	L/kg-day	EPA 1993, average of male and female rates for herring gull
RACCOON			
Body Weight	5.78	kg	EPA 1993, average of adult male and female weights given throughout year
Food Ingestion Rate	0.05	kg dry wt./kg-day	EPA 1993, calculated using the presented allometric equation for food ingestion
Food Ingestion Rate	0.19	kg wet wt./kg-day	EPA 1993, converted assuming 75% prey moisture (USACHPPM 2004)
Incidental Soil Ingestion Rate	9.40%	% of total mass of diet	Beyer et al. 1994
Water Ingestion Rate	0.0825	L/kg-day	EPA 1993, average of male and female rates
BELTED KINGFISHER			
Body Weight	0.15	kg	EPA 1993, average of reported mean adult breeding weights
Food Ingestion Rate	0.13	kg dry wt./kg-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Food Ingestion Rate	0.50	kg wet wt./kg-day	EPA 1993
Incidental Soil Ingestion Rate	2.00%	% of total mass of diet	As a piscivore, expected to be negligible (Sample and Suter 1994), conservative value used.
Water Ingestion Rate	0.11	L/kg-day	EPA 1993

Table 4-6
Wildlife Exposure Factors for Ecological Risk Assessment

Exposure Parameter	Value	Units	Notes
GREAT BLUE HERON			
Body Weight	2.229	kg	USACHPPM 2004
Food Ingestion Rate	0.0450	kg dry wt./kg-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Food Ingestion Rate	0.18	kg wet wt./kg-day	USACHPPM 2004
Incidental Sediment Ingestion Rate	2.00%	% of total mass of diet	As a piscivore, expected to be negligible (Sample and Suter 1994), conservative value used.
Water Ingestion Rate	0.045	L/kg-day	USACHPPM 2004
RIVER OTTER			
Body Weight	7.990	kg	EPA 1993, average of reported adult weights
Food Ingestion Rate	0.048	kg dry wt./kg-day	EPA 1993, calculated using the presented allometric equation for food ingestion
Food Ingestion Rate	0.19	kg wet wt./kg-day	Converted assuming 75% prey moisture (USACHPPM 2004)
Incidental Sediment Ingestion Rate	2.00%	% of total mass of diet	As a piscivore, expected to be negligible (Sample and Suter 1994), conservative value used.
Water Ingestion Rate	0.081	L/kg-day	EPA 1993, average of male and female rate

Table 4-7
Soil Toxicity Reference Values for Plants and Soil Invertebrates

Chemical	Plant TRV (mg/kg dry wt)	Toxicity Reference Value Source and Notes	Earthworm TRV (mg/kg dry wt)	Toxicity Reference Value Source and Notes
Metals				
Aluminum	5.00E+01	Efroymson et al. 1997a	NA	---
Antimony	5.00E+00	Efroymson et al. 1997a	7.80E+01	EPA 2005a
Arsenic	1.80E+01	EPA 2005b	6.00E+01	Efroymson et al. 1997b
Barium	5.00E+02	Efroymson et al. 1997a	3.30E+02	EPA 2005c
Beryllium	1.00E+01	Efroymson et al. 1997a	4.00E+01	EPA 2005d
Cadmium	3.20E+01	EPA 2005e	1.40E+02	EPA 2005e
Calcium	NA	---	NA	---
Chromium	1.00E+00	Efroymson et al. 1997a	4.00E-01	Efroymson et al. 1997b
Cobalt	1.30E+01	EPA 2005f	NA	---
Copper	7.00E+01	EPA 2007b	8.00E+01	EPA 2007b
Iron	NA	---	NA	---
Lead	1.20E+02	EPA 2005g	1.70E+03	EPA 2005g
Magnesium	NA	---	NA	---
Manganese	2.20E+02	EPA 2007c	4.50E+02	EPA 2007c
Mercury	3.00E-01	Efroymson et al. 1997a	1.00E-01	Efroymson et al. 1997b
Nickel	3.80E+01	EPA 2007d	2.80E+02	EPA 2007d
Potassium	NA	---	NA	---
Selenium	5.20E-01	EPA 2007f	4.10E+00	EPA 2007f
Silver	5.60E+02	EPA 2006	NA	---
Sodium	NA	---	NA	---
Thallium	1.00E+00	Efroymson et al. 1997a	NA	---
Vanadium	2.00E+00	Efroymson et al. 1997a	NA	---
Zinc	1.60E+02	EPA 2007g	1.20E+02	EPA 2007g
PCBS				
Aroclor-1016	4.00E+01	Efroymson et al. 1997a, value for PCBs	NA	---
Aroclor-1221	4.00E+01	Efroymson et al. 1997a, value for PCBs	NA	---
Aroclor-1242	4.00E+01	Efroymson et al. 1997a, value for PCBs	NA	---
Aroclor-1248	4.00E+01	Efroymson et al. 1997a, value for PCBs	NA	---
Aroclor-1254	4.00E+01	Efroymson et al. 1997a, value for PCBs	NA	---
Aroclor-1260	4.00E+01	Efroymson et al. 1997a, value for PCBs	NA	---
Total PCB Congeners	4.00E+01	Efroymson et al. 1997a, value for PCBs	NA	---
Total PCB Aroclors	4.00E+01	Efroymson et al. 1997a, value for PCBs	NA	---

Table 4-7
Soil Toxicity Reference Values for Plants and Soil Invertebrates

Chemical	Plant TRV (mg/kg dry wt)	Toxicity Reference Value Source and Notes	Earthworm TRV (mg/kg dry wt)	Toxicity Reference Value Source and Notes
PESTICIDES				
DDTr	NA	---	NA	---
Aldrin	NA	---	NA	---
alpha-BHC	NA	---	NA	---
alpha-Chlordane	NA	---	NA	---
beta-BHC	NA	---	NA	---
delta-BHC	NA	---	NA	---
Dieldrin	NA	---	NA	---
Endosulfan I	NA	---	NA	---
Endosulfan II	NA	---	NA	---
Endosulfan sulfate	NA	---	NA	---
Endrin	NA	---	NA	---
Endrin aldehyde	NA	---	NA	---
Endrin ketone	NA	---	NA	---
gamma-BHC (Lindane)	NA	---	NA	---
gamma-Chlordane	NA	---	NA	---
Heptachlor	NA	---	NA	---
Heptachlor epoxide	NA	---	NA	---
Methoxychlor	NA	---	NA	---
Toxaphene	NA	---	NA	---
PAHs				
Total LMW PAHs	2.00E+01	Efroymson et al. 1997a	2.90E+01	EPA 2007e
Total HMW PAHs	2.00E+01	Efroymson et al. 1997a	1.80E+01	EPA 2007e
SVOCS				
2-Methylphenol	NA	---	NA	---
3-&4-Methylphenols	NA	---	NA	---
Benzaldehyde	NA	---	NA	---
Bis(2-ethylhexyl)phthalate	1.00E+02	Efroymson et al. 1997a, value for diethyl phthalate	2.00E+02	Efroymson et al. 1997b, value for dimethyl phthalate
Butylbenzylphthalate	1.00E+02	Efroymson et al. 1997a, value for diethyl phthalate	2.00E+02	Efroymson et al. 1997b, value for dimethyl phthalate
Caprolactam	NA	---	NA	---
Carbazole	NA	---	NA	---
Dibenzofuran	NA	---	NA	---
Diethyl phthalate	1.00E+02	Efroymson et al. 1997a	2.00E+02	Efroymson et al. 1997b, value for dimethyl phthalate
Di-n-butyl phthalate	2.00E+02	Efroymson et al. 1997a	NA	---
Phenol	7.00E+01	Efroymson et al. 1997a	3.00E+01	Efroymson et al. 1997b

Table 4-7
Soil Toxicity Reference Values for Plants and Soil Invertebrates

Chemical	Plant TRV (mg/kg dry wt)	Toxicity Reference Value Source and Notes	Earthworm TRV (mg/kg dry wt)	Toxicity Reference Value Source and Notes
VOCS				
Acetone	NA	---	NA	---
Acetophenone	NA	---	NA	---
Bromodichloromethane	NA	---	NA	---
Bromoform	NA	---	NA	---
Chloroform	NA	---	NA	---
Dibromochloromethane	NA	---	NA	---
Methylene chloride	NA	---	NA	---
Toluene	2.00E+02	Efroymson et al. 1997a	NA	---

Note:
NA: TRV not available
mg/kg dry wt: milligrams per kilogram dry weight
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
TRV: Toxicity reference value

Table 4-8
Dose-based Toxicity Reference Values for Birds

Chemical	Avian NOAEL (mg/kg-bw day)	Avian NOAEL Source and Notes	Avian LOAEL (mg/kg-bw day)	Avian LOAEL Source and Notes
Metals				
Aluminum	1.10E+02	Sample et al. 1996	NA	---
Antimony	NA	---	NA	---
Arsenic	2.24E+00	EPA 2005b	4.51E+00	Geometric mean of LOAELs for growth and reproduction in EPA 2005b
Barium	2.08E+01	Sample et al. 1996	4.17E+01	Sample et al. 1996
Beryllium	NA	---	NA	---
Cadmium	1.47E+00	EPA 2005e	6.35E+00	Geometric mean of LOAELs for growth and reproduction in EPA 2005e
Calcium	NA	---	NA	---
Chromium	2.66E+00	EPA 2008	1.56E+01	Geometric mean of LOAELs for growth and reproduction in EPA 2008
Cobalt	7.61E+00	EPA 2005f	1.83E+01	Geometric mean of LOAELs for growth and reproduction in EPA 2005f
Copper	4.05E+00	EPA 2007b	1.21E+01	Corresponding LOAEL from EPA 2007b
Iron	NA	---	NA	---
Lead	1.63E+00	EPA 2005g	3.26E+00	Corresponding LOAEL from EPA 2005g
Magnesium	NA	---	NA	---
Manganese	1.79E+02	EPA 2007c	3.77E+02	Geometric mean of LOAELs for growth and reproduction in EPA 2007c
Mercury	4.50E-01	Sample et al. 1996	9.00E-01	Sample et al. 1996
Nickel	6.71E+00	EPA 2007d	1.86E+01	Geometric mean of LOAELs for growth and reproduction in EPA 2007d
Potassium	NA	---	NA	---
Selenium	2.90E-01	EPA 2007f	5.79E-01	Corresponding LOAEL from EPA 2007f
Silver	2.02E+00	EPA 2006	2.02E+01	Corresponding LOAEL from EPA 2006
Sodium	NA	---	NA	---
Thallium	NA	---	NA	---
Vanadium	3.44E-01	EPA 2005h	6.88E-01	Corresponding LOAEL from EPA 2005h
Zinc	6.61E+01	EPA 2007g	1.71E+02	Geometric mean of LOAELs for growth and reproduction in EPA 2007g

Table 4-8
Dose-based Toxicity Reference Values for Birds

Chemical	Avian NOAEL (mg/kg-bw day)	Avian NOAEL Source and Notes	Avian LOAEL (mg/kg-bw day)	Avian LOAEL Source and Notes
PCBS				
Aroclor-1016	1.80E-01	Sample et al. 1996, value for Aroclor-1254	1.80E+00	Sample et al. 1996, value for Aroclor-1254
Aroclor-1221	1.80E-01	Sample et al. 1996, value for Aroclor-1254	1.80E+00	Sample et al. 1996, value for Aroclor-1254
Aroclor-1242	4.10E-01	Sample et al. 1996	NA	---
Aroclor-1248	1.80E-01	Sample et al. 1996, value for Aroclor-1254	1.80E+00	Sample et al. 1996, value for Aroclor-1254
Aroclor-1254	1.80E-01	Sample et al. 1996	1.80E+00	Sample et al. 1996
Aroclor-1260	1.80E-01	Sample et al. 1996, value for Aroclor-1254	1.80E+00	Sample et al. 1996, value for Aroclor-1254
Total PCB Congeners	1.80E-01	Sample et al. 1996, value for Aroclor-1254	1.80E+00	Sample et al. 1996, value for Aroclor-1254
Total PCB Aroclors	1.80E-01	Sample et al. 1996, value for Aroclor-1254	1.80E+00	Sample et al. 1996, value for Aroclor-1254
PESTICIDES				
DDTr	2.80E-03	Sample et al. 1996	2.80E-02	Sample et al. 1996
Aldrin	NA	---	NA	---
alpha-BHC	5.60E-01	Sample et al. 1996, value for BHC mixed isomers	2.25E+00	Sample et al. 1996, value for BHC mixed isomers
alpha-Chlordane	2.14E+00	Sample et al. 1996, value for chlordane	1.07E+01	Sample et al. 1996, value for chlordane
beta-BHC	5.60E-01	Sample et al. 1996, value for BHC mixed isomers	2.25E+00	Sample et al. 1996, value for BHC mixed isomers
delta-BHC	5.60E-01	Sample et al. 1996, value for BHC mixed isomers	2.25E+00	Sample et al. 1996, value for BHC mixed isomers
Dieldrin	7.70E-02	Sample et al. 1996	NA	---
Endosulfan I	1.00E+01	Sample et al. 1996, value for endosulfan	NA	---
Endosulfan II	1.00E+01	Sample et al. 1996, value for endosulfan	NA	---
Endosulfan sulfate	NA	---	NA	---
Endrin	1.00E-02	Sample et al. 1996	1.00E-01	Sample et al. 1996
Endrin aldehyde	NA	---	NA	---
Endrin ketone	NA	---	NA	---
gamma-BHC (Lindane)	2.00E+00	Sample et al. 1996	2.00E+01	Sample et al. 1996
gamma-Chlordane	2.14E+00	Sample et al. 1996, value for chlordane	1.07E+01	Sample et al. 1996, value for chlordane
Heptachlor	NA	---	NA	---
Heptachlor epoxide	NA	---	NA	---
Methoxychlor	NA	---	NA	---
Toxaphene	NA	---	NA	---

Table 4-8
Dose-based Toxicity Reference Values for Birds

Chemical	Avian NOAEL (mg/kg-bw day)	Avian NOAEL Source and Notes	Avian LOAEL (mg/kg-bw day)	Avian LOAEL Source and Notes
PAHs				
Total LMW PAHs	5.62E+03	EPA 2007e did not derive value due to too few studies, value is from the only study not rejected for use (Landis Associates Inc. 1985)	5.62E+02	Value is derived from the NOAEL by applying a factor of 10
Total HMW PAHs	2.00E+00	EPA 2007e did not derive value due to too few studies, values if from the only study not rejected for use (Trust et al. 1994)	2.00E+01	EPA 2007e did not derive value due to too few studies, values if from the only study not rejected for use (Trust et al. 1994)
SVOCS				
2-Methylphenol	NA	---	NA	---
3-&4-Methylphenols	NA	---	NA	---
Benzaldehyde	NA	---	NA	---
Bis(2-ethylhexyl)phthalate	1.10E+00	Sample et al. 1996	1.10E+01	DOE 2012
Butylbenzylphthalate	1.10E-01	Sample et al. 1996, value for di-n-butyl phthalate	1.10E+00	Sample et al. 1996, value for di-n-butyl phthalate
Caprolactam	NA	---	NA	---
Carbazole	NA	---	NA	---
Dibenzofuran	NA	---	NA	---
Diethyl phthalate	1.10E-01	Sample et al. 1996, value for di-n-butyl phthalate	1.10E+00	Sample et al. 1996, value for di-n-butyl phthalate
Di-n-butyl phthalate	1.10E-01	Sample et al. 1996	1.10E+00	Sample et al. 1996
Phenol	3.77E+00	Derived from Schafer et al. 1983	NA	---
VOCS				
Acetone	NA	---	NA	---
Acetophenone	NA	---	NA	---
Bromodichloromethane	NA	---	NA	---
Bromoform	NA	---	NA	---
Chloroform	NA	---	NA	---
Dibromochloromethane	NA	---	NA	---
Methylene chloride	NA	---	NA	---
Toluene	NA	---	NA	---

Note:
LOAEL: Lowest observed adverse effects level
mg/kg-bw day: milligrams per kilogram body weight per day
NA: Not available
NOAEL: No observed adverse effects level
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls

Table 4-9
Dose-based Toxicity Reference Values for Mammals

Chemical	Mammalian NOAEL (mg/kg-bw day)	Mammalian NOAEL Source and Notes	Mammalian LOAEL (mg/kg-bw day)	Mammalian LOAEL Source and Notes
Metals				
Aluminum	1.93E+00	Sample et al. 1996	1.93E+01	Sample et al. 1996
Antimony	5.90E-02	EPA 2005a	5.90E-01	Corresponding LOAEL from EPA 2005a
Arsenic	1.04E+00	EPA 2005b	1.66E+00	Corresponding LOAEL from EPA 2005b
Barium	5.18E+01	EPA 2005c	8.27E+01	Geometric mean of LOAELs for growth and reproduction in EPA 2005c
Beryllium	5.32E-01	EPA 2005d	6.73E-01	Geometric mean of LOAELs for growth and reproduction in EPA 2005d
Cadmium	7.70E-01	EPA 2005e	7.70E+00	Corresponding LOAEL from EPA 2005e
Calcium	NA	---	NA	---
Chromium	2.40E+00	EPA 2008 value for trivalent chromium	5.82E+01	Geometric mean of LOAELs for growth and reproduction for trivalent chromium in EPA 2008
Cobalt	7.33E+00	EPA 2005f	1.89E+01	Geometric mean of LOAELs for growth and reproduction in EPA 2005f
Copper	5.60E+00	EPA 2007b	9.34E+00	Corresponding LOAEL from EPA 2007b
Iron	NA	---	NA	---
Lead	4.70E+00	EPA 2005g	8.90E+00	Corresponding LOAEL from EPA 2005g
Magnesium	NA	---	NA	---
Manganese	5.15E+01	EPA 2007c	1.46E+02	Geometric mean of LOAELs for growth and reproduction in EPA 2007c
Mercury	1.32E+01	Sample et al. 1996	NA	---
Nickel	1.70E+00	EPA 2007d	3.40E+00	Corresponding LOAEL from EPA 2007d
Potassium	NA	---	NA	EPA 2007d
Selenium	1.43E-01	EPA 2007f	2.15E-01	Corresponding LOAEL from EPA 2007f
Silver	6.02E+00	EPA 2006	6.02E+01	Corresponding LOAEL from EPA 2006
Sodium	NA	---	NA	---
Thallium	7.40E-03	Sample et al. 1996	7.40E-02	Sample et al. 1996
Vanadium	4.16E+00	EPA 2005h	8.31E+00	Corresponding LOAEL from EPA 2005h
Zinc	7.54E+01	EPA 2007g	2.98E+02	Geometric mean of LOAELs for growth and reproduction in EPA 2007g

Table 4-9
Dose-based Toxicity Reference Values for Mammals

Chemical	Mammalian NOAEL (mg/kg-bw day)	Mammalian NOAEL Source and Notes	Mammalian LOAEL (mg/kg-bw day)	Mammalian LOAEL Source and Notes
PCBS				
Aroclor-1016	1.37E+00	Sample et al. 1996	3.43E+00	Sample et al. 1996
Aroclor-1221	1.00E-02	Sample et al. 1996, value for Aroclor-1248	1.00E-01	Sample et al. 1996, value for Aroclor-1248
Aroclor-1242	6.90E-02	Sample et al. 1996	6.90E-01	Sample et al. 1996
Aroclor-1248	1.00E-02	Sample et al. 1996	1.00E-01	Sample et al. 1996
Aroclor-1254	6.80E-02	Sample et al. 1996	6.80E-01	Sample et al. 1996
Aroclor-1260	1.00E-02	Sample et al. 1996, value for Aroclor-1248	1.00E-01	Sample et al. 1996, value for Aroclor-1248
Total PCB Congeners	1.00E-02	Sample et al. 1996, value for Aroclor-1248	1.00E-01	Sample et al. 1996, value for Aroclor-1248
Total PCB Aroclors	1.00E-02	Sample et al. 1996, value for Aroclor-1248	1.00E-01	Sample et al. 1996, value for Aroclor-1248
PESTICIDES				
DDTr	8.00E-01	Sample et al. 1996	4.00E+00	Sample et al. 1996
Aldrin	2.00E-01	Sample et al. 1996	1.00E+00	Sample et al. 1996
alpha-BHC	4.00E-01	Sample et al. 1996, value for beta-BHC	2.00E+00	Sample et al. 1996, value for beta-BHC
alpha-Chlordane	4.60E+00	Sample et al. 1996, value for chlordane	9.20E+00	Sample et al. 1996, value for chlordane
beta-BHC	4.00E-01	Sample et al. 1996	2.00E+00	Sample et al. 1996
delta-BHC	4.00E-01	Sample et al. 1996, value for beta-BHC	2.00E+00	Sample et al. 1996, value for beta-BHC
Dieldrin	2.00E-02	Sample et al. 1996	2.00E-01	Sample et al. 1996
Endosulfan I	1.50E-01	Sample et al. 1996, value for endosulfan	NA	--
Endosulfan II	1.50E-01	Sample et al. 1996, value for endosulfan	NA	--
Endosulfan sulfate	NA	--	NA	--
Endrin	9.20E-02	Sample et al. 1996	9.20E-01	Sample et al. 1996
Endrin aldehyde	NA	--	NA	--
Endrin ketone	NA	--	NA	--
gamma-BHC (Lindane)	8.00E+00	Sample et al. 1996	NA	--
gamma-Chlordane	4.60E+00	Sample et al. 1996, value for chlordane	9.20E+00	Sample et al. 1996, value for chlordane
Heptachlor	1.00E-01	Sample et al. 1996	1.00E+00	Sample et al. 1996
Heptachlor epoxide	NA	--	NA	--
Methoxychlor	4.00E+00	Sample et al. 1996	8.00E+00	Sample et al. 1996
Toxaphene	8.00E+00	Sample et al. 1997	NA	--

Table 4-9
Dose-based Toxicity Reference Values for Mammals

Chemical	Mammalian NOAEL (mg/kg-bw day)	Mammalian NOAEL Source and Notes	Mammalian LOAEL (mg/kg-bw day)	Mammalian LOAEL Source and Notes
PAHs				
Total LMW PAHs	6.56E+01	EPA 2007e	3.28E+02	Corresponding LOAEL from EPA 2007e
Total HMW PAHs	6.15E-01	EPA 2007e	3.01E+00	Corresponding LOAEL from EPA 2007e
SVOCS				
2-Methylphenol	NA	---	NA	---
3-&4-Methylphenols	NA	---	NA	---
Benzaldehyde	NA	---	NA	---
Bis(2-ethylhexyl)phthalate	1.83E+01	Sample et al. 1996	1.83E+02	Sample et al. 1996
Butylbenzylphthalate	5.50E+02	Sample et al. 1996, value for di-n-butyl phthalate	1.83E+03	Sample et al. 1996, value for di-n-butyl phthalate
Caprolactam	NA	---	NA	---
Carbazole	NA	---	NA	---
Dibenzofuran	NA	---	NA	---
Diethyl phthalate	4.58E+03	Sample et al. 1996	NA	---
Di-n-butyl phthalate	5.50E+02	Sample et al. 1996	1.83E+03	Sample et al. 1996
Phenol	1.20E+01	USACHPPM 2008	3.60E+01	USACHPPM 2008
VOCS				
Acetone	1.00E+01	Sample et al. 1996	5.00E+01	Sample et al. 1996
Acetophenone	NA	---	NA	---
Bromodichloromethane	NA	---	NA	---
Bromoform	NA	---	NA	---
Chloroform	1.50E+01	Sample et al. 1996	4.10E+01	Sample et al. 1996
Dibromochloromethane	NA	---	NA	---
Methylene chloride	5.85E+00	Sample et. al 1996	5.00E+01	Sample et. al 1996
Toluene	2.60E+01	Sample et. al 1996	2.60E+02	Sample et. al 1996

Note:
HMW: High molecular weight
LMW: Low molecular weight
LOAEL: Lowest observed adverse effects level
NA: Not available
NOAEL: No observed adverse effects level
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
mg/kg-bw day: milligrams per kilogram body weight per day

Table 4-10
Sediment Toxicity Reference Values for Benthic Organism Exposures

Chemical	Sediment TRV based on threshold effects (mg/kg dry wt.)	TRV based on the mid-point between threshold and probable effects (mg/kg dry wt.)	Sediment TRV based on probable effects (mg/kg dry wt.)	Source
Metals				
Aluminum	2.55E+04	NA	NA	ARCS H. azteca TEL (EPA 1996)
Antimony	2.00E+00	1.35E+01	2.50E+01	ER-L and ER-M for marine sediment from Long and Morgan (1991)
Arsenic	9.79E+00	2.14E+01	3.30E+01	TEC and PEC values from MacDonald et al. (2000)
Barium	1.30E+02	NA	NA	Value is marine sediment TEL from Leung et al. 2005
Beryllium	1.10E+00	1.56E+01	3.00E+01	Dutch Target and Intervention values for soil/sediment (Verbruggen et al. 2001)
Cadmium	9.90E-01	2.99E+00	4.98E+00	TEC and PEC values from MacDonald et al. (2000)
Calcium	NA	NA	NA	---
Chromium	4.34E+01	7.72E+01	1.11E+02	TEC and PEC values from MacDonald et al. (2000)
Cobalt	5.00E+01	NA	NA	Ontario Ministry of the Environment (1993) open water disposal guideline parameter
Copper	3.16E+01	9.03E+01	1.49E+02	TEC and PEC values from MacDonald et al. (2000)
Iron	2.00E+04	3.00E+04	4.00E+04	LEL and SEL from Ontario Ministry of the Environment (2008)
Lead	3.58E+01	8.19E+01	1.28E+02	TEC and PEC values from MacDonald et al. (2000)
Magnesium	NA	NA	NA	---
Manganese	4.60E+02	7.80E+02	1.10E+03	LEL and SEL from Ontario Ministry of the Environment (2008)
Mercury	1.80E-01	6.20E-01	1.06E+00	TEC and PEC values from MacDonald et al. (2000)
Nickel	2.27E+01	3.57E+01	4.86E+01	TEC and PEC values from MacDonald et al. (2000)
Potassium	NA	NA	NA	---
Selenium	7.00E-01	5.04E+01	1.00E+02	Dutch Target and Intervention values for soil/sediment (Netherlands Ministry of Housing, Spatial Planning and the Environment 2000)
Silver	5.00E-01	7.75E+00	1.50E+01	Ontario Ministry of the Environment (1993) open water disposal guideline parameter and Intervention value for soil/sediment (Netherlands Ministry of Housing, Spatial Planning and the Environment 2000)
Sodium	NA	NA	NA	---
Thallium	1.00E+00	8.00E+00	1.50E+01	Dutch Target and Intervention values for soil/sediment (Verbruggen et al. 2001)
Vanadium	4.20E+01	1.46E+02	2.50E+02	Dutch Target and Intervention values for soil/sediment (Verbruggen et al. 2001)
Zinc	1.21E+02	2.90E+02	4.59E+02	TEC and PEC values from MacDonald et al. (2000)
PCBS				
Aroclor-1016	7.00E-03	2.69E-01	5.30E-01	Ontario Ministry of the Environment LEL and SEL (2008) assuming total organic carbon concentration of 1%
Aroclor-1221	5.00E-03	1.23E-01	2.40E-01	Ontario Ministry of the Environment LEL and SEL for Aroclor-1260 (2008) assuming total organic carbon concentration of 1%
Aroclor-1242	5.00E-03	1.23E-01	2.40E-01	Ontario Ministry of the Environment LEL and SEL for Aroclor-1260 (2008) assuming total organic carbon concentration of 1%
Aroclor-1248	3.00E-02	7.65E-01	1.50E+00	Ontario Ministry of the Environment LEL and SEL (2008) assuming total organic carbon concentration of 1%
Aroclor-1254	6.00E-02	2.00E-01	3.40E-01	Ontario Ministry of the Environment LEL and SEL (2008) assuming total organic carbon concentration of 1%
Aroclor-1260	5.00E-03	1.23E-01	2.40E-01	Ontario Ministry of the Environment LEL and SEL (2008) assuming total organic carbon concentration of 1%
Total PCB Congeners	5.98E-02	3.68E-01	6.76E-01	TEC and PEC values for total PCBs from MacDonald et al. (2000)
Total PCB Aroclors	5.98E-02	3.68E-01	6.76E-01	TEC and PEC values for total PCBs from MacDonald et al. (2000)

Table 4-10
Sediment Toxicity Reference Values for Benthic Organism Exposures

Chemical	Sediment TRV based on threshold effects (mg/kg dry wt.)	TRV based on the mid-point between threshold and probable effects (mg/kg dry wt.)	Sediment TRV based on probable effects (mg/kg dry wt.)	Source
PESTICIDES				
DDTr	5.28E-03	2.89E-01	5.72E-01	TEC and PEC values from MacDonald et al. (2000)
Aldrin	2.00E-03	4.10E-02	8.00E-02	LEL and SEL from Ontario Ministry of the Environment (2008)
alpha-BHC	6.00E-03	5.30E-02	1.00E-01	LEL and SEL from Ontario Ministry of the Environment (2008)
alpha-Chlordane	3.24E-03	1.04E-02	1.76E-02	TEC and PEC values for chlordane from MacDonald et al. (2000)
beta-BHC	5.00E-03	1.08E-01	2.10E-01	LEL and SEL from Ontario Ministry of the Environment (2008)
delta-BHC	2.37E-03	3.68E-03	4.99E-03	TEC and PEC values for gamma-BHC from MacDonald et al. (2000)
Dieldrin	1.90E-03	3.19E-02	6.18E-02	TEC and PEC values from MacDonald et al. (2000)
Endosulfan I	1.00E-05	2.00E+00	4.00E+00	Dutch Target and Intervention values for soil/sediment (Netherlands Ministry of Housing, Spatial Planning and the Environment 2000)
Endosulfan II	1.00E-05	2.00E+00	4.00E+00	Dutch Target and Intervention values for soil/sediment (Netherlands Ministry of Housing, Spatial Planning and the Environment 2000)
Endosulfan sulfate	NA	NA	NA	---
Endrin	2.22E-03	1.05E-01	2.07E-01	TEC and PEC values from MacDonald et al. (2000)
Endrin aldehyde	NA	NA	NA	---
Endrin ketone	NA	NA	NA	---
gamma-BHC (Lindane)	2.37E-03	3.68E-03	4.99E-03	TEC and PEC values from MacDonald et al. (2000)
gamma-Chlordane	3.24E-03	1.04E-02	1.76E-02	TEC and PEC values for chlordane from MacDonald et al. (2000)
Heptachlor	7.00E-04	2.00E+00	4.00E+00	Dutch Target and Intervention values for soil/sediment (Netherlands Ministry of Housing, Spatial Planning and the Environment 2000)
Heptachlor epoxide	2.47E-03	9.24E-03	1.60E-02	TEC and PEC values from MacDonald et al. (2000)
Methoxychlor	1.90E-02	NA	NA	Ecotox Threshold (EPA Office of Solid Waste and Emergency Response 1996)
Toxaphene	1.00E-04	NA	NA	Interim sediment quality guideline from Canadian Council of Ministers of the Environment (2002)
PAHs				
Total LMW PAHs	1.61E+00	1.22E+01	2.28E+01	TEC and PEC values for total PAHs from MacDonald et al. (2000)
Total HMW PAHs	1.61E+00	1.22E+01	2.28E+01	TEC and PEC values for total PAHs from MacDonald et al. (2000)
SVOCS				
2-Methylphenol	NA	NA	NA	---
3-&4-Methylphenols	NA	NA	NA	---
Benzaldehyde	NA	NA	NA	---
Bis(2-ethylhexyl)phthalate	1.82E-01	1.41E+00	2.65E+00	Marine TEL and PEL values from MacDonald et al. 1996
Butylbenzylphthalate	1.10E+01	NA	NA	Ecotox Threshold (EPA Office of Solid Waste and Emergency Response 1996)
Caprolactam	NA	NA	NA	---
Carbazole	NA	NA	NA	---
Dibenzofuran	2.00E+00	NA	NA	Ecotox Threshold (EPA Office of Solid Waste and Emergency Response 1996)
Diethyl phthalate	9.40E+01	3.37E+02	5.80E+02	MPC and SRCeco from Verbruggen et al. 2001
Di-n-butyl phthalate	7.00E-01	1.84E+01	3.60E+01	MPC and SRCeco from Verbruggen et al. 2001
Phenol	5.00E-02	2.00E+01	4.00E+01	Dutch Target and Intervention values for soil/sediment (Netherlands Ministry of Housing, Spatial Planning and the Environment 2000)

Table 4-10
Sediment Toxicity Reference Values for Benthic Organism Exposures

Chemical	Sediment TRV based on threshold effects (mg/kg dry wt.)	TRV based on the mid-point between threshold and probable effects (mg/kg dry wt.)	Sediment TRV based on probable effects (mg/kg dry wt.)	Source
VOCS				
Acetone	2.27E+00	NA	NA	Sediment quality guideline from DiToro et al. 2000, assuming 1% organic carbon
Acetophenone	NA	NA	NA	---
Bromodichloromethane	7.70E+00	NA	NA	Sediment quality guideline from DiToro et al. 2000, assuming 1% organic carbon
Bromoform	1.22E+01	NA	NA	Sediment quality guideline from DiToro et al. 2000, assuming 1% organic carbon
Chloroform	2.00E-02	5.01E+00	1.00E+01	Dutch Target and Intervention values for soil/sediment (Netherlands Ministry of Housing, Spatial Planning and the Environment 2000)
Dibromochloromethane	9.93E+00	NA	NA	Sediment quality guideline from DiToro et al. 2000, assuming 1% organic carbon
Methylene chloride	3.73E+00	NA	NA	Sediment quality guideline from DiToro et al. 2000, assuming 1% organic carbon
Toluene	1.00E-02	6.50E+01	1.30E+02	Dutch Target and Intervention values for soil/sediment (Netherlands Ministry of Housing, Spatial Planning and the Environment 2000)

Note:
HMW: High molecular weight
LEL: Lowest effect level
LMW: Low molecular weight
LOAEL: Lowest observed adverse effects level
MPC: Maximal permissible concentration
NA: Not available
ND: Analyte not detected in media
NOAEL: No observed adverse effects level
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
PEC: Probable effect concentration
SEL: Severe effect level
SRCeco: Serious risk concentration for ecosystems
TCEQ: Texas Commission on Environmental Quality
TEC: Threshold effect concentration
TRV: Toxicity reference
mg/kg dry wt: milligrams per kilogram dry weight

Table 4-11
Surface Water Toxicity Reference Values for Aquatic Organism Exposures

Chemical	Chronic Surface Water TRV (ug/L)	Acute Surface Water TRV (ug/L)	Source for Surface Water TRVs
Metals			
Aluminum	8.70E+01	7.50E+02	NAWQC values (EPA 2015)
Antimony	3.00E+01	1.80E+02	Tier II values from Suter and Tsao 1996
Arsenic	1.50E+02	3.40E+02	NAWQC (EPA 2015), based on dissolved concentrations
Barium	4.00E+00	1.10E+02	Tier II values from Suter and Tsao 1996
Beryllium	6.60E-01	3.50E+01	Tier II values from Suter and Tsao 1996
Cadmium	2.50E-01	2.00E+00	NAWQC (EPA 2015), based on dissolved concentrations. Criterion is a function of hardness. Default of 100 mg/L used.
Calcium	NA	NA	---
Chromium	1.10E+01	1.60E+01	Hexavalent chromium value from NAWQC (EPA 2015), based on dissolved concentrations.
Cobalt	2.30E+01	1.50E+03	Tier II values from Suter and Tsao 1996
Copper	1.20E+01	1.80E+01	NAWQC (Suter and Tsao 1996)
Iron	1.00E+03	NA	NAWQC (EPA 2015)
Lead	8.10E+00	2.10E+02	NAWQC (EPA 2015)
Magnesium	NA	NA	---
Manganese	1.20E+02	2.30E+03	Tier II values from Suter and Tsao 1996
Mercury	7.70E-01	1.40E+00	NAWQC (EPA 2015)
Nickel	5.20E+01	4.70E+02	NAWQC (EPA 2015), based on dissolved concentrations. Criterion is a function of hardness. Default of 100 mg/L used.
Potassium	NA	NA	---
Selenium	5.00E+00	NA	NAWQC (EPA 2015)
Silver	3.60E-01	3.20E+00	Tier II value from Suter and Tsao 1996 and NAWQC (EPA 2015)
Sodium	NA	NA	---
Thallium	1.20E+01	1.10E+02	Tier II values from Suter and Tsao 1996
Vanadium	2.00E+01	2.80E+02	Tier II values from Suter and Tsao 1996
Zinc	1.20E+02	1.20E+02	NAWQC (EPA 2015), based on dissolved concentrations. Criterion is a function of hardness. Default of 100 mg/L used.
PCBS			
Aroclor-1016	3.30E-02	6.00E-01	Tier II values for Aroclor-1254 from Suter and Tsao 1996
Aroclor-1221	2.80E-01	5.00E+00	Tier II values from Suter and Tsao 1996
Aroclor-1242	5.30E-02	1.20E+00	Tier II values from Suter and Tsao 1996
Aroclor-1248	8.10E-02	1.40E+00	Tier II values from Suter and Tsao 1996
Aroclor-1254	3.30E-02	6.00E-01	Tier II values from Suter and Tsao 1996
Aroclor-1260	9.40E+01	1.70E+03	Tier II values from Suter and Tsao 1996
Total PCB Congeners	1.40E-02	2.00E+00	NAWQC value for PCBs (EPA 2015) and NAWQC value for total PCBs (Suter and Tsao 1996)
Total PCB Aroclors	1.40E-02	2.00E+00	NAWQC value for PCBs (EPA 2015) and NAWQC value for total PCBs (Suter and Tsao 1996)

Table 4-11
Surface Water Toxicity Reference Values for Aquatic Organism Exposures

Chemical	Chronic Surface Water TRV (ug/L)	Acute Surface Water TRV (ug/L)	Source for Surface Water TRVs
PESTICIDES			
DDTr	1.00E-03	1.10E+00	NAWQC value for 4,4'-DDT(EPA 2015)
Aldrin	NA	3.00E+00	NAWQC (EPA 2015)
alpha-BHC	2.20E+00	3.90E+01	Tier II values from Suter and Tsao 1996, value for BHC (other)
alpha-Chlordane	4.30E-03	2.40E+00	NAWQC value for chlordane (EPA 2015)
beta-BHC	2.20E+00	3.90E+01	Tier II values from Suter and Tsao 1996, value for BHC (other)
delta-BHC	2.20E+00	3.90E+01	Tier II values from Suter and Tsao 1996, value for BHC (other)
Dieldrin	5.60E-02	2.40E-01	NAWQC (EPA 2015)
Endosulfan I	5.60E-02	2.20E-01	NAWQC (EPA 2015)
Endosulfan II	5.60E-02	2.20E-01	NAWQC (EPA 2015)
Endosulfan sulfate	NA	NA	---
Endrin	3.60E-02	8.60E-02	NAWQC (EPA 2015)
Endrin aldehyde	NA	NA	---
Endrin ketone	NA	NA	---
gamma-BHC (Lindane)	8.00E-02	9.50E-01	NAWQC (Suter and Tsao 1996) and NAWQC (EPA 2015)
gamma-Chlordane	4.30E-03	2.40E+00	NAWQC value for chlordane (EPA 2015)
Heptachlor	3.80E-03	5.20E-01	NAWQC (EPA 2015)
Heptachlor epoxide	3.80E-03	5.20E-01	NAWQC (EPA 2015)
Methoxychlor	3.00E-02	NA	NAWQC (EPA 2015)
Toxaphene	2.00E-04	7.30E-01	NAWQC (EPA 2015)
PAHs			
Total LMW PAHs	NA	NA	---
Total HMW PAHs	NA	NA	---
SVOCS			
2-Methylphenol	1.30E+01	2.30E+02	Tier II values from Suter and Tsao 1996
3-&4-Methylphenols	1.30E+01	2.30E+02	Tier II values for 2-methylphenol from Suter and Tsao 1996
Benzaldehyde	NA	NA	---
Bis(2-ethylhexyl)phthalate	3.00E+00	2.70E+01	Tier II values from Suter and Tsao 1996
Butylbenzylphthalate	1.90E+01	NA	Tier II value from Suter and Tsao 1996
Caprolactam	NA	NA	---
Carbazole	NA	NA	---
Dibenzofuran	3.70E+00	6.60E+01	Tier II values from Suter and Tsao 1996
Diethyl phthalate	2.10E+02	1.80E+03	Tier II values from Suter and Tsao 1996
Di-n-butyl phthalate	3.50E+01	1.90E+02	Tier II values from Suter and Tsao 1996
Phenol	1.10E+02	3.60E+03	NAWQC (Suter and Tsao 1996)
VOCS			
Acetone	1.50E+03	2.80E+04	Tier II values from Suter and Tsao 1996
Acetophenone	NA	NA	---
Bromodichloromethane	NA	NA	---
Bromoform	2.93E+02	2.93E+03	Region IV screening values (Suter and Tsao 1996)
Chloroform	2.80E+01	4.90E+02	Tier II values from Suter and Tsao 1996
Dibromochloromethane	NA	NA	---
Methylene chloride	2.20E+03	2.60E+04	Tier II values from Suter and Tsao 1996
Toluene	9.80E+00	1.20E+02	Tier II values from Suter and Tsao 1996

Table 4-11

Surface Water Toxicity Reference Values for Aquatic Organism Exposures

Chemical	Chronic Surface Water TRV (ug/L)	Acute Surface Water TRV (ug/L)	Source for Surface Water TRVs

Note:
HMW: High molecular weight
LMW: Low molecular weight
LOAEL: Lowest observed adverse effects level
NA: TRV not available
NAWQC - National Ambient Water Quality Criteria
ND: Analyte not detected in media
NOAEL: No observed adverse effects level
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
TRV: Toxicity reference value
µg/L: micrograms per liter

Table 4-12
Background Concentrations in Surface Soil

Chemical	Frequency of Detection	Surface Soil 95UCLM (mg/kg)	Surface Soil Maximum Detected Concentration (mg/kg)
Metals			
Aluminum	10/10	2.08E+04	1.80E+04
Antimony	--	--	--
Arsenic	--	--	--
Barium	10/10	1.69E+02	1.45E+02
Beryllium	10/10	1.20E+00	1.01E+00
Cadmium	--	--	--
Calcium	10/10	1.27E+05	1.01E+05
Chromium	10/10	1.58E+01	1.46E+01
Cobalt	--	--	--
Copper	--	--	--
Iron	10/10	1.98E+04	1.76E+04
Lead	10/10	2.53E+01	1.89E+01
Magnesium	10/10	7.00E+03	6.15E+03
Manganese	10/10	5.67E+02	4.85E+02
Mercury	--	--	--
Nickel	--	--	--
Potassium	10/10	7.43E+03	6.38E+03
Selenium	9/10	5.70E-01	3.47E-01
Silver	--	--	--
Sodium	10/10	2.53E+02	2.16E+02
Thallium	--	--	--
Vanadium	10/10	2.65E+01	2.22E+01
Zinc	10/10	8.74E+01	6.70E+01
PCBS			
Aroclor-1016	--	--	--
Aroclor-1221	--	--	--
Aroclor-1242	--	--	--
Aroclor-1248	--	--	--
Aroclor-1254	--	--	--
Aroclor-1260	--	--	--
Total PCB Congeners	3/3	6.20E-04	6.20E-04
Total PCB Aroclors	--	--	--
PESTICIDES			
4,4´-DDD	--	--	--
4,4´-DDE	10/10	2.90E-01	1.45E-01
4,4´-DDT	7/10	6.10E-03	3.71E-03
DDTr	10/10	2.91E-01	1.49E-01
Aldrin	--	--	--
alpha-BHC	--	--	--
alpha-Chlordane	--	--	--
beta-BHC	--	--	--
delta-BHC	--	--	--
Dieldrin	--	--	--
Endosulfan I	--	--	--
Endosulfan II	--	--	--
Endosulfan sulfate	--	--	--
Endrin	--	--	--
Endrin aldehyde	--	--	--

Table 4-12

Background Concentrations in Surface Soil

Chemical	Frequency of Detection	Surface Soil 95UCLM (mg/kg)	Surface Soil Maximum Detected Concentration (mg/kg)
Endrin ketone	--	--	--
gamma-BHC (Lindane)	--	--	--
gamma-Chlordane	--	--	--
Heptachlor	--	--	--
Heptachlor epoxide	--	--	--
Methoxychlor	--	--	--
Toxaphene	--	--	--
PAHs			
Total LMW PAHs	--	--	--
Total HMW PAHs	--	--	--
SVOCS			
2-Methylphenol	--	--	--
3-&4-Methylphenols	--	--	--
Benzaldehyde	--	--	--
Bis(2-ethylhexyl)phthalate	--	--	--
Butylbenzylphthalate	--	--	--
Caprolactam	--	--	--
Carbazole	--	--	--
Dibenzofuran	--	--	--
Diethyl phthalate	--	--	--
Di-n-butyl phthalate	1/10	1.10E-01	1.10E-01
Phenol	--	--	--
VOCS			
Acetone	--	--	--
Acetophenone	--	--	--
Bromodichloromethane	--	--	--
Bromoform	--	--	--
Chloroform	--	--	--
Dibromochloromethane	--	--	--
Methylene chloride	--	--	--

DDTr - Sum of DDD, DDE, DDT
HMW: High molecular weight
LMW: Low molecular weight
--: Analyte not detected in media
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
SVOCs - Semi-volatile organic compounds
VOCs - Volatile organic compounds

Table 4-13
Upgradient Reference Concentrations in Sediment

Chemical	Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado			
	Frequency of Detection	Sediment Mean (mg/kg)	Sediment Maximum (mg/kg)	95% Upper Prediction Limit (mg/kg)
Metals				
Aluminum	25 / 25	1.31E+04	2.40E+04	2.12E+04
Antimony	0 / 25	--	--	--
Arsenic	25 / 25	4.13E+00	6.60E+00	6.30E+00
Barium	25 / 25	1.57E+02	2.55E+02	2.18E+02
Beryllium	9 / 25	6.20E-01	9.80E-01	9.80E-01
Cadmium	16 / 25	3.79E-01	4.90E-01	4.90E-01
Calcium	25 / 25	7.11E+04	1.00E+05	9.18E+04
Chromium	25 / 25	9.43E+00	1.67E+01	1.55E+01
Cobalt	25 / 25	5.13E+00	7.20E+00	6.70E+00
Copper	23 / 25	8.83E+00	1.69E+01	1.45E+01
Iron	25 / 25	1.46E+04	2.19E+04	1.92E+04
Lead	25 / 25	8.42E+00	1.37E+01	1.20E+01
Magnesium	25 / 25	4.94E+03	8.35E+03	7.01E+03
Manganese	25 / 25	4.23E+02	1.18E+03	8.36E+02
Mercury	24 / 25	4.63E-02	2.20E-01	1.70E-01
Nickel	25 / 25	9.38E+00	1.49E+01	1.33E+01
Potassium	23 / 25	3.03E+03	5.62E+03	4.81E+03
Selenium	0 / 25	--	--	--
Silver	0 / 25	--	--	--
Sodium	15 / 25	9.68E+02	2.12E+03	1.86E+03
Thallium	0 / 25	--	--	--
Vanadium	25 / 25	1.89E+01	2.85E+01	2.69E+01
Zinc	25 / 25	4.04E+01	7.45E+01	6.70E+01
PCBS				
Aroclor-1016	0 / 44	--	--	--
Aroclor-1221	0 / 44	--	--	--
Aroclor-1242	0 / 44	--	--	--
Aroclor-1248	0 / 44	--	--	--
Aroclor-1254	0 / 44	--	--	--
Aroclor-1260	0 / 44	--	--	--
Total PCB Congeners	14 / 14	1.85E-03	1.20E-02	1.20E-02
Total PCB Aroclors	0 / 44	--	--	--
PESTICIDES				
4,4´-DDD	0 / 27	--	--	--
4,4´-DDE	0 / 27	--	--	--
4,4´-DDT	0 / 27	--	--	--
DDTr	12 / 12	8.48E-03	5.40E-02	5.40E-02
Aldrin	0 / 27	--	--	--
alpha-BHC	0 / 27	--	--	--
alpha-Chlordane	0 / 27	--	--	--
beta-BHC	0 / 27	--	--	--
delta-BHC	1 / 27	9.10E-04	9.10E-04	9.10E-04
Dieldrin	0 / 27	--	--	--
Endosulfan I	0 / 27	--	--	--
Endosulfan II	0 / 27	--	--	--

Table 4-13
Upgradient Reference Concentrations in Sediment

Chemical	Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado			
	Frequency of Detection	Sediment Mean (mg/kg)	Sediment Maximum (mg/kg)	95% Upper Prediction Limit (mg/kg)
Endosulfan sulfate	0 / 27	--	--	--
Endrin	0 / 27	--	--	--
Endrin aldehyde	0 / 27	--	--	--
Endrin ketone	0 / 27	--	--	--
gamma-BHC (Lindane)	0 / 27	--	--	--
gamma-Chlordane	0 / 27	--	--	--
Heptachlor	0 / 27	--	--	--
Heptachlor epoxide	0 / 27	--	--	--
Methoxychlor	0 / 27	--	--	--
Toxaphene	0 / 27	--	--	--
PAHs				
Total LMW PAHs	1 / 27	2.95E-01	3.99E-01	3.99E-01
Total HMW PAHs	1 / 27	3.20E-01	3.20E-01	3.20E-01
SVOCS				
2-Methylphenol	0 / 27	--	--	--
3-&4-Methylphenols	0 / 27	--	--	--
Benzaldehyde	0 / 27	--	--	--
Bis(2-ethylhexyl)phthalate	9 / 27	1.84E-01	6.10E-01	4.00E-01
Butylbenzylphthalate	0 / 27	--	--	--
Caprolactam	0 / 27	--	--	--
Carbazole	0 / 27	--	--	--
Dibenzofuran	0 / 27	--	--	--
Diethyl phthalate	0 / 27	--	--	--
Di-n-butyl phthalate	0 / 27	--	--	--
Phenol	4 / 27	5.95E-02	6.70E-02	6.70E-02
VOCS				
Acetone	2 / 7	2.72E-02	5.20E-02	5.20E-02
Acetophenone	6 / 27	6.63E-02	8.30E-02	8.30E-02
Bromodichloromethane	0 / 7	--	--	--
Bromoform	0 / 7	--	--	--
Chloroform	0 / 7	--	--	--
Dibromochloromethane	0 / 7	--	--	--
Methylene chloride	1 / 7	4.40E-03	4.40E-03	4.40E-03
Toluene	1 / 7	2.70E-03	2.70E-03	2.70E-03

Note:
DDTr - Sum of DDD, DDE, DDT
HMW: High molecular weight
LMW: Low molecular weight
--: Analyte not detected in media
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
SVOCs: Semi-volatile organic compounds
VOCs: Volatile organic compounds

Table 4-14

Upgradient Reference Concentrations in Surface Water

Chemical	Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado			
	Frequency of Detection	Surface Water Mean (ug/L)	Surface Water Maximum (ug/L)	95% Upper Prediction Limit (ug/L)
Metals				
Aluminum	11 / 11	9.20E+02	2.21E+03	2.21E+03
Antimony	0 / 11	--	--	--
Arsenic	11 / 11	8.76E+00	1.51E+01	1.51E+01
Barium	11 / 11	1.26E+02	1.64E+02	1.64E+02
Beryllium	0 / 11	--	--	--
Cadmium	1 / 11	1.70E-01	1.70E-01	1.70E-01
Calcium	11 / 11	1.23E+05	2.19E+05	2.19E+05
Chromium	3 / 11	9.97E-01	2.70E+00	2.70E+00
Cobalt	3 / 11	1.16E+00	2.00E+00	2.00E+00
Copper	10 / 11	4.44E+00	9.20E+00	9.20E+00
Iron	10 / 11	8.20E+02	1.80E+03	1.80E+03
Lead	11 / 11	1.62E+00	4.30E+00	4.30E+00
Magnesium	11 / 11	4.17E+04	7.61E+04	7.61E+04
Manganese	11 / 11	1.53E+02	3.42E+02	3.42E+02
Mercury	1 / 11	6.00E-02	6.00E-02	6.00E-02
Nickel	11 / 11	2.41E+00	4.30E+00	4.30E+00
Potassium	11 / 11	8.93E+03	1.38E+04	1.38E+04
Selenium	5 / 11	1.96E+00	5.60E+00	5.60E+00
Silver	0 / 11	--	--	--
Sodium	11 / 11	2.55E+05	5.62E+05	5.62E+05
Thallium	0 / 11	--	--	--
Vanadium	11 / 11	1.13E+01	1.58E+01	1.58E+01
Zinc	11 / 11	7.73E+00	1.86E+01	1.86E+01
PCBS				
Aroclor-1016	0 / 20	--	--	--
Aroclor-1221	0 / 20	--	--	--
Aroclor-1242	0 / 20	--	--	--
Aroclor-1248	0 / 20	--	--	--
Aroclor-1254	0 / 20	--	--	--
Aroclor-1260	0 / 20	--	--	--
Total PCB Congeners	13 / 13	3.34E-04	1.20E-03	1.20E-03
Total PCB Aroclors	0 / 20	--	--	--
PESTICIDES				
4,4´-DDD	0 / 11	--	--	--
4,4´-DDE	0 / 11	--	--	--
4,4´-DDT	0 / 11	--	--	--
DDTr	0 / 11	--	--	--
Aldrin	0 / 11	--	--	--
alpha-BHC	0 / 11	--	--	--
alpha-Chlordane	0 / 11	--	--	--
beta-BHC	0 / 11	--	--	--
delta-BHC	0 / 11	--	--	--
Dieldrin	0 / 11	--	--	--
Endosulfan I	0 / 11	--	--	--
Endosulfan II	0 / 11	--	--	--

Table 4-14
Upgradient Reference Concentrations in Surface Water

Chemical	Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado			
	Frequency of Detection	Surface Water Mean (ug/L)	Surface Water Maximum (ug/L)	95% Upper Prediction Limit (ug/L)
Endosulfan sulfate	0 / 11	--	--	--
Endrin	0 / 11	--	--	--
Endrin aldehyde	0 / 11	--	--	--
Endrin ketone	0 / 11	--	--	--
gamma-BHC (Lindane)	1 / 11	1.70E-02	1.70E-02	1.70E-02
gamma-Chlordane	0 / 11	--	--	--
Heptachlor	0 / 11	--	--	--
Heptachlor epoxide	0 / 11	--	--	--
Methoxychlor	0 / 11	--	--	--
Phenanthrene	0 / 11	--	--	--
Pyrene	0 / 11	--	--	--
Total LMW PAHs	0 / 11	--	--	--
Total HMW PAHs	0 / 11	--	--	--
SVOCS				
2-Methylphenol	0 / 11	--	--	--
3-&4-Methylphenols	0 / 11	--	--	--
Benzaldehyde	0 / 11	--	--	--
Bis(2-ethylhexyl)phthalate	3 / 11	1.52E+01	1.40E+02	1.40E+02
Butylbenzylphthalate	0 / 11	--	--	--
Caprolactam	0 / 11	--	--	--
Carbazole	0 / 11	--	--	--
Dibenzofuran	0 / 11	--	--	--
Diethyl phthalate	1 / 11	1.10E+00	1.10E+00	1.10E+00
Di-n-butyl phthalate	0 / 11	--	--	--
Phenol	0 / 11	--	--	--
VOCS				
Acetone	0 / 4	--	--	--
Acetophenone	1 / 11	2.10E+00	2.10E+00	2.10E+00
Bromodichloromethane	0 / 4	--	--	--
Bromoform	0 / 4	--	--	--
Chloroform	0 / 4	--	--	--
Dibromochloromethane	0 / 4	--	--	--

Note:
DDTr - Sum of DDD, DDE, DDT
HMW: High molecular weight
LMW: Low molecular weight
--: Analyte not detected in media
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
SVOCs: Semi-volatile organic compounds
VOCs: Volatile organic compounds

Table 5-1
Frequency of Detection and Exposure Point Concentrations for Exposure Area 1: Upstream of the Siphon

Analyte	Sediment			Surface Water (Total Concentration)			Surface Water (Dissolved Concentration)		
	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)
Metals									
Barium	11/11	1.66E+02	1.66E+02	4/4	1.40E+02	1.40E+02	4/4	1.25E+02	1.25E+02
Beryllium	1/11	7.10E-01	7.10E-01	--	--	--	--	--	--
Lead	11/11	9.00E+00	7.80E+00	4/4	1.40E+00	1.40E+00	--	--	--
Vanadium	11/11	1.98E+01	1.71E+01	4/4	9.60E+00	9.60E+00	4/4	9.00E+00	9.00E+00
PCBS									
Aroclor-1260	1/22	7.40E-04	7.40E-04	--	--	--	--	--	--
Total PCB Congeners	10/10	7.70E-03	3.27E-03	9/9	4.40E-04	3.45E-04	--	--	--
Total PCB Aroclors	1/1	7.40E-04	7.40E-04	--	--	--	--	--	--
PESTICIDES									
DDTr	9/13	5.40E-02	5.40E-02	--	--	--	--	--	--
SVOCS									
Bis(2-ethylhexyl)phthalate	6/13	6.10E-01	3.00E-01	--	--	--	--	--	--
Phenol	4/13	6.70E-02	6.70E-02	--	--	--	--	--	--
VOCS									
Acetophenone	6/13	8.30E-02	7.41E-02	--	--	--	--	--	--

Table 5-2
Comparison of Maximum Modeled Wildlife Doses to Birds to Avian TRVs for Exposure Area 1: Upstream of the Siphon

Chemical	Avian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs				Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals										
Barium	2.08E+01	4.17E+01	1.46E-02	4.60E-01	6.40E-02	2.31E-02	7.31E-03	2.29E-01	3.19E-02	1.15E-02
Beryllium	NA	NA	--	--	--	--	--	--	--	--
Lead	1.63E+00	3.26E+00	7.87E-03	6.65E-02	2.52E-02	9.09E-03	3.93E-03	3.32E-02	1.26E-02	4.55E-03
Vanadium	3.44E-01	6.88E-01	4.03E-02	**3.31E+00**	9.61E-01	3.46E-01	2.01E-02	**1.66E+00**	4.80E-01	1.73E-01
PCBS										
Aroclor-1260	1.80E-01	1.80E+00	2.63E-06	8.16E-03	1.03E-05	3.70E-06	2.63E-07	8.16E-04	1.03E-06	3.70E-07
Total PCB Congeners	1.80E-01	1.80E+00	3.01E-05	8.49E-02	3.10E-02	1.12E-02	3.01E-06	8.49E-03	3.10E-03	1.12E-03
Total PCB Aroclors	1.80E-01	1.80E+00	2.88E-06	8.16E-03	1.03E-05	3.70E-06	2.88E-07	8.16E-04	1.03E-06	3.70E-07
PESTICIDES										
DDTr	2.80E-03	2.80E-02	1.52E-02	**5.91E+01**	**1.78E+01**	**6.41E+00**	1.52E-03	**5.91E+00**	**1.78E+00**	6.41E-01
SVOCS										
Bis(2-ethylhexyl)phthalate	1.10E+00	1.10E+01	3.55E-04	**1.30E+00**	1.39E-03	4.99E-04	3.55E-05	1.30E-01	1.39E-04	4.99E-05
Phenol	3.77E+00	NA	7.26E-04	4.17E-02	1.64E-03	5.89E-04	--	--	--	--
VOCS										
Acetophenone	NA	NA	--	--	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 5-3
Comparison of 95UCLM Modeled Wildlife Doses to Birds to Avian TRVs for Exposure Area 1: Upstream of the Siphon

Chemical	Avian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs				95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals										
Barium	2.08E+01	4.17E+01	1.46E-02	4.60E-01	6.40E-02	2.31E-02	7.31E-03	2.29E-01	3.19E-02	1.15E-02
Beryllium	NA	NA	--	--	--	--	--	--	--	--
Lead	1.63E+00	3.26E+00	7.07E-03	5.76E-02	2.34E-02	8.43E-03	3.53E-03	2.88E-02	1.17E-02	4.22E-03
Vanadium	3.44E-01	6.88E-01	3.50E-02	**2.87E+00**	9.41E-01	3.39E-01	1.75E-02	**1.43E+00**	4.71E-01	1.70E-01
PCBS										
Aroclor-1260	1.80E-01	1.80E+00	2.63E-06	8.16E-03	1.03E-05	3.70E-06	2.63E-07	8.16E-04	1.03E-06	3.70E-07
Total PCB Congeners	1.80E-01	1.80E+00	1.28E-05	3.60E-02	2.43E-02	8.74E-03	1.28E-06	3.60E-03	2.43E-03	8.74E-04
Total PCB Aroclors	1.80E-01	1.80E+00	2.88E-06	8.16E-03	1.03E-05	3.70E-06	2.88E-07	8.16E-04	1.03E-06	3.70E-07
PESTICIDES										
DDTr	2.80E-03	2.80E-02	1.52E-02	**5.91E+01**	**1.78E+01**	**6.41E+00**	1.52E-03	**5.91E+00**	**1.78E+00**	6.41E-01
SVOCS										
Bis(2-ethylhexyl)phthalate	1.10E+00	1.10E+01	1.74E-04	6.41E-01	6.82E-04	2.45E-04	1.74E-05	6.41E-02	6.82E-05	2.45E-05
Phenol	3.77E+00	NA	7.26E-04	4.17E-02	1.64E-03	5.89E-04	--	--	--	--
VOCS										
Acetophenone	NA	NA	--	--	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 5-4
Comparison of Maximum Modeled Wildlife Doses to Mammals to Mammalian TRVs for Exposure Area 1: Upstream of the Siphon

Chemical	Mammalian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs			Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs		
	NOAEL	LOAEL	Aquatic Herbivorous Mammals Nutria	Aquatic Carnivorous Mammals Raccoon	Piscivorous Mammals River Otter	Aquatic Herbivorous Mammals Nutria	Aquatic Carnivorous Mammals Raccoon	Piscivorous Mammals River Otter
Metals								
Barium	5.18E+01	8.27E+01	2.57E-02	1.69E-01	9.97E-03	1.61E-02	1.06E-01	6.25E-03
Beryllium	5.32E-01	6.73E-01	1.70E-03	7.01E-02	1.28E-03	1.34E-03	5.54E-02	1.01E-03
Lead	4.70E+00	8.90E+00	1.01E-02	1.47E-02	3.37E-03	5.34E-03	7.78E-03	1.78E-03
Vanadium	4.16E+00	8.31E+00	7.40E-03	2.50E-01	3.06E-02	3.70E-03	1.25E-01	1.53E-02
PCBS								
Aroclor-1260	1.00E-02	1.00E-01	6.48E-05	1.44E-01	7.10E-05	6.48E-06	1.44E-02	7.10E-06
Total PCB Congeners	1.00E-02	1.00E-01	9.72E-04	**1.50E+00**	2.14E-01	9.72E-05	1.50E-01	2.14E-02
Total PCB Aroclors	1.00E-02	1.00E-01	8.93E-05	1.44E-01	7.10E-05	8.93E-06	1.44E-02	7.10E-06
PESTICIDES								
DDTr	8.00E-01	4.00E+00	1.14E-04	2.03E-01	2.39E-02	2.27E-05	4.07E-02	4.79E-03
SVOCS								
Bis(2-ethylhexyl)phthalate	1.83E+01	1.83E+02	2.90E-05	7.70E-02	3.20E-05	2.90E-06	7.70E-03	3.20E-06
Phenol	1.20E+01	3.60E+01	1.23E-03	1.29E-02	1.97E-04	4.11E-04	4.30E-03	6.58E-05
VOCS								
Acetophenone	NA	NA	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 5-5
Comparison of 95UCLM Modeled Wildlife Doses to Mammals to Mammalian TRVs for Exposure Area 1: Upstream of the Siphon

Chemical	Mammalian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs			95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
Metals								
Barium	5.18E+01	8.27E+01	2.57E-02	1.69E-01	9.97E-03	1.61E-02	1.06E-01	6.25E-03
Beryllium	5.32E-01	6.73E-01	1.70E-03	7.01E-02	1.28E-03	1.34E-03	5.54E-02	1.01E-03
Lead	4.70E+00	8.90E+00	9.27E-03	1.28E-02	3.13E-03	4.90E-03	6.75E-03	1.65E-03
Vanadium	4.16E+00	8.31E+00	6.70E-03	2.16E-01	3.00E-02	3.35E-03	1.08E-01	1.50E-02
PCBS								
Aroclor-1260	1.00E-02	1.00E-01	6.48E-05	1.44E-01	7.10E-05	6.48E-06	1.44E-02	7.10E-06
Total PCB Congeners	1.00E-02	1.00E-01	4.28E-04	6.37E-01	1.68E-01	4.28E-05	6.37E-02	1.68E-02
Total PCB Aroclors	1.00E-02	1.00E-01	8.93E-05	1.44E-01	7.10E-05	8.93E-06	1.44E-02	7.10E-06
PESTICIDES								
DDTr	8.00E-01	4.00E+00	1.14E-04	2.03E-01	2.39E-02	2.27E-05	4.07E-02	4.79E-03
SVOCS								
Bis(2-ethylhexyl)phthalate	1.83E+01	1.83E+02	1.43E-05	3.78E-02	1.57E-05	1.43E-06	3.78E-03	1.57E-06
Phenol	1.20E+01	3.60E+01	1.23E-03	1.29E-02	1.97E-04	4.11E-04	4.30E-03	6.58E-05
VOCS								
Acetophenone	NA	NA	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 5-6
Comparison of Exposure Point Concentrations in Sediment to Plant TRVs for Exposure Area 1: Upstream of the Siphon

Chemical	Plant Toxicity Reference Value (mg/kg dry wt)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Barium	5.00E+02	11/11	1.66E+02	3.32E-01	1.66E+02	3.32E-01
Beryllium	1.00E+01	1/11	7.10E-01	7.10E-02	7.10E-01	7.10E-02
Lead	1.20E+02	11/11	9.00E+00	7.50E-02	7.80E+00	6.50E-02
Vanadium	2.00E+00	11/11	1.98E+01	**9.90E+00**	1.71E+01	**8.56E+00**
PCBS						
Aroclor-1260	4.00E+01	1/22	7.40E-04	1.85E-05	7.40E-04	1.85E-05
Total PCB Congeners	4.00E+01	10/10	7.70E-03	1.93E-04	3.27E-03	8.18E-05
Total PCB Aroclors	4.00E+01	1/1	7.40E-04	1.85E-05	7.40E-04	1.85E-05
PESTICIDES						
DDTr	NA	9/13	5.40E-02	--	5.40E-02	--
SVOCS						
Bis(2-ethylhexyl)phthalate	1.00E+02	6/13	6.10E-01	6.10E-03	3.00E-01	3.00E-03
Phenol	7.00E+01	4/13	6.70E-02	9.57E-04	6.70E-02	9.57E-04
VOCS						
Acetophenone	NA	6/13	8.30E-02	--	7.41E-02	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 5-7
Comparison of Exposure Point Concentrations in Sediment to Benthic Organism TRVs for Exposure Area 1: Upstream of the Siphon

Chemical	Sediment TEC Toxicity Reference Value (mg/kg)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Barium	1.30E+02	11/11	1.66E+02	**1.28E+00**	1.66E+02	**1.28E+00**
Beryllium	1.10E+00	1/11	7.10E-01	6.45E-01	7.10E-01	6.45E-01
Lead	3.58E+01	11/11	9.00E+00	2.51E-01	7.80E+00	2.18E-01
Vanadium	4.20E+01	11/11	1.98E+01	4.71E-01	1.71E+01	4.08E-01
PCBS						
Aroclor-1260	5.00E-03	1/22	7.40E-04	1.48E-01	7.40E-04	1.48E-01
Total PCB Congeners	5.98E-02	10/10	7.70E-03	1.29E-01	3.27E-03	5.47E-02
Total PCB Aroclors	5.98E-02	1/1	7.40E-04	1.24E-02	7.40E-04	1.24E-02
PESTICIDES						
DDTr	5.28E-03	9/13	5.40E-02	**1.02E+01**	5.40E-02	**1.02E+01**
SVOCS						
Bis(2-ethylhexyl)phthalate	1.82E-01	6/13	6.10E-01	**3.35E+00**	3.00E-01	**1.65E+00**
Phenol	5.00E-02	4/13	6.70E-02	**1.34E+00**	6.70E-02	**1.34E+00**
VOCS						
Acetophenone	NA	6/13	8.30E-02	--	7.41E-02	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 5-8
Comparison of Exposure Point Concentrations in Surface Water to Aquatic Organism TRVs for Exposure Area 1: Upstream of the Siphon

Chemical	Chronic Surface Water Toxicity Reference Value (µg/L)	Dissolved Concentrations					Total Concentrations				
		Frequency of Detection	Maximum EPC (µg/L)	Hazard Quotient for Maximum EPC	95UCLM EPC (µg/L)	Hazard Quotient for 95UCLM EPC	Frequency of Detection	Maximum EPC (µg/L)	Hazard Quotient for Maximum EPC	95UCLM EPC (µg/L)	Hazard Quotient for 95UCLM EPC
Metals											
Barium	4.00E+00	4/4	1.25E+02	**3.13E+01**	1.25E+02	**3.13E+01**	4/4	1.40E+02	**3.50E+01**	1.40E+02	**3.50E+01**
Lead	8.10E+00	--	--	--	--	--	4/4	1.40E+00	1.73E-01	1.40E+00	1.73E-01
Vanadium	2.00E+01	4/4	9.00E+00	4.50E-01	9.00E+00	4.50E-01	4/4	9.60E+00	4.80E-01	9.60E+00	4.80E-01
PCBS											
Total PCB Congeners	1.40E-02	--	--	--	--	--	9/9	4.40E-04	3.14E-02	3.45E-04	2.46E-02

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 6-1
Frequency of Detection and Exposure Point Concentrations for Exposure Area 2: Arroyo Colorado

Analyte	Sediment			Surface Water (Total Concentration)			Surface Water (Dissolved Concentration)		
	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)
Metals									
Barium	14/14	2.55E+02	1.98E+02	7/7	1.64E+02	1.41E+02	7/7	1.52E+02	1.20E+02
Beryllium	8/14	9.80E-01	7.85E-01	--	0.00E+00	0.00E+00	--	--	--
Cadmium	14/14	4.90E-01	4.14E-01	1/7	1.70E-01	1.70E-01	--	--	--
Copper	14/14	1.69E+01	1.26E+01	7/7	9.20E+00	7.47E+00	7/7	7.10E+00	5.71E+00
Lead	14/14	1.37E+01	1.07E+01	7/7	4.30E+00	2.82E+00	1/7	2.50E-01	2.50E-01
Manganese	14/14	1.18E+03	6.82E+02	7/7	3.42E+02	2.52E+02	7/7	1.38E+02	8.93E+01
Mercury	13/14	2.20E-01	1.12E-01	1/7	6.00E-02	6.00E-02	--	--	--
Selenium	--	0.00E+00	0.00E+00	2/7	5.60E+00	5.60E+00	7/7	6.00E+00	6.00E+00
Vanadium	14/14	2.85E+01	2.37E+01	7/7	1.58E+01	1.43E+01	7/7	1.18E+01	1.09E+01
PCBS									
Aroclor-1260	5/22	5.60E-03	4.58E-03	--	--	--	--	--	--
Total PCB Congeners	4/4	1.20E-02	1.20E-02	4/4	1.20E-03	1.20E-03	--	--	--
Total PCB Aroclors	5/22	5.60E-03	4.58E-03	--	--	--	--	--	--
PESTICIDES									
DDTr	3/14	1.30E-02	1.30E-02	--	0.00E+00	0.00E+00	--	--	--
VOCS									
Acetophenone	--	0.00E+00	0.00E+00	1/7	2.10E+00	2.10E+00	--	--	--

Table 6-2
Comparison of Maximum Modeled Wildlife Doses to Birds to Avian TRVs for Exposure Area 2: Arroyo Colorado

Chemical	Avian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs				Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals										
Barium	2.08E+01	4.17E+01	2.24E-02	7.06E-01	1.25E-01	4.51E-02	1.12E-02	3.52E-01	6.25E-02	2.25E-02
Beryllium	NA	NA	--	--	--	--	--	--	--	--
Cadmium	1.47E+00	6.35E+00	2.44E-03	5.29E-02	4.26E-03	1.53E-03	5.64E-04	1.22E-02	9.86E-04	3.55E-04
Copper	4.05E+00	1.21E+01	1.41E-02	**1.10E+00**	1.19E-01	4.30E-02	4.73E-03	3.70E-01	3.99E-02	1.44E-02
Lead	1.63E+00	3.26E+00	1.09E-02	1.01E-01	6.12E-02	2.20E-02	5.46E-03	5.06E-02	3.06E-02	1.10E-02
Manganese	1.79E+02	3.77E+02	1.70E-02	3.80E-01	8.09E-02	2.91E-02	8.10E-03	1.80E-01	3.85E-02	1.39E-02
Mercury	4.50E-01	9.00E-01	3.11E-03	7.27E-02	4.79E-02	1.72E-02	1.55E-03	3.63E-02	2.40E-02	8.62E-03
Selenium	2.90E-01	5.79E-01	8.54E-04	1.10E-03	6.40E-01	2.31E-01	4.28E-04	5.51E-04	3.21E-01	1.15E-01
Vanadium	3.44E-01	6.88E-01	5.82E-02	**4.77E+00**	2.35E-01	8.49E-02	2.91E-02	**2.39E+00**	1.18E-01	4.24E-02
PCBS										
Aroclor-1260	1.80E-01	1.80E+00	1.99E-05	6.17E-02	2.12E-02	7.63E-03	1.99E-06	6.17E-03	2.12E-03	7.63E-04
Total PCB Congeners	1.80E-01	1.80E+00	4.70E-05	1.32E-01	8.45E-02	3.04E-02	4.70E-06	1.32E-02	8.45E-03	3.04E-03
Total PCB Aroclors	1.80E-01	1.80E+00	2.18E-05	6.17E-02	2.12E-02	7.63E-03	2.18E-06	6.17E-03	2.12E-03	7.63E-04
PESTICIDES										
DDTr	2.80E-03	2.80E-02	3.66E-03	**1.42E+01**	**7.00E+01**	**2.52E+01**	3.66E-04	**1.42E+00**	**7.00E+00**	**2.52E+00**
VOCS										
Acetophenone	NA	NA	--	--	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 6-3
Comparison of 95UCLM Modeled Wildlife Doses to Birds to Avian TRVs for Exposure Area 2: Arroyo Colorado

Chemical	Avian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs				95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals										
Barium	2.08E+01	4.17E+01	1.74E-02	5.49E-01	1.18E-01	4.26E-02	8.69E-03	2.74E-01	5.90E-02	2.13E-02
Beryllium	NA	NA	--	--	--	--	--	--	--	--
Cadmium	1.47E+00	6.35E+00	2.21E-03	4.47E-02	4.13E-03	1.49E-03	5.11E-04	1.03E-02	9.56E-04	3.44E-04
Copper	4.05E+00	1.21E+01	1.22E-02	8.26E-01	1.17E-01	4.20E-02	4.09E-03	2.76E-01	3.90E-02	1.41E-02
Lead	1.63E+00	3.26E+00	8.98E-03	7.87E-02	5.64E-02	2.03E-02	4.49E-03	3.93E-02	2.82E-02	1.02E-02
Manganese	1.79E+02	3.77E+02	9.86E-03	2.19E-01	7.39E-02	2.66E-02	4.69E-03	1.04E-01	3.51E-02	1.27E-02
Mercury	4.50E-01	9.00E-01	2.10E-03	3.70E-02	4.73E-02	1.70E-02	1.05E-03	1.85E-02	2.37E-02	8.52E-03
Selenium	2.90E-01	5.79E-01	8.54E-04	1.10E-03	6.40E-01	2.31E-01	4.28E-04	5.51E-04	3.21E-01	1.15E-01
Vanadium	3.44E-01	6.88E-01	4.86E-02	**3.97E+00**	1.98E-01	7.15E-02	2.43E-02	**1.99E+00**	9.90E-02	3.57E-02
PCBS										
Aroclor-1260	1.80E-01	1.80E+00	1.63E-05	5.05E-02	2.12E-02	7.62E-03	1.63E-06	5.05E-03	2.12E-03	7.62E-04
Total PCB Congeners	1.80E-01	1.80E+00	4.70E-05	1.32E-01	8.45E-02	3.04E-02	4.70E-06	1.32E-02	8.45E-03	3.04E-03
Total PCB Aroclors	1.80E-01	1.80E+00	1.78E-05	5.05E-02	2.12E-02	7.62E-03	1.78E-06	5.05E-03	2.12E-03	7.62E-04
PESTICIDES										
DDTr	2.80E-03	2.80E-02	3.66E-03	**1.42E+01**	**7.00E+01**	**2.52E+01**	3.66E-04	**1.42E+00**	**7.00E+00**	**2.52E+00**
VOCS										
Acetophenone	NA	NA	--	--	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 6-4
Comparison of Maximum Modeled Wildlife Doses to Mammals to Mammalian TRVs
for Exposure Area 2: Arroyo Colorado

Chemical	Mammalian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs			Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
Metals								
Barium	5.18E+01	8.27E+01	3.86E-02	2.59E-01	1.94E-02	2.42E-02	1.62E-01	1.22E-02
Beryllium	5.32E-01	6.73E-01	2.34E-03	9.67E-02	1.77E-03	1.85E-03	7.65E-02	1.40E-03
Cadmium	7.70E-01	7.70E+00	2.39E-02	9.68E-02	3.13E-03	2.39E-03	9.68E-03	3.13E-04
Copper	5.60E+00	9.34E+00	4.92E-02	7.74E-01	3.32E-02	2.95E-02	4.64E-01	1.99E-02
Lead	4.70E+00	8.90E+00	1.37E-02	2.25E-02	8.18E-03	7.26E-03	1.19E-02	4.32E-03
Manganese	5.15E+01	1.46E+02	2.69E-01	**1.20E+00**	1.08E-01	9.50E-02	4.26E-01	3.83E-02
Mercury	1.32E+01	NA	5.39E-04	2.37E-03	6.27E-04	--	--	--
Selenium	1.43E-01	2.15E-01	3.82E-02	3.23E-03	5.00E-01	2.54E-02	2.15E-03	3.33E-01
Vanadium	4.16E+00	8.31E+00	1.11E-02	3.60E-01	7.61E-03	5.56E-03	1.80E-01	3.81E-03
PCBS								
Aroclor-1260	1.00E-02	1.00E-01	4.90E-04	**1.09E+00**	1.46E-01	4.90E-05	1.09E-01	1.46E-02
Total PCB Congeners	1.00E-02	1.00E-01	1.56E-03	**2.34E+00**	5.84E-01	1.56E-04	2.34E-01	5.84E-02
Total PCB Aroclors	1.00E-02	1.00E-01	6.75E-04	**1.09E+00**	1.46E-01	6.75E-05	1.09E-01	1.46E-02
PESTICIDES								
DDTr	8.00E-01	4.00E+00	2.74E-05	4.90E-02	9.41E-02	5.47E-06	9.79E-03	1.88E-02
VOCS								
Acetophenone	NA	NA	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 6-5
Comparison of 95UCLM Modeled Wildlife Doses to Mammals to Mammalian TRVs for Exposure Area 2: Arroyo Colorado

Chemical	Mammalian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs			95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
Metals								
Barium	5.18E+01	8.27E+01	3.02E-02	2.01E-01	1.83E-02	1.89E-02	1.26E-01	1.15E-02
Beryllium	5.32E-01	6.73E-01	1.88E-03	7.75E-02	1.42E-03	1.49E-03	6.13E-02	1.12E-03
Cadmium	7.70E-01	7.70E+00	2.18E-02	8.18E-02	3.04E-03	2.18E-03	8.18E-03	3.04E-04
Copper	5.60E+00	9.34E+00	4.34E-02	5.79E-01	3.24E-02	2.60E-02	3.47E-01	1.95E-02
Lead	4.70E+00	8.90E+00	1.15E-02	1.75E-02	7.53E-03	6.08E-03	9.22E-03	3.98E-03
Manganese	5.15E+01	1.46E+02	1.56E-01	6.95E-01	9.88E-02	5.53E-02	2.46E-01	3.49E-02
Mercury	1.32E+01	NA	3.72E-04	1.21E-03	6.19E-04	--	--	--
Selenium	1.43E-01	2.15E-01	3.82E-02	3.23E-03	5.00E-01	2.54E-02	2.15E-03	3.33E-01
Vanadium	4.16E+00	8.31E+00	9.53E-03	3.00E-01	6.42E-03	4.77E-03	1.50E-01	3.21E-03
PCBS								
Aroclor-1260	1.00E-02	1.00E-01	4.01E-04	8.93E-01	1.46E-01	4.01E-05	8.93E-02	1.46E-02
Total PCB Congeners	1.00E-02	1.00E-01	1.56E-03	**2.34E+00**	5.84E-01	1.56E-04	2.34E-01	5.84E-02
Total PCB Aroclors	1.00E-02	1.00E-01	5.52E-04	8.93E-01	1.46E-01	5.52E-05	8.93E-02	1.46E-02
PESTICIDES								
DDTr	8.00E-01	4.00E+00	2.74E-05	4.90E-02	9.41E-02	5.47E-06	9.79E-03	1.88E-02
VOCS								
Acetophenone	NA	NA	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 6-6
Comparison of Exposure Point Concentrations in Sediment to Plant TRVs for Exposure Area 2: Arroyo Colorado

Chemical	Plant Toxicity Reference Value (mg/kg dry wt)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Barium	5.00E+02	14/14	2.55E+02	5.10E-01	1.98E+02	3.96E-01
Beryllium	1.00E+01	8/14	9.80E-01	9.80E-02	7.85E-01	7.85E-02
Cadmium	3.20E+01	14/14	4.90E-01	1.53E-02	4.14E-01	1.29E-02
Copper	7.00E+01	14/14	1.69E+01	2.41E-01	1.26E+01	1.80E-01
Lead	1.20E+02	14/14	1.37E+01	1.14E-01	1.07E+01	8.88E-02
Manganese	2.20E+02	14/14	1.18E+03	**5.36E+00**	6.82E+02	**3.10E+00**
Mercury	3.00E-01	13/14	2.20E-01	7.33E-01	1.12E-01	3.73E-01
Vanadium	2.00E+00	14/14	2.85E+01	**1.43E+01**	2.37E+01	**1.19E+01**
PCBS						
Aroclor-1260	4.00E+01	5/22	5.60E-03	1.40E-04	4.58E-03	1.15E-04
Total PCB Congeners	4.00E+01	4/4	1.20E-02	3.00E-04	1.20E-02	3.00E-04
Total PCB Aroclors	4.00E+01	5/22	5.60E-03	1.40E-04	4.58E-03	1.15E-04
PESTICIDES						
DDTr	NA	3/14	1.30E-02	--	1.30E-02	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 6-7
Comparison of Exposure Point Concentrations in Sediment to Benthic Organism TRVs for Exposure Area 2: Arroyo Colorado

Chemical	Sediment TEC Toxicity Reference Value (mg/kg)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Barium	1.30E+02	14/14	2.55E+02	**1.96E+00**	1.98E+02	**1.52E+00**
Beryllium	1.10E+00	8/14	9.80E-01	8.91E-01	7.85E-01	7.14E-01
Cadmium	9.90E-01	14/14	4.90E-01	4.95E-01	4.14E-01	4.18E-01
Copper	3.16E+01	14/14	1.69E+01	5.35E-01	1.26E+01	4.00E-01
Lead	3.58E+01	14/14	1.37E+01	3.83E-01	1.07E+01	2.97E-01
Manganese	4.60E+02	14/14	1.18E+03	**2.57E+00**	6.82E+02	**1.48E+00**
Mercury	1.80E-01	13/14	2.20E-01	**1.22E+00**	1.12E-01	6.22E-01
Vanadium	4.20E+01	14/14	2.85E+01	6.79E-01	2.37E+01	5.65E-01
PCBS						
Aroclor-1260	5.00E-03	5/22	5.60E-03	**1.12E+00**	4.58E-03	9.16E-01
Total PCB Congeners	5.98E-02	4/4	1.20E-02	2.01E-01	1.20E-02	2.01E-01
Total PCB Aroclors	5.98E-02	5/22	5.60E-03	9.36E-02	4.58E-03	7.66E-02
PESTICIDES						
DDTr	5.28E-03	3/14	1.30E-02	**2.46E+00**	1.30E-02	**2.46E+00**

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 6-8
Comparison of Exposure Point Concentrations in Surface Water to Aquatic Organism TRVs for Exposure Area 2: Arroyo Colorado

Chemical	Chronic Surface Water Toxicity Reference Value (µg/L)	Dissolved Concentrations					Total Concentrations				
		Frequency of Detection	Maximum EPC (µg/L)	HQ for Maximum EPC	95UCLM EPC (µg/L)	HQ for 95UCLM EPC	Frequency of Detection	Maximum EPC (µg/L)	Hazard Quotient for Maximum EPC	95UCLM EPC (µg/L)	Hazard Quotient for 95UCLM EPC
Metals											
Barium	4.00E+00	7/7	1.52E+02	**3.80E+01**	1.20E+02	**3.00E+01**	7/7	1.64E+02	**4.10E+01**	1.41E+02	**3.51E+01**
Beryllium	6.60E-01	--	--	--	--	--	--	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	2.50E-01	--	--	--	--	--	1/7	1.70E-01	6.80E-01	1.70E-01	6.80E-01
Copper	1.20E+01	7/7	7.10E+00	5.92E-01	5.71E+00	4.76E-01	7/7	9.20E+00	7.67E-01	7.47E+00	6.22E-01
Lead	8.10E+00	1/7	2.50E-01	3.09E-02	2.50E-01	3.09E-02	7/7	4.30E+00	5.31E-01	2.82E+00	3.48E-01
Manganese	1.20E+02	7/7	1.38E+02	**1.15E+00**	8.93E+01	7.44E-01	7/7	3.42E+02	**2.85E+00**	2.52E+02	**2.10E+00**
Mercury	7.70E-01	--	--	--	--	--	1/7	6.00E-02	7.79E-02	6.00E-02	7.79E-02
Selenium	5.00E+00	7/7	6.00E+00	**1.20E+00**	6.00E+00	**1.20E+00**	2/7	5.60E+00	**1.12E+00**	5.60E+00	**1.12E+00**
Vanadium	2.00E+01	7/7	1.18E+01	5.90E-01	1.09E+01	5.47E-01	7/7	1.58E+01	7.90E-01	1.43E+01	7.16E-01
PCBS											
Total PCB Congeners	1.40E-02	--	--	--	--	--	4/4	1.20E-03	8.57E-02	1.20E-03	8.57E-02
VOCS											
Acetophenone	NA	--	--	--	--	--	1/7	2.10E+00	--	2.10E+00	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 7-1
Frequency of Detection and Exposure Point Concentrations for Exposure Area 3: LWMCU at the Siphon Exit

Analyte	Sediment			Surface Water (Total Concentration)			Surface Water (Dissolved Concentration)		
	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)
Metals									
Barium	11/11	2.72E+02	1.86E+02	3/3	1.52E+02	1.52E+02	3/3	1.24E+02	1.24E+02
Beryllium	1/11	6.00E-01	6.00E-01	--	--	--	--	--	--
Lead	11/11	1.27E+01	9.84E+00	3/3	1.80E+00	1.80E+00	--	--	--
Manganese	11/11	6.95E+02	4.34E+02	3/3	1.26E+02	1.26E+02	3/3	9.50E+00	9.50E+00
Selenium	4/11	2.10E-01	2.10E-01	3/3	7.70E-01	7.70E-01	2/3	1.60E+00	1.60E+00
Vanadium	11/11	2.17E+01	1.80E+01	3/3	1.11E+01	1.11E+01	3/3	9.00E+00	9.00E+00
PCBS									
Aroclor-1221	1/70	2.10E-03	2.10E-03	--	--	--	--	--	--
Aroclor-1242	1/70	1.70E-01	1.70E-01	--	--	--	--	--	--
Aroclor-1248	1/70	1.00E-03	1.00E-03	--	--	--	--	--	--
Aroclor-1254	56/70	1.10E+01	1.37E+00	1/20	1.50E-02	1.50E-02	--	--	--
Aroclor-1260	10/70	1.80E-01	1.17E-02	--	--	--	--	--	--
Total PCB Congeners	17/17	6.10E+00	2.71E+00	19/19	2.60E-02	5.81E-03	--	--	--
Total PCB Aroclors	58/58	1.10E+01	1.05E+00	1/1	1.50E-02	1.50E-02	--	--	--
PESTICIDES									
DDTr	11/11	7.80E-02	4.02E-02	--	--	--	--	--	--
Dieldrin	6/11	1.90E-02	7.90E-03	--	--	--	--	--	--
Endosulfan I	3/11	2.10E-03	2.10E-03	--	--	--	--	--	--
Endosulfan II	6/11	6.10E-03	3.02E-03	--	--	--	--	--	--
Endrin	6/11	8.60E-03	5.20E-03	--	--	--	--	--	--
Endrin aldehyde	5/11	6.50E-03	4.18E-03	--	--	--	--	--	--
gamma-Chlordane	11/11	1.80E-02	1.14E-02	--	--	--	--	--	--
Heptachlor epoxide	11/11	8.60E-03	4.24E-03	--	--	--	--	--	--

Table 7-1
Frequency of Detection and Exposure Point Concentrations
for Exposure Area 3: LWMCU at the Siphon Exit

Analyte	Sediment			Surface Water (Total Concentration)			Surface Water (Dissolved Concentration)		
	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)
PAHs									
Total LMW PAHs	1/11	9.36E-01	9.36E-01	--	--	--	--	--	--
Total HMW PAHs	3/11	2.74E+00	2.74E+00	--	--	--	--	--	--
SVOCS									
Bis(2-ethylhexyl)phthalate	2/11	6.70E-01	6.70E-01	--	--	--	--	--	--
Carbazole	1/11	8.60E-02	8.60E-02	--	--	--	--	--	--
Di-n-butyl phthalate	1/11	2.00E-01	2.00E-01	--	--	--	--	--	--
Phenol	3/11	8.30E-02	8.30E-02	--	--	--	--	--	--
VOCS									
Acetophenone	3/11	1.20E-01	1.20E-01	--	--	--	--	--	--

Table 7-2
Comparison of Maximum Modeled Wildlife Doses to Birds to Avian TRVs
for Exposure Area 3: LWMCU at the Siphon Exit

	Avian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs				Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
Chemical	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals										
Barium	2.08E+01	4.17E+01	2.38E-02	7.53E-01	1.92E-01	6.92E-02	1.19E-02	3.76E-01	9.58E-02	3.45E-02
Beryllium	NA	NA	--	--	--	--	--	--	--	--
Lead	1.63E+00	3.26E+00	1.02E-02	9.38E-02	1.88E-01	6.78E-02	5.12E-03	4.69E-02	9.42E-02	3.39E-02
Manganese	1.79E+02	3.77E+02	1.00E-02	2.24E-01	9.64E-02	3.47E-02	4.76E-03	1.06E-01	4.58E-02	1.65E-02
Selenium	2.90E-01	5.79E-01	3.00E-03	4.18E-02	3.99E-01	1.44E-01	1.50E-03	2.10E-02	2.00E-01	7.19E-02
Vanadium	3.44E-01	6.88E-01	4.42E-02	**3.63E+00**	**2.49E+00**	8.95E-01	2.21E-02	**1.82E+00**	**1.24E+00**	4.48E-01
PCBS										
Aroclor-1221	1.80E-01	1.80E+00	1.74E-05	2.31E-02	2.92E-05	1.05E-05	1.74E-06	2.31E-03	2.92E-06	1.05E-06
Aroclor-1242	4.10E-01	NA	2.91E-04	8.22E-01	1.04E-03	3.73E-04	--	--	--	--
Aroclor-1248	1.80E-01	1.80E+00	3.89E-06	1.10E-02	1.39E-05	5.00E-06	3.89E-07	1.10E-03	1.39E-06	5.00E-07
Aroclor-1254	1.80E-01	1.80E+00	4.05E-02	7.44E-01	**3.21E+00**	**1.16E+00**	4.05E-03	7.44E-02	3.21E-01	1.16E-01
Aroclor-1260	1.80E-01	1.80E+00	6.40E-04	**1.98E+00**	2.50E-03	9.00E-04	6.40E-05	1.98E-01	2.50E-04	9.00E-05
Total PCB Congeners	1.80E-01	1.80E+00	2.38E-02	**1.06E+00**	**1.43E+01**	**5.13E+00**	2.38E-03	1.06E-01	**1.43E+00**	5.13E-01
Total PCB Aroclors	1.80E-01	1.80E+00	4.28E-02	7.44E-01	**3.21E+00**	**1.16E+00**	4.28E-03	7.44E-02	3.21E-01	1.16E-01
PESTICIDES										
DDTr	2.80E-03	2.80E-02	2.20E-02	**8.54E+01**	**3.44E+01**	**1.24E+01**	2.20E-03	**8.54E+00**	**3.44E+00**	**1.24E+00**
Dieldrin	7.70E-02	NA	2.09E-04	2.99E-01	3.24E-02	1.17E-02	--	--	--	--
Endosulfan I	1.00E+01	NA	7.34E-07	4.93E-04	1.36E-04	4.88E-05	--	--	--	--
Endosulfan II	1.00E+01	NA	2.13E-06	1.43E-03	6.15E-05	2.21E-05	--	--	--	--
Endrin	1.00E-02	1.00E-01	7.30E-04	2.18E-02	**3.95E+00**	**1.42E+00**	7.30E-05	2.18E-03	3.95E-01	1.42E-01
Endrin aldehyde	NA	NA	--	--	--	--	--	--	--	--
gamma-Chlordane	2.14E+00	1.07E+01	5.57E-06	5.39E-03	5.86E-03	2.11E-03	1.11E-06	1.08E-03	1.17E-03	4.22E-04
Heptachlor epoxide	NA	NA	--	--	--	--	--	--	--	--

Table 7-2
Comparison of Maximum Modeled Wildlife Doses to Birds to Avian TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Avian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs				Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
PAHs										
Total LMW PAHs	5.62E+03	5.62E+02	2.37E-07	6.99E-06	4.16E-07	1.50E-07	2.37E-06	6.99E-05	4.16E-06	1.50E-06
Total HMW PAHs	2.00E+00	2.00E+01	1.95E-03	2.63E-02	3.43E-03	1.23E-03	1.95E-04	2.63E-03	3.43E-04	1.23E-04
SVOCS										
Bis(2-ethylhexyl)phthalate	1.10E+00	1.10E+01	3.90E-04	**1.43E+00**	1.52E-03	5.48E-04	3.90E-05	1.43E-01	1.52E-04	5.48E-05
Carbazole	NA	NA	--	--	--	--	--	--	--	--
Di-n-butyl phthalate	1.10E-01	1.10E+00	2.34E-03	**4.27E+00**	4.55E-03	1.64E-03	2.34E-04	4.27E-01	4.55E-04	1.64E-04
Phenol	3.77E+00	NA	9.00E-04	5.17E-02	1.46E-02	5.27E-03	--	--	--	--
VOCS										
Acetophenone	NA	NA	--	--	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 7-3
Comparison of 95UCLM Modeled Wildlife Doses to Birds to Avian TRVs
for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Avian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs				95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals										
Barium	2.08E+01	4.17E+01	1.64E-02	5.15E-01	1.82E-01	6.55E-02	8.19E-03	2.57E-01	9.07E-02	3.27E-02
Beryllium	NA	NA	--	--	--	--	--	--	--	--
Lead	1.63E+00	3.26E+00	8.43E-03	7.26E-02	1.84E-01	6.62E-02	4.21E-03	3.63E-02	9.20E-02	3.31E-02
Manganese	1.79E+02	3.77E+02	6.27E-03	1.40E-01	9.27E-02	3.34E-02	2.98E-03	6.64E-02	4.41E-02	1.59E-02
Selenium	2.90E-01	5.79E-01	3.00E-03	4.18E-02	3.99E-01	1.44E-01	1.50E-03	2.10E-02	2.00E-01	7.19E-02
Vanadium	3.44E-01	6.88E-01	3.70E-02	**3.02E+00**	**2.46E+00**	8.86E-01	1.85E-02	**1.51E+00**	**1.23E+00**	4.43E-01
PCBS										
Aroclor-1221	1.80E-01	1.80E+00	1.74E-05	2.31E-02	2.92E-05	1.05E-05	1.74E-06	2.31E-03	2.92E-06	1.05E-06
Aroclor-1242	4.10E-01	NA	2.91E-04	8.22E-01	1.04E-03	3.73E-04	--	--	--	--
Aroclor-1248	1.80E-01	1.80E+00	3.89E-06	1.10E-02	1.39E-05	5.00E-06	3.89E-07	1.10E-03	1.39E-06	5.00E-07
Aroclor-1254	1.80E-01	1.80E+00	5.06E-03	1.59E-01	**2.12E+00**	7.65E-01	5.06E-04	1.59E-02	2.12E-01	7.65E-02
Aroclor-1260	1.80E-01	1.80E+00	4.16E-05	1.29E-01	1.63E-04	5.85E-05	4.16E-06	1.29E-02	1.63E-05	5.85E-06
Total PCB Congeners	1.80E-01	1.80E+00	1.06E-02	6.17E-01	**1.42E+01**	**5.11E+00**	1.06E-03	6.17E-02	**1.42E+00**	5.11E-01
Total PCB Aroclors	1.80E-01	1.80E+00	4.09E-03	1.43E-01	**1.96E+00**	7.04E-01	4.09E-04	1.43E-02	1.96E-01	7.04E-02
PESTICIDES										
DDTr	2.80E-03	2.80E-02	1.13E-02	**4.40E+01**	**3.43E+01**	**1.24E+01**	1.13E-03	**4.40E+00**	**3.43E+00**	**1.24E+00**
Dieldrin	7.70E-02	NA	8.71E-05	1.24E-01	3.21E-02	1.15E-02	--	--	--	--
Endosulfan I	1.00E+01	NA	7.34E-07	4.93E-04	1.36E-04	4.88E-05	--	--	--	--
Endosulfan II	1.00E+01	NA	1.06E-06	7.09E-04	6.08E-05	2.19E-05	--	--	--	--
Endrin	1.00E-02	1.00E-01	4.41E-04	1.32E-02	**3.95E+00**	**1.42E+00**	4.41E-05	1.32E-03	3.95E-01	1.42E-01
Endrin aldehyde	NA	NA	--	--	--	--	--	--	--	--
gamma-Chlordane	2.14E+00	1.07E+01	3.53E-06	3.42E-03	5.85E-03	2.11E-03	7.06E-07	6.83E-04	1.17E-03	4.22E-04
Heptachlor epoxide	NA	NA	--	--	--	--	--	--	--	--

Table 7-3
Comparison of 95UCLM Modeled Wildlife Doses to Birds to Avian TRVs
for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Avian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs				95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
PAHs										
Total LMW PAHs	5.62E+03	5.62E+02	2.37E-07	6.99E-06	4.16E-07	1.50E-07	2.37E-06	6.99E-05	4.16E-06	1.50E-06
Total HMW PAHs	2.00E+00	2.00E+01	1.95E-03	2.63E-02	3.43E-03	1.23E-03	1.95E-04	2.63E-03	3.43E-04	1.23E-04
SVOCS										
Bis(2-ethylhexyl)phthalate	1.10E+00	1.10E+01	3.90E-04	**1.43E+00**	1.52E-03	5.48E-04	3.90E-05	1.43E-01	1.52E-04	5.48E-05
Carbazole	NA	NA	--	--	--	--	--	--	--	--
Di-n-butyl phthalate	1.10E-01	1.10E+00	2.34E-03	**4.27E+00**	4.55E-03	1.64E-03	2.34E-04	4.27E-01	4.55E-04	1.64E-04
Phenol	3.77E+00	NA	9.00E-04	5.17E-02	1.46E-02	5.27E-03	--	--	--	--
VOCS										
Acetophenone	NA	NA	--	--	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 7-4
Comparison of Maximum Modeled Wildlife Doses to Mammals to Mammalian TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Mammalian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs			Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
Metals								
Barium	5.18E+01	8.27E+01	4.07E-02	2.76E-01	2.97E-02	2.55E-02	1.73E-01	1.86E-02
Beryllium	5.32E-01	6.73E-01	1.43E-03	5.92E-02	8.66E-03	1.14E-03	4.68E-02	6.85E-03
Lead	4.70E+00	8.90E+00	1.26E-02	2.08E-02	2.51E-02	6.66E-03	1.10E-02	1.33E-02
Manganese	5.15E+01	1.46E+02	1.57E-01	7.09E-01	1.29E-01	5.55E-02	2.51E-01	4.55E-02
Selenium	1.43E-01	2.15E-01	3.34E-02	7.76E-02	3.11E-01	2.22E-02	5.16E-02	2.07E-01
Vanadium	4.16E+00	8.31E+00	8.24E-03	2.74E-01	7.91E-02	4.13E-03	1.37E-01	3.96E-02
PCBS								
Aroclor-1221	1.00E-02	1.00E-01	1.16E-03	4.09E-01	2.02E-04	1.16E-04	4.09E-02	2.02E-05
Aroclor-1242	6.90E-02	6.90E-01	2.97E-03	**4.80E+00**	2.37E-03	2.97E-04	4.80E-01	2.37E-04
Aroclor-1248	1.00E-02	1.00E-01	1.21E-04	1.95E-01	9.60E-05	1.21E-05	1.95E-02	9.60E-06
Aroclor-1254	6.80E-02	6.80E-01	1.62E-01	**1.27E+00**	**3.26E+00**	1.62E-02	1.27E-01	3.26E-01
Aroclor-1260	1.00E-02	1.00E-01	1.58E-02	**3.51E+01**	1.73E-02	1.58E-03	**3.51E+00**	1.73E-03
Total PCB Congeners	1.00E-02	1.00E-01	7.38E-01	**1.62E+01**	**9.85E+01**	7.38E-02	**1.62E+00**	**9.85E+00**
Total PCB Aroclors	1.00E-02	1.00E-01	**1.33E+00**	**8.61E+00**	**2.22E+01**	1.33E-01	8.61E-01	**2.22E+00**
PESTICIDES								
DDTr	8.00E-01	4.00E+00	1.64E-04	2.94E-01	4.62E-02	3.28E-05	5.87E-02	9.24E-03
Dieldrin	2.00E-02	2.00E-01	1.91E-03	**1.13E+00**	4.80E-02	1.91E-04	1.13E-01	4.80E-03
Endosulfan I	1.50E-01	NA	2.31E-04	3.23E-02	3.47E-03	--	--	--
Endosulfan II	1.50E-01	NA	6.71E-04	9.39E-02	1.58E-03	--	--	--
Endrin	9.20E-02	9.20E-01	1.88E-04	1.95E-03	1.65E-01	1.88E-05	1.95E-04	1.65E-02
Endrin aldehyde	NA	NA	--	--	--	--	--	--
gamma-Chlordane	4.60E+00	9.20E+00	3.90E-06	2.45E-03	1.05E-03	1.95E-06	1.23E-03	5.24E-04
Heptachlor epoxide	NA	NA	--	--	--	--	--	--

Table 7-4
Comparison of Maximum Modeled Wildlife Doses to Mammals to Mammalian TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Mammalian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs			Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
PAHs								
Total LMW PAHs	6.56E+01	3.28E+02	7.34E-05	5.30E-04	1.37E-05	1.47E-05	1.06E-04	2.74E-06
Total HMW PAHs	6.15E-01	3.01E+00	2.29E-02	6.57E-02	4.28E-03	4.68E-03	1.34E-02	8.74E-04
SVOCS								
Bis(2-ethylhexyl)phthalate	1.83E+01	1.83E+02	3.19E-05	8.45E-02	3.51E-05	3.19E-06	8.45E-03	3.51E-06
Carbazole	NA	NA	--	--	--	--	--	--
Di-n-butyl phthalate	5.50E+02	1.83E+03	1.60E-06	8.39E-04	3.49E-07	4.80E-07	2.52E-04	1.05E-07
Phenol	1.20E+01	3.60E+01	1.53E-03	1.60E-02	1.77E-03	5.10E-04	5.32E-03	5.89E-04
VOCS								
Acetophenone	NA	NA	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 7-5
Comparison of 95UCLM Modeled Wildlife Doses to Mammals to Mammalian TRVs
for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Mammalian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs			95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
Metals								
Barium	5.18E+01	8.27E+01	2.88E-02	1.89E-01	2.81E-02	1.80E-02	1.18E-01	1.76E-02
Beryllium	5.32E-01	6.73E-01	1.43E-03	5.92E-02	8.66E-03	1.14E-03	4.68E-02	6.85E-03
Lead	4.70E+00	8.90E+00	1.08E-02	1.61E-02	2.45E-02	5.69E-03	8.50E-03	1.29E-02
Manganese	5.15E+01	1.46E+02	9.90E-02	4.43E-01	1.24E-01	3.50E-02	1.57E-01	4.38E-02
Selenium	1.43E-01	2.15E-01	3.34E-02	7.76E-02	3.11E-01	2.22E-02	5.16E-02	2.07E-01
Vanadium	4.16E+00	8.31E+00	7.29E-03	2.28E-01	7.82E-02	3.65E-03	1.14E-01	3.92E-02
PCBS								
Aroclor-1221	1.00E-02	1.00E-01	1.16E-03	4.09E-01	2.02E-04	1.16E-04	4.09E-02	2.02E-05
Aroclor-1242	6.90E-02	6.90E-01	2.97E-03	**4.80E+00**	2.37E-03	2.97E-04	4.80E-01	2.37E-04
Aroclor-1248	1.00E-02	1.00E-01	1.21E-04	1.95E-01	9.60E-05	1.21E-05	1.95E-02	9.60E-06
Aroclor-1254	6.80E-02	6.80E-01	2.02E-02	3.30E-01	**2.16E+00**	2.02E-03	3.30E-02	2.16E-01
Aroclor-1260	1.00E-02	1.00E-01	1.02E-03	**2.28E+00**	1.12E-03	1.02E-04	2.28E-01	1.12E-04
Total PCB Congeners	1.00E-02	1.00E-01	3.28E-01	**9.81E+00**	**9.82E+01**	3.28E-02	9.81E-01	**9.82E+00**
Total PCB Aroclors	1.00E-02	1.00E-01	1.28E-01	**2.10E+00**	**1.35E+01**	1.28E-02	2.10E-01	**1.35E+00**
PESTICIDES								
DDTr	8.00E-01	4.00E+00	8.46E-05	1.51E-01	4.62E-02	1.69E-05	3.03E-02	9.23E-03
Dieldrin	2.00E-02	2.00E-01	7.96E-04	4.70E-01	4.74E-02	7.96E-05	4.70E-02	4.74E-03
Endosulfan I	1.50E-01	NA	2.31E-04	3.23E-02	3.47E-03	--	--	--
Endosulfan II	1.50E-01	NA	3.32E-04	4.65E-02	1.56E-03	--	--	--
Endrin	9.20E-02	9.20E-01	1.14E-04	1.18E-03	1.65E-01	1.14E-05	1.18E-04	1.65E-02
Endrin aldehyde	NA	NA	--	--	--	--	--	--
gamma-Chlordane	4.60E+00	9.20E+00	2.47E-06	1.55E-03	1.05E-03	1.23E-06	7.77E-04	5.23E-04
Heptachlor epoxide	NA	NA	--	--	--	--	--	--

Table 7-5
Comparison of 95UCLM Modeled Wildlife Doses to Mammals to Mammalian TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Mammalian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs			95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
PAHs								
Total LMW PAHs	6.56E+01	3.28E+02	7.34E-05	5.30E-04	1.37E-05	1.47E-05	1.06E-04	2.74E-06
Total HMW PAHs	6.15E-01	3.01E+00	2.29E-02	6.57E-02	4.28E-03	4.68E-03	1.34E-02	8.74E-04
SVOCS								
Bis(2-ethylhexyl)phthalate	1.83E+01	1.83E+02	3.19E-05	8.45E-02	3.51E-05	3.19E-06	8.45E-03	3.51E-06
Carbazole	NA	NA	--	--	--	--	--	--
Di-n-butyl phthalate	5.50E+02	1.83E+03	1.60E-06	8.39E-04	3.49E-07	4.80E-07	2.52E-04	1.05E-07
Phenol	1.20E+01	3.60E+01	1.53E-03	1.60E-02	1.77E-03	5.10E-04	5.32E-03	5.89E-04
VOCS								
Acetophenone	NA	NA	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 7-6
Comparison of Exposure Point Concentrations in Sediment to Plant TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Plant Toxicity Reference Value (mg/kg dry wt)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Barium	5.00E+02	11/11	2.72E+02	5.44E-01	1.86E+02	3.72E-01
Beryllium	1.00E+01	1/11	6.00E-01	6.00E-02	6.00E-01	6.00E-02
Lead	1.20E+02	11/11	1.27E+01	1.06E-01	9.84E+00	8.20E-02
Manganese	2.20E+02	11/11	6.95E+02	**3.16E+00**	4.34E+02	**1.97E+00**
Selenium	5.20E-01	4/11	2.10E-01	4.04E-01	2.10E-01	4.04E-01
Vanadium	2.00E+00	11/11	2.17E+01	**1.09E+01**	1.80E+01	**9.01E+00**
PCBS						
Aroclor-1221	4.00E+01	1/70	2.10E-03	5.25E-05	2.10E-03	5.25E-05
Aroclor-1242	4.00E+01	1/70	1.70E-01	4.25E-03	1.70E-01	4.25E-03
Aroclor-1248	4.00E+01	1/70	1.00E-03	2.50E-05	1.00E-03	2.50E-05
Aroclor-1254	4.00E+01	56/70	1.10E+01	2.75E-01	1.37E+00	3.43E-02
Aroclor-1260	4.00E+01	10/70	1.80E-01	4.50E-03	1.17E-02	2.93E-04
Total PCB Congeners	4.00E+01	17/17	6.10E+00	1.53E-01	2.71E+00	6.78E-02
Total PCB Aroclors	4.00E+01	58/58	1.10E+01	2.75E-01	1.05E+00	2.62E-02
PESTICIDES						
DDTr	NA	11/11	7.80E-02	--	4.02E-02	--
Dieldrin	NA	6/11	1.90E-02	--	7.90E-03	--
Endosulfan I	NA	3/11	2.10E-03	--	2.10E-03	--
Endosulfan II	NA	6/11	6.10E-03	--	3.02E-03	--
Endrin	NA	6/11	8.60E-03	--	5.20E-03	--
Endrin aldehyde	NA	5/11	6.50E-03	--	4.18E-03	--
gamma-Chlordane	NA	11/11	1.80E-02	--	1.14E-02	--
Heptachlor epoxide	NA	11/11	8.60E-03	--	4.24E-03	--

Table 7-6
Comparison of Exposure Point Concentrations in Sediment to Plant TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Plant Toxicity Reference Value (mg/kg dry wt)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
PAHs						
Total LMW PAHs	2.00E+01	1/11	9.36E-01	4.68E-02	9.36E-01	4.68E-02
Total HMW PAHs	2.00E+01	3/11	2.74E+00	1.37E-01	2.74E+00	1.37E-01
SVOCS						
Bis(2-ethylhexyl)phthalate	1.00E+02	2/11	6.70E-01	6.70E-03	6.70E-01	6.70E-03
Carbazole	NA	1/11	8.60E-02	--	8.60E-02	--
Di-n-butyl phthalate	2.00E+02	1/11	2.00E-01	1.00E-03	2.00E-01	1.00E-03
Phenol	7.00E+01	3/11	8.30E-02	1.19E-03	8.30E-02	1.19E-03
VOCS						
Acetophenone	NA	3/11	1.20E-01	--	1.20E-01	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 7-7
Comparison of Exposure Point Concentrations in Sediment to Benthic Organism TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Sediment TEC Toxicity Reference Value (mg/kg)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Barium	1.30E+02	11/11	2.72E+02	**2.09E+00**	1.86E+02	**1.43E+00**
Beryllium	1.10E+00	1/11	6.00E-01	5.45E-01	6.00E-01	5.45E-01
Lead	3.58E+01	11/11	1.27E+01	3.55E-01	9.84E+00	2.75E-01
Manganese	4.60E+02	11/11	6.95E+02	**1.51E+00**	4.34E+02	9.44E-01
Selenium	7.00E-01	4/11	2.10E-01	3.00E-01	2.10E-01	3.00E-01
Vanadium	4.20E+01	11/11	2.17E+01	5.17E-01	1.80E+01	4.29E-01
PCBS						
Aroclor-1221	5.00E-03	1/70	2.10E-03	4.20E-01	2.10E-03	4.20E-01
Aroclor-1242	5.00E-03	1/70	1.70E-01	**3.40E+01**	1.70E-01	**3.40E+01**
Aroclor-1248	3.00E-02	1/70	1.00E-03	3.33E-02	1.00E-03	3.33E-02
Aroclor-1254	6.00E-02	56/70	1.10E+01	**1.83E+02**	1.37E+00	**2.29E+01**
Aroclor-1260	5.00E-03	10/70	1.80E-01	**3.60E+01**	1.17E-02	**2.34E+00**
Total PCB Congeners	5.98E-02	17/17	6.10E+00	**1.02E+02**	2.71E+00	**4.53E+01**
Total PCB Aroclors	5.98E-02	58/58	1.10E+01	**1.84E+02**	1.05E+00	**1.75E+01**
PESTICIDES						
DDTr	5.28E-03	11/11	7.80E-02	**1.48E+01**	4.02E-02	**7.61E+00**
Dieldrin	1.90E-03	6/11	1.90E-02	**1.00E+01**	7.90E-03	**4.16E+00**
Endosulfan I	1.00E-05	3/11	2.10E-03	**2.10E+02**	2.10E-03	**2.10E+02**
Endosulfan II	1.00E-05	6/11	6.10E-03	**6.10E+02**	3.02E-03	**3.02E+02**
Endrin	2.22E-03	6/11	8.60E-03	**3.87E+00**	5.20E-03	**2.34E+00**
Endrin aldehyde	NA	5/11	6.50E-03	--	4.18E-03	--
gamma-Chlordane	3.24E-03	11/11	1.80E-02	**5.56E+00**	1.14E-02	**3.52E+00**
Heptachlor epoxide	2.47E-03	11/11	8.60E-03	**3.48E+00**	4.24E-03	**1.72E+00**

Table 7-7
Comparison of Exposure Point Concentrations in Sediment to Benthic Organism TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Sediment TEC Toxicity Reference Value (mg/kg)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
PAHs						
Total LMW PAHs	1.61E+00	1/11	9.36E-01	5.81E-01	9.36E-01	5.81E-01
Total HMW PAHs	1.61E+00	3/11	2.74E+00	**1.70E+00**	2.74E+00	**1.70E+00**
SVOCS						
Bis(2-ethylhexyl)phthalate	1.82E-01	2/11	6.70E-01	**3.68E+00**	6.70E-01	**3.68E+00**
Carbazole	NA	1/11	8.60E-02	--	8.60E-02	--
Di-n-butyl phthalate	7.00E-01	1/11	2.00E-01	2.86E-01	2.00E-01	2.86E-01
Phenol	5.00E-02	3/11	8.30E-02	**1.66E+00**	8.30E-02	**1.66E+00**
VOCS						
Acetophenone	NA	3/11	1.20E-01	--	1.20E-01	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 7-8
Comparison of Exposure Point Concentrations in Surface Water to Aquatic Organism TRVs for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Chronic Surface Water Toxicity Reference Value (µg/L)	Dissolved Concentrations					Total Concentrations				
		Frequency of Detection	Maximum EPC (µg/L)	HQ for Maximum EPC	95UCLM EPC (µg/L)	HQ for 95UCLM EPC	Frequency of Detection	Maximum EPC (µg/L)	Hazard Quotient for Maximum EPC	95UCLM EPC (µg/L)	Hazard Quotient for 95UCLM EPC
Metals											
Barium	4.00E+00	3/3	1.24E+02	**3.10E+01**	1.24E+02	**3.10E+01**	3/3	1.52E+02	**3.80E+01**	1.52E+02	**3.80E+01**
Lead	8.10E+00	--	--	--	--	--	3/3	1.80E+00	2.22E-01	1.80E+00	2.22E-01
Manganese	1.20E+02	3/3	9.50E+00	7.92E-02	9.50E+00	7.92E-02	3/3	1.26E+02	**1.05E+00**	1.26E+02	**1.05E+00**
Selenium	5.00E+00	2/3	1.60E+00	3.20E-01	1.60E+00	3.20E-01	3/3	7.70E-01	1.54E-01	7.70E-01	1.54E-01
Vanadium	2.00E+01	3/3	9.00E+00	4.50E-01	9.00E+00	4.50E-01	3/3	1.11E+01	5.55E-01	1.11E+01	5.55E-01
PCBS											
Aroclor-1221	2.80E-01	--	--	--	--	--	--	--	--	--	--
Aroclor-1242	5.30E-02	--	--	--	--	--	--	--	--	--	--
Aroclor-1248	8.10E-02	--	--	--	--	--	--	--	--	--	--
Aroclor-1254	3.30E-02	--	--	--	--	--	1/20	1.50E-02	4.55E-01	1.50E-02	4.55E-01
Aroclor-1260	9.40E+01	--	--	--	--	--	--	--	--	--	--
Total PCB Congeners	1.40E-02	--	--	--	--	--	19/19	2.60E-02	**1.86E+00**	5.81E-03	4.15E-01
Total PCB Aroclors	1.40E-02	--	--	--	--	--	1/1	1.50E-02	**1.07E+00**	1.50E-02	**1.07E+00**

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 7-9

Comparison of Reference Sediment Concentrations to Sediment Concentrations for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Reference Sediment Concentrations Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Sediment for Exposure Area 3: LWMCU at the Siphon Exit			Maximum Exposure Area 3 Concentration Exceeds Reference 95UPL?	95UCLM Exposure Area 3 Concentration Exeeds Reference 95UCLM?
	Frequency of detection	Sediment 95UCLM (mg/kg)	Sediment Maximum Concentration (mg/kg)	95UPL (mg/kg)	Frequency of detection	95UCL (mg/kg)	Sediment Maximum (mg/kg)		
Metals									
Aluminum	25 / 25	1.31E+04	2.40E+04	2.12E+04	11/11	1.17E+04	1.40E+04	--	--
Arsenic	25 / 25	4.13E+00	6.60E+00	6.30E+00	11/11	4.24E+00	4.70E+00	--	--
Barium	25 / 25	1.57E+02	2.55E+02	2.18E+02	11/11	1.86E+02	2.72E+02	Exceeds	--
Beryllium	9 / 25	6.20E-01	9.80E-01	9.80E-01	1/11	6.00E-01	6.00E-01	--	--
Cadmium	16 / 25	3.79E-01	4.90E-01	4.90E-01	11/11	3.05E-01	3.80E-01	--	--
Calcium	25 / 25	7.11E+04	1.00E+05	9.18E+04	11/11	1.17E+05	1.68E+05	Exceeds	Exceeds
Cobalt	25 / 25	5.13E+00	7.20E+00	6.70E+00	11/11	6.62E+00	7.70E+00	Exceeds	--
Copper	23 / 25	8.83E+00	1.69E+01	1.45E+01	11/11	1.17E+01	2.15E+01	Exceeds	--
Iron	25 / 25	1.46E+04	2.19E+04	1.92E+04	11/11	1.42E+04	1.65E+04	--	--
Lead	25 / 25	8.42E+00	1.37E+01	1.20E+01	11/11	9.84E+00	1.27E+01	Exceeds	--
Magnesium	25 / 25	4.94E+03	8.35E+03	7.01E+03	11/11	4.49E+03	5.45E+03	--	--
Manganese	25 / 25	4.23E+02	1.18E+03	8.36E+02	11/11	4.34E+02	6.95E+02	--	--
Mercury	24 / 25	4.63E-02	2.20E-01	1.70E-01	11/11	5.39E-02	7.70E-02	--	--
Nickel	25 / 25	9.38E+00	1.49E+01	1.33E+01	11/11	8.34E+00	1.01E+01	--	--
Potassium	23 / 25	3.03E+03	5.62E+03	4.81E+03	11/11	2.66E+03	3.25E+03	--	--
Selenium	0 / 25	--	--	--	4/11	2.10E-01	2.10E-01	Exceeds	Exceeds
Sodium	15 / 25	9.68E+02	2.12E+03	1.86E+03	5/11	8.57E+02	1.17E+03	--	--
Vanadium	25 / 25	1.89E+01	2.85E+01	2.69E+01	11/11	1.80E+01	2.17E+01	--	--
Zinc	25 / 25	4.04E+01	7.45E+01	6.70E+01	11/11	4.10E+01	5.11E+01	--	--
PCBS									
Aroclor-1221	0 / 44	--	--	--	1/70	2.10E-03	2.10E-03	Exceeds	Exceeds
Aroclor-1242	0 / 44	--	--	--	1/70	1.70E-01	1.70E-01	Exceeds	Exceeds
Aroclor-1248	0 / 44	--	--	--	1/70	1.00E-03	1.00E-03	Exceeds	Exceeds
Aroclor-1254	0 / 44	--	--	--	56/70	1.37E+00	1.10E+01	Exceeds	Exceeds
Aroclor-1260	0 / 44	--	--	--	10/70	1.17E-02	1.80E-01	Exceeds	Exceeds
Total PCB Congeners	14 / 14	1.85E-03	1.20E-02	1.20E-02	17/17	2.71E+00	6.10E+00	Exceeds	Exceeds
Total PCB Aroclors	0 / 44	--	--	--	58/58	1.05E+00	1.10E+01	Exceeds	Exceeds

Table 7-9

Comparison of Reference Sediment Concentrations to Sediment Concentrations for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Reference Sediment Concentrations Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Sediment for Exposure Area 3: LWMCU at the Siphon Exit			Maximum Exposure Area 3 Concentration Exceeds Reference 95UPL?	95UCLM Exposure Area 3 Concentration Exeeds Reference 95UCLM?
	Frequency of detection	Sediment 95UCLM (mg/kg)	Sediment Maximum Concentration (mg/kg)	95UPL (mg/kg)	Frequency of detection	95UCL (mg/kg)	Sediment Maximum (mg/kg)		
PESTICIDES									
DDTr	12 / 12	8.48E-03	5.40E-02	5.40E-02	11/11	4.02E-02	7.80E-02	Exceeds	--
alpha-Chlordane	0 / 27	--	--	--	3/11	2.40E-03	2.40E-03	Exceeds	Exceeds
beta-BHC	0 / 27	--	--	--	1/11	2.10E-03	2.10E-03	Exceeds	Exceeds
delta-BHC	1 / 27	9.10E-04	9.10E-04	9.10E-04	1/11	9.90E-04	9.90E-04	Exceeds	Exceeds
Dieldrin	0 / 27	--	--	--	6/11	7.90E-03	1.90E-02	Exceeds	Exceeds
Endosulfan I	0 / 27	--	--	--	3/11	2.10E-03	2.10E-03	Exceeds	Exceeds
Endosulfan II	0 / 27	--	--	--	6/11	3.02E-03	6.10E-03	Exceeds	Exceeds
Endrin	0 / 27	--	--	--	6/11	5.20E-03	8.60E-03	Exceeds	Exceeds
Endrin aldehyde	0 / 27	--	--	--	5/11	4.18E-03	6.50E-03	Exceeds	Exceeds
gamma-BHC (Lindane)	0 / 27	--	--	--	1/11	5.80E-04	5.80E-04	Exceeds	Exceeds
gamma-Chlordane	0 / 27	--	--	--	11/11	1.14E-02	1.80E-02	Exceeds	Exceeds
Heptachlor epoxide	0 / 27	--	--	--	11/11	4.24E-03	8.60E-03	Exceeds	Exceeds
PAHs									
Total LMW PAHs	1 / 27	2.95E-01	3.99E-01	3.99E-01	1/11	9.36E-01	9.36E-01	Exceeds	Exceeds
Total HMW PAHs	1 / 27	3.20E-01	3.20E-01	3.20E-01	3/11	2.74E+00	2.74E+00	Exceeds	Exceeds
SVOCS									
Bis(2-ethylhexyl)phthalate	9 / 27	1.84E-01	6.10E-01	4.00E-01	2/11	6.70E-01	6.70E-01	Exceeds	Exceeds
Carbazole	0 / 27	--	--	--	1/11	8.60E-02	8.60E-02	Exceeds	Exceeds
Di-n-butyl phthalate	0 / 27	--	--	--	1/11	2.00E-01	2.00E-01	Exceeds	Exceeds
Phenol	4 / 27	5.95E-02	6.70E-02	6.70E-02	3/11	8.30E-02	8.30E-02	Exceeds	Exceeds
VOCS									
Acetone	2 / 7	2.72E-02	5.20E-02	5.20E-02	--	--	--	--	--
Acetophenone	6 / 27	6.63E-02	8.30E-02	8.30E-02	3/11	1.20E-01	1.20E-01	Exceeds	Exceeds
Methylene chloride	1 / 7	4.40E-03	4.40E-03	4.40E-03	--	--	--	--	--
Toluene	1 / 7	2.70E-03	2.70E-03	2.70E-03	--	--	--	--	--

Note:
HMW: High molecular weight
LMW: Low molecular weight
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
95UCL: 95 percent upper confidence limit
95UCLM: 95 percent upper confidence limit of the mean
95UPL: 95 percent upper prediction limit

Table 7-10

Comparison of Reference Surface Water Concentrations to Surface Water Concentrations for Exposure Area 3: LWMCU at the Siphon Exit

Chemical	Reference Surface Water Concentrations Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Surface Water for Exposure Area 3: LWMCU at the Siphon Exit			Maximum Exposure Area 3 Concentration Exceeds Reference 95UPL?	95UCLM Exposure Area 3 Concentration Exceeds Reference 95UCLM?
	Frequency of Detection	Surface Water Mean (ug/L)	Surface Water Maximum (ug/L)	95UPL (ug/L)	Frequency of detection	95UCL (mg/kg)	Surface Water Maximum (ug/L)		
Metals									
Aluminum	11 / 11	9.20E+02	2.21E+03	2.21E+03	3/3	1.94E+03	1.94E+03	--	--
Arsenic	11 / 11	8.76E+00	1.51E+01	1.51E+01	3/3	4.70E+00	4.70E+00	--	--
Barium	11 / 11	1.26E+02	1.64E+02	1.64E+02	3/3	1.52E+02	1.52E+02	--	--
Cadmium	1 / 11	1.70E-01	1.70E-01	1.70E-01	--	--	--	--	--
Calcium	11 / 11	1.23E+05	2.19E+05	2.19E+05	3/3	8.60E+04	8.60E+04	--	--
Cobalt	3 / 11	1.16E+00	2.00E+00	2.00E+00	--	--	--	--	--
Copper	10 / 11	4.44E+00	9.20E+00	9.20E+00	3/3	2.80E+00	2.80E+00	--	--
Iron	10 / 11	8.20E+02	1.80E+03	1.80E+03	3/3	1.67E+03	1.67E+03	--	--
Lead	11 / 11	1.62E+00	4.30E+00	4.30E+00	3/3	1.80E+00	1.80E+00	--	--
Magnesium	11 / 11	4.17E+04	7.61E+04	7.61E+04	3/3	3.11E+04	3.11E+04	--	--
Manganese	11 / 11	1.53E+02	3.42E+02	3.42E+02	3/3	1.26E+02	1.26E+02	--	--
Mercury	1 / 11	6.00E-02	6.00E-02	6.00E-02	--	--	--	--	--
Nickel	11 / 11	2.41E+00	4.30E+00	4.30E+00	3/3	2.00E+00	2.00E+00	--	--
Potassium	11 / 11	8.93E+03	1.38E+04	1.38E+04	3/3	7.10E+03	7.10E+03	--	--
Selenium	5 / 11	1.96E+00	5.60E+00	5.60E+00	3/3	7.70E-01	7.70E-01	--	--
Sodium	11 / 11	2.55E+05	5.62E+05	5.62E+05	3/3	1.62E+05	1.62E+05	--	--
Vanadium	11 / 11	1.13E+01	1.58E+01	1.58E+01	3/3	1.11E+01	1.11E+01	--	--
Zinc	11 / 11	7.73E+00	1.86E+01	1.86E+01	3/3	6.20E+00	6.20E+00	--	--
PCBS									
Aroclor-1254	0 / 20	--	--	--	1/20	1.50E-02	1.50E-02	Exceeds	Exceeds
Total PCB Congeners	13 / 13	3.34E-04	1.20E-03	1.20E-03	19/19	2.60E-02	2.60E-02	Exceeds	Exceeds
Total PCB Aroclors	0 / 20	--	--	--	1/1	1.50E-02	1.50E-02	Exceeds	Exceeds
PESTICIDES									
gamma-BHC (Lindane)	1 / 11	1.70E-02	1.70E-02	1.70E-02	--	--	--	--	--
SVOCS									
Bis(2-ethylhexyl)phthalate	3 / 11	1.52E+01	1.40E+02	1.40E+02	--	--	--	--	--
Diethyl phthalate	1 / 11	1.10E+00	1.10E+00	1.10E+00	--	--	--	--	--
VOCS									
Acetophenone	1 / 11	2.10E+00	2.10E+00	2.10E+00	--	--	--	--	--

Note:
HMW: High molecular weight
LMW: Low molecular weight
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
95UCL: 95 percent upper confidence limit
95UCLM: 95 percent upper confidence limit of the mean
95UPL: 95 percent upper prediction limit

Table 8-1
Frequency of Detection and Exposure Point Concentrations
for Exposure Area 4: LWMCU Downstream of the Siphon

Analyte	Sediment			Surface Water (Total Concentration)			Surface Water (Dissolved Concentration)		
	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)
Metals									
Barium	8/8	2.10E+02	1.81E+02	2/2	1.46E+02	1.46E+02	2/2	1.28E+02	1.28E+02
Lead	8/8	1.56E+01	1.26E+01	2/2	1.60E+00	1.60E+00	--	--	--
Manganese	8/8	5.42E+02	4.37E+02	2/2	1.14E+02	1.14E+02	2/2	5.40E+00	5.40E+00
Vanadium	8/8	2.57E+01	2.15E+01	2/2	1.06E+01	1.06E+01	2/2	9.40E+00	9.40E+00
PCBS									
Aroclor-1254	21/24	1.10E-01	5.10E-02	--	--	--	--	--	--
Total PCB Congeners	2/2	3.50E-02	3.50E-02	--	--	--	--	--	--
Total PCB Aroclors	21/24	1.10E-01	5.68E-02	--	--	--	--	--	--
PESTICIDES									
DDTr	10/10	1.87E-02	1.20E-02	1/1	7.40E-02	7.40E-02	--	--	--
gamma-Chlordane	9/10	4.40E-03	2.42E-03	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 8-2
Comparison of Maximum Modeled Wildlife Doses to Birds to Avian TRVs
for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Avian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs				Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals										
Barium	2.08E+01	4.17E+01	1.85E-02	5.82E-01	1.85E-01	6.65E-02	9.21E-03	2.90E-01	9.21E-02	3.32E-02
Lead	1.63E+00	3.26E+00	1.20E-02	1.15E-01	1.93E-01	6.94E-02	6.01E-03	5.76E-02	9.64E-02	3.47E-02
Manganese	1.79E+02	3.77E+02	7.82E-03	1.74E-01	9.42E-02	3.39E-02	3.72E-03	8.29E-02	4.48E-02	1.61E-02
Vanadium	3.44E-01	6.88E-01	5.20E-02	**4.30E+00**	**2.52E+00**	9.06E-01	2.60E-02	**2.15E+00**	**1.26E+00**	4.53E-01
PCBS										
Aroclor-1254	1.80E-01	1.80E+00	4.05E-04	7.69E-02	**3.06E+00**	**1.10E+00**	4.05E-05	7.69E-03	3.06E-01	1.10E-01
Total PCB Congeners	1.80E-01	1.80E+00	1.36E-04	1.75E-01	**1.42E+01**	**5.10E+00**	1.36E-05	1.75E-02	**1.42E+00**	5.10E-01
Total PCB Aroclors	1.80E-01	1.80E+00	4.28E-04	7.69E-02	**3.06E+00**	**1.10E+00**	4.28E-05	7.69E-03	3.06E-01	1.10E-01
PESTICIDES										
DDTr	2.80E-03	2.80E-02	6.43E-03	**2.05E+01**	**3.43E+01**	**1.24E+01**	6.43E-04	**2.05E+00**	**3.43E+00**	**1.24E+00**
gamma-Chlordane	2.14E+00	1.07E+01	1.36E-06	1.32E-03	5.85E-03	2.10E-03	2.72E-07	2.64E-04	1.17E-03	4.21E-04

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 8-3
Comparison of 95UCLM Modeled Wildlife Doses to Birds to Avian TRVs for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Avian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs				95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs			
			Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals										
Barium	2.08E+01	4.17E+01	1.60E-02	5.02E-01	1.81E-01	6.53E-02	7.96E-03	2.50E-01	9.04E-02	3.26E-02
Lead	1.63E+00	3.26E+00	1.02E-02	9.32E-02	1.88E-01	6.77E-02	5.09E-03	4.66E-02	9.41E-02	3.39E-02
Manganese	1.79E+02	3.77E+02	6.30E-03	1.40E-01	9.28E-02	3.34E-02	3.00E-03	6.68E-02	4.41E-02	1.59E-02
Vanadium	3.44E-01	6.88E-01	4.38E-02	**3.60E+00**	**2.49E+00**	8.95E-01	2.19E-02	**1.80E+00**	**1.24E+00**	4.47E-01
PCBS										
Aroclor-1254	1.80E-01	1.80E+00	1.88E-04	7.40E-02	**2.11E+00**	7.58E-01	1.88E-05	7.40E-03	2.11E-01	7.58E-02
Total PCB Congeners	1.80E-01	1.80E+00	1.36E-04	1.75E-01	**1.42E+01**	**5.10E+00**	1.36E-05	1.75E-02	**1.42E+00**	5.10E-01
Total PCB Aroclors	1.80E-01	1.80E+00	2.21E-04	7.43E-02	**1.94E+00**	6.99E-01	2.21E-05	7.43E-03	1.94E-01	6.99E-02
PESTICIDES										
DDTr	2.80E-03	2.80E-02	4.55E-03	**1.31E+01**	**3.43E+01**	**1.24E+01**	4.55E-04	**1.31E+00**	**3.43E+00**	**1.24E+00**
gamma-Chlordane	2.14E+00	1.07E+01	7.49E-07	7.25E-04	5.84E-03	2.10E-03	1.50E-07	1.45E-04	1.17E-03	4.21E-04

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 8-4
Comparison of Maximum Modeled Wildlife Doses to Mammals to Mammalian TRVs for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Mammalian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs			Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
Metals								
Barium	5.18E+01	8.27E+01	3.20E-02	2.13E-01	2.86E-02	2.00E-02	1.34E-01	1.79E-02
Lead	4.70E+00	8.90E+00	1.43E-02	2.55E-02	2.57E-02	7.56E-03	1.35E-02	1.36E-02
Manganese	5.15E+01	1.46E+02	1.23E-01	5.53E-01	1.26E-01	4.34E-02	1.95E-01	4.45E-02
Vanadium	4.16E+00	8.31E+00	9.17E-03	3.25E-01	8.00E-02	4.59E-03	1.63E-01	4.00E-02
PCBS								
Aroclor-1254	6.80E-02	6.80E-01	1.62E-03	1.94E-01	**3.11E+00**	1.62E-04	1.94E-02	3.11E-01
Total PCB Congeners	1.00E-02	1.00E-01	4.22E-03	**3.09E+00**	**9.79E+01**	4.22E-04	3.09E-01	**9.79E+00**
Total PCB Aroclors	1.00E-02	1.00E-01	1.33E-02	**1.32E+00**	**2.11E+01**	1.33E-03	1.32E-01	**2.11E+00**
PESTICIDES								
DDTr	8.00E-01	4.00E+00	1.30E-04	7.04E-02	4.61E-02	2.59E-05	1.41E-02	9.23E-03
gamma-Chlordane	4.60E+00	9.20E+00	9.53E-07	6.00E-04	1.14E-04	4.76E-07	3.00E-04	5.68E-05

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 8-5
Comparison of 95UCLM Modeled Wildlife Doses to Mammals to Mammalian TRVs for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Mammalian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs			95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs		
			Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	Nutria	Raccoon	River Otter	Nutria	Raccoon	River Otter
Metals								
Barium	5.18E+01	8.27E+01	2.80E-02	1.84E-01	2.80E-02	1.75E-02	1.15E-01	1.76E-02
Lead	4.70E+00	8.90E+00	1.25E-02	2.06E-02	2.51E-02	6.61E-03	1.09E-02	1.32E-02
Manganese	5.15E+01	1.46E+02	9.92E-02	4.45E-01	1.24E-01	3.51E-02	1.57E-01	4.38E-02
Vanadium	4.16E+00	8.31E+00	8.08E-03	2.72E-01	7.90E-02	4.04E-03	1.36E-01	3.96E-02
PCBS								
Aroclor-1254	6.80E-02	6.80E-01	7.50E-04	1.90E-01	**2.14E+00**	7.50E-05	1.90E-02	2.14E-01
Total PCB Congeners	1.00E-02	1.00E-01	4.22E-03	**3.09E+00**	**9.79E+01**	4.22E-04	3.09E-01	**9.79E+00**
Total PCB Aroclors	1.00E-02	1.00E-01	6.85E-03	**1.29E+00**	**1.34E+01**	6.85E-04	1.29E-01	**1.34E+00**
PESTICIDES								
DDTr	8.00E-01	4.00E+00	1.15E-04	4.52E-02	4.61E-02	2.31E-05	9.04E-03	9.23E-03
gamma-Chlordane	4.60E+00	9.20E+00	5.24E-07	3.30E-04	1.04E-03	2.62E-07	1.65E-04	5.22E-04

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 8-6
Comparison of Exposure Point Concentrations in Sediment to Plant TRVs for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Plant Toxicity Reference Value (mg/kg dry wt)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Barium	5.00E+02	8/8	2.10E+02	4.20E-01	1.81E+02	3.62E-01
Lead	1.20E+02	8/8	1.56E+01	1.30E-01	1.26E+01	1.05E-01
Manganese	2.20E+02	8/8	5.42E+02	**2.46E+00**	4.37E+02	**1.98E+00**
Vanadium	2.00E+00	8/8	2.57E+01	**1.29E+01**	2.15E+01	**1.08E+01**
PCBS						
Aroclor-1254	4.00E+01	21/24	1.10E-01	2.75E-03	5.10E-02	1.28E-03
Total PCB Congeners	4.00E+01	2/2	3.50E-02	8.75E-04	3.50E-02	8.75E-04
Total PCB Aroclors	4.00E+01	21/24	1.10E-01	2.75E-03	5.68E-02	1.42E-03
PESTICIDES						
DDTr	NA	10/10	1.87E-02	--	1.20E-02	--
gamma-Chlordane	NA	9/10	4.40E-03	--	2.42E-03	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 8-7

Comparison of Exposure Point Concentrations in Sediment to Benthic Organism TRVs for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Sediment TEC Toxicity Reference Value (mg/kg)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Barium	1.30E+02	8/8	2.10E+02	**1.61E+00**	1.81E+02	**1.39E+00**
Lead	3.58E+01	8/8	1.56E+01	4.36E-01	1.26E+01	3.53E-01
Manganese	4.60E+02	8/8	5.42E+02	**1.18E+00**	4.37E+02	9.49E-01
Vanadium	4.20E+01	8/8	2.57E+01	6.12E-01	2.15E+01	5.12E-01
PCBS						
Aroclor-1254	6.00E-02	21/24	1.10E-01	**1.83E+00**	5.10E-02	8.50E-01
Total PCB Congeners	5.98E-02	2/2	3.50E-02	5.85E-01	3.50E-02	5.85E-01
Total PCB Aroclors	5.98E-02	21/24	1.10E-01	**1.84E+00**	5.68E-02	9.50E-01
PESTICIDES						
DDTr	5.28E-03	10/10	1.87E-02	**3.54E+00**	1.20E-02	**2.27E+00**
gamma-Chlordane	3.24E-03	9/10	4.40E-03	**1.36E+00**	2.42E-03	7.47E-01

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 8-8
Comparison of Exposure Point Concentrations in Surface Water to Aquatic Organism TRVs
for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Chronic Surface Water Toxicity Reference Value (µg/L)	Dissolved Concentrations					Total Concentrations				
		Frequency of Detection	Maximum EPC (µg/L)	Hazard Quotient for Maximum EPC	95UCLM EPC (µg/L)	Hazard Quotient for 95UCLM EPC	Frequency of Detection	Maximum EPC (µg/L)	Hazard Quotient for Maximum EPC	95UCLM EPC (µg/L)	Hazard Quotient for 95UCLM EPC
Metals											
Barium	4.00E+00	2/2	1.28E+02	**3.20E+01**	1.28E+02	**3.20E+01**	2/2	1.46E+02	**3.65E+01**	1.46E+02	**3.65E+01**
Lead	8.10E+00	--	--	--	--	--	2/2	1.60E+00	1.98E-01	1.60E+00	1.98E-01
Manganese	1.20E+02	2/2	5.40E+00	4.50E-02	5.40E+00	4.50E-02	2/2	1.14E+02	9.50E-01	1.14E+02	9.50E-01
Vanadium	2.00E+01	2/2	9.40E+00	4.70E-01	9.40E+00	4.70E-01	2/2	1.06E+01	5.30E-01	1.06E+01	5.30E-01
PCBS											
Aroclor-1254	3.30E-02	--	--	--	--	--	--	--	--	--	--
Total PCB Congeners	1.40E-02	--	--	--	--	--	--	--	--	--	--
Total PCB Aroclors	1.40E-02	--	--	--	--	--	--	--	--	--	--
PESTICIDES											
DDTr	1.00E-03	--	--	--	--	--	1/1	7.40E-02	**7.40E+01**	7.40E-02	**7.40E+01**

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 8-9

Comparison of Background Concentrations in Sediment to Sediment Concentrations for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Background Concentrations Based on Combined Data from the Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Sediment for Exposure Area 4: LWMCU Downstream of the Siphon			Maximum On-site Exceeds Background 95% UPL?	95% UCLM On-site Exceeds Background 95% UCLM?
	Frequency of detection	Sediment 95% UCLM (mg/kg)	Sediment Maximum Concentration (mg/kg)	95% Upper Prediction Limit (mg/kg)	Frequency of detection	95% Upper Confidence Limit (mg/kg)	Sediment Maximum Concentration (mg/kg)		
Metals									
Aluminum	25 / 25	1.31E+04	2.40E+04	2.12E+04	8/8	1.74E+04	2.19E+04	Exceeds	--
Arsenic	25 / 25	4.13E+00	6.60E+00	6.30E+00	8/8	4.45E+00	4.90E+00	--	--
Barium	25 / 25	1.57E+02	2.55E+02	2.18E+02	8/8	1.81E+02	2.10E+02	--	--
Beryllium	9 / 25	6.20E-01	9.80E-01	9.80E-01	--	--	--	--	--
Cadmium	16 / 25	3.79E-01	4.90E-01	4.90E-01	8/8	3.98E-01	4.90E-01	--	--
Calcium	25 / 25	7.11E+04	1.00E+05	9.18E+04	8/8	9.39E+04	1.13E+05	Exceeds	--
Cobalt	25 / 25	5.13E+00	7.20E+00	6.70E+00	8//8	6.03E+00	6.40E+00	--	--
Copper	23 / 25	8.83E+00	1.69E+01	1.45E+01	8/8	1.07E+01	1.42E+01	--	--
Iron	25 / 25	1.46E+04	2.19E+04	1.92E+04	8/8	1.82E+04	2.21E+04	Exceeds	--
Lead	25 / 25	8.42E+00	1.37E+01	1.20E+01	8/8	1.26E+01	1.56E+01	Exceeds	--
Magnesium	25 / 25	4.94E+03	8.35E+03	7.01E+03	8/8	6.05E+03	7.19E+03	Exceeds	--
Manganese	25 / 25	4.23E+02	1.18E+03	8.36E+02	8/8	4.37E+02	5.42E+02	--	--
Mercury	24 / 25	4.63E-02	2.20E-01	1.70E-01	8/8	7.47E-02	1.00E-01	--	--
Nickel	25 / 25	9.38E+00	1.49E+01	1.33E+01	8/8	1.09E+01	1.35E+01	Exceeds	--
Potassium	23 / 25	3.03E+03	5.62E+03	4.81E+03	8/8	3.91E+03	4.90E+03	Exceeds	--
Sodium	15 / 25	9.68E+02	2.12E+03	1.86E+03	5/8	5.61E+02	6.80E+02	--	--
Vanadium	25 / 25	1.89E+01	2.85E+01	2.69E+01	8/8	2.15E+01	2.57E+01	--	--
Zinc	25 / 25	4.04E+01	7.45E+01	6.70E+01	8/8	4.96E+01	6.20E+01	--	--
PCBS									
Aroclor-1254	0 / 44	--	--	--	21/24	5.10E-02	1.10E-01	Exceeds	Exceeds
Total PCB Congeners	14 / 14	1.85E-03	1.20E-02	1.20E-02	2/2	3.50E-02	3.50E-02	Exceeds	Exceeds
Total PCB Aroclors	0 / 44	--	--	--	21/24	5.68E-02	1.10E-01	Exceeds	Exceeds
PESTICIDES									
DDTr	12 / 12	8.48E-03	5.40E-02	5.40E-02	10/10	1.20E-02	1.87E-02	--	--
delta-BHC	1 / 27	9.10E-04	9.10E-04	9.10E-04	1/10	9.80E-04	9.80E-04	Exceeds	Exceeds
Endrin	0 / 27	--	--	--	1/10	1.50E-03	1.50E-03	Exceeds	Exceeds
gamma-Chlordane	0 / 27	--	--	--	9/10	2.42E-03	4.40E-03	Exceeds	Exceeds
Heptachlor epoxide	0 / 27	--	--	--	3/10	1.50E-03	1.50E-03	Exceeds	Exceeds
SVOCS									
Bis(2-ethylhexyl)phthalate	9 / 27	1.84E-01	6.10E-01	4.00E-01	--	--	--	--	--
Phenol	4 / 27	5.95E-02	6.70E-02	6.70E-02	--	--	--	--	--
VOCS									
Acetone	2 / 7	2.72E-02	5.20E-02	5.20E-02	--	--	--	--	--
Acetophenone	6 / 27	6.63E-02	8.30E-02	8.30E-02	--	--	--	--	--
Methylene chloride	1 / 7	4.40E-03	4.40E-03	4.40E-03	--	--	--	--	--
Toluene	1 / 7	2.70E-03	2.70E-03	2.70E-03	--	--	--	--	--

Note:
COC: Chemical of concern
HMW: High molecular weight
LEL: Lowest effect level
LMW: Low molecular weight
LOAEL: Lowest observed adverse effects level
MPC: Maximal permissible concentration
NA: TRV not available
ND: Analyte not detected in media
NOAEL: No observed adverse effects level
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
PEC: Probable effect concentration
SEL: Severe effect level
SRCeco: Serious risk concentration for ecosystems
TCEQ: Texas Commission on Environmental Quality
TEC: Threshold effect concentration
TRV: Toxicity reference value

Table 8-10
Comparison of Background Concentrations in Surface Water to Surface Water Concentrations for Exposure Area 4: LWMCU Downstream of the Siphon

Chemical	Background Concentrations Based on Combined Data from the Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Surface Water for Exposure Area 4: LWMCU Downstream of the Siphon			Maximum On-site Exceeds Background 95% UPL?	95% UCLM On-site Exceeds Background 95% UCLM?
	Frequency of Detection	Surface Water Mean (ug/L)	Surface Water Maximum (ug/L)	95% Upper Prediction Limit (ug/L)	Frequency of detection	95% Upper Confidence Limit (mg/kg)	Surface Maximum (ug/L)		
Metals									
Aluminum	11 / 11	9.20E+02	2.21E+03	2.21E+03	2/2	1.60E+03	1.60E+03	--	--
Arsenic	11 / 11	8.76E+00	1.51E+01	1.51E+01	2/2	4.9	4.90E+00	--	--
Barium	11 / 11	1.26E+02	1.64E+02	1.64E+02	2/2	146	1.46E+02	--	--
Cadmium	1 / 11	1.70E-01	1.70E-01	1.70E-01	--	--	--	--	--
Calcium	11 / 11	1.23E+05	2.19E+05	2.19E+05	2/2	87600	8.76E+04	--	--
Cobalt	3 / 11	1.16E+00	2.00E+00	2.00E+00	--	--	--	--	--
Copper	10 / 11	4.44E+00	9.20E+00	9.20E+00	2/2	3.1	3.10E+00	--	--
Iron	10 / 11	8.20E+02	1.80E+03	1.80E+03	2/2	1340	1.34E+03	--	--
Lead	11 / 11	1.62E+00	4.30E+00	4.30E+00	2/2	1.6	1.60E+00	--	--
Magnesium	11 / 11	4.17E+04	7.61E+04	7.61E+04	2/2	32200	3.22E+04	--	--
Manganese	11 / 11	1.53E+02	3.42E+02	3.42E+02	2/2	114	1.14E+02	--	--
Mercury	1 / 11	6.00E-02	6.00E-02	6.00E-02	--	--	--	--	--
Nickel	11 / 11	2.41E+00	4.30E+00	4.30E+00	2/2	1.8	1.80E+00	--	--
Potassium	11 / 11	8.93E+03	1.38E+04	1.38E+04	2/2	7020	7.02E+03	--	--
Selenium	5 / 11	1.96E+00	5.60E+00	5.60E+00	2/2	1.7	1.70E+00	--	--
Sodium	11 / 11	2.55E+05	5.62E+05	5.62E+05	2/2	167000	1.67E+05	--	--
Vanadium	11 / 11	1.13E+01	1.58E+01	1.58E+01	2/2	10.6	1.06E+01	--	--
Zinc	11 / 11	7.73E+00	1.86E+01	1.86E+01	2/2	5.6	5.60E+00	--	--
PCBS									
Total PCB Congeners	13 / 13	3.34E-04	1.20E-03	1.20E-03	--	--	--	--	--
PESTICIDES									
DDTr	0 / 11	--	--	--	1/1	0.074	7.40E-02	Exceeds	Exceeds
gamma-BHC (Lindane)	1 / 11	1.70E-02	1.70E-02	1.70E-02	--	--	--	--	--
SVOCS									
Bis(2-ethylhexyl)phthalate	3 / 11	1.52E+01	1.40E+02	1.40E+02	--	--	--	--	--
Diethyl phthalate	1 / 11	1.10E+00	1.10E+00	1.10E+00	--	--	--	--	--
VOCS									
Acetophenone	1 / 11	2.10E+00	2.10E+00	2.10E+00	--	--	--	--	--

Note:
COC: Chemical of concern
HMW: High molecular weight
LEL: Lowest effect level
LMW: Low molecular weight
LOAEL: Lowest observed adverse effects level
MPC: Maximal permissible concentration
NA: TRV not available
ND: Analyte not detected in media
NOAEL: No observed adverse effects level
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
PEC: Probable effect concentration
SEL: Severe effect level
SRCeco: Serious risk concentration for ecosystems
TCEQ: Texas Commission on Environmental Quality
TEC: Threshold effect concentration
TRV: Toxicity reference value

Table 9-1
Frequency of Detection and Exposure Point Concentrations
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Analyte	Surface Soil			Surface Water Accessible for Drinking by Wildlife (Total Concentrations)			Sediment			Surface Water (Total Concentration)			Surface Water (Dissolved Concentration)		
	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (mg/L)	95UCLM (mg/L)	Frequency	Maximum (mg/kg)	95UCLM (mg/kg)	Frequency	Maximum (µg/L)	95UCLM (µg/L)	Frequency	Maximum (µg/L)	95UCLM (µg/L)
Metals															
Arsenic	NO COPC	NO COPC	NO COPC	12/12	4.90E-03	4.90E-03	18/18	2.51E+01	7.65E+00	12/12	4.90E+00	4.90E+00	12/12	4.80E+00	4.50E+00
Barium	58/58	3.59E+02	1.91E+02	12/12	1.54E-01	1.39E-01	18/18	2.14E+02	1.77E+02	12/12	1.54E+02	1.39E+02	12/12	1.47E+02	1.27E+02
Beryllium	NO COPC	NO COPC	NO COPC	--	0.00E+00	0.00E+00	6/18	1.00E+00	8.95E-01	--	--	--	--	--	--
Chromium	58/58	1.61E+01	1.21E+01	4/12	7.60E-04	7.60E-04	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
Copper	NO COPC	NO COPC	NO COPC	12/12	2.64E-01	1.19E-01	18/18	7.59E+03	4.62E+03	12/12	2.64E+02	1.19E+02	3/12	2.50E+02	2.50E+02
Lead	NO COPC	NO COPC	NO COPC	10/12	2.00E-03	1.35E-03	18/18	4.09E+01	1.84E+01	10/12	2.00E+00	1.35E+00	1/12	2.20E+00	2.20E+00
Manganese	58/58	7.79E+02	3.96E+02	12/12	1.15E-01	8.82E-02	18/18	5.09E+02	4.40E+02	12/12	1.15E+02	8.82E+01	6/12	1.31E+02	4.99E+01
Selenium	NO COPC	NO COPC	NO COPC	12/12	1.80E-03	1.22E-03	13/18	4.80E-01	3.57E-01	12/12	1.80E+00	1.22E+00	7/12	1.50E+00	1.51E+00
Vanadium	58/58	3.14E+01	2.33E+01	12/12	1.05E-02	1.00E-02	18/18	3.58E+01	2.47E+01	12/12	1.05E+01	1.00E+01	12/12	1.10E+01	9.16E+00
Zinc	58/58	1.60E+02	6.03E+01	12/12	8.10E-03	5.43E-03	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
PCBS															
Aroclor-1016	1/70	3.40E-03	3.40E-03	--	0.00E+00	0.00E+00	--	--	--	--	--	--	--	--	--
Aroclor-1254	3/70	1.10E-02	1.10E-02	--	0.00E+00	0.00E+00	15/33	2.30E-02	6.08E-03	--	--	--	--	--	--
Aroclor-1260	27/70	1.00E-02	2.67E-03	--	0.00E+00	0.00E+00	4/33	2.80E-03	2.20E-03	--	--	--	--	--	--
Total PCB Congeners	24/24	4.50E-02	1.02E-02	6/6	1.10E-05	1.10E-05	10/10	2.10E-02	1.32E-02	6/6	1.10E-02	1.10E-02	--	--	--
Total PCB Aroclors	28/28	1.76E-02	6.23E-03	--	0.00E+00	0.00E+00	18/33	2.30E-02	1.33E-02	--	--	--	--	--	--
PESTICIDES															
DDTr	47/58	8.14E-02	2.10E-02	1/12	3.10E-05	3.10E-05	16/19	9.67E-02	4.51E-02	1/12	3.10E-02	3.10E-02	--	--	--
alpha-Chlordane	1/58	2.30E-03	2.30E-03	--	0.00E+00	0.00E+00	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
delta-BHC	NO COPC	NO COPC	NO COPC	1/12	2.80E-05	2.80E-05	2/19	3.00E-03	3.00E-03	1/12	2.80E-02	2.80E-02	--	--	--
Dieldrin	2/58	1.40E-02	1.40E-02	--	0.00E+00	0.00E+00	1/19	7.50E-03	7.50E-03	--	--	--	--	--	--
Endosulfan I	1/58	7.50E-04	7.50E-04	--	0.00E+00	0.00E+00	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
Endosulfan II	5/58	1.70E-02	2.36E-03	--	0.00E+00	0.00E+00	2/19	6.00E-03	6.00E-03	--	--	--	--	--	--
Endosulfan sulfate	2/58	1.30E-02	1.30E-02	--	0.00E+00	0.00E+00	1/19	1.70E-03	1.70E-03	--	--	--	--	--	--
Endrin	3/58	6.90E-03	6.90E-03	--	0.00E+00	0.00E+00	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
Endrin aldehyde	10/58	3.50E-02	4.14E-03	--	0.00E+00	0.00E+00	3/19	5.60E-03	5.60E-03	--	--	--	--	--	--
Endrin ketone	1/58	2.10E-03	2.10E-03	--	0.00E+00	0.00E+00	1/19	2.10E-02	2.10E-02	--	--	--	--	--	--
gamma-Chlordane	3/58	1.40E-03	1.40E-03	--	0.00E+00	0.00E+00	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
Heptachlor	NO COPC	NO COPC	NO COPC	--	0.00E+00	0.00E+00	1/19	3.90E-03	3.90E-03	--	--	--	--	--	--
Heptachlor epoxide	2/58	1.10E-03	1.10E-03	--	0.00E+00	0.00E+00	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
Methoxychlor	2/58	1.10E-02	1.10E-02	--	0.00E+00	0.00E+00	1/19	3.00E-02	3.00E-02	--	--	--	--	--	--
Toxaphene	2/58	5.60E-01	5.60E-01	--	0.00E+00	0.00E+00	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
PAHs															
Total LMW PAHs	NO COPC	NO COPC	NO COPC	--	0.00E+00	0.00E+00	2/19	2.77E+01	2.77E+01	--	--	--	--	--	--
Total HMW PAHs	NO COPC	NO COPC	NO COPC	--	0.00E+00	0.00E+00	3/19	2.38E+02	2.38E+02	--	--	--	--	--	--
SVOCS															
Benzaldehyde	NO COPC	NO COPC	NO COPC	1/12	2.00E-03	2.00E-03	--	0.00E+00	0.00E+00	1/12	2.00E+00	2.00E+00	--	--	--
Bis(2-ethylhexyl)phthalate	22/58	5.20E+00	4.75E-01	1/12	3.10E-03	3.10E-03	5/19	8.10E+00	3.41E+00	1/12	3.10E+00	3.10E+00	--	--	--
Butylbenzylphthalate	1/58	4.70E-01	4.70E-01	--	0.00E+00	0.00E+00	1/19	9.90E-01	9.90E-01	--	--	--	--	--	--
Caprolactam	NO COPC	NO COPC	NO COPC	1/12	3.10E-03	3.10E-03	0.00E+00	0.00E+00	0.00E+00	1/12	3.10E+00	3.10E+00	--	--	--
Carbazole	NO COPC	NO COPC	NO COPC	--	0.00E+00	0.00E+00	1/19	2.40E+00	2.40E+00	--	--	--	--	--	--
Dibenzofuran	NO COPC	NO COPC	NO COPC	--	0.00E+00	0.00E+00	1/19	3.50E-01	3.50E-01	--	--	--	--	--	--
VOCS															
Acetone	7/19	1.71E-02	1.35E-02	1/6	0.00E+00	0.00E+00	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC
Methylene chloride	4/19	3.60E-03	3.52E-03	--	0.00E+00	0.00E+00	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC	NO COPC

Table 9-2
Comparison of Exposure Point Concentrations in Soil to Plant TRVs for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Plant Toxicity Reference Value (mg/kg dry wt)	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM EPC (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals					
Barium	5.00E+02	3.59E+02	7.18E-01	1.91E+02	3.82E-01
Chromium	1.00E+00	1.61E+01	**1.61E+01**	1.21E+01	**1.21E+01**
Manganese	2.20E+02	7.79E+02	**3.54E+00**	3.96E+02	**1.80E+00**
Vanadium	2.00E+00	3.14E+01	**1.57E+01**	2.33E+01	**1.16E+01**
Zinc	1.60E+02	1.60E+02	**1.00E+00**	6.03E+01	3.77E-01
PCBS					
Aroclor-1016	4.00E+01	3.40E-03	8.50E-05	3.40E-03	8.50E-05
Aroclor-1254	4.00E+01	1.10E-02	2.75E-04	1.10E-02	2.75E-04
Aroclor-1260	4.00E+01	1.00E-02	2.50E-04	2.67E-03	6.68E-05
Total PCB Congeners	4.00E+01	4.50E-02	1.13E-03	1.02E-02	2.55E-04
Total PCB Aroclors	4.00E+01	1.76E-02	4.40E-04	6.23E-03	1.56E-04
PESTICIDES					
DDTr	NA	8.14E-02	--	2.10E-02	--
alpha-Chlordane	NA	2.30E-03	--	2.30E-03	--
Dieldrin	NA	1.40E-02	--	1.40E-02	--
Endosulfan I	NA	7.50E-04	--	7.50E-04	--
Endosulfan II	NA	1.70E-02	--	2.36E-03	--
Endosulfan sulfate	NA	1.30E-02	--	1.30E-02	--
Endrin	NA	6.90E-03	--	6.90E-03	--
Endrin aldehyde	NA	3.50E-02	--	4.14E-03	--
Endrin ketone	NA	2.10E-03	--	2.10E-03	--
gamma-Chlordane	NA	1.40E-03	--	1.40E-03	--
Heptachlor epoxide	NA	1.10E-03	--	1.10E-03	--
Methoxychlor	NA	1.10E-02	--	1.10E-02	--
Toxaphene	NA	5.60E-01	--	5.60E-01	--

Table 9-2
Comparison of Exposure Point Concentrations in Soil to Plant TRVs for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Plant Toxicity Reference Value (mg/kg dry wt)	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM EPC (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
SVOCS					
Bis(2-ethylhexyl)phthalate	1.00E+02	5.20E+00	5.20E-02	4.75E-01	4.75E-03
Butylbenzylphthalate	1.00E+02	4.70E-01	4.70E-03	4.70E-01	4.70E-03
VOCS					
Acetone	NA	1.71E-02	--	1.35E-02	--
Methylene chloride	NA	3.60E-03	--	3.52E-03	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-3
Comparison of Exposure Point Concentrations in Soil to Soil Invertebrate TRVs for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Invertebrate Toxicity Reference Value (mg/kg dry wt)	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals					
Barium	3.30E+02	3.59E+02	**1.09E+00**	1.91E+02	5.79E-01
Chromium	4.00E-01	1.61E+01	**4.03E+01**	1.21E+01	**3.03E+01**
Manganese	4.50E+02	7.79E+02	**1.73E+00**	3.96E+02	8.80E-01
Vanadium	NA	3.14E+01	--	2.33E+01	--
Zinc	1.20E+02	1.60E+02	**1.33E+00**	6.03E+01	5.03E-01
PCBS					
Aroclor-1016	NA	3.40E-03	--	3.40E-03	--
Aroclor-1254	NA	1.10E-02	--	1.10E-02	--
Aroclor-1260	NA	1.00E-02	--	2.67E-03	--
Total PCB Congeners	NA	4.50E-02	--	1.02E-02	--
Total PCB Aroclors	NA	1.76E-02	--	6.23E-03	--
PESTICIDES					
DDTr	NA	8.14E-02	--	2.10E-02	--
alpha-Chlordane	NA	2.30E-03	--	2.30E-03	--
Dieldrin	NA	1.40E-02	--	1.40E-02	--
Endosulfan I	NA	7.50E-04	--	7.50E-04	--
Endosulfan II	NA	1.70E-02	--	2.36E-03	--
Endosulfan sulfate	NA	1.30E-02	--	1.30E-02	--
Endrin	NA	6.90E-03	--	6.90E-03	--
Endrin aldehyde	NA	3.50E-02	--	4.14E-03	--
Endrin ketone	NA	2.10E-03	--	2.10E-03	--
gamma-Chlordane	NA	1.40E-03	--	1.40E-03	--
Heptachlor epoxide	NA	1.10E-03	--	1.10E-03	--
Methoxychlor	NA	1.10E-02	--	1.10E-02	--
Toxaphene	NA	5.60E-01	--	5.60E-01	--

Table 9-3
Comparison of Exposure Point Concentrations in Soil to Soil Invertebrate TRVs for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Invertebrate Toxicity Reference Value (mg/kg dry wt)	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
SVOCS					
Bis(2-ethylhexyl)phthalate	2.00E+02	5.20E+00	2.60E-02	4.75E-01	2.38E-03
Butylbenzylphthalate	2.00E+02	4.70E-01	2.35E-03	4.70E-01	2.35E-03
VOCS					
Acetone	NA	1.71E-02	--	1.35E-02	--
Methylene chloride	NA	3.60E-03	--	3.52E-03	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-4
Comparison of Maximum Modeled Wildlife Doses to Birds to Avian TRVs
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Avian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs							Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs						
	NOAEL	LOAEL	Herbivorous Birds Northern Bobwhite	Terrestrial Omnivorous Birds American Robin	Predatory Birds Red-Tailed Hawk	Aquatic Herbivorous Birds Canada Goose	Aquatic Insectivorous Birds Laughing Gull	Small Piscivorous Birds Belted Kingfisher	Large Piscivorous Birds Great Blue Heron	Herbivorous Birds Northern Bobwhite	Terrestrial Omnivorous Birds American Robin	Predatory Birds Red-Tailed Hawk	Aquatic Herbivorous Birds Canada Goose	Aquatic Insectivorous Birds Laughing Gull	Small Piscivorous Birds Belted Kingfisher	Large Piscivorous Birds Great Blue Heron
Metals																
Arsenic	2.24E+00	4.51E+00	NO COPC	NO COPC	NO COPC	1.01E-02	1.68E-01	3.26E-02	1.18E-02	NO COPC	NO COPC	NO COPC	5.03E-03	8.36E-02	1.62E-02	5.84E-03
Barium	2.08E+01	4.17E+01	2.94E-01	**1.02E+00**	4.26E-02	1.88E-02	5.93E-01	1.92E-01	6.93E-02	1.47E-01	5.08E-01	2.13E-02	9.39E-03	2.96E-01	9.60E-02	3.46E-02
Beryllium	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	2.66E+00	1.56E+01	4.26E-02	9.71E-01	3.93E-02	NO COPC	NO COPC	NO COPC	NO COPC	7.25E-03	1.65E-01	6.70E-03	NO COPC	NO COPC	NO COPC	NO COPC
Copper	4.05E+00	1.21E+01	NO COPC	NO COPC	NO COPC	**1.32E+00**	**4.96E+02**	**4.81E+00**	**1.73E+00**	NO COPC	NO COPC	NO COPC	4.42E-01	**1.66E+02**	**1.61E+00**	5.80E-01
Lead	1.63E+00	3.26E+00	NO COPC	NO COPC	NO COPC	2.61E-02	3.02E-01	8.43E-02	3.04E-02	NO COPC	NO COPC	NO COPC	1.31E-02	1.51E-01	4.22E-02	1.52E-02
Manganese	1.79E+02	3.77E+02	1.05E-01	1.54E-01	1.50E-02	7.34E-03	1.64E-01	2.92E-02	1.05E-02	4.97E-02	7.30E-02	7.14E-03	3.49E-03	7.78E-02	1.39E-02	5.01E-03
Selenium	2.90E-01	5.79E-01	NO COPC	NO COPC	NO COPC	7.36E-03	9.56E-02	4.88E-01	1.76E-01	NO COPC	NO COPC	NO COPC	3.69E-03	4.79E-02	2.44E-01	8.79E-02
Vanadium	3.44E-01	6.88E-01	6.33E-01	**2.00E+01**	3.93E-01	7.19E-02	**5.99E+00**	**1.03E+00**	3.72E-01	3.16E-01	**1.00E+01**	1.97E-01	3.60E-02	**3.00E+00**	5.17E-01	1.86E-01
Zinc	6.61E+01	1.71E+02	1.01E-01	**1.58E+00**	1.13E-01	NO COPC	NO COPC	NO COPC	NO COPC	3.90E-02	6.08E-01	4.35E-02	NO COPC	NO COPC	NO COPC	NO COPC
PCBS																
Aroclor-1016	1.80E-01	1.80E+00	1.49E-04	2.65E-03	5.46E-05	--	--	--	--	1.49E-05	2.65E-04	5.46E-06	--	--	--	--
Aroclor-1254	1.80E-01	1.80E+00	4.13E-04	1.24E-02	3.43E-03	8.47E-05	2.53E-01	8.06E-01	2.90E-01	4.13E-05	1.24E-03	3.43E-04	8.47E-06	2.53E-02	8.06E-02	2.90E-02
Aroclor-1260	1.80E-01	1.80E+00	3.64E-04	1.09E-02	6.07E-02	9.96E-06	3.09E-02	3.89E-05	1.40E-05	3.64E-05	1.09E-03	6.07E-03	9.96E-07	3.09E-03	3.89E-06	1.40E-06
Total PCB Congeners	1.80E-01	1.80E+00	1.78E-03	8.02E-02	3.19E-03	8.45E-05	2.31E-01	3.33E-01	1.20E-01	1.78E-04	8.02E-03	3.19E-04	8.45E-06	2.31E-02	3.33E-02	1.20E-02
Total PCB Aroclors	1.80E-01	1.80E+00	6.94E-04	2.30E-02	1.25E-03	8.96E-05	2.53E-01	8.06E-01	2.90E-01	6.94E-05	2.30E-03	1.25E-04	8.96E-06	2.53E-02	8.06E-02	2.90E-02
PESTICIDES																
DDTr	2.80E-03	2.80E-02	2.30E-01	**5.89E+01**	**1.06E+00**	2.77E-02	**1.06E+02**	**1.02E+01**	**3.68E+00**	2.30E-02	**5.89E+00**	1.06E-01	2.77E-03	**1.06E+01**	**1.02E+00**	3.68E-01
alpha-Chlordane	2.14E+00	1.07E+01	7.70E-06	2.64E-04	1.15E-05	NO COPC	NO COPC	NO COPC	NO COPC	1.54E-06	5.28E-05	2.30E-06	NO COPC	NO COPC	NO COPC	NO COPC
delta-BHC	5.60E-01	2.25E+00	NO COPC	NO COPC	NO COPC	1.12E-05	1.26E-02	6.28E-03	2.26E-03	NO COPC	NO COPC	NO COPC	2.78E-06	3.13E-03	1.56E-03	5.63E-04
Dieldrin	7.70E-02	NA	1.53E-03	7.67E-02	3.00E-04	8.27E-05	1.18E-01	2.44E-04	8.77E-05	--	--	--	--	--	--	--
Endosulfan I	1.00E+01	NA	2.42E-06	1.84E-05	1.39E-09	NO COPC	NO COPC	NO COPC	NO COPC	--	--	--	--	--	--	--
Endosulfan II	1.00E+01	NA	5.49E-05	4.18E-04	3.14E-08	2.10E-06	1.41E-03	1.50E-06	5.40E-07	--	--	--	--	--	--	--
Endosulfan sulfate	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Endrin	1.00E-02	1.00E-01	5.82E-03	5.53E-01	1.14E-03	NO COPC	NO COPC	NO COPC	NO COPC	5.82E-04	5.53E-02	1.14E-04	NO COPC	NO COPC	NO COPC	NO COPC
Endrin aldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Endrin ketone	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
gamma-Chlordane	2.14E+00	1.07E+01	4.42E-06	1.61E-04	3.86E-05	NO COPC	NO COPC	NO COPC	NO COPC	8.83E-07	3.22E-05	7.72E-06	NO COPC	NO COPC	NO COPC	NO COPC
Heptachlor	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methoxychlor	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toxaphene	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PAHs																
Total LMW PAHs	5.62E+03	5.62E+02	NO COPC	NO COPC	NO COPC	7.01E-06	2.07E-04	1.23E-05	4.44E-06	NO COPC	NO COPC	NO COPC	7.01E-05	2.07E-03	1.23E-04	4.44E-05
Total HMW PAHs	2.00E+00	2.00E+01	NO COPC	NO COPC	NO COPC	1.69E-01	**2.28E+00**	2.97E-01	1.07E-01	NO COPC	NO COPC	NO COPC	1.69E-02	2.28E-01	2.97E-02	1.07E-02
SVOCS																
Benzaldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	1.10E+00	1.10E+01	3.13E-02	**1.16E+00**	**6.83E+00**	4.84E-03	**1.73E+01**	**2.43E+00**	8.74E-01	3.13E-03	1.16E-01	6.83E-01	4.84E-04	**1.73E+00**	2.43E-01	8.74E-02
Butylbenzylphthalate	1.10E-01	1.10E+00	4.63E-02	**1.05E+00**	1.74E-03	1.00E-02	**2.11E+01**	2.25E-02	8.10E-03	4.63E-03	1.05E-01	1.74E-04	1.00E-03	**2.11E+00**	2.25E-03	8.10E-04
Caprolactam	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbazole	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOCS																
Acetone	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene chloride	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-5
Comparison of 95UCLM Modeled Wildlife Doses to Birds to Avian TRVs
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Avian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs							95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs						
			Herbivorous Birds	Terrestrial Omnivorous Birds	Predatory Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds	Herbivorous Birds	Terrestrial Omnivorous Birds	Predatory Birds	Aquatic Herbivorous Birds	Aquatic Insectivorous Birds	Small Piscivorous Birds	Large Piscivorous Birds
	NOAEL	LOAEL	Northern Bobwhite	American Robin	Red-Tailed Hawk	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron	Northern Bobwhite	American Robin	Red-Tailed Hawk	Canada Goose	Laughing Gull	Belted Kingfisher	Great Blue Heron
Metals																
Arsenic	2.24E+00	4.51E+00	NO COPC	NO COPC	NO COPC	3.75E-03	5.13E-02	1.31E-02	4.74E-03	NO COPC	NO COPC	NO COPC	1.87E-03	2.55E-02	6.53E-03	2.36E-03
Barium	2.08E+01	4.17E+01	1.57E-01	5.42E-01	2.75E-02	1.56E-02	4.91E-01	1.88E-01	6.77E-02	7.83E-02	2.71E-01	1.37E-02	7.79E-03	2.45E-01	9.37E-02	3.38E-02
Beryllium	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	2.66E+00	1.56E+01	3.20E-02	9.52E-01	3.19E-02	NO COPC	NO COPC	NO COPC	NO COPC	5.45E-03	1.62E-01	5.43E-03	NO COPC	NO COPC	NO COPC	NO COPC
Copper	4.05E+00	1.21E+01	NO COPC	NO COPC	NO COPC	8.30E-01	**3.02E+02**	**2.97E+00**	**1.07E+00**	NO COPC	NO COPC	NO COPC	2.78E-01	**1.01E+02**	9.95E-01	3.58E-01
Lead	1.63E+00	3.26E+00	NO COPC	NO COPC	NO COPC	1.36E-02	1.36E-01	4.97E-02	1.79E-02	NO COPC	NO COPC	NO COPC	6.82E-03	6.78E-02	2.49E-02	8.95E-03
Manganese	1.79E+02	3.77E+02	5.31E-02	8.44E-02	7.64E-03	6.35E-03	1.42E-01	2.83E-02	1.02E-02	2.53E-02	4.01E-02	3.63E-03	3.02E-03	6.73E-02	1.34E-02	4.84E-03
Selenium	2.90E-01	5.79E-01	NO COPC	NO COPC	NO COPC	5.32E-03	7.11E-02	4.86E-01	1.75E-01	NO COPC	NO COPC	NO COPC	2.66E-03	3.56E-02	2.44E-01	8.77E-02
Vanadium	3.44E-01	6.88E-01	4.70E-01	**1.48E+01**	2.92E-01	5.00E-02	**4.14E+00**	9.53E-01	3.43E-01	2.35E-01	**7.42E+00**	1.46E-01	2.50E-02	**2.07E+00**	4.77E-01	1.72E-01
Zinc	6.61E+01	1.71E+02	5.57E-02	**1.13E+00**	1.05E-01	NO COPC	NO COPC	NO COPC	NO COPC	2.15E-02	4.34E-01	4.05E-02	NO COPC	NO COPC	NO COPC	NO COPC
PCBS																
Aroclor-1016	1.80E-01	1.80E+00	1.49E-04	2.65E-03	5.46E-05	--	--	--	--	1.49E-05	2.65E-04	5.46E-06	--	--	--	--
Aroclor-1254	1.80E-01	1.80E+00	4.13E-04	1.24E-02	3.43E-03	2.24E-05	6.70E-02	3.33E-01	1.20E-01	4.13E-05	1.24E-03	3.43E-04	2.24E-06	6.70E-03	3.33E-02	1.20E-02
Aroclor-1260	1.80E-01	1.80E+00	9.72E-05	1.94E-03	1.62E-02	7.83E-06	2.42E-02	3.06E-05	1.10E-05	9.72E-06	1.94E-04	1.62E-03	7.83E-07	2.42E-03	3.06E-06	1.10E-06
Total PCB Congeners	1.80E-01	1.80E+00	4.09E-04	1.12E-02	7.25E-04	5.41E-05	1.45E-01	3.33E-01	1.20E-01	4.09E-05	1.12E-03	7.25E-05	5.41E-06	1.45E-02	3.33E-02	1.20E-02
Total PCB Aroclors	1.80E-01	1.80E+00	2.46E-04	5.85E-03	4.41E-04	5.18E-05	1.47E-01	6.64E-01	2.39E-01	2.46E-05	5.85E-04	4.41E-05	5.18E-06	1.47E-02	6.64E-02	2.39E-02
PESTICIDES																
DDTr	2.80E-03	2.80E-02	6.04E-02	**1.52E+01**	2.73E-01	1.32E-02	**4.94E+01**	**1.02E+01**	**3.66E+00**	6.04E-03	**1.52E+00**	2.73E-02	1.32E-03	**4.94E+00**	**1.02E+00**	3.66E-01
alpha-Chlordane	2.14E+00	1.07E+01	7.70E-06	2.64E-04	1.15E-05	NO COPC	NO COPC	NO COPC	NO COPC	1.54E-06	5.28E-05	2.30E-06	NO COPC	NO COPC	NO COPC	NO COPC
delta-BHC	5.60E-01	2.25E+00	NO COPC	NO COPC	NO COPC	1.12E-05	1.26E-02	6.28E-03	2.26E-03	NO COPC	NO COPC	NO COPC	2.78E-06	3.13E-03	1.56E-03	5.63E-04
Dieldrin	7.70E-02	NA	1.53E-03	7.67E-02	3.00E-04	8.27E-05	1.18E-01	2.44E-04	8.77E-05	--	--	--	--	--	--	--
Endosulfan I	1.00E+01	NA	2.42E-06	1.84E-05	1.39E-09	NO COPC	NO COPC	NO COPC	NO COPC	--	--	--	--	--	--	--
Endosulfan II	1.00E+01	NA	7.63E-06	5.80E-05	4.36E-09	2.10E-06	1.41E-03	1.50E-06	5.40E-07	--	--	--	--	--	--	--
Endosulfan sulfate	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Endrin	1.00E-02	1.00E-01	5.82E-03	5.53E-01	1.14E-03	NO COPC	NO COPC	NO COPC	NO COPC	5.82E-04	5.53E-02	1.14E-04	NO COPC	NO COPC	NO COPC	NO COPC
Endrin aldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Endrin ketone	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
gamma-Chlordane	2.14E+00	1.07E+01	4.42E-06	1.61E-04	3.86E-05	NO COPC	NO COPC	NO COPC	NO COPC	8.83E-07	3.22E-05	7.72E-06	NO COPC	NO COPC	NO COPC	NO COPC
Heptachlor	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methoxychlor	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toxaphene	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PAHs																
Total LMW PAHs	5.62E+03	5.62E+02	NO COPC	NO COPC	NO COPC	7.01E-06	2.07E-04	1.23E-05	4.44E-06	NO COPC	NO COPC	NO COPC	7.01E-05	2.07E-03	1.23E-04	4.44E-05
Total HMW PAHs	2.00E+00	2.00E+01	NO COPC	NO COPC	NO COPC	1.69E-01	**2.28E+00**	2.97E-01	1.07E-01	NO COPC	NO COPC	NO COPC	1.69E-02	2.28E-01	2.97E-02	1.07E-02
SVOCS																
Benzaldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	1.10E+00	1.10E+01	3.14E-03	1.07E-01	6.24E-01	2.11E-03	**7.29E+00**	**2.42E+00**	8.70E-01	3.14E-04	1.07E-02	6.24E-02	2.11E-04	7.29E-01	2.42E-01	8.70E-02
Butylbenzylphthalate	1.10E-01	1.10E+00	4.63E-02	**1.05E+00**	1.74E-03	1.00E-02	**2.11E+01**	2.25E-02	8.10E-03	4.63E-03	1.05E-01	1.74E-04	1.00E-03	**2.11E+00**	2.25E-03	8.10E-04
Caprolactam	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbazole	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOCS																
Acetone	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene chloride	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-6
Comparison of Maximum Modeled Wildlife Doses to Mammals to Mammalian TRVs
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Mammalian TRVs (mg/kg-bw day)		Maximum Case Scenario HQs Based on Comparison of Doses to NOAELs						Maximum Case Scenario HQs Based on Comparison of Doses to LOAELs					
	NOAEL	LOAEL	Terrestrial Herbivorous Mammals White-Footed Mouse	Terrestrial Insectivorous Mammals Least Shrew	Predatory Mammals Coyote	Aquatic Herbivorous Mammals Nutria	Aquatic Carnivorous Mammals Raccoon	Piscivorous Mammals River Otter	Terrestrial Herbivorous Mammals White-Footed Mouse	Terrestrial Insectivorous Mammals Least Shrew	Predatory Mammals Coyote	Aquatic Herbivorous Mammals Nutria	Aquatic Carnivorous Mammals Raccoon	Piscivorous Mammals River Otter
Metals														
Arsenic	1.04E+00	1.66E+00	NO COPC	NO COPC	NO COPC	5.93E-02	2.56E-01	2.72E-02	NO COPC	NO COPC	NO COPC	3.72E-02	1.61E-01	1.70E-02
Barium	5.18E+01	8.27E+01	4.64E-02	3.94E-01	8.59E-03	3.27E-02	2.17E-01	2.98E-02	2.91E-02	2.47E-01	5.38E-03	2.05E-02	1.36E-01	1.87E-02
Beryllium	5.32E-01	6.73E-01	NO COPC	NO COPC	NO COPC	2.39E-03	9.87E-02	1.80E-03	NO COPC	NO COPC	NO COPC	1.89E-03	7.81E-02	1.43E-03
Chromium	2.40E+00	5.82E+01	7.22E-03	9.80E-01	1.61E-02	NO COPC	NO COPC	NO COPC	2.98E-04	4.04E-02	6.64E-04	NO COPC	NO COPC	NO COPC
Copper	5.60E+00	9.34E+00	NO COPC	NO COPC	NO COPC	**1.70E+00**	**3.48E+02**	**1.34E+00**	NO COPC	NO COPC	NO COPC	**1.02E+00**	**2.08E+02**	8.02E-01
Lead	4.70E+00	8.90E+00	NO COPC	NO COPC	NO COPC	2.70E-02	6.69E-02	1.12E-02	NO COPC	NO COPC	NO COPC	1.42E-02	3.53E-02	5.94E-03
Manganese	5.15E+01	1.46E+02	1.58E-01	5.44E-01	2.28E-02	1.15E-01	5.19E-01	3.91E-02	5.60E-02	1.92E-01	8.06E-03	4.08E-02	1.84E-01	1.38E-02
Selenium	1.43E-01	2.15E-01	NO COPC	NO COPC	NO COPC	8.21E-02	1.77E-01	3.80E-01	NO COPC	NO COPC	NO COPC	5.46E-02	1.18E-01	2.53E-01
Vanadium	4.16E+00	8.31E+00	8.19E-03	**1.49E+00**	1.34E-02	1.18E-02	4.52E-01	3.29E-02	4.10E-03	7.48E-01	6.70E-03	5.89E-03	2.26E-01	1.65E-02
Zinc	7.54E+01	2.98E+02	4.31E-02	**1.23E+00**	3.01E-02	NO COPC	NO COPC	NO COPC	1.09E-02	3.11E-01	7.64E-03	NO COPC	NO COPC	NO COPC
PCBS														
Aroclor-1016	1.37E+00	3.43E+00	3.83E-06	3.19E-04	3.31E-06	--	--	--	1.53E-06	1.27E-04	1.32E-06	--	--	--
Aroclor-1254	6.80E-02	6.80E-01	1.47E-04	2.96E-02	2.75E-03	3.38E-04	6.59E-01	8.19E-01	1.47E-05	2.96E-03	2.75E-04	3.38E-05	6.59E-02	8.19E-02
Aroclor-1260	1.00E-02	1.00E-01	7.98E-04	1.78E-01	3.22E-01	2.45E-04	5.46E-01	2.69E-04	7.98E-05	1.78E-02	3.22E-02	2.45E-05	5.46E-02	2.69E-05
Total PCB Congeners	1.00E-02	1.00E-01	5.27E-03	**1.29E+00**	1.91E-02	3.61E-03	**4.09E+00**	**2.30E+00**	5.27E-04	1.29E-01	1.91E-03	3.61E-04	4.09E-01	2.30E-01
Total PCB Aroclors	1.00E-02	1.00E-01	1.93E-03	3.73E-01	7.45E-03	2.77E-03	**4.48E+00**	**5.57E+00**	1.93E-04	3.73E-02	7.45E-04	2.77E-04	4.48E-01	5.57E-01
PESTICIDES														
DDTr	8.00E-01	4.00E+00	1.68E-04	1.82E-01	1.14E-03	2.41E-04	3.64E-01	1.37E-02	3.35E-05	3.64E-02	2.28E-04	4.83E-05	7.28E-02	2.75E-03
alpha-Chlordane	4.60E+00	9.20E+00	5.67E-07	1.11E-04	1.82E-06	NO COPC	NO COPC	NO COPC	2.83E-07	5.53E-05	9.09E-07	NO COPC	NO COPC	NO COPC
delta-BHC	4.00E-01	2.00E+00	NO COPC	NO COPC	NO COPC	1.17E-04	1.73E-02	3.38E-03	NO COPC	NO COPC	NO COPC	2.34E-05	3.46E-03	6.76E-04
Dieldrin	2.00E-02	2.00E-01	1.28E-03	2.63E-01	6.78E-04	7.55E-04	4.46E-01	3.60E-04	1.28E-04	2.63E-02	6.78E-05	7.55E-05	4.46E-02	3.60E-05
Endosulfan I	1.50E-01	NA	7.51E-05	1.11E-03	2.44E-06	NO COPC	NO COPC	NO COPC	--	--	--	--	--	--
Endosulfan II	1.50E-01	NA	1.70E-03	2.51E-02	5.54E-05	6.60E-04	9.23E-02	3.84E-05	--	--	--	--	--	--
Endosulfan sulfate	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Endrin	9.20E-02	9.20E-01	1.38E-04	5.33E-02	7.27E-05	NO COPC	NO COPC	NO COPC	1.38E-05	5.33E-03	7.27E-06	NO COPC	NO COPC	NO COPC
Endrin aldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Endrin ketone	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
gamma-Chlordane	4.60E+00	9.20E+00	2.76E-07	6.73E-05	5.43E-06	NO COPC	NO COPC	NO COPC	1.38E-07	3.37E-05	2.71E-06	NO COPC	NO COPC	NO COPC
Heptachlor	1.00E-01	1.00E+00	NO COPC	NO COPC	NO COPC	5.92E-05	2.83E-01	3.74E-05	NO COPC	NO COPC	NO COPC	5.92E-06	2.83E-02	3.74E-06
Heptachlor epoxide	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Methoxychlor	4.00E+00	8.00E+00	4.31E-06	6.09E-04	3.54E-06	1.29E-05	1.73E-02	2.90E-04	2.15E-06	3.04E-04	1.77E-06	6.45E-06	8.66E-03	1.45E-04
Toxaphene	8.00E+00	NA	6.65E-05	1.55E-02	7.90E-04	NO COPC	NO COPC	NO COPC	--	--	--	--	--	--
PAHs														
Total LMW PAHs	6.56E+01	3.28E+02	NO COPC	NO COPC	NO COPC	2.17E-03	1.57E-02	4.06E-04	NO COPC	NO COPC	NO COPC	4.35E-04	3.14E-03	8.12E-05
Total HMW PAHs	6.15E-01	3.01E+00	NO COPC	NO COPC	NO COPC	**1.99E+00**	**5.70E+00**	3.71E-01	NO COPC	NO COPC	NO COPC	4.06E-01	**1.16E+00**	7.58E-02
SVOCS														
Benzaldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	1.83E+01	1.83E+02	2.76E-04	6.29E-02	1.21E-01	5.51E-04	**1.02E+00**	5.61E-02	2.76E-05	6.29E-03	1.21E-02	5.51E-05	1.02E-01	5.61E-03
Butylbenzylphthalate	5.50E+02	1.83E+03	2.70E-06	1.89E-04	5.15E-07	6.24E-06	4.16E-03	1.73E-06	8.10E-07	5.67E-05	1.55E-07	1.87E-06	1.25E-03	5.18E-07
Caprolactam	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Carbazole	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
VOCS														
Acetone	1.00E+01	5.00E+01	3.50E-03	3.78E-04	8.26E-07	NO COPC	NO COPC	NO COPC	7.00E-04	7.57E-05	1.65E-07	NO COPC	NO COPC	NO COPC
Methylene chloride	5.85E+00	5.00E+01	1.55E-04	1.36E-04	2.97E-07	NO COPC	NO COPC	NO COPC	1.82E-05	1.59E-05	3.48E-08	NO COPC	NO COPC	NO COPC

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-7
Comparison of 95UCLM Modeled Wildlife Doses to Mammals to Mammalian TRVs
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Mammalian TRVs (mg/kg-bw day)		95UCLM Case Scenario HQs Based on Comparison of Doses to NOAELs						95UCLM Case Scenario HQs Based on Comparison of Doses to LOAELs					
			Terrestrial Herbivorous Mammals	Terrestrial Insectivorous Mammals	Predatory Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals	Terrestrial Herbivorous Mammals	Terrestrial Insectivorous Mammals	Predatory Mammals	Aquatic Herbivorous Mammals	Aquatic Carnivorous Mammals	Piscivorous Mammals
	NOAEL	LOAEL	White-Footed Mouse	Least Shrew	Coyote	Nutria	Raccoon	River Otter	White-Footed Mouse	Least Shrew	Coyote	Nutria	Raccoon	River Otter
Metals														
Arsenic	1.04E+00	1.66E+00	NO COPC	NO COPC	NO COPC	2.84E-02	7.84E-02	1.11E-02	NO COPC	NO COPC	NO COPC	1.78E-02	4.91E-02	6.93E-03
Barium	5.18E+01	8.27E+01	2.50E-02	2.10E-01	5.22E-03	2.73E-02	1.80E-01	2.91E-02	1.57E-02	1.32E-01	3.27E-03	1.71E-02	1.13E-01	1.82E-02
Beryllium	5.32E-01	6.73E-01	NO COPC	NO COPC	NO COPC	2.14E-03	8.83E-02	1.62E-03	NO COPC	NO COPC	NO COPC	1.69E-03	6.99E-02	1.28E-03
Chromium	2.40E+00	5.82E+01	5.45E-03	9.54E-01	1.29E-02	NO COPC	NO COPC	NO COPC	2.25E-04	3.93E-02	5.31E-04	NO COPC	NO COPC	NO COPC
Copper	5.60E+00	9.34E+00	NO COPC	NO COPC	NO COPC	**1.13E+00**	**2.12E+02**	8.26E-01	NO COPC	NO COPC	NO COPC	6.78E-01	**1.27E+02**	4.96E-01
Lead	4.70E+00	8.90E+00	NO COPC	NO COPC	NO COPC	1.58E-02	3.00E-02	6.63E-03	NO COPC	NO COPC	NO COPC	8.36E-03	1.59E-02	3.50E-03
Manganese	5.15E+01	1.46E+02	8.07E-02	2.96E-01	1.16E-02	9.95E-02	4.49E-01	3.78E-02	2.85E-02	1.05E-01	4.11E-03	3.52E-02	1.59E-01	1.34E-02
Selenium	1.43E-01	2.15E-01	NO COPC	NO COPC	NO COPC	5.87E-02	1.32E-01	3.79E-01	NO COPC	NO COPC	NO COPC	3.90E-02	8.77E-02	2.52E-01
Vanadium	4.16E+00	8.31E+00	6.24E-03	**1.11E+00**	9.98E-03	8.77E-03	3.12E-01	3.04E-02	3.12E-03	5.55E-01	4.99E-03	4.39E-03	1.56E-01	1.52E-02
Zinc	7.54E+01	2.98E+02	2.47E-02	8.73E-01	2.75E-02	NO COPC	NO COPC	NO COPC	6.27E-03	2.21E-01	6.96E-03	NO COPC	NO COPC	NO COPC
PCBS														
Aroclor-1016	1.37E+00	3.43E+00	3.83E-06	3.19E-04	3.31E-06	--	--	--	1.53E-06	1.27E-04	1.32E-06	--	--	--
Aroclor-1254	6.80E-02	6.80E-01	1.47E-04	2.96E-02	2.75E-03	8.94E-05	1.74E-01	3.39E-01	1.47E-05	2.96E-03	2.75E-04	8.94E-06	1.74E-02	3.39E-02
Aroclor-1260	1.00E-02	1.00E-01	2.13E-04	3.20E-02	8.60E-02	1.93E-04	4.29E-01	2.11E-04	2.13E-05	3.20E-03	8.60E-03	1.93E-05	4.29E-02	2.11E-05
Total PCB Congeners	1.00E-02	1.00E-01	1.45E-03	1.82E-01	4.41E-03	2.66E-03	**2.57E+00**	**2.30E+00**	1.45E-04	1.82E-02	4.41E-04	2.66E-04	2.57E-01	2.30E-01
Total PCB Aroclors	1.00E-02	1.00E-01	6.85E-04	9.58E-02	2.64E-03	1.60E-03	**2.59E+00**	**4.59E+00**	6.85E-05	9.58E-03	2.64E-04	1.60E-04	2.59E-01	4.59E-01
PESTICIDES														
DDTr	8.00E-01	4.00E+00	5.19E-05	4.69E-02	2.97E-04	1.33E-04	1.70E-01	1.37E-02	1.04E-05	9.39E-03	5.93E-05	2.65E-05	3.40E-02	2.73E-03
alpha-Chlordane	4.60E+00	9.20E+00	5.67E-07	1.11E-04	1.82E-06	NO COPC	NO COPC	NO COPC	2.83E-07	5.53E-05	9.09E-07	NO COPC	NO COPC	NO COPC
delta-BHC	4.00E-01	2.00E+00	NO COPC	NO COPC	NO COPC	1.17E-04	1.73E-02	3.38E-03	NO COPC	NO COPC	NO COPC	2.34E-05	3.46E-03	6.76E-04
Dieldrin	2.00E-02	2.00E-01	1.28E-03	2.63E-01	6.78E-04	7.55E-04	4.46E-01	3.60E-04	1.28E-04	2.63E-02	6.78E-05	7.55E-05	4.46E-02	3.60E-05
Endosulfan I	1.50E-01	NA	7.51E-05	1.11E-03	2.44E-06	NO COPC	NO COPC	NO COPC	--	--	--	--	--	--
Endosulfan II	1.50E-01	NA	2.36E-04	3.48E-03	7.68E-06	6.60E-04	9.23E-02	3.84E-05	--	--	--	--	--	--
Endosulfan sulfate	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Endrin	9.20E-02	9.20E-01	1.38E-04	5.33E-02	7.27E-05	NO COPC	NO COPC	NO COPC	1.38E-05	5.33E-03	7.27E-06	NO COPC	NO COPC	NO COPC
Endrin aldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Endrin ketone	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
gamma-Chlordane	4.60E+00	9.20E+00	2.76E-07	6.73E-05	5.43E-06	NO COPC	NO COPC	NO COPC	1.38E-07	3.37E-05	2.71E-06	NO COPC	NO COPC	NO COPC
Heptachlor	1.00E-01	1.00E+00	NO COPC	NO COPC	NO COPC	5.92E-05	2.83E-01	3.74E-05	NO COPC	NO COPC	NO COPC	5.92E-06	2.83E-02	3.74E-06
Heptachlor epoxide	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Methoxychlor	4.00E+00	8.00E+00	4.31E-06	6.09E-04	3.54E-06	1.29E-05	1.73E-02	2.90E-04	2.15E-06	3.04E-04	1.77E-06	6.45E-06	8.66E-03	1.45E-04
Toxaphene	8.00E+00	NA	6.65E-05	1.55E-02	7.90E-04	NO COPC	NO COPC	NO COPC	--	--	--	--	--	--
PAHs														
Total LMW PAHs	6.56E+01	3.28E+02	NO COPC	NO COPC	NO COPC	2.17E-03	1.57E-02	4.06E-04	NO COPC	NO COPC	NO COPC	4.35E-04	3.14E-03	8.12E-05
Total HMW PAHs	6.15E-01	3.01E+00	NO COPC	NO COPC	NO COPC	**1.99E+00**	**5.70E+00**	3.71E-01	NO COPC	NO COPC	NO COPC	4.06E-01	**1.16E+00**	7.58E-02
SVOCS														
Benzaldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	1.83E+01	1.83E+02	7.14E-05	5.78E-03	1.11E-02	3.28E-04	4.30E-01	5.58E-02	7.14E-06	5.78E-04	1.11E-03	3.28E-05	4.30E-02	5.58E-03
Butylbenzylphthalate	5.50E+02	1.83E+03	2.70E-06	1.89E-04	5.15E-07	6.24E-06	4.16E-03	1.73E-06	8.10E-07	5.67E-05	1.55E-07	1.87E-06	1.25E-03	5.18E-07
Caprolactam	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Carbazole	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
VOCS														
Acetone	1.00E+01	5.00E+01	2.76E-03	2.99E-04	6.52E-07	NO COPC	NO COPC	NO COPC	5.53E-04	5.97E-05	1.30E-07	NO COPC	NO COPC	NO COPC
Methylene chloride	5.85E+00	5.00E+01	1.52E-04	1.33E-04	2.91E-07	NO COPC	NO COPC	NO COPC	1.78E-05	1.56E-05	3.40E-08	NO COPC	NO COPC	NO COPC

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-8
Comparison of Exposure Point Concentrations in Sediment to Plant TRVs
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Plant Toxicity Reference Value (mg/kg dry wt)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Arsenic	1.80E+01	18/18	2.51E+01	**1.39E+00**	7.65E+00	4.25E-01
Barium	5.00E+02	18/18	2.14E+02	4.28E-01	1.77E+02	3.55E-01
Beryllium	1.00E+01	6/18	1.00E+00	1.00E-01	8.95E-01	8.95E-02
Copper	7.00E+01	18/18	7.59E+03	**1.08E+02**	4.62E+03	**6.60E+01**
Lead	1.20E+02	18/18	4.09E+01	3.41E-01	1.84E+01	1.53E-01
Manganese	2.20E+02	18/18	5.09E+02	**2.31E+00**	4.40E+02	**2.00E+00**
Selenium	5.20E-01	13/18	4.80E-01	9.23E-01	3.57E-01	6.87E-01
Vanadium	2.00E+00	18/18	3.58E+01	**1.79E+01**	2.47E+01	**1.24E+01**
PCBS						
Aroclor-1254	4.00E+01	15/33	2.30E-02	5.75E-04	6.08E-03	1.52E-04
Aroclor-1260	4.00E+01	4/33	2.80E-03	7.00E-05	2.20E-03	5.50E-05
Total PCB Congeners	4.00E+01	10/10	2.10E-02	5.25E-04	1.32E-02	3.30E-04
Total PCB Aroclors	4.00E+01	18/33	2.30E-02	5.75E-04	1.33E-02	3.33E-04
PESTICIDES						
DDTr	NA	16/19	9.67E-02	--	4.51E-02	--
delta-BHC	NA	2/19	3.00E-03	--	3.00E-03	--
Dieldrin	NA	1/19	7.50E-03	--	7.50E-03	--
Endosulfan II	NA	2/19	6.00E-03	--	6.00E-03	--
Endosulfan sulfate	NA	1/19	1.70E-03	--	1.70E-03	--
Endrin aldehyde	NA	3/19	5.60E-03	--	5.60E-03	--
Endrin ketone	NA	1/19	2.10E-02	--	2.10E-02	--
Heptachlor	NA	1/19	3.90E-03	--	3.90E-03	--
Methoxychlor	NA	1/19	3.00E-02	--	3.00E-02	--
PAHs						
Total LMW PAHs	2.00E+01	2/19	2.77E+01	**1.39E+00**	2.77E+01	**1.39E+00**
Total HMW PAHs	2.00E+01	3/19	2.38E+02	**1.19E+01**	2.38E+02	**1.19E+01**
SVOCS						
Bis(2-ethylhexyl)phthalate	1.00E+02	5/19	8.10E+00	8.10E-02	3.41E+00	3.41E-02
Butylbenzylphthalate	1.00E+02	1/19	9.90E-01	9.90E-03	9.90E-01	9.90E-03
Carbazole	NA	1/19	2.40E+00	--	2.40E+00	--
Dibenzofuran	NA	1/19	3.50E-01	--	3.50E-01	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-9
Comparison of Exposure Point Concentrations in Sediment to Benthic Organism TRVs for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Sediment TEC Toxicity Reference Value (mg/kg)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
Metals						
Arsenic	9.79E+00	18/18	2.51E+01	**2.56E+00**	7.65E+00	7.81E-01
Barium	1.30E+02	18/18	2.14E+02	**1.64E+00**	1.77E+02	**1.36E+00**
Beryllium	1.10E+00	6/18	1.00E+00	9.09E-01	8.95E-01	8.14E-01
Copper	3.16E+01	18/18	7.59E+03	**2.40E+02**	4.62E+03	**1.46E+02**
Lead	3.58E+01	18/18	4.09E+01	**1.14E+00**	1.84E+01	5.13E-01
Manganese	4.60E+02	18/18	5.09E+02	**1.11E+00**	4.40E+02	9.57E-01
Selenium	7.00E-01	13/18	4.80E-01	6.86E-01	3.57E-01	5.10E-01
Vanadium	4.20E+01	18/18	3.58E+01	8.52E-01	2.47E+01	5.88E-01
PCBS						
Aroclor-1254	6.00E-02	15/33	2.30E-02	3.83E-01	6.08E-03	1.01E-01
Aroclor-1260	5.00E-03	4/33	2.80E-03	5.60E-01	2.20E-03	4.40E-01
Total PCB Congeners	5.98E-02	10/10	2.10E-02	3.51E-01	1.32E-02	2.21E-01
Total PCB Aroclors	5.98E-02	18/33	2.30E-02	3.85E-01	1.33E-02	2.22E-01
PESTICIDES						
DDTr	5.28E-03	16/19	9.67E-02	**1.83E+01**	4.51E-02	**8.54E+00**
delta-BHC	2.37E-03	2/19	3.00E-03	**1.27E+00**	3.00E-03	**1.27E+00**
Dieldrin	1.90E-03	1/19	7.50E-03	**3.95E+00**	7.50E-03	**3.95E+00**
Endosulfan II	1.00E-05	2/19	6.00E-03	**6.00E+02**	6.00E-03	**6.00E+02**
Endosulfan sulfate	NA	1/19	1.70E-03	--	1.70E-03	--
Endrin aldehyde	NA	3/19	5.60E-03	--	5.60E-03	--
Endrin ketone	NA	1/19	2.10E-02	--	2.10E-02	--
Heptachlor	7.00E-04	1/19	3.90E-03	**5.57E+00**	3.90E-03	**5.57E+00**
Methoxychlor	1.90E-02	1/19	3.00E-02	**1.58E+00**	3.00E-02	**1.58E+00**
PAHs						
Total LMW PAHs	1.61E+00	2/19	2.77E+01	**1.72E+01**	2.77E+01	**1.72E+01**
Total HMW PAHs	1.61E+00	3/19	2.38E+02	**1.48E+02**	2.38E+02	**1.48E+02**

Table 9-9
Comparison of Exposure Point Concentrations in Sediment to Benthic Organism TRVs
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Sediment TEC Toxicity Reference Value (mg/kg)	Frequency of Detection	Maximum Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for Maximum EPC	95UCLM Exposure Point Concentration (mg/kg dry wt)	Hazard Quotient for 95UCLM EPC
SVOCS						
Bis(2-ethylhexyl)phthalate	1.82E-01	5/19	8.10E+00	**4.45E+01**	3.41E+00	**1.87E+01**
Butylbenzylphthalate	1.10E+01	1/19	9.90E-01	9.00E-02	9.90E-01	9.00E-02
Carbazole	NA	1/19	2.40E+00	--	2.40E+00	--
Dibenzofuran	2.00E+00	1/19	3.50E-01	1.75E-01	3.50E-01	1.75E-01

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-10
Comparison of Exposure Point Concentrations in Surface Water to Aquatic Organism TRVs for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Chronic Surface Water Toxicity Reference Value (µg/L)	Dissolved Concentrations					Total Concentrations				
		Frequency of Detection	Maximum EPC (µg/L)	Hazard Quotient for Maximum EPC	95UCLM EPC (µg/L)	Hazard Quotient for 95UCLM EPC	Frequency of Detection	Maximum EPC (µg/L)	Hazard Quotient for Maximum EPC	95UCLM EPC (µg/L)	Hazard Quotient for 95UCLM EPC
Metals											
Arsenic	1.50E+02	12/12	4.80E+00	3.20E-02	4.50E+00	3.00E-02	12/12	4.90E+00	3.27E-02	4.90E+00	3.26E-02
Barium	4.00E+00	12/12	1.47E+02	**3.68E+01**	1.27E+02	**3.18E+01**	12/12	1.54E+02	**3.85E+01**	1.39E+02	**3.48E+01**
Copper	1.20E+01	3/12	2.50E+02	**2.08E+01**	2.50E+02	**2.08E+01**	12/12	2.64E+02	**2.20E+01**	1.19E+02	**9.94E+00**
Lead	8.10E+00	1/12	2.20E+00	2.72E-01	2.20E+00	2.72E-01	10/12	2.00E+00	2.47E-01	1.35E+00	1.66E-01
Manganese	1.20E+02	6/12	1.31E+02	**1.09E+00**	4.99E+01	4.16E-01	12/12	1.15E+02	9.58E-01	8.82E+01	7.35E-01
Selenium	5.00E+00	7/12	1.50E+00	3.00E-01	1.51E+00	3.02E-01	12/12	1.80E+00	3.60E-01	1.22E+00	2.43E-01
Vanadium	2.00E+01	12/12	1.10E+01	5.50E-01	9.16E+00	4.58E-01	12/12	1.05E+01	5.25E-01	1.00E+01	5.01E-01
PCBS											
Total PCB Congeners	1.40E-02	--	--	--	--	--	6/6	1.10E-02	7.86E-01	1.10E-02	7.86E-01
PESTICIDES											
DDTr	1.00E-03	--	--	--	--	--	1/12	3.10E-02	**3.10E+01**	3.10E-02	**3.10E+01**
delta-BHC	2.20E+00	--	--	--	--	--	1/12	2.80E-02	1.27E-02	2.80E-02	1.27E-02
SVOCS											
Benzaldehyde	NA	--	--	--	--	--	1/12	2.00E+00	--	2.00E+00	--
Bis(2-ethylhexyl)phthalate	3.00E+00	--	--	--	--	--	1/12	3.10E+00	**1.03E+00**	3.10E+00	**1.03E+00**
Caprolactam	NA	--	--	--	--	--	1/12	3.10E+00	--	3.10E+00	--

Note:
Bold represents a hazard quotient greater than 1
NA: Toxicity reference value not available.

Table 9-11
Comparison of Exposure Point Concentrations in Soil to Background Soil Concentrations for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Background Surface Soil			Exposure Area 5: Lined Canals, Reservoirs, and Soil		Maximum Exposure Area 5 Concentration Exceeds Background Maximum?	95UCLM Exposure Area 5 Concentration Exceeds Background 95UCLM?
	Frequency of Detection	Maximum Soil Concentration (mg/kg dry wt)	95UCLM Soil Concentration (mg/kg dry wt)	Maximum EPC (mg/kg dry wt)	95UCLM EPC (mg/kg dry wt)		
Metals							
Barium	10/10	1.69E+02	1.45E+02	3.59E+02	1.91E+02	Exceeds	Exceeds
Chromium	10/10	1.58E+01	1.46E+01	1.61E+01	1.21E+01	Exceeds	--
Manganese	10/10	5.67E+02	4.85E+02	7.79E+02	3.96E+02	Exceeds	--
Vanadium	10/10	2.65E+01	2.22E+01	3.14E+01	2.33E+01	Exceeds	Exceeds
Zinc	10/10	8.74E+01	6.70E+01	1.60E+02	6.03E+01	Exceeds	--
PCBS							
Aroclor-1016	--	--	--	3.40E-03	3.40E-03	Exceeds	Exceeds
Aroclor-1254	--	--	--	1.10E-02	1.10E-02	Exceeds	Exceeds
Aroclor-1260	--	--	--	1.00E-02	2.67E-03	Exceeds	Exceeds
Total PCB Congeners	3/3	6.20E-04	6.20E-04	4.50E-02	1.02E-02	Exceeds	Exceeds
Total PCB Aroclors	--	--	--	1.76E-02	6.23E-03	Exceeds	Exceeds
PESTICIDES							
DDTr	10/10	2.91E-01	1.49E-01	8.14E-02	2.10E-02	--	--
alpha-Chlordane	--	--	--	2.30E-03	2.30E-03	Exceeds	Exceeds
Dieldrin	--	--	--	1.40E-02	1.40E-02	Exceeds	Exceeds
Endosulfan I	--	--	--	7.50E-04	7.50E-04	Exceeds	Exceeds
Endosulfan II	--	--	--	1.70E-02	2.36E-03	Exceeds	Exceeds
Endosulfan sulfate	--	--	--	1.30E-02	1.30E-02	Exceeds	Exceeds
Endrin	--	--	--	6.90E-03	6.90E-03	Exceeds	Exceeds
Endrin aldehyde	--	--	--	3.50E-02	4.14E-03	Exceeds	Exceeds
Endrin ketone	--	--	--	2.10E-03	2.10E-03	Exceeds	Exceeds
gamma-Chlordane	--	--	--	1.40E-03	1.40E-03	Exceeds	Exceeds
Heptachlor epoxide	--	--	--	1.10E-03	1.10E-03	Exceeds	Exceeds
Methoxychlor	--	--	--	1.10E-02	1.10E-02	Exceeds	Exceeds
Toxaphene	--	--	--	5.60E-01	5.60E-01	Exceeds	Exceeds
SVOCS							
Bis(2-ethylhexyl)phthalate	--	--	--	5.20E+00	4.75E-01	Exceeds	Exceeds
Butylbenzylphthalate	--	--	--	4.70E-01	4.70E-01	Exceeds	Exceeds
VOCS							
Acetone	--	--	--	1.71E-02	1.35E-02	Exceeds	Exceeds
Methylene chloride	--	--	--	3.60E-03	3.52E-03	Exceeds	Exceeds

Table 9-12

Comparison of Reference Sediment Concentrations to Sediment Concentrations for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Reference Sediment Concentrations Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Sediment for Exposure Area 5: Lined Canals, Reservoirs, and Soil			Maximum Exposure Area 5 Concentration Exceeds Reference 95UPL?	95UCLM Exposure Area 5 Concentration Exceeds Reference 95UCLM?
	Frequency of detection	Sediment 95UCLM (mg/kg)	Sediment Maximum Concentration (mg/kg)	95UPL (mg/kg)	Frequency of detection	95UCLM (mg/kg)	Sediment Maximum (mg/kg)		
Metals									
Aluminum	25 / 25	1.31E+04	2.40E+04	2.12E+04	18/18	2.67E+04	6.74E+04	Exceeds	Exceeds
Arsenic	25 / 25	4.13E+00	6.60E+00	6.30E+00	18/18	7.65E+00	2.51E+01	Exceeds	Exceeds
Barium	25 / 25	1.57E+02	2.55E+02	2.18E+02	18/18	1.77E+02	2.14E+02	--	--
Beryllium	9 / 25	6.20E-01	9.80E-01	9.80E-01	6/18	8.95E-01	1.00E+00	Exceeds	--
Cadmium	16 / 25	3.79E-01	4.90E-01	4.90E-01	18/18	4.25E-01	5.10E-01	Exceeds	--
Calcium	25 / 25	7.11E+04	1.00E+05	9.18E+04	18/18	1.24E+05	2.11E+05	Exceeds	Exceeds
Cobalt	25 / 25	5.13E+00	7.20E+00	6.70E+00	18/18	5.73E+00	6.60E+00	--	--
Copper	23 / 25	8.83E+00	1.69E+01	1.45E+01	18/18	4.62E+03	7.59E+03	Exceeds	Exceeds
Iron	25 / 25	1.46E+04	2.19E+04	1.92E+04	18/18	1.92E+04	2.34E+04	Exceeds	--
Lead	25 / 25	8.42E+00	1.37E+01	1.20E+01	18/18	1.84E+01	4.09E+01	Exceeds	Exceeds
Magnesium	25 / 25	4.94E+03	8.35E+03	7.01E+03	18/18	7.13E+03	9.00E+03	Exceeds	--
Manganese	25 / 25	4.23E+02	1.18E+03	8.36E+02	18/18	4.40E+02	5.09E+02	--	--
Mercury	24 / 25	4.63E-02	2.20E-01	1.70E-01	17/18	4.33E-02	6.00E-02	--	--
Nickel	25 / 25	9.38E+00	1.49E+01	1.33E+01	18/18	1.18E+01	1.45E+01	Exceeds	--
Potassium	23 / 25	3.03E+03	5.62E+03	4.81E+03	18/18	4.70E+03	6.03E+03	Exceeds	--
Selenium	0 / 25	--	--	--	13/18	3.57E-01	4.80E-01	Exceeds	Exceeds
Sodium	15 / 25	9.68E+02	2.12E+03	1.86E+03	16/18	8.44E+02	1.18E+03	--	--
Vanadium	25 / 25	1.89E+01	2.85E+01	2.69E+01	18/18	2.47E+01	3.58E+01	Exceeds	--
Zinc	25 / 25	4.04E+01	7.45E+01	6.70E+01	18/18	5.33E+01	6.95E+01	Exceeds	--
PCBS									
Aroclor-1254	0 / 44	--	--	--	15/33	6.08E-03	2.30E-02	Exceeds	Exceeds
Aroclor-1260	0 / 44	--	--	--	4/33	2.20E-03	2.80E-03	Exceeds	Exceeds
Total PCB Congeners	14 / 14	1.85E-03	1.20E-02	1.20E-02	10/10	1.32E-02	2.10E-02	Exceeds	Exceeds
Total PCB Aroclors	0 / 44	--	--	--	18/33	1.33E-02	2.30E-02	Exceeds	Exceeds
PESTICIDES									
DDTr	12 / 12	8.48E-03	5.40E-02	5.40E-02	16/19	4.51E-02	9.67E-02	Exceeds	--
Aldrin	0 / 27	--	--	--	1/19	6.50E-04	6.50E-04	Exceeds	Exceeds
alpha-BHC	0 / 27	--	--	--	2/19	6.70E-04	6.70E-04	Exceeds	Exceeds
alpha-Chlordane	0 / 27	--	--	--	3/19	1.30E-03	1.30E-03	Exceeds	Exceeds
Endrin	0 / 27	--	--	--	1/19	1.30E-03	1.30E-03	Exceeds	Exceeds
Endrin ketone	0 / 27	--	--	--	1/19	2.10E-02	2.10E-02	Exceeds	Exceeds
gamma-BHC (Lindane)	0 / 27	--	--	--	1/19	9.40E-04	9.40E-04	Exceeds	Exceeds

Table 9-12

Comparison of Reference Sediment Concentrations to Sediment Concentrations for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Chemical	Reference Sediment Concentrations Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Sediment for Exposure Area 5: Lined Canals, Reservoirs, and Soil			Maximum Exposure Area 5 Concentration Exceeds Reference 95UPL?	95UCLM Exposure Area 5 Concentration Exceeds Reference 95UCLM?
	Frequency of detection	Sediment 95UCLM (mg/kg)	Sediment Maximum Concentration (mg/kg)	95UPL (mg/kg)	Frequency of detection	95UCLM (mg/kg)	Sediment Maximum (mg/kg)		
gamma-Chlordane	0 / 27	--	--	--	7/19	1.98E-03	2.90E-03	Exceeds	Exceeds
Heptachlor	0 / 27	--	--	--	1/19	3.90E-03	3.90E-03	Exceeds	Exceeds
Heptachlor epoxide	0 / 27	--	--	--	6/19	1.53E-03	1.80E-03	Exceeds	Exceeds
Methoxychlor	0 / 27	--	--	--	1/19	3.00E-02	3.00E-02	Exceeds	Exceeds
PAHs									
Total LMW PAHs	1 / 27	2.95E-01	3.99E-01	3.99E-01	2/19	2.77E+01	2.77E+01	Exceeds	Exceeds
Total HMW PAHs	1 / 27	3.20E-01	3.20E-01	3.20E-01	3/19	2.38E+02	2.38E+02	Exceeds	Exceeds
SVOCS									
Bis(2-ethylhexyl)phthalate	9 / 27	1.84E-01	6.10E-01	4.00E-01	5/19	3.41E+00	8.10E+00	Exceeds	Exceeds
Butylbenzylphthalate	0 / 27	--	--	--	1/19	9.90E-01	9.90E-01	Exceeds	Exceeds
Carbazole	0 / 27	--	--	--	1/19	2.40E+00	2.40E+00	Exceeds	Exceeds
Dibenzofuran	0 / 27	--	--	--	1/19	3.50E-01	3.50E-01	Exceeds	Exceeds

Note:
HMW: High molecular weight
LMW: Low molecular weight
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
95UCL: 95 percent upper confidence limit
95UCLM: 95 percent upper confidence limit of the mean
95UPL: 95 percent upper prediction limit

Table 9-13

Comparison of Reference Surface Water Concentrations to Surface Water Concentrations for Exposure Area 5: Lined Canals, Reservoirs and Soil

Chemical	Reference Surface Water Concentrations Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Surface Water for Exposure Area 5: Lined Canals, Reservoirs, and Soil			Maximum Exposure Area 5 Concentration Exceeds Reference 95UPL?	95UCLM Exposure Area 5 Concentration Exceeds Reference 95UCLM?
	Frequency of detection	Surface Water Mean (ug/L)	Surface Water Maximum (ug/L)	95UPL (ug/L)	Frequency of detection	95UCLM (mg/kg)	Surface Maximum (ug/L)		
Metals									
Aluminum	11 / 11	9.20E+02	2.21E+03	2.21E+03	11/12	1.16E+03	1.86E+03	--	--
Arsenic	11 / 11	8.76E+00	1.51E+01	1.51E+01	12/12	4.90E+00	4.90E+00	--	--
Barium	11 / 11	1.26E+02	1.64E+02	1.64E+02	12/12	1.39E+02	1.54E+02	--	--
Calcium	11 / 11	1.23E+05	2.19E+05	2.19E+05	12/12	1.06E+05	1.90E+05	--	--
Copper	10 / 11	4.44E+00	9.20E+00	9.20E+00	12/12	1.19E+02	2.64E+02	Exceeds	Exceeds
Iron	10 / 11	8.20E+02	1.80E+03	1.80E+03	11/12	1.01E+03	1.55E+03	--	--
Lead	11 / 11	1.62E+00	4.30E+00	4.30E+00	10/12	1.35E+00	2.00E+00	--	--
Magnesium	11 / 11	4.17E+04	7.61E+04	7.61E+04	12/12	3.73E+04	5.63E+04	--	--
Manganese	11 / 11	1.53E+02	3.42E+02	3.42E+02	12/12	8.82E+01	1.15E+02	--	--
Nickel	11 / 11	2.41E+00	4.30E+00	4.30E+00	11/12	1.79E+00	2.30E+00	--	--
Potassium	11 / 11	8.93E+03	1.38E+04	1.38E+04	12/12	8.28E+03	1.22E+04	--	--
Selenium	5 / 11	1.96E+00	5.60E+00	5.60E+00	12/12	1.22E+00	1.80E+00	--	--
Sodium	11 / 11	2.55E+05	5.62E+05	5.62E+05	12/12	2.05E+05	3.34E+05	--	--
Vanadium	11 / 11	1.13E+01	1.58E+01	1.58E+01	12/12	1.00E+01	1.05E+01	--	--
Zinc	11 / 11	7.73E+00	1.86E+01	1.86E+01	12/12	5.43E+00	8.10E+00	--	--
PCBS									
Total PCB Congeners	13 / 13	3.34E-04	1.20E-03	1.20E-03	6/6	1.10E-02	1.10E-02	Exceeds	Exceeds
PESTICIDES									
DDTr	0 / 11	--	--	--	1/12	3.10E-02	3.10E-02	Exceeds	Exceeds
SVOCS									
Benzaldehyde	0 / 11	--	--	--	1/12	2.00E+00	2.00E+00	Exceeds	Exceeds
Bis(2-ethylhexyl)phthalate	3 / 11	1.52E+01	1.40E+02	1.40E+02	1/12	3.10E+00	3.10E+00	--	--
Caprolactam	0 / 11	--	--	--	1/12	3.10E+00	3.10E+00	Exceeds	Exceeds
VOCS									
Acetone	0 / 4	--	--	--	1/6	4.80E+00	4.80E+00	Exceeds	Exceeds
Bromodichloromethane	0 / 4	--	--	--	1/6	3.40E+00	3.40E+00	Exceeds	Exceeds
Bromoform	0 / 4	--	--	--	1/6	3.60E+00	3.60E+00	Exceeds	Exceeds
Chloroform	0 / 4	--	--	--	1/6	2.10E+00	2.10E+00	Exceeds	Exceeds
Dibromochloromethane	0 / 4	--	--	--	1/6	4.20E+00	4.20E+00	Exceeds	Exceeds

Note:
HMW: High molecular weight 95UCL: 95 percent upper confidence limit

Table 9-13

Comparison of Reference Surface Water Concentrations to Surface Water Concentrations for Exposure Area 5: Lined Canals, Reservoirs and Soil

Chemical	Reference Surface Water Concentrations Combined Data from Exposure Area 1: Upstream of the Siphon and Exposure Area 2: Arroyo Colorado				Concentrations in Surface Water for Exposure Area 5: Lined Canals, Reservoirs, and Soil			Maximum Exposure Area 5 Concentration Exceeds Reference 95UPL?	95UCLM Exposure Area 5 Concentration Exceeds Reference 95UCLM?
	Frequency of detection	Surface Water Mean (ug/L)	Surface Water Maximum (ug/L)	95UPL (ug/L)	Frequency of detection	95UCLM (mg/kg)	Surface Maximum (ug/L)		

LMW: Low molecular weight
PAH: Polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
95UCLM: 95 percent upper confidence limit of the mean
95UPL: 95 percent upper prediction limit

Appendix A

Supplemental Tables

Table A-1
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

			Food Item (Plant) Uptake		Maximum Case Scenario Doses			
Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.66E+02	1.40E-01	1.50E-01	2.49E+01	1.05E-01	1.93E-01	6.20E-03	3.05E-01
Beryllium	7.10E-01	0.00E+00	1.00E-02	7.10E-03	4.51E-04	5.50E-05	0.00E+00	5.06E-04
Lead	9.00E+00	1.40E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	9.09E-01	5.72E-03	7.05E-03	6.20E-05	1.28E-02
Vanadium	1.98E+01	9.60E-03	5.50E-03	1.09E-01	1.26E-02	8.44E-04	4.25E-04	1.39E-02
PCBS								
Aroclor-1260	7.40E-04	0.00E+00	6.44E-04	4.76E-07	4.70E-07	3.69E-09	0.00E+00	4.74E-07
Total PCB Congeners	7.70E-03	4.40E-07	8.44E-03	6.50E-05	4.89E-06	5.04E-07	1.95E-08	5.42E-06
Total PCB Aroclors	7.40E-04	0.00E+00	8.44E-03	6.25E-06	4.70E-07	4.84E-08	0.00E+00	5.19E-07
PESTICIDES								
DDTr	5.40E-02	0.00E+00	1.97E-02	1.06E-03	3.43E-05	8.24E-06	0.00E+00	4.26E-05
SVOCS								
Bis(2-ethylhexyl)phthalate	6.10E-01	0.00E+00	5.48E-04	3.34E-04	3.88E-04	2.59E-06	0.00E+00	3.90E-04
Phenol	6.70E-02	0.00E+00	5.19E+00	3.48E-01	4.26E-05	2.70E-03	0.00E+00	2.74E-03
VOCS								
Acetophenone	8.30E-02	0.00E+00	4.18E+00	3.47E-01	5.27E-05	2.69E-03	0.00E+00	2.74E-03

Table A-2
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.66E+02	1.40E-01	1.50E-01	2.49E+01	1.05E-01	1.93E-01	6.20E-03	3.05E-01
Beryllium	7.10E-01	0.00E+00	1.00E-02	7.10E-03	4.51E-04	5.50E-05	0.00E+00	5.06E-04
Lead	7.80E+00	1.40E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	8.39E-01	4.96E-03	6.50E-03	6.20E-05	1.15E-02
Vanadium	1.71E+01	9.60E-03	5.50E-03	9.42E-02	1.09E-02	7.30E-04	4.25E-04	1.20E-02
PCBS								
Aroclor-1260	7.40E-04	0.00E+00	6.44E-04	4.76E-07	4.70E-07	3.69E-09	0.00E+00	4.74E-07
Total PCB Congeners	3.27E-03	3.45E-07	8.44E-03	2.76E-05	2.08E-06	2.14E-07	1.52E-08	2.31E-06
Total PCB Aroclors	7.40E-04	0.00E+00	8.44E-03	6.25E-06	4.70E-07	4.84E-08	0.00E+00	5.19E-07
PESTICIDES								
DDTr	5.40E-02	0.00E+00	1.97E-02	1.06E-03	3.43E-05	8.24E-06	0.00E+00	4.26E-05
SVOCS								
Bis(2-ethylhexyl)phthalate	3.00E-01	0.00E+00	5.48E-04	1.64E-04	1.91E-04	1.27E-06	0.00E+00	1.92E-04
Phenol	6.70E-02	0.00E+00	5.19E+00	3.48E-01	4.26E-05	2.70E-03	0.00E+00	2.74E-03
VOCS								
Acetophenone	7.41E-02	0.00E+00	4.18E+00	3.09E-01	4.71E-05	2.40E-03	0.00E+00	2.44E-03

Table A-3
Wildlife Exposure Modeling of Maximum Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.66E+02	1.40E-01	--	1.00E+00	Uptake Factor	1.66E+02	modeled	1.46E+00	8.09E+00	7.98E-03	9.56E+00
Beryllium	7.10E-01	0.00E+00	--	1.00E+00	Uptake Factor	7.10E-01	modeled	6.26E-03	3.46E-02	0.00E+00	4.09E-02
Lead	9.00E+00	1.40E-03	--	6.60E-02	Uptake Factor	5.94E-01	modeled	7.93E-02	2.90E-02	7.98E-05	1.08E-01
Vanadium	1.98E+01	9.60E-03	--	1.00E+00	Uptake Factor	1.98E+01	modeled	1.74E-01	9.65E-01	5.47E-04	1.14E+00
PCBS											
Aroclor-1260	7.40E-04	0.00E+00	--	3.38E+00	BSAF	3.00E-02	modeled	6.52E-06	1.46E-03	0.00E+00	1.47E-03
Total PCB Congeners	7.70E-03	4.40E-07	--	3.38E+00	BSAF	3.12E-01	modeled	6.78E-05	1.52E-02	2.51E-08	1.53E-02
Total PCB Aroclors	7.40E-04	0.00E+00	--	3.38E+00	BSAF	3.00E-02	modeled	6.52E-06	1.46E-03	0.00E+00	1.47E-03
PESTICIDES											
DDTr	5.40E-02	0.00E+00	--	5.22E+00	BSAF	3.38E+00	modeled	4.76E-04	1.65E-01	0.00E+00	1.65E-01
SVOCS											
Bis(2-ethylhexyl)phthalate	6.10E-01	0.00E+00	--	4.00E+00	BSAF	2.93E+01	modeled	5.38E-03	1.43E+00	0.00E+00	1.43E+00
Phenol	6.70E-02	0.00E+00	--	4.00E+00	BSAF	3.22E+00	modeled	5.90E-04	1.57E-01	0.00E+00	1.57E-01
VOCS											
Acetophenone	8.30E-02	0.00E+00	--	4.00E+00	BSAF	3.98E+00	modeled	7.31E-04	1.94E-01	0.00E+00	1.95E-01

Table A-4
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media
for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.66E+02	1.40E-01	--	1.00E+00	Uptake Factor	1.66E+02	modeled	1.46E+00	8.09E+00	7.98E-03	9.56E+00
Beryllium	7.10E-01	0.00E+00	--	1.00E+00	Uptake Factor	7.10E-01	modeled	6.26E-03	3.46E-02	0.00E+00	4.09E-02
Lead	7.80E+00	1.40E-03	--	6.60E-02	Uptake Factor	5.15E-01	modeled	6.87E-02	2.51E-02	7.98E-05	9.39E-02
Vanadium	1.71E+01	9.60E-03	--	1.00E+00	Uptake Factor	1.71E+01	modeled	1.51E-01	8.35E-01	5.47E-04	9.86E-01
PCBS											
Aroclor-1260	7.40E-04	0.00E+00	--	3.38E+00	BSAF	3.00E-02	modeled	6.52E-06	1.46E-03	0.00E+00	1.47E-03
Total PCB Congeners	3.27E-03	3.45E-07	--	3.38E+00	BSAF	1.32E-01	modeled	2.88E-05	6.46E-03	1.96E-08	6.49E-03
Total PCB Aroclors	7.40E-04	0.00E+00	--	3.38E+00	BSAF	3.00E-02	modeled	6.52E-06	1.46E-03	0.00E+00	1.47E-03
PESTICIDES											
DDTr	5.40E-02	0.00E+00	--	5.22E+00	BSAF	3.38E+00	modeled	4.76E-04	1.65E-01	0.00E+00	1.65E-01
SVOCS											
Bis(2-ethylhexyl)phthalate	3.00E-01	0.00E+00	--	4.00E+00	BSAF	1.44E+01	modeled	2.64E-03	7.02E-01	0.00E+00	7.05E-01
Phenol	6.70E-02	0.00E+00	--	4.00E+00	BSAF	3.22E+00	modeled	5.90E-04	1.57E-01	0.00E+00	1.57E-01
VOCS											
Acetophenone	7.41E-02	0.00E+00	--	4.00E+00	BSAF	3.56E+00	modeled	6.53E-04	1.73E-01	0.00E+00	1.74E-01

Table A-5
Wildlife Exposure Modeling of Maximum Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.66E+02	1.40E-01	7.20E+00	1.60E+01	2.24E+00	actual	4.15E-01	9.00E-01	1.54E-02	1.33E+00
Beryllium	7.10E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	1.78E-03	0.00E+00	0.00E+00	1.78E-03
Lead	9.00E+00	1.40E-03	1.48E-01	1.80E+02	2.52E-01	actual	2.25E-02	1.85E-02	1.54E-04	4.12E-02
Vanadium	1.98E+01	9.60E-03	2.24E+00	4.00E+00	3.84E-02	actual	4.95E-02	2.80E-01	1.06E-03	3.31E-01
PCBS										
Aroclor-1260	7.40E-04	0.00E+00	--	1.10E+05	0.00E+00	modeled	1.85E-06	0.00E+00	0.00E+00	1.85E-06
Total PCB Congeners	7.70E-03	4.40E-07	--	1.01E+05	4.45E-02	modeled	1.93E-05	5.57E-03	4.84E-08	5.59E-03
Total PCB Aroclors	7.40E-04	0.00E+00	--	1.01E+05	0.00E+00	modeled	1.85E-06	0.00E+00	0.00E+00	1.85E-06
PESTICIDES										
DDTr	5.40E-02	0.00E+00	3.98E-01	6.74E+04	0.00E+00	actual	1.35E-04	4.97E-02	0.00E+00	4.99E-02
SVOCS										
Bis(2-ethylhexyl)phthalate	6.10E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	1.53E-03	0.00E+00	0.00E+00	1.53E-03
Phenol	6.70E-02	0.00E+00	4.80E-02	1.71E+01	0.00E+00	actual	1.68E-04	6.00E-03	0.00E+00	6.17E-03
VOCS										
Acetophenone	8.30E-02	0.00E+00	--	5.33E+00	0.00E+00	modeled	2.08E-04	0.00E+00	0.00E+00	2.08E-04

Table A-6
Wildlife Exposure Modeling of 95UCLM Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.66E+02	1.40E-01	7.20E+00	1.60E+01	2.24E+00	actual	4.15E-01	9.00E-01	1.54E-02	1.33E+00
Beryllium	7.10E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	1.78E-03	0.00E+00	0.00E+00	1.78E-03
Lead	7.80E+00	1.40E-03	1.48E-01	1.80E+02	2.52E-01	actual	1.95E-02	1.85E-02	1.54E-04	3.82E-02
Vanadium	1.71E+01	9.60E-03	2.24E+00	4.00E+00	3.84E-02	actual	4.28E-02	2.80E-01	1.06E-03	3.24E-01
PCBS										
Aroclor-1260	7.40E-04	0.00E+00	--	1.10E+05	0.00E+00	modeled	1.85E-06	0.00E+00	0.00E+00	1.85E-06
Total PCB Congeners	3.27E-03	3.45E-07	--	1.01E+05	3.49E-02	modeled	8.18E-06	4.36E-03	3.79E-08	4.37E-03
Total PCB Aroclors	7.40E-04	0.00E+00	--	1.01E+05	0.00E+00	modeled	1.85E-06	0.00E+00	0.00E+00	1.85E-06
PESTICIDES										
DDTr	5.40E-02	0.00E+00	3.98E-01	6.74E+04	0.00E+00	actual	1.35E-04	4.97E-02	0.00E+00	4.99E-02
SVOCS										
Bis(2-ethylhexyl)phthalate	3.00E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	7.50E-04	0.00E+00	0.00E+00	7.50E-04
Phenol	6.70E-02	0.00E+00	4.80E-02	1.71E+01	0.00E+00	actual	1.68E-04	6.00E-03	0.00E+00	6.17E-03
VOCS										
Acetophenone	7.41E-02	0.00E+00	--	5.33E+00	0.00E+00	modeled	1.85E-04	0.00E+00	0.00E+00	1.85E-04

Table A-7
Wildlife Exposure Modeling of Maximum Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.66E+02	1.40E-01	7.20E+00	1.60E+01	2.24E+00	actual	1.49E-01	3.24E-01	6.30E-03	4.80E-01
Beryllium	7.10E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	6.39E-04	0.00E+00	0.00E+00	6.39E-04
Lead	9.00E+00	1.40E-03	1.48E-01	1.80E+02	2.52E-01	actual	8.10E-03	6.66E-03	6.30E-05	1.48E-02
Vanadium	1.98E+01	9.60E-03	2.24E+00	4.00E+00	3.84E-02	actual	1.78E-02	1.01E-01	4.32E-04	1.19E-01
PCBS										
Aroclor-1260	7.40E-04	0.00E+00	--	1.10E+05	0.00E+00	modeled	6.66E-07	0.00E+00	0.00E+00	6.66E-07
Total PCB Congeners	7.70E-03	4.40E-07	--	1.01E+05	4.45E-02	modeled	6.93E-06	2.00E-03	1.98E-08	2.01E-03
Total PCB Aroclors	7.40E-04	0.00E+00	--	1.01E+05	0.00E+00	modeled	6.66E-07	0.00E+00	0.00E+00	6.66E-07
PESTICIDES										
DDTr	5.40E-02	0.00E+00	3.98E-01	6.74E+04	0.00E+00	actual	4.86E-05	1.79E-02	0.00E+00	1.79E-02
SVOCS										
Bis(2-ethylhexyl)phthalate	6.10E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	5.49E-04	0.00E+00	0.00E+00	5.49E-04
Phenol	6.70E-02	0.00E+00	4.80E-02	1.71E+01	0.00E+00	actual	6.03E-05	2.16E-03	0.00E+00	2.22E-03
VOCS										
Acetophenone	8.30E-02	0.00E+00	--	5.33E+00	0.00E+00	modeled	7.47E-05	0.00E+00	0.00E+00	7.47E-05

Table A-8
Wildlife Exposure Modeling of 95UCLM Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.66E+02	1.40E-01	7.20E+00	1.60E+01	2.24E+00	actual	1.49E-01	3.24E-01	6.30E-03	4.80E-01
Beryllium	7.10E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	6.39E-04	0.00E+00	0.00E+00	6.39E-04
Lead	7.80E+00	1.40E-03	1.48E-01	1.80E+02	2.52E-01	actual	7.02E-03	6.66E-03	6.30E-05	1.37E-02
Vanadium	1.71E+01	9.60E-03	2.24E+00	4.00E+00	3.84E-02	actual	1.54E-02	1.01E-01	4.32E-04	1.17E-01
PCBS										
Aroclor-1260	7.40E-04	0.00E+00	--	1.10E+05	0.00E+00	modeled	6.66E-07	0.00E+00	0.00E+00	6.66E-07
Total PCB Congeners	3.27E-03	3.45E-07	--	1.01E+05	3.49E-02	modeled	2.94E-06	1.57E-03	1.55E-08	1.57E-03
Total PCB Aroclors	7.40E-04	0.00E+00	--	1.01E+05	0.00E+00	modeled	6.66E-07	0.00E+00	0.00E+00	6.66E-07
PESTICIDES										
DDTr	5.40E-02	0.00E+00	3.98E-01	6.74E+04	0.00E+00	actual	4.86E-05	1.79E-02	0.00E+00	1.79E-02
SVOCS										
Bis(2-ethylhexyl)phthalate	3.00E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	2.70E-04	0.00E+00	0.00E+00	2.70E-04
Phenol	6.70E-02	0.00E+00	4.80E-02	1.71E+01	0.00E+00	actual	6.03E-05	2.16E-03	0.00E+00	2.22E-03
VOCS										
Acetophenone	7.41E-02	0.00E+00	--	5.33E+00	0.00E+00	modeled	6.67E-05	0.00E+00	0.00E+00	6.67E-05

Table A-9
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.66E+02	1.40E-01	1.50E-01	2.49E+01	1.41E-01	1.06E+00	1.37E-01	1.33E+00
Beryllium	7.10E-01	0.00E+00	1.00E-02	7.10E-03	6.02E-04	3.01E-04	0.00E+00	9.03E-04
Lead	9.00E+00	1.40E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	9.09E-01	7.63E-03	3.86E-02	1.37E-03	4.76E-02
Vanadium	1.98E+01	9.60E-03	5.50E-03	1.09E-01	1.68E-02	4.62E-03	9.36E-03	3.08E-02
PCBS								
Aroclor-1260	7.40E-04	0.00E+00	6.44E-04	4.76E-07	6.28E-07	2.02E-08	0.00E+00	6.48E-07
Total PCB Congeners	7.70E-03	4.40E-07	8.44E-03	6.50E-05	6.53E-06	2.76E-06	4.29E-07	9.72E-06
Total PCB Aroclors	7.40E-04	0.00E+00	8.44E-03	6.25E-06	6.28E-07	2.65E-07	0.00E+00	8.93E-07
PESTICIDES								
DDTr	5.40E-02	0.00E+00	1.97E-02	1.06E-03	4.58E-05	4.51E-05	0.00E+00	9.09E-05
SVOCS								
Bis(2-ethylhexyl)phthalate	6.10E-01	0.00E+00	5.48E-04	3.34E-04	5.17E-04	1.42E-05	0.00E+00	5.32E-04
Phenol	6.70E-02	0.00E+00	5.19E+00	3.48E-01	5.68E-05	1.47E-02	0.00E+00	1.48E-02
VOCS								
Acetophenone	8.30E-02	0.00E+00	4.18E+00	3.47E-01	7.04E-05	1.47E-02	0.00E+00	1.48E-02

Table A-10
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.66E+02	1.40E-01	1.50E-01	2.49E+01	1.41E-01	1.06E+00	1.37E-01	1.33E+00
Beryllium	7.10E-01	0.00E+00	1.00E-02	7.10E-03	6.02E-04	3.01E-04	0.00E+00	9.03E-04
Lead	7.80E+00	1.40E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	8.39E-01	6.62E-03	3.56E-02	1.37E-03	4.36E-02
Vanadium	1.71E+01	9.60E-03	5.50E-03	9.42E-02	1.45E-02	3.99E-03	9.36E-03	2.79E-02
PCBS								
Aroclor-1260	7.40E-04	0.00E+00	6.44E-04	4.76E-07	6.28E-07	2.02E-08	0.00E+00	6.48E-07
Total PCB Congeners	3.27E-03	3.45E-07	8.44E-03	2.76E-05	2.77E-06	1.17E-06	3.36E-07	4.28E-06
Total PCB Aroclors	7.40E-04	0.00E+00	8.44E-03	6.25E-06	6.28E-07	2.65E-07	0.00E+00	8.93E-07
PESTICIDES								
DDTr	5.40E-02	0.00E+00	1.97E-02	1.06E-03	4.58E-05	4.51E-05	0.00E+00	9.09E-05
SVOCS								
Bis(2-ethylhexyl)phthalate	3.00E-01	0.00E+00	5.48E-04	1.64E-04	2.54E-04	6.97E-06	0.00E+00	2.61E-04
Phenol	6.70E-02	0.00E+00	5.19E+00	3.48E-01	5.68E-05	1.47E-02	0.00E+00	1.48E-02
VOCS								
Acetophenone	7.41E-02	0.00E+00	4.18E+00	3.09E-01	6.29E-05	1.31E-02	0.00E+00	1.32E-02

Table A-11
Wildlife Exposure Modeling of Maximum Doses to Aquatic Carnivorous Mammals (Raccoon) from Media
for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.66E+02	1.40E-01	--	1.00E+00	Uptake Factor	1.66E+02	modeled	7.49E-01	7.97E+00	1.16E-02	8.73E+00
Beryllium	7.10E-01	0.00E+00	--	1.00E+00	Uptake Factor	7.10E-01	modeled	3.20E-03	3.41E-02	0.00E+00	3.73E-02
Lead	9.00E+00	1.40E-03	--	6.60E-02	Uptake Factor	5.94E-01	modeled	4.06E-02	2.85E-02	1.16E-04	6.92E-02
Vanadium	1.98E+01	9.60E-03	--	1.00E+00	Uptake Factor	1.98E+01	modeled	8.93E-02	9.50E-01	7.92E-04	1.04E+00
PCBS											
Aroclor-1260	7.40E-04	0.00E+00	--	3.38E+00	BSAF	3.00E-02	modeled	3.34E-06	1.44E-03	0.00E+00	1.44E-03
Total PCB Congeners	7.70E-03	4.40E-07	--	3.38E+00	BSAF	3.12E-01	modeled	3.47E-05	1.50E-02	3.63E-08	1.50E-02
Total PCB Aroclors	7.40E-04	0.00E+00	--	3.38E+00	BSAF	3.00E-02	modeled	3.34E-06	1.44E-03	0.00E+00	1.44E-03
PESTICIDES											
DDTr	5.40E-02	0.00E+00	--	5.22E+00	BSAF	3.38E+00	modeled	2.44E-04	1.62E-01	0.00E+00	1.63E-01
SVOCS											
Bis(2-ethylhexyl)phthalate	6.10E-01	0.00E+00	--	4.00E+00	BSAF	2.93E+01	modeled	2.75E-03	1.41E+00	0.00E+00	1.41E+00
Phenol	6.70E-02	0.00E+00	--	4.00E+00	BSAF	3.22E+00	modeled	3.02E-04	1.54E-01	0.00E+00	1.55E-01
VOCS											
Acetophenone	8.30E-02	0.00E+00	--	4.00E+00	BSAF	3.98E+00	modeled	3.74E-04	1.91E-01	0.00E+00	1.92E-01

Table A-12
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Carnivorous Mammals (Raccoon) from Media
for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.66E+02	1.40E-01	--	1.00E+00	Uptake Factor	1.66E+02	modeled	7.49E-01	7.97E+00	1.16E-02	8.73E+00
Beryllium	7.10E-01	0.00E+00	--	1.00E+00	Uptake Factor	7.10E-01	modeled	3.20E-03	3.41E-02	0.00E+00	3.73E-02
Lead	7.80E+00	1.40E-03	--	6.60E-02	Uptake Factor	5.15E-01	modeled	3.52E-02	2.47E-02	1.16E-04	6.00E-02
Vanadium	1.71E+01	9.60E-03	--	1.00E+00	Uptake Factor	1.71E+01	modeled	7.72E-02	8.22E-01	7.92E-04	9.00E-01
PCBS											
Aroclor-1260	7.40E-04	0.00E+00	--	3.38E+00	BSAF	3.00E-02	modeled	3.34E-06	1.44E-03	0.00E+00	1.44E-03
Total PCB Congeners	3.27E-03	3.45E-07	--	3.38E+00	BSAF	1.32E-01	modeled	1.48E-05	6.36E-03	2.84E-08	6.37E-03
Total PCB Aroclors	7.40E-04	0.00E+00	--	3.38E+00	BSAF	3.00E-02	modeled	3.34E-06	1.44E-03	0.00E+00	1.44E-03
PESTICIDES											
DDTr	5.40E-02	0.00E+00	--	5.22E+00	BSAF	3.38E+00	modeled	2.44E-04	1.62E-01	0.00E+00	1.63E-01
SVOCS											
Bis(2-ethylhexyl)phthalate	3.00E-01	0.00E+00	--	4.00E+00	BSAF	1.44E+01	modeled	1.35E-03	6.91E-01	0.00E+00	6.93E-01
Phenol	6.70E-02	0.00E+00	--	4.00E+00	BSAF	3.22E+00	modeled	3.02E-04	1.54E-01	0.00E+00	1.55E-01
VOCS											
Acetophenone	7.41E-02	0.00E+00	--	4.00E+00	BSAF	3.56E+00	modeled	3.34E-04	1.71E-01	0.00E+00	1.71E-01

Table A-13
Wildlife Exposure Modeling of Maximum Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.66E+02	1.40E-01	7.20E+00	1.60E+01	2.24E+00	actual	1.59E-01	3.46E-01	1.13E-02	5.16E-01
Beryllium	7.10E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	6.82E-04	0.00E+00	0.00E+00	6.82E-04
Lead	9.00E+00	1.40E-03	1.48E-01	1.80E+02	2.52E-01	actual	8.64E-03	7.10E-03	1.13E-04	1.59E-02
Vanadium	1.98E+01	9.60E-03	2.24E+00	4.00E+00	3.84E-02	actual	1.90E-02	1.08E-01	7.78E-04	1.27E-01
PCBS										
Aroclor-1260	7.40E-04	0.00E+00	--	1.10E+05	0.00E+00	modeled	7.10E-07	0.00E+00	0.00E+00	7.10E-07
Total PCB Congeners	7.70E-03	4.40E-07	--	1.01E+05	4.45E-02	modeled	7.39E-06	2.14E-03	3.56E-08	2.14E-03
Total PCB Aroclors	7.40E-04	0.00E+00	--	1.01E+05	0.00E+00	modeled	7.10E-07	0.00E+00	0.00E+00	7.10E-07
PESTICIDES										
DDTr	5.40E-02	0.00E+00	3.98E-01	6.74E+04	0.00E+00	actual	5.18E-05	1.91E-02	0.00E+00	1.91E-02
SVOCS										
Bis(2-ethylhexyl)phthalate	6.10E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	5.86E-04	0.00E+00	0.00E+00	5.86E-04
Phenol	6.70E-02	0.00E+00	4.80E-02	1.71E+01	0.00E+00	actual	6.43E-05	2.30E-03	0.00E+00	2.37E-03
VOCS										
Acetophenone	8.30E-02	0.00E+00	--	5.33E+00	0.00E+00	modeled	7.97E-05	0.00E+00	0.00E+00	7.97E-05

Table A-14
Wildlife Exposure Modeling of 95UCLM Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 1: Upstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	95UCLM Water Total Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.66E+02	1.40E-01	7.20E+00	1.60E+01	2.24E+00	actual	1.59E-01	3.46E-01	1.13E-02	5.16E-01
Beryllium	7.10E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	6.82E-04	0.00E+00	0.00E+00	6.82E-04
Lead	7.80E+00	1.40E-03	1.48E-01	1.80E+02	2.52E-01	actual	7.49E-03	7.10E-03	1.13E-04	1.47E-02
Vanadium	1.71E+01	9.60E-03	2.24E+00	4.00E+00	3.84E-02	actual	1.64E-02	1.08E-01	7.78E-04	1.25E-01
PCBS										
Aroclor-1260	7.40E-04	0.00E+00	--	1.10E+05	0.00E+00	modeled	7.10E-07	0.00E+00	0.00E+00	7.10E-07
Total PCB Congeners	3.27E-03	3.45E-07	--	1.01E+05	3.49E-02	modeled	3.14E-06	1.67E-03	2.79E-08	1.68E-03
Total PCB Aroclors	7.40E-04	0.00E+00	--	1.01E+05	0.00E+00	modeled	7.10E-07	0.00E+00	0.00E+00	7.10E-07
PESTICIDES										
DDTr	5.40E-02	0.00E+00	3.98E-01	6.74E+04	0.00E+00	actual	5.18E-05	1.91E-02	0.00E+00	1.91E-02
SVOCS										
Bis(2-ethylhexyl)phthalate	3.00E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	2.88E-04	0.00E+00	0.00E+00	2.88E-04
Phenol	6.70E-02	0.00E+00	4.80E-02	1.71E+01	0.00E+00	actual	6.43E-05	2.30E-03	0.00E+00	2.37E-03
VOCS										
Acetophenone	7.41E-02	0.00E+00	--	5.33E+00	0.00E+00	modeled	7.11E-05	0.00E+00	0.00E+00	7.11E-05

Table A-15
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	2.55E+02	1.64E-01	1.50E-01	3.83E+01	1.62E-01	2.96E-01	7.26E-03	4.66E-01
Beryllium	9.80E-01	0.00E+00	1.00E-02	9.80E-03	6.23E-04	7.60E-05	0.00E+00	6.99E-04
Cadmium	4.90E-01	1.70E-04	ln(dry plant conc, mg/kg) = (-0.476+0.546*ln(soil conc))	4.21E-01	3.11E-04	3.26E-03	7.52E-06	3.58E-03
Copper	1.69E+01	9.20E-03	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	5.95E+00	1.07E-02	4.61E-02	4.07E-04	5.72E-02
Lead	1.37E+01	4.30E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.15E+00	8.71E-03	8.92E-03	1.90E-04	1.78E-02
Manganese	1.18E+03	3.42E-01	2.50E-01	2.95E+02	7.50E-01	2.29E+00	1.51E-02	3.05E+00
Mercury	2.20E-01	6.00E-05	ln(dry plant conc, mg/kg) = (-0.996+0.544*ln(soil conc))	1.62E-01	1.40E-04	1.26E-03	2.66E-06	1.40E-03
Selenium	0.00E+00	5.60E-03	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	0.00E+00	0.00E+00	0.00E+00	2.48E-04	2.48E-04
Vanadium	2.85E+01	1.58E-02	5.50E-03	1.57E-01	1.81E-02	1.21E-03	6.99E-04	2.00E-02
PCBS								
Aroclor-1260	5.60E-03	0.00E+00	6.44E-04	3.61E-06	3.56E-06	2.79E-08	0.00E+00	3.59E-06
Total PCB Congeners	1.20E-02	1.20E-06	8.44E-03	1.01E-04	7.63E-06	7.85E-07	5.31E-08	8.46E-06
Total PCB Aroclors	5.60E-03	0.00E+00	8.44E-03	4.73E-05	3.56E-06	3.66E-07	0.00E+00	3.93E-06
PESTICIDES								
DDTr	1.30E-02	0.00E+00	1.97E-02	2.56E-04	8.26E-06	1.98E-06	0.00E+00	1.02E-05
VOCS								
Acetophenone	0.00E+00	2.10E-03	4.18E+00	0.00E+00	0.00E+00	0.00E+00	9.29E-05	9.29E-05

Table A-16
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Birds (Canada Goose) from Media
for Exposure Area 2: Arroyo Colorado

Exposure Parameters		
Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.98E+02	1.41E-01	1.50E-01	2.97E+01	1.26E-01	2.30E-01	6.22E-03	3.62E-01
Beryllium	7.85E-01	0.00E+00	1.00E-02	7.85E-03	4.99E-04	6.08E-05	0.00E+00	5.60E-04
Cadmium	4.14E-01	1.70E-04	ln(dry plant conc, mg/kg) = (-0.476+0.546*ln(soil conc))	3.84E-01	2.63E-04	2.97E-03	7.52E-06	3.25E-03
Copper	1.26E+01	7.47E-03	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	5.30E+00	8.03E-03	4.11E-02	3.30E-04	4.95E-02
Lead	1.07E+01	2.82E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	9.99E-01	6.77E-03	7.74E-03	1.25E-04	1.46E-02
Manganese	6.82E+02	2.52E-01	2.50E-01	1.70E+02	4.33E-01	1.32E+00	1.12E-02	1.76E+00
Mercury	1.12E-01	6.00E-05	ln(dry plant conc, mg/kg) = (-0.996+0.544*ln(soil conc))	1.12E-01	7.12E-05	8.70E-04	2.66E-06	9.44E-04
Selenium	0.00E+00	5.60E-03	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	0.00E+00	0.00E+00	0.00E+00	2.48E-04	2.48E-04
Vanadium	2.37E+01	1.43E-02	5.50E-03	1.31E-01	1.51E-02	1.01E-03	6.33E-04	1.67E-02
PCBS								
Aroclor-1260	4.58E-03	0.00E+00	6.44E-04	2.95E-06	2.91E-06	2.29E-08	0.00E+00	2.93E-06
Total PCB Congeners	1.20E-02	1.20E-06	8.44E-03	1.01E-04	7.63E-06	7.85E-07	5.31E-08	8.46E-06
Total PCB Aroclors	4.58E-03	0.00E+00	8.44E-03	3.87E-05	2.91E-06	3.00E-07	0.00E+00	3.21E-06
PESTICIDES								
DDTr	1.30E-02	0.00E+00	1.97E-02	2.56E-04	8.26E-06	1.98E-06	0.00E+00	1.02E-05
VOCS								
Acetophenone	0.00E+00	2.10E-03	4.18E+00	0.00E+00	0.00E+00	0.00E+00	9.29E-05	9.29E-05

Table A-17
Wildlife Exposure Modeling of Maximum Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	2.55E+02	1.64E-01	--	1.00E+00	Uptake Factor	2.55E+02	modeled	2.25E+00	1.24E+01	9.35E-03	1.47E+01
Beryllium	9.80E-01	0.00E+00	--	1.00E+00	Uptake Factor	9.80E-01	modeled	8.64E-03	4.78E-02	0.00E+00	5.64E-02
Cadmium	4.90E-01	1.70E-04	--	3.07E+00	Uptake Factor	1.51E+00	modeled	4.32E-03	7.34E-02	9.69E-06	7.77E-02
Copper	1.69E+01	9.20E-03	--	5.25E+00	Uptake Factor	8.87E+01	modeled	1.49E-01	4.33E+00	5.24E-04	4.47E+00
Lead	1.37E+01	4.30E-03	--	6.60E-02	Uptake Factor	9.04E-01	modeled	1.21E-01	4.41E-02	2.45E-04	1.65E-01
Manganese	1.18E+03	3.42E-01	--	1.00E+00	Uptake Factor	1.18E+03	modeled	1.04E+01	5.75E+01	1.95E-02	6.79E+01
Mercury	2.20E-01	6.00E-05	--	2.87E+00	Uptake Factor	6.31E-01	modeled	1.94E-03	3.08E-02	3.42E-06	3.27E-02
Selenium	0.00E+00	5.60E-03	--	1.00E+00	Uptake Factor	0.00E+00	modeled	0.00E+00	0.00E+00	3.19E-04	3.19E-04
Vanadium	2.85E+01	1.58E-02	--	1.00E+00	Uptake Factor	2.85E+01	modeled	2.51E-01	1.39E+00	9.01E-04	1.64E+00
PCBS											
Aroclor-1260	5.60E-03	0.00E+00	--	3.38E+00	BSAF	2.27E-01	modeled	4.93E-05	1.11E-02	0.00E+00	1.11E-02
Total PCB Congeners	1.20E-02	1.20E-06	--	3.38E+00	BSAF	4.86E-01	modeled	1.06E-04	2.37E-02	6.84E-08	2.38E-02
Total PCB Aroclors	5.60E-03	0.00E+00	--	3.38E+00	BSAF	2.27E-01	modeled	4.93E-05	1.11E-02	0.00E+00	1.11E-02
PESTICIDES											
DDTr	1.30E-02	0.00E+00	--	5.22E+00	BSAF	8.15E-01	modeled	1.15E-04	3.97E-02	0.00E+00	3.98E-02
VOCS											
Acetophenone	0.00E+00	2.10E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.20E-04	1.20E-04

Table A-18
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media
for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.98E+02	1.41E-01	--	1.00E+00	Uptake Factor	1.98E+02	modeled	1.75E+00	9.66E+00	8.01E-03	1.14E+01
Beryllium	7.85E-01	0.00E+00	--	1.00E+00	Uptake Factor	7.85E-01	modeled	6.92E-03	3.83E-02	0.00E+00	4.52E-02
Cadmium	4.14E-01	1.70E-04	--	3.07E+00	Uptake Factor	1.27E+00	modeled	3.65E-03	6.20E-02	9.69E-06	6.57E-02
Copper	1.26E+01	7.47E-03	--	5.25E+00	Uptake Factor	6.63E+01	modeled	1.11E-01	3.23E+00	4.26E-04	3.34E+00
Lead	1.07E+01	2.82E-03	--	6.60E-02	Uptake Factor	7.03E-01	modeled	9.38E-02	3.43E-02	1.60E-04	1.28E-01
Manganese	6.82E+02	2.52E-01	--	1.00E+00	Uptake Factor	6.82E+02	modeled	6.01E+00	3.32E+01	1.44E-02	3.92E+01
Mercury	1.12E-01	6.00E-05	--	2.87E+00	Uptake Factor	3.21E-01	modeled	9.87E-04	1.57E-02	3.42E-06	1.66E-02
Selenium	0.00E+00	5.60E-03	--	1.00E+00	Uptake Factor	0.00E+00	modeled	0.00E+00	0.00E+00	3.19E-04	3.19E-04
Vanadium	2.37E+01	1.43E-02	--	1.00E+00	Uptake Factor	2.37E+01	modeled	2.09E-01	1.16E+00	8.16E-04	1.37E+00
PCBS											
Aroclor-1260	4.58E-03	0.00E+00	--	3.38E+00	BSAF	1.86E-01	modeled	4.04E-05	9.04E-03	0.00E+00	9.09E-03
Total PCB Congeners	1.20E-02	1.20E-06	--	3.38E+00	BSAF	4.86E-01	modeled	1.06E-04	2.37E-02	6.84E-08	2.38E-02
Total PCB Aroclors	4.58E-03	0.00E+00	--	3.38E+00	BSAF	1.86E-01	modeled	4.04E-05	9.04E-03	0.00E+00	9.09E-03
PESTICIDES											
DDTr	1.30E-02	0.00E+00	--	5.22E+00	BSAF	8.15E-01	modeled	1.15E-04	3.97E-02	0.00E+00	3.98E-02
VOCS											
Acetophenone	0.00E+00	2.10E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.20E-04	1.20E-04

Table A-19
Wildlife Exposure Modeling of Maximum Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.55E+02	1.64E-01	1.56E+01	1.60E+01	2.62E+00	actual	6.38E-01	1.95E+00	1.80E-02	2.61E+00
Beryllium	9.80E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	2.45E-03	0.00E+00	0.00E+00	2.45E-03
Cadmium	4.90E-01	1.70E-04	--	2.36E+02	4.01E-02	modeled	1.23E-03	5.02E-03	1.87E-05	6.26E-03
Copper	1.69E+01	9.20E-03	3.52E+00	1.86E+03	1.71E+01	actual	4.23E-02	4.40E-01	1.01E-03	4.83E-01
Lead	1.37E+01	4.30E-03	5.20E-01	1.80E+02	7.74E-01	actual	3.43E-02	6.50E-02	4.73E-04	9.97E-02
Manganese	1.18E+03	3.42E-01	9.20E+01	1.60E+03	5.47E+02	actual	2.95E+00	1.15E+01	3.76E-02	1.45E+01
Mercury	2.20E-01	6.00E-05	1.68E-01	7.20E+03	4.32E-01	actual	5.50E-04	2.10E-02	6.60E-06	2.16E-02
Selenium	0.00E+00	5.60E-03	1.48E+00	9.68E+02	5.42E+00	actual	0.00E+00	1.85E-01	6.16E-04	1.86E-01
Vanadium	2.85E+01	1.58E-02	--	4.00E+00	6.32E-02	modeled	7.13E-02	7.90E-03	1.74E-03	8.09E-02
PCBS										
Aroclor-1260	5.60E-03	0.00E+00	3.04E-02	1.10E+05	0.00E+00	actual	1.40E-05	3.80E-03	0.00E+00	3.81E-03
Total PCB Congeners	1.20E-02	1.20E-06	--	1.01E+05	1.21E-01	modeled	3.00E-05	1.52E-02	1.32E-07	1.52E-02
Total PCB Aroclors	5.60E-03	0.00E+00	3.04E-02	1.01E+05	0.00E+00	actual	1.40E-05	3.80E-03	0.00E+00	3.81E-03
PESTICIDES										
DDTr	1.30E-02	0.00E+00	1.57E+00	6.74E+04	0.00E+00	actual	3.25E-05	1.96E-01	0.00E+00	1.96E-01
VOCS										
Acetophenone	0.00E+00	2.10E-03	2.32E-02	5.33E+00	1.12E-02	actual	0.00E+00	2.90E-03	2.31E-04	3.13E-03

Table A-20
Wildlife Exposure Modeling of 95UCLM Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.98E+02	1.41E-01	1.56E+01	1.60E+01	2.25E+00	actual	4.95E-01	1.95E+00	1.55E-02	2.46E+00
Beryllium	7.85E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	1.96E-03	0.00E+00	0.00E+00	1.96E-03
Cadmium	4.14E-01	1.70E-04	--	2.36E+02	4.01E-02	modeled	1.04E-03	5.02E-03	1.87E-05	6.07E-03
Copper	1.26E+01	7.47E-03	3.52E+00	1.86E+03	1.39E+01	actual	3.16E-02	4.40E-01	8.21E-04	4.72E-01
Lead	1.07E+01	2.82E-03	5.20E-01	1.80E+02	5.07E-01	actual	2.66E-02	6.50E-02	3.10E-04	9.19E-02
Manganese	6.82E+02	2.52E-01	9.20E+01	1.60E+03	4.03E+02	actual	1.70E+00	1.15E+01	2.77E-02	1.32E+01
Mercury	1.12E-01	6.00E-05	1.68E-01	7.20E+03	4.32E-01	actual	2.80E-04	2.10E-02	6.60E-06	2.13E-02
Selenium	0.00E+00	5.60E-03	1.48E+00	9.68E+02	5.42E+00	actual	0.00E+00	1.85E-01	6.16E-04	1.86E-01
Vanadium	2.37E+01	1.43E-02	--	4.00E+00	5.72E-02	modeled	5.94E-02	7.16E-03	1.57E-03	6.81E-02
PCBS										
Aroclor-1260	4.58E-03	0.00E+00	3.04E-02	1.10E+05	0.00E+00	actual	1.15E-05	3.80E-03	0.00E+00	3.81E-03
Total PCB Congeners	1.20E-02	1.20E-06	--	1.01E+05	1.21E-01	modeled	3.00E-05	1.52E-02	1.32E-07	1.52E-02
Total PCB Aroclors	4.58E-03	0.00E+00	3.04E-02	1.01E+05	0.00E+00	actual	1.15E-05	3.80E-03	0.00E+00	3.81E-03
PESTICIDES										
DDTr	1.30E-02	0.00E+00	1.57E+00	6.74E+04	0.00E+00	actual	3.25E-05	1.96E-01	0.00E+00	1.96E-01
VOCS										
Acetophenone	0.00E+00	2.10E-03	2.32E-02	5.33E+00	1.12E-02	actual	0.00E+00	2.90E-03	2.31E-04	3.13E-03

Table A-21
Wildlife Exposure Modeling of Maximum Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.55E+02	1.64E-01	1.56E+01	1.60E+01	2.62E+00	actual	2.30E-01	7.02E-01	7.38E-03	9.39E-01
Beryllium	9.80E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	8.82E-04	0.00E+00	0.00E+00	8.82E-04
Cadmium	4.90E-01	1.70E-04	--	2.36E+02	4.01E-02	modeled	4.41E-04	1.81E-03	7.65E-06	2.25E-03
Copper	1.69E+01	9.20E-03	3.52E+00	1.86E+03	1.71E+01	actual	1.52E-02	1.58E-01	4.14E-04	1.74E-01
Lead	1.37E+01	4.30E-03	5.20E-01	1.80E+02	7.74E-01	actual	1.23E-02	2.34E-02	1.94E-04	3.59E-02
Manganese	1.18E+03	3.42E-01	9.20E+01	1.60E+03	5.47E+02	actual	1.06E+00	4.14E+00	1.54E-02	5.22E+00
Mercury	2.20E-01	6.00E-05	1.68E-01	7.20E+03	4.32E-01	actual	1.98E-04	7.56E-03	2.70E-06	7.76E-03
Selenium	0.00E+00	5.60E-03	1.48E+00	9.68E+02	5.42E+00	actual	0.00E+00	6.66E-02	2.52E-04	6.69E-02
Vanadium	2.85E+01	1.58E-02	--	4.00E+00	6.32E-02	modeled	2.57E-02	2.84E-03	7.11E-04	2.92E-02
PCBS										
Aroclor-1260	5.60E-03	0.00E+00	3.04E-02	1.10E+05	0.00E+00	actual	5.04E-06	1.37E-03	0.00E+00	1.37E-03
Total PCB Congeners	1.20E-02	1.20E-06	--	1.01E+05	1.21E-01	modeled	1.08E-05	5.46E-03	5.40E-08	5.48E-03
Total PCB Aroclors	5.60E-03	0.00E+00	3.04E-02	1.01E+05	0.00E+00	actual	5.04E-06	1.37E-03	0.00E+00	1.37E-03
PESTICIDES										
DDTr	1.30E-02	0.00E+00	1.57E+00	6.74E+04	0.00E+00	actual	1.17E-05	7.05E-02	0.00E+00	7.06E-02
VOCS										
Acetophenone	0.00E+00	2.10E-03	2.32E-02	5.33E+00	1.12E-02	actual	0.00E+00	1.04E-03	9.45E-05	1.14E-03

Table A-22
Wildlife Exposure Modeling of 95UCLM Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.98E+02	1.41E-01	1.56E+01	1.60E+01	2.25E+00	actual	1.78E-01	7.02E-01	6.32E-03	8.87E-01
Beryllium	7.85E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	7.07E-04	0.00E+00	0.00E+00	7.07E-04
Cadmium	4.14E-01	1.70E-04	--	2.36E+02	4.01E-02	modeled	3.73E-04	1.81E-03	7.65E-06	2.19E-03
Copper	1.26E+01	7.47E-03	3.52E+00	1.86E+03	1.39E+01	actual	1.14E-02	1.58E-01	3.36E-04	1.70E-01
Lead	1.07E+01	2.82E-03	5.20E-01	1.80E+02	5.07E-01	actual	9.59E-03	2.34E-02	1.27E-04	3.31E-02
Manganese	6.82E+02	2.52E-01	9.20E+01	1.60E+03	4.03E+02	actual	6.13E-01	4.14E+00	1.13E-02	4.76E+00
Mercury	1.12E-01	6.00E-05	1.68E-01	7.20E+03	4.32E-01	actual	1.01E-04	7.56E-03	2.70E-06	7.66E-03
Selenium	0.00E+00	5.60E-03	1.48E+00	9.68E+02	5.42E+00	actual	0.00E+00	6.66E-02	2.52E-04	6.69E-02
Vanadium	2.37E+01	1.43E-02	--	4.00E+00	5.72E-02	modeled	2.14E-02	2.58E-03	6.44E-04	2.46E-02
PCBS										
Aroclor-1260	4.58E-03	0.00E+00	3.04E-02	1.10E+05	0.00E+00	actual	4.12E-06	1.37E-03	0.00E+00	1.37E-03
Total PCB Congeners	1.20E-02	1.20E-06	--	1.01E+05	1.21E-01	modeled	1.08E-05	5.46E-03	5.40E-08	5.48E-03
Total PCB Aroclors	4.58E-03	0.00E+00	3.04E-02	1.01E+05	0.00E+00	actual	4.12E-06	1.37E-03	0.00E+00	1.37E-03
PESTICIDES										
DDTr	1.30E-02	0.00E+00	1.57E+00	6.74E+04	0.00E+00	actual	1.17E-05	7.05E-02	0.00E+00	7.06E-02
VOCS										
Acetophenone	0.00E+00	2.10E-03	2.32E-02	5.33E+00	1.12E-02	actual	0.00E+00	1.04E-03	9.45E-05	1.14E-03

Table A-23
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	2.55E+02	1.64E-01	1.50E-01	3.83E+01	2.16E-01	1.62E+00	1.60E-01	2.00E+00
Beryllium	9.80E-01	0.00E+00	1.00E-02	9.80E-03	8.31E-04	4.16E-04	0.00E+00	1.25E-03
Cadmium	4.90E-01	1.70E-04	ln(dry plant conc, mg/kg) = (-0.476+0.546*ln(soil conc))	4.21E-01	4.16E-04	1.78E-02	1.66E-04	1.84E-02
Copper	1.69E+01	9.20E-03	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	5.95E+00	1.43E-02	2.52E-01	8.97E-03	2.76E-01
Lead	1.37E+01	4.30E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.15E+00	1.16E-02	4.88E-02	4.19E-03	6.46E-02
Manganese	1.18E+03	3.42E-01	2.50E-01	2.95E+02	1.00E+00	1.25E+01	3.33E-01	1.38E+01
Mercury	2.20E-01	6.00E-05	ln(dry plant conc, mg/kg) = (-0.996+0.544*ln(soil conc))	1.62E-01	1.87E-04	6.87E-03	5.85E-05	7.12E-03
Selenium	0.00E+00	5.60E-03	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	0.00E+00	0.00E+00	0.00E+00	5.46E-03	5.46E-03
Vanadium	2.85E+01	1.58E-02	5.50E-03	1.57E-01	2.42E-02	6.65E-03	1.54E-02	4.62E-02
PCBS								
Aroclor-1260	5.60E-03	0.00E+00	6.44E-04	3.61E-06	4.75E-06	1.53E-07	0.00E+00	4.90E-06
Total PCB Congeners	1.20E-02	1.20E-06	8.44E-03	1.01E-04	1.02E-05	4.30E-06	1.17E-06	1.56E-05
Total PCB Aroclors	5.60E-03	0.00E+00	8.44E-03	4.73E-05	4.75E-06	2.00E-06	0.00E+00	6.75E-06
PESTICIDES								
DDTr	1.30E-02	0.00E+00	1.97E-02	2.56E-04	1.10E-05	1.09E-05	0.00E+00	2.19E-05
VOCS								
Acetophenone	0.00E+00	2.10E-03	4.18E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-03	2.05E-03

Table A-24
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.98E+02	1.41E-01	1.50E-01	2.97E+01	1.68E-01	1.26E+00	1.37E-01	1.57E+00
Beryllium	7.85E-01	0.00E+00	1.00E-02	7.85E-03	6.66E-04	3.33E-04	0.00E+00	9.99E-04
Cadmium	4.14E-01	1.70E-04	ln(dry plant conc, mg/kg) = (-0.476+0.546*ln(soil conc))	3.84E-01	3.51E-04	1.63E-02	1.66E-04	1.68E-02
Copper	1.26E+01	7.47E-03	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	5.30E+00	1.07E-02	2.25E-01	7.28E-03	2.43E-01
Lead	1.07E+01	2.82E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	9.99E-01	9.03E-03	4.24E-02	2.74E-03	5.42E-02
Manganese	6.82E+02	2.52E-01	2.50E-01	1.70E+02	5.78E-01	7.23E+00	2.46E-01	8.05E+00
Mercury	1.12E-01	6.00E-05	ln(dry plant conc, mg/kg) = (-0.996+0.544*ln(soil conc))	1.12E-01	9.50E-05	4.76E-03	5.85E-05	4.91E-03
Selenium	0.00E+00	5.60E-03	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	0.00E+00	0.00E+00	0.00E+00	5.46E-03	5.46E-03
Vanadium	2.37E+01	1.43E-02	5.50E-03	1.31E-01	2.01E-02	5.54E-03	1.40E-02	3.96E-02
PCBS								
Aroclor-1260	4.58E-03	0.00E+00	6.44E-04	2.95E-06	3.88E-06	1.25E-07	0.00E+00	4.01E-06
Total PCB Congeners	1.20E-02	1.20E-06	8.44E-03	1.01E-04	1.02E-05	4.30E-06	1.17E-06	1.56E-05
Total PCB Aroclors	4.58E-03	0.00E+00	8.44E-03	3.87E-05	3.88E-06	1.64E-06	0.00E+00	5.52E-06
PESTICIDES								
DDTr	1.30E-02	0.00E+00	1.97E-02	2.56E-04	1.10E-05	1.09E-05	0.00E+00	2.19E-05
VOCS								
Acetophenone	0.00E+00	2.10E-03	4.18E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-03	2.05E-03

Table A-25
Wildlife Exposure Modeling of Maximum Doses to Aquatic Carnivorous Mammals (Raccoon) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	2.55E+02	1.64E-01	--	1.00E+00	Uptake Factor	2.55E+02	modeled	1.15E+00	1.22E+01	1.35E-02	1.34E+01
Beryllium	9.80E-01	0.00E+00	--	1.00E+00	Uptake Factor	9.80E-01	modeled	4.42E-03	4.70E-02	0.00E+00	5.15E-02
Cadmium	4.90E-01	1.70E-04	--	3.07E+00	Uptake Factor	1.51E+00	modeled	2.21E-03	7.23E-02	1.40E-05	7.45E-02
Copper	1.69E+01	9.20E-03	--	5.25E+00	Uptake Factor	8.87E+01	modeled	7.63E-02	4.26E+00	7.59E-04	4.34E+00
Lead	1.37E+01	4.30E-03	--	6.60E-02	Uptake Factor	9.04E-01	modeled	6.18E-02	4.34E-02	3.55E-04	1.06E-01
Manganese	1.18E+03	3.42E-01	--	1.00E+00	Uptake Factor	1.18E+03	modeled	5.32E+00	5.66E+01	2.82E-02	6.20E+01
Mercury	2.20E-01	6.00E-05	--	2.87E+00	Uptake Factor	6.31E-01	modeled	9.93E-04	3.03E-02	4.95E-06	3.13E-02
Selenium	0.00E+00	5.60E-03	--	1.00E+00	Uptake Factor	0.00E+00	modeled	0.00E+00	0.00E+00	4.62E-04	4.62E-04
Vanadium	2.85E+01	1.58E-02	--	1.00E+00	Uptake Factor	2.85E+01	modeled	1.29E-01	1.37E+00	1.30E-03	1.50E+00
PCBS											
Aroclor-1260	5.60E-03	0.00E+00	--	3.38E+00	BSAF	2.27E-01	modeled	2.53E-05	1.09E-02	0.00E+00	1.09E-02
Total PCB Congeners	1.20E-02	1.20E-06	--	3.38E+00	BSAF	4.86E-01	modeled	5.41E-05	2.33E-02	9.90E-08	2.34E-02
Total PCB Aroclors	5.60E-03	0.00E+00	--	3.38E+00	BSAF	2.27E-01	modeled	2.53E-05	1.09E-02	0.00E+00	1.09E-02
PESTICIDES											
DDTr	1.30E-02	0.00E+00	--	5.22E+00	BSAF	8.15E-01	modeled	5.87E-05	3.91E-02	0.00E+00	3.92E-02
VOCS											
Acetophenone	0.00E+00	2.10E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.73E-04	1.73E-04

Table A-26
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Carnivorous Mammals (Raccoon) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.98E+02	1.41E-01	--	1.00E+00	Uptake Factor	1.98E+02	modeled	8.94E-01	9.51E+00	1.16E-02	1.04E+01
Beryllium	7.85E-01	0.00E+00	--	1.00E+00	Uptake Factor	7.85E-01	modeled	3.54E-03	3.77E-02	0.00E+00	4.12E-02
Cadmium	4.14E-01	1.70E-04	--	3.07E+00	Uptake Factor	1.27E+00	modeled	1.87E-03	6.11E-02	1.40E-05	6.29E-02
Copper	1.26E+01	7.47E-03	--	5.25E+00	Uptake Factor	6.63E+01	modeled	5.70E-02	3.18E+00	6.16E-04	3.24E+00
Lead	1.07E+01	2.82E-03	--	6.60E-02	Uptake Factor	7.03E-01	modeled	4.81E-02	3.37E-02	2.32E-04	8.20E-02
Manganese	6.82E+02	2.52E-01	--	1.00E+00	Uptake Factor	6.82E+02	modeled	3.07E+00	3.27E+01	2.08E-02	3.58E+01
Mercury	1.12E-01	6.00E-05	--	2.87E+00	Uptake Factor	3.21E-01	modeled	5.05E-04	1.54E-02	4.95E-06	1.59E-02
Selenium	0.00E+00	5.60E-03	--	1.00E+00	Uptake Factor	0.00E+00	modeled	0.00E+00	0.00E+00	4.62E-04	4.62E-04
Vanadium	2.37E+01	1.43E-02	--	1.00E+00	Uptake Factor	2.37E+01	modeled	1.07E-01	1.14E+00	1.18E-03	1.25E+00
PCBS											
Aroclor-1260	4.58E-03	0.00E+00	--	3.38E+00	BSAF	1.86E-01	modeled	2.07E-05	8.91E-03	0.00E+00	8.93E-03
Total PCB Congeners	1.20E-02	1.20E-06	--	3.38E+00	BSAF	4.86E-01	modeled	5.41E-05	2.33E-02	9.90E-08	2.34E-02
Total PCB Aroclors	4.58E-03	0.00E+00	--	3.38E+00	BSAF	1.86E-01	modeled	2.07E-05	8.91E-03	0.00E+00	8.93E-03
PESTICIDES											
DDTr	1.30E-02	0.00E+00	--	5.22E+00	BSAF	8.15E-01	modeled	5.87E-05	3.91E-02	0.00E+00	3.92E-02
VOCS											
Acetophenone	0.00E+00	2.10E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.73E-04	1.73E-04

Table A-27
Wildlife Exposure Modeling of Maximum Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.55E+02	1.64E-01	1.56E+01	1.60E+01	2.62E+00	actual	2.45E-01	7.49E-01	1.33E-02	1.01E+00
Beryllium	9.80E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	9.41E-04	0.00E+00	0.00E+00	9.41E-04
Cadmium	4.90E-01	1.70E-04	--	2.36E+02	4.01E-02	modeled	4.70E-04	1.93E-03	1.38E-05	2.41E-03
Copper	1.69E+01	9.20E-03	3.52E+00	1.86E+03	1.71E+01	actual	1.62E-02	1.69E-01	7.45E-04	1.86E-01
Lead	1.37E+01	4.30E-03	5.20E-01	1.80E+02	7.74E-01	actual	1.32E-02	2.50E-02	3.48E-04	3.85E-02
Manganese	1.18E+03	3.42E-01	9.20E+01	1.60E+03	5.47E+02	actual	1.13E+00	4.42E+00	2.77E-02	5.58E+00
Mercury	2.20E-01	6.00E-05	1.68E-01	7.20E+03	4.32E-01	actual	2.11E-04	8.06E-03	4.86E-06	8.28E-03
Selenium	0.00E+00	5.60E-03	1.48E+00	9.68E+02	5.42E+00	actual	0.00E+00	7.10E-02	4.54E-04	7.15E-02
Vanadium	2.85E+01	1.58E-02	--	4.00E+00	6.32E-02	modeled	2.74E-02	3.03E-03	1.28E-03	3.17E-02
PCBS										
Aroclor-1260	5.60E-03	0.00E+00	3.04E-02	1.10E+05	0.00E+00	actual	5.38E-06	1.46E-03	0.00E+00	1.46E-03
Total PCB Congeners	1.20E-02	1.20E-06	--	1.01E+05	1.21E-01	modeled	1.15E-05	5.83E-03	9.72E-08	5.84E-03
Total PCB Aroclors	5.60E-03	0.00E+00	3.04E-02	1.01E+05	0.00E+00	actual	5.38E-06	1.46E-03	0.00E+00	1.46E-03
PESTICIDES										
DDTr	1.30E-02	0.00E+00	1.57E+00	6.74E+04	0.00E+00	actual	1.25E-05	7.52E-02	0.00E+00	7.53E-02
VOCS										
Acetophenone	0.00E+00	2.10E-03	2.32E-02	5.33E+00	1.12E-02	actual	0.00E+00	1.11E-03	1.70E-04	1.28E-03

Table A-28
Wildlife Exposure Modeling of 95UCLM Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 2: Arroyo Colorado

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.98E+02	1.41E-01	1.56E+01	1.60E+01	2.25E+00	actual	1.90E-01	7.49E-01	1.14E-02	9.50E-01
Beryllium	7.85E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	7.54E-04	0.00E+00	0.00E+00	7.54E-04
Cadmium	4.14E-01	1.70E-04	--	2.36E+02	4.01E-02	modeled	3.97E-04	1.93E-03	1.38E-05	2.34E-03
Copper	1.26E+01	7.47E-03	3.52E+00	1.86E+03	1.39E+01	actual	1.21E-02	1.69E-01	6.05E-04	1.82E-01
Lead	1.07E+01	2.82E-03	5.20E-01	1.80E+02	5.07E-01	actual	1.02E-02	2.50E-02	2.28E-04	3.54E-02
Manganese	6.82E+02	2.52E-01	9.20E+01	1.60E+03	4.03E+02	actual	6.54E-01	4.42E+00	2.04E-02	5.09E+00
Mercury	1.12E-01	6.00E-05	1.68E-01	7.20E+03	4.32E-01	actual	1.08E-04	8.06E-03	4.86E-06	8.18E-03
Selenium	0.00E+00	5.60E-03	1.48E+00	9.68E+02	5.42E+00	actual	0.00E+00	7.10E-02	4.54E-04	7.15E-02
Vanadium	2.37E+01	1.43E-02	--	4.00E+00	5.72E-02	modeled	2.28E-02	2.75E-03	1.16E-03	2.67E-02
PCBS										
Aroclor-1260	4.58E-03	0.00E+00	3.04E-02	1.10E+05	0.00E+00	actual	4.40E-06	1.46E-03	0.00E+00	1.46E-03
Total PCB Congeners	1.20E-02	1.20E-06	--	1.01E+05	1.21E-01	modeled	1.15E-05	5.83E-03	9.72E-08	5.84E-03
Total PCB Aroclors	4.58E-03	0.00E+00	3.04E-02	1.01E+05	0.00E+00	actual	4.40E-06	1.46E-03	0.00E+00	1.46E-03
PESTICIDES										
DDTr	1.30E-02	0.00E+00	1.57E+00	6.74E+04	0.00E+00	actual	1.25E-05	7.52E-02	0.00E+00	7.53E-02
VOCS										
Acetophenone	0.00E+00	2.10E-03	2.32E-02	5.33E+00	1.12E-02	actual	0.00E+00	1.11E-03	1.70E-04	1.28E-03

Table A-29
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	2.72E+02	1.52E-01	1.50E-01	4.08E+01	1.73E-01	3.16E-01	6.73E-03	4.96E-01
Beryllium	6.00E-01	0.00E+00	1.00E-02	6.00E-03	3.81E-04	4.65E-05	0.00E+00	4.28E-04
Lead	1.27E+01	1.80E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.10E+00	8.07E-03	8.55E-03	7.97E-05	1.67E-02
Manganese	6.95E+02	1.26E-01	2.50E-01	1.74E+02	4.42E-01	1.35E+00	5.58E-03	1.79E+00
Selenium	2.10E-01	7.70E-04	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	9.06E-02	1.33E-04	7.02E-04	3.41E-05	8.70E-04
Vanadium	2.17E+01	1.11E-02	5.50E-03	1.19E-01	1.38E-02	9.25E-04	4.91E-04	1.52E-02
PCBS								
Aroclor-1221	2.10E-03	0.00E+00	1.11E-01	2.32E-04	1.33E-06	1.80E-06	0.00E+00	3.14E-06
Aroclor-1242	1.70E-01	0.00E+00	8.44E-03	1.43E-03	1.08E-04	1.11E-05	0.00E+00	1.19E-04
Aroclor-1248	1.00E-03	0.00E+00	8.44E-03	8.44E-06	6.36E-07	6.54E-08	0.00E+00	7.01E-07
Aroclor-1254	1.10E+01	0.00E+00	3.58E-03	3.94E-02	6.99E-03	3.05E-04	0.00E+00	7.30E-03
Aroclor-1260	1.80E-01	0.00E+00	6.44E-04	1.16E-04	1.14E-04	8.98E-07	0.00E+00	1.15E-04
Total PCB Congeners	6.10E+00	2.60E-05	8.44E-03	5.15E-02	3.88E-03	3.99E-04	1.15E-06	4.28E-03
Total PCB Aroclors	1.10E+01	1.50E-05	8.44E-03	9.28E-02	6.99E-03	7.20E-04	6.64E-07	7.71E-03
PESTICIDES								
DDTr	7.80E-02	0.00E+00	1.97E-02	1.54E-03	4.96E-05	1.19E-05	0.00E+00	6.15E-05
Dieldrin	1.90E-02	0.00E+00	2.75E-02	5.22E-04	1.21E-05	4.05E-06	0.00E+00	1.61E-05
Endosulfan I	2.10E-03	0.00E+00	3.69E-01	7.75E-04	1.33E-06	6.00E-06	0.00E+00	7.34E-06
Endosulfan II	6.10E-03	0.00E+00	3.69E-01	2.25E-03	3.88E-06	1.74E-05	0.00E+00	2.13E-05
Endrin	8.60E-03	0.00E+00	2.75E-02	2.36E-04	5.47E-06	1.83E-06	0.00E+00	7.30E-06
Endrin aldehyde	6.50E-03	0.00E+00	6.47E-02	4.21E-04	4.13E-06	3.26E-06	0.00E+00	7.39E-06
gamma-Chlordane	1.80E-02	0.00E+00	3.48E-03	6.27E-05	1.14E-05	4.86E-07	0.00E+00	1.19E-05
Heptachlor epoxide	8.60E-03	0.00E+00	8.92E-02	7.67E-04	5.47E-06	5.95E-06	0.00E+00	1.14E-05

Table A-29
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs								
Total LMW PAHs	9.36E-01	0.00E+00	1.01E-01	9.48E-02	5.95E-04	7.35E-04	0.00E+00	1.33E-03
Total HMW PAHs	2.74E+00	0.00E+00	1.01E-01	2.77E-01	1.74E-03	2.15E-03	0.00E+00	3.89E-03
SVOCS								
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	5.48E-04	3.67E-04	4.26E-04	2.84E-06	0.00E+00	4.29E-04
Carbazole	8.60E-02	0.00E+00	5.26E-01	4.52E-02	5.47E-05	3.51E-04	0.00E+00	4.05E-04
Di-n-butyl phthalate	2.00E-01	0.00E+00	8.38E-02	1.68E-02	1.27E-04	1.30E-04	0.00E+00	2.57E-04
Phenol	8.30E-02	0.00E+00	5.19E+00	4.31E-01	5.27E-05	3.34E-03	0.00E+00	3.39E-03
VOCS								
Acetophenone	1.20E-01	0.00E+00	4.18E+00	5.01E-01	7.63E-05	3.88E-03	0.00E+00	3.96E-03

Table A-30
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.86E+02	1.52E-01	1.50E-01	2.79E+01	1.18E-01	2.16E-01	6.73E-03	3.41E-01
Beryllium	6.00E-01	0.00E+00	1.00E-02	6.00E-03	3.81E-04	4.65E-05	0.00E+00	4.28E-04
Lead	9.84E+00	1.80E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	9.55E-01	6.25E-03	7.40E-03	7.97E-05	1.37E-02
Manganese	4.34E+02	1.26E-01	2.50E-01	1.09E+02	2.76E-01	8.41E-01	5.58E-03	1.12E+00
Selenium	2.10E-01	7.70E-04	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	9.06E-02	1.33E-04	7.02E-04	3.41E-05	8.70E-04
Vanadium	1.80E+01	1.11E-02	5.50E-03	9.91E-02	1.15E-02	7.68E-04	4.91E-04	1.27E-02
PCBS								
Aroclor-1221	2.10E-03	0.00E+00	1.11E-01	2.32E-04	1.33E-06	1.80E-06	0.00E+00	3.14E-06
Aroclor-1242	1.70E-01	0.00E+00	8.44E-03	1.43E-03	1.08E-04	1.11E-05	0.00E+00	1.19E-04
Aroclor-1248	1.00E-03	0.00E+00	8.44E-03	8.44E-06	6.36E-07	6.54E-08	0.00E+00	7.01E-07
Aroclor-1254	1.37E+00	0.00E+00	3.58E-03	4.91E-03	8.73E-04	3.81E-05	0.00E+00	9.11E-04
Aroclor-1260	1.17E-02	0.00E+00	6.44E-04	7.53E-06	7.44E-06	5.84E-08	0.00E+00	7.49E-06
Total PCB Congeners	2.71E+00	5.81E-06	8.44E-03	2.29E-02	1.72E-03	1.77E-04	2.57E-07	1.90E-03
Total PCB Aroclors	1.05E+00	1.50E-05	8.44E-03	8.85E-03	6.67E-04	6.86E-05	6.64E-07	7.36E-04
PESTICIDES								
DDTr	4.02E-02	0.00E+00	1.97E-02	7.92E-04	2.55E-05	6.14E-06	0.00E+00	3.17E-05
Dieldrin	7.90E-03	0.00E+00	2.75E-02	2.17E-04	5.02E-06	1.68E-06	0.00E+00	6.70E-06
Endosulfan I	2.10E-03	0.00E+00	3.69E-01	7.75E-04	1.33E-06	6.00E-06	0.00E+00	7.34E-06
Endosulfan II	3.02E-03	0.00E+00	3.69E-01	1.11E-03	1.92E-06	8.63E-06	0.00E+00	1.06E-05
Endrin	5.20E-03	0.00E+00	2.75E-02	1.43E-04	3.30E-06	1.11E-06	0.00E+00	4.41E-06
Endrin aldehyde	4.18E-03	0.00E+00	6.47E-02	2.70E-04	2.66E-06	2.10E-06	0.00E+00	4.75E-06
gamma-Chlordane	1.14E-02	0.00E+00	3.48E-03	3.97E-05	7.24E-06	3.08E-07	0.00E+00	7.55E-06
Heptachlor epoxide	4.24E-03	0.00E+00	8.92E-02	3.78E-04	2.69E-06	2.93E-06	0.00E+00	5.63E-06
PAHs								
Total LMW PAHs	9.36E-01	0.00E+00	1.01E-01	9.48E-02	5.95E-04	7.35E-04	0.00E+00	1.33E-03
Total HMW PAHs	2.74E+00	0.00E+00	1.01E-01	2.77E-01	1.74E-03	2.15E-03	0.00E+00	3.89E-03

Table A-30
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
SVOCS								
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	5.48E-04	3.67E-04	4.26E-04	2.84E-06	0.00E+00	4.29E-04
Carbazole	8.60E-02	0.00E+00	5.26E-01	4.52E-02	5.47E-05	3.51E-04	0.00E+00	4.05E-04
Di-n-butyl phthalate	2.00E-01	0.00E+00	8.38E-02	1.68E-02	1.27E-04	1.30E-04	0.00E+00	2.57E-04
Phenol	8.30E-02	0.00E+00	5.19E+00	4.31E-01	5.27E-05	3.34E-03	0.00E+00	3.39E-03
VOCS								
Acetophenone	1.20E-01	0.00E+00	4.18E+00	5.01E-01	7.63E-05	3.88E-03	0.00E+00	3.96E-03

Table A-31
Wildlife Exposure Modeling of Maximum Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	2.72E+02	1.52E-01	--	1.00E+00	Uptake Factor	2.72E+02	modeled	2.40E+00	1.33E+01	8.66E-03	1.57E+01
Beryllium	6.00E-01	0.00E+00	--	1.00E+00	Uptake Factor	6.00E-01	modeled	5.29E-03	2.93E-02	0.00E+00	3.45E-02
Lead	1.27E+01	1.80E-03	--	6.60E-02	Uptake Factor	8.38E-01	modeled	1.12E-01	4.09E-02	1.03E-04	1.53E-01
Manganese	6.95E+02	1.26E-01	--	1.00E+00	Uptake Factor	6.95E+02	modeled	6.12E+00	3.39E+01	7.18E-03	4.00E+01
Selenium	2.10E-01	7.70E-04	--	1.00E+00	Uptake Factor	2.10E-01	modeled	1.85E-03	1.02E-02	4.39E-05	1.21E-02
Vanadium	2.17E+01	1.11E-02	--	1.00E+00	Uptake Factor	2.17E+01	modeled	1.91E-01	1.06E+00	6.33E-04	1.25E+00
PCBS											
Aroclor-1221	2.10E-03	0.00E+00	--	3.38E+00	BSAF	8.51E-02	modeled	1.85E-05	4.15E-03	0.00E+00	4.17E-03
Aroclor-1242	1.70E-01	0.00E+00	--	3.38E+00	BSAF	6.89E+00	modeled	1.50E-03	3.36E-01	0.00E+00	3.37E-01
Aroclor-1248	1.00E-03	0.00E+00	--	3.38E+00	BSAF	4.05E-02	modeled	8.81E-06	1.97E-03	0.00E+00	1.98E-03
Aroclor-1254	1.10E+01	0.00E+00	7.60E-01	3.38E+00	BSAF	4.46E+02	actual	9.69E-02	3.71E-02	0.00E+00	1.34E-01
Aroclor-1260	1.80E-01	0.00E+00	--	3.38E+00	BSAF	7.29E+00	modeled	1.59E-03	3.55E-01	0.00E+00	3.57E-01
Total PCB Congeners	6.10E+00	2.60E-05	2.80E+00	3.38E+00	BSAF	2.47E+02	actual	5.38E-02	1.37E-01	1.48E-06	1.90E-01
Total PCB Aroclors	1.10E+01	1.50E-05	7.60E-01	3.38E+00	BSAF	4.46E+02	actual	9.69E-02	3.71E-02	8.55E-07	1.34E-01
PESTICIDES											
DDTr	7.80E-02	0.00E+00	--	5.22E+00	BSAF	4.89E+00	modeled	6.87E-04	2.38E-01	0.00E+00	2.39E-01
Dieldrin	1.90E-02	0.00E+00	--	2.06E+00	BSAF	4.69E-01	modeled	1.67E-04	2.29E-02	0.00E+00	2.31E-02
Endosulfan I	2.10E-03	0.00E+00	--	4.00E+00	BSAF	1.01E-01	modeled	1.85E-05	4.91E-03	0.00E+00	4.93E-03
Endosulfan II	6.10E-03	0.00E+00	--	4.00E+00	BSAF	2.93E-01	modeled	5.38E-05	1.43E-02	0.00E+00	1.43E-02
Endrin	8.60E-03	0.00E+00	--	2.83E-02	BSAF	2.92E-03	modeled	7.58E-05	1.42E-04	0.00E+00	2.18E-04
Endrin aldehyde	6.50E-03	0.00E+00	--	4.00E+00	BSAF	3.12E-01	modeled	5.73E-05	1.52E-02	0.00E+00	1.53E-02
gamma-Chlordane	1.80E-02	0.00E+00	--	1.08E+00	BSAF	2.34E-01	modeled	1.59E-04	1.14E-02	0.00E+00	1.15E-02
Heptachlor epoxide	8.60E-03	0.00E+00	--	6.77E+00	BSAF	6.99E-01	modeled	7.58E-05	3.41E-02	0.00E+00	3.41E-02
PAHs											
Total LMW PAHs	9.36E-01	0.00E+00	--	5.66E-02	BSAF	6.36E-01	modeled	8.25E-03	3.10E-02	0.00E+00	3.93E-02
Total HMW PAHs	2.74E+00	0.00E+00	--	1.78E-02	BSAF	5.84E-01	modeled	2.41E-02	2.85E-02	0.00E+00	5.26E-02
SVOCS											
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	4.00E+00	BSAF	3.22E+01	modeled	5.90E-03	1.57E+00	0.00E+00	1.57E+00
Carbazole	8.60E-02	0.00E+00	--	4.00E+00	BSAF	4.13E+00	modeled	7.58E-04	2.01E-01	0.00E+00	2.02E-01
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	4.00E+00	BSAF	9.60E+00	modeled	1.76E-03	4.68E-01	0.00E+00	4.70E-01
Phenol	8.30E-02	0.00E+00	--	4.00E+00	BSAF	3.98E+00	modeled	7.31E-04	1.94E-01	0.00E+00	1.95E-01
VOCS											
Acetophenone	1.20E-01	0.00E+00	--	4.00E+00	BSAF	5.76E+00	modeled	1.06E-03	2.81E-01	0.00E+00	2.82E-01

Table A-32
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media
for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.86E+02	1.52E-01	--	1.00E+00	Uptake Factor	1.86E+02	modeled	1.64E+00	9.07E+00	8.66E-03	1.07E+01
Beryllium	6.00E-01	0.00E+00	--	1.00E+00	Uptake Factor	6.00E-01	modeled	5.29E-03	2.93E-02	0.00E+00	3.45E-02
Lead	9.84E+00	1.80E-03	--	6.60E-02	Uptake Factor	6.49E-01	modeled	8.67E-02	3.16E-02	1.03E-04	1.18E-01
Manganese	4.34E+02	1.26E-01	--	1.00E+00	Uptake Factor	4.34E+02	modeled	3.83E+00	2.12E+01	7.18E-03	2.50E+01
Selenium	2.10E-01	7.70E-04	--	1.00E+00	Uptake Factor	2.10E-01	modeled	1.85E-03	1.02E-02	4.39E-05	1.21E-02
Vanadium	1.80E+01	1.11E-02	--	1.00E+00	Uptake Factor	1.80E+01	modeled	1.59E-01	8.78E-01	6.33E-04	1.04E+00
PCBS											
Aroclor-1221	2.10E-03	0.00E+00	--	3.38E+00	BSAF	8.51E-02	modeled	1.85E-05	4.15E-03	0.00E+00	4.17E-03
Aroclor-1242	1.70E-01	0.00E+00	--	3.38E+00	BSAF	6.89E+00	modeled	1.50E-03	3.36E-01	0.00E+00	3.37E-01
Aroclor-1248	1.00E-03	0.00E+00	--	3.38E+00	BSAF	4.05E-02	modeled	8.81E-06	1.97E-03	0.00E+00	1.98E-03
Aroclor-1254	1.37E+00	0.00E+00	3.38E-01	3.38E+00	BSAF	5.56E+01	actual	1.21E-02	1.65E-02	0.00E+00	2.86E-02
Aroclor-1260	1.17E-02	0.00E+00	--	3.38E+00	BSAF	4.74E-01	modeled	1.03E-04	2.31E-02	0.00E+00	2.32E-02
Total PCB Congeners	2.71E+00	5.81E-06	1.79E+00	3.38E+00	BSAF	1.10E+02	actual	2.39E-02	8.72E-02	3.31E-07	1.11E-01
Total PCB Aroclors	1.05E+00	1.50E-05	3.38E-01	3.38E+00	BSAF	4.25E+01	actual	9.24E-03	1.65E-02	8.55E-07	2.57E-02
PESTICIDES											
DDTr	4.02E-02	0.00E+00	--	5.22E+00	BSAF	2.52E+00	modeled	3.54E-04	1.23E-01	0.00E+00	1.23E-01
Dieldrin	7.90E-03	0.00E+00	--	2.06E+00	BSAF	1.95E-01	modeled	6.96E-05	9.51E-03	0.00E+00	9.58E-03
Endosulfan I	2.10E-03	0.00E+00	--	4.00E+00	BSAF	1.01E-01	modeled	1.85E-05	4.91E-03	0.00E+00	4.93E-03
Endosulfan II	3.02E-03	0.00E+00	--	4.00E+00	BSAF	1.45E-01	modeled	2.66E-05	7.07E-03	0.00E+00	7.09E-03
Endrin	5.20E-03	0.00E+00	--	2.83E-02	BSAF	1.77E-03	modeled	4.58E-05	8.61E-05	0.00E+00	1.32E-04
Endrin aldehyde	4.18E-03	0.00E+00	--	4.00E+00	BSAF	2.01E-01	modeled	3.68E-05	9.78E-03	0.00E+00	9.82E-03
gamma-Chlordane	1.14E-02	0.00E+00	--	1.08E+00	BSAF	1.48E-01	modeled	1.00E-04	7.21E-03	0.00E+00	7.31E-03
Heptachlor epoxide	4.24E-03	0.00E+00	--	6.77E+00	BSAF	3.45E-01	modeled	3.74E-05	1.68E-02	0.00E+00	1.68E-02
PAHs											
Total LMW PAHs	9.36E-01	0.00E+00	--	5.66E-02	BSAF	6.36E-01	modeled	8.25E-03	3.10E-02	0.00E+00	3.93E-02
Total HMW PAHs	2.74E+00	0.00E+00	--	1.78E-02	BSAF	5.84E-01	modeled	2.41E-02	2.85E-02	0.00E+00	5.26E-02
SVOCS											
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	4.00E+00	BSAF	3.22E+01	modeled	5.90E-03	1.57E+00	0.00E+00	1.57E+00
Carbazole	8.60E-02	0.00E+00	--	4.00E+00	BSAF	4.13E+00	modeled	7.58E-04	2.01E-01	0.00E+00	2.02E-01
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	4.00E+00	BSAF	9.60E+00	modeled	1.76E-03	4.68E-01	0.00E+00	4.70E-01
Phenol	8.30E-02	0.00E+00	--	4.00E+00	BSAF	3.98E+00	modeled	7.31E-04	1.94E-01	0.00E+00	1.95E-01
VOCS											
Acetophenone	1.20E-01	0.00E+00	--	4.00E+00	BSAF	5.76E+00	modeled	1.06E-03	2.81E-01	0.00E+00	2.82E-01

Table A-33
Wildlife Exposure Modeling of Maximum Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.72E+02	1.52E-01	2.64E+01	1.60E+01	2.43E+00	actual	6.80E-01	3.30E+00	1.67E-02	4.00E+00
Beryllium	6.00E-01	0.00E+00	8.40E-02	2.48E+02	0.00E+00	actual	1.50E-03	1.05E-02	0.00E+00	1.20E-02
Lead	1.27E+01	1.80E-03	2.20E+00	1.80E+02	3.24E-01	actual	3.18E-02	2.75E-01	1.98E-04	3.07E-01
Manganese	6.95E+02	1.26E-01	1.24E+02	1.60E+03	2.02E+02	actual	1.74E+00	1.55E+01	1.39E-02	1.73E+01
Selenium	2.10E-01	7.70E-04	9.20E-01	9.68E+02	7.45E-01	actual	5.25E-04	1.15E-01	8.47E-05	1.16E-01
Vanadium	2.17E+01	1.11E-02	6.40E+00	4.00E+00	4.44E-02	actual	5.43E-02	8.00E-01	1.22E-03	8.55E-01
PCBS										
Aroclor-1221	2.10E-03	0.00E+00	--	2.17E+03	0.00E+00	modeled	5.25E-06	0.00E+00	0.00E+00	5.25E-06
Aroclor-1242	1.70E-01	0.00E+00	--	1.01E+05	0.00E+00	modeled	4.25E-04	0.00E+00	0.00E+00	4.25E-04
Aroclor-1248	1.00E-03	0.00E+00	--	8.83E+04	0.00E+00	modeled	2.50E-06	0.00E+00	0.00E+00	2.50E-06
Aroclor-1254	1.10E+01	0.00E+00	4.40E+00	2.16E+05	0.00E+00	actual	2.75E-02	5.50E-01	0.00E+00	5.78E-01
Aroclor-1260	1.80E-01	0.00E+00	--	1.10E+05	0.00E+00	modeled	4.50E-04	0.00E+00	0.00E+00	4.50E-04
Total PCB Congeners	6.10E+00	2.60E-05	2.04E+01	1.01E+05	2.63E+00	actual	1.53E-02	2.55E+00	2.86E-06	2.57E+00
Total PCB Aroclors	1.10E+01	1.50E-05	4.40E+00	1.01E+05	1.52E+00	actual	2.75E-02	5.50E-01	1.65E-06	5.78E-01
PESTICIDES										
DDTr	7.80E-02	0.00E+00	7.68E-01	6.74E+04	0.00E+00	actual	1.95E-04	9.61E-02	0.00E+00	9.62E-02
Dieldrin	1.90E-02	0.00E+00	1.96E-02	5.01E+03	0.00E+00	actual	4.75E-05	2.45E-03	0.00E+00	2.50E-03
Endosulfan I	2.10E-03	0.00E+00	1.08E-02	6.25E+02	0.00E+00	actual	5.25E-06	1.35E-03	0.00E+00	1.36E-03
Endosulfan II	6.10E-03	0.00E+00	4.80E-03	6.25E+02	0.00E+00	actual	1.53E-05	6.00E-04	0.00E+00	6.15E-04
Endrin	8.60E-03	0.00E+00	3.16E-01	5.01E+03	0.00E+00	actual	2.15E-05	3.95E-02	0.00E+00	3.95E-02
Endrin aldehyde	6.50E-03	0.00E+00	2.76E-02	2.75E+03	0.00E+00	actual	1.63E-05	3.45E-03	0.00E+00	3.47E-03
gamma-Chlordane	1.80E-02	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	4.50E-05	1.25E-02	0.00E+00	1.25E-02
Heptachlor epoxide	8.60E-03	0.00E+00	1.08E-02	3.59E+03	0.00E+00	actual	2.15E-05	1.35E-03	0.00E+00	1.37E-03

Table A-33
Wildlife Exposure Modeling of Maximum Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs										
Total LMW PAHs	9.36E-01	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.34E-03	0.00E+00	0.00E+00	2.34E-03
Total HMW PAHs	2.74E+00	0.00E+00	--	1.43E+04	0.00E+00	modeled	6.85E-03	0.00E+00	0.00E+00	6.85E-03
SVOCS										
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	1.68E-03	0.00E+00	0.00E+00	1.68E-03
Carbazole	8.60E-02	0.00E+00	--	5.28E+02	0.00E+00	modeled	2.15E-04	0.00E+00	0.00E+00	2.15E-04
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	1.73E+03	0.00E+00	modeled	5.00E-04	0.00E+00	0.00E+00	5.00E-04
Phenol	8.30E-02	0.00E+00	4.40E-01	1.71E+01	0.00E+00	actual	2.08E-04	5.50E-02	0.00E+00	5.52E-02
VOCS										
Acetophenone	1.20E-01	0.00E+00	--	5.33E+00	0.00E+00	modeled	3.00E-04	0.00E+00	0.00E+00	3.00E-04

Table A-34
Wildlife Exposure Modeling of 95UCLM Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.86E+02	1.52E-01	2.64E+01	1.60E+01	2.43E+00	actual	4.65E-01	3.30E+00	1.67E-02	3.78E+00
Beryllium	6.00E-01	0.00E+00	8.40E-02	2.48E+02	0.00E+00	actual	1.50E-03	1.05E-02	0.00E+00	1.20E-02
Lead	9.84E+00	1.80E-03	2.20E+00	1.80E+02	3.24E-01	actual	2.46E-02	2.75E-01	1.98E-04	3.00E-01
Manganese	4.34E+02	1.26E-01	1.24E+02	1.60E+03	2.02E+02	actual	1.09E+00	1.55E+01	1.39E-02	1.66E+01
Selenium	2.10E-01	7.70E-04	9.20E-01	9.68E+02	7.45E-01	actual	5.25E-04	1.15E-01	8.47E-05	1.16E-01
Vanadium	1.80E+01	1.11E-02	6.40E+00	4.00E+00	4.44E-02	actual	4.51E-02	8.00E-01	1.22E-03	8.46E-01
PCBS										
Aroclor-1221	2.10E-03	0.00E+00	--	2.17E+03	0.00E+00	modeled	5.25E-06	0.00E+00	0.00E+00	5.25E-06
Aroclor-1242	1.70E-01	0.00E+00	--	1.01E+05	0.00E+00	modeled	4.25E-04	0.00E+00	0.00E+00	4.25E-04
Aroclor-1248	1.00E-03	0.00E+00	--	8.83E+04	0.00E+00	modeled	2.50E-06	0.00E+00	0.00E+00	2.50E-06
Aroclor-1254	1.37E+00	0.00E+00	3.03E+00	2.16E+05	0.00E+00	actual	3.43E-03	3.79E-01	0.00E+00	3.82E-01
Aroclor-1260	1.17E-02	0.00E+00	--	1.10E+05	0.00E+00	modeled	2.93E-05	0.00E+00	0.00E+00	2.93E-05
Total PCB Congeners	2.71E+00	5.81E-06	2.04E+01	1.01E+05	5.88E-01	actual	6.78E-03	2.55E+00	6.39E-07	2.56E+00
Total PCB Aroclors	1.05E+00	1.50E-05	2.80E+00	1.01E+05	1.52E+00	actual	2.62E-03	3.50E-01	1.65E-06	3.52E-01
PESTICIDES										
DDTr	4.02E-02	0.00E+00	7.68E-01	6.74E+04	0.00E+00	actual	1.01E-04	9.61E-02	0.00E+00	9.62E-02
Dieldrin	7.90E-03	0.00E+00	1.96E-02	5.01E+03	0.00E+00	actual	1.98E-05	2.45E-03	0.00E+00	2.47E-03
Endosulfan I	2.10E-03	0.00E+00	1.08E-02	6.25E+02	0.00E+00	actual	5.25E-06	1.35E-03	0.00E+00	1.36E-03
Endosulfan II	3.02E-03	0.00E+00	4.80E-03	6.25E+02	0.00E+00	actual	7.55E-06	6.00E-04	0.00E+00	6.08E-04
Endrin	5.20E-03	0.00E+00	3.16E-01	5.01E+03	0.00E+00	actual	1.30E-05	3.95E-02	0.00E+00	3.95E-02
Endrin aldehyde	4.18E-03	0.00E+00	2.76E-02	2.75E+03	0.00E+00	actual	1.05E-05	3.45E-03	0.00E+00	3.46E-03
gamma-Chlordane	1.14E-02	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	2.85E-05	1.25E-02	0.00E+00	1.25E-02
Heptachlor epoxide	4.24E-03	0.00E+00	1.08E-02	3.59E+03	0.00E+00	actual	1.06E-05	1.35E-03	0.00E+00	1.36E-03

Table A-34
Wildlife Exposure Modeling of 95UCLM Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs										
Total LMW PAHs	9.36E-01	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.34E-03	0.00E+00	0.00E+00	2.34E-03
Total HMW PAHs	2.74E+00	0.00E+00	--	1.43E+04	0.00E+00	modeled	6.85E-03	0.00E+00	0.00E+00	6.85E-03
SVOCS										
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	1.68E-03	0.00E+00	0.00E+00	1.68E-03
Carbazole	8.60E-02	0.00E+00	--	5.28E+02	0.00E+00	modeled	2.15E-04	0.00E+00	0.00E+00	2.15E-04
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	1.73E+03	0.00E+00	modeled	5.00E-04	0.00E+00	0.00E+00	5.00E-04
Phenol	8.30E-02	0.00E+00	4.40E-01	1.71E+01	0.00E+00	actual	2.08E-04	5.50E-02	0.00E+00	5.52E-02
VOCS										
Acetophenone	1.20E-01	0.00E+00	--	5.33E+00	0.00E+00	modeled	3.00E-04	0.00E+00	0.00E+00	3.00E-04

Table A-35
Wildlife Exposure Modeling of Maximum Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.72E+02	1.52E-01	2.64E+01	1.60E+01	2.43E+00	actual	2.45E-01	1.19E+00	6.84E-03	1.44E+00
Beryllium	6.00E-01	0.00E+00	8.40E-02	2.48E+02	0.00E+00	actual	5.40E-04	3.78E-03	0.00E+00	4.32E-03
Lead	1.27E+01	1.80E-03	2.20E+00	1.80E+02	3.24E-01	actual	1.14E-02	9.90E-02	8.10E-05	1.11E-01
Manganese	6.95E+02	1.26E-01	1.24E+02	1.60E+03	2.02E+02	actual	6.26E-01	5.58E+00	5.67E-03	6.21E+00
Selenium	2.10E-01	7.70E-04	9.20E-01	9.68E+02	7.45E-01	actual	1.89E-04	4.14E-02	3.47E-05	4.16E-02
Vanadium	2.17E+01	1.11E-02	6.40E+00	4.00E+00	4.44E-02	actual	1.95E-02	2.88E-01	5.00E-04	3.08E-01
PCBS										
Aroclor-1221	2.10E-03	0.00E+00	--	2.17E+03	0.00E+00	modeled	1.89E-06	0.00E+00	0.00E+00	1.89E-06
Aroclor-1242	1.70E-01	0.00E+00	--	1.01E+05	0.00E+00	modeled	1.53E-04	0.00E+00	0.00E+00	1.53E-04
Aroclor-1248	1.00E-03	0.00E+00	--	8.83E+04	0.00E+00	modeled	9.00E-07	0.00E+00	0.00E+00	9.00E-07
Aroclor-1254	1.10E+01	0.00E+00	4.40E+00	2.16E+05	0.00E+00	actual	9.90E-03	1.98E-01	0.00E+00	2.08E-01
Aroclor-1260	1.80E-01	0.00E+00	--	1.10E+05	0.00E+00	modeled	1.62E-04	0.00E+00	0.00E+00	1.62E-04
Total PCB Congeners	6.10E+00	2.60E-05	2.04E+01	1.01E+05	2.63E+00	actual	5.49E-03	9.18E-01	1.17E-06	9.23E-01
Total PCB Aroclors	1.10E+01	1.50E-05	4.40E+00	1.01E+05	1.52E+00	actual	9.90E-03	1.98E-01	6.75E-07	2.08E-01
PESTICIDES										
DDTr	7.80E-02	0.00E+00	7.68E-01	6.74E+04	0.00E+00	actual	7.02E-05	3.46E-02	0.00E+00	3.46E-02
Dieldrin	1.90E-02	0.00E+00	1.96E-02	5.01E+03	0.00E+00	actual	1.71E-05	8.82E-04	0.00E+00	8.99E-04
Endosulfan I	2.10E-03	0.00E+00	1.08E-02	6.25E+02	0.00E+00	actual	1.89E-06	4.86E-04	0.00E+00	4.88E-04
Endosulfan II	6.10E-03	0.00E+00	4.80E-03	6.25E+02	0.00E+00	actual	5.49E-06	2.16E-04	0.00E+00	2.21E-04
Endrin	8.60E-03	0.00E+00	3.16E-01	5.01E+03	0.00E+00	actual	7.74E-06	1.42E-02	0.00E+00	1.42E-02
Endrin aldehyde	6.50E-03	0.00E+00	2.76E-02	2.75E+03	0.00E+00	actual	5.85E-06	1.24E-03	0.00E+00	1.25E-03
gamma-Chlordane	1.80E-02	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	1.62E-05	4.50E-03	0.00E+00	4.52E-03
Heptachlor epoxide	8.60E-03	0.00E+00	1.08E-02	3.59E+03	0.00E+00	actual	7.74E-06	4.86E-04	0.00E+00	4.94E-04

Table A-35
Wildlife Exposure Modeling of Maximum Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs										
Total LMW PAHs	9.36E-01	0.00E+00	--	1.43E+04	0.00E+00	modeled	8.42E-04	0.00E+00	0.00E+00	8.42E-04
Total HMW PAHs	2.74E+00	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.47E-03	0.00E+00	0.00E+00	2.47E-03
SVOCS										
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	6.03E-04	0.00E+00	0.00E+00	6.03E-04
Carbazole	8.60E-02	0.00E+00	--	5.28E+02	0.00E+00	modeled	7.74E-05	0.00E+00	0.00E+00	7.74E-05
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	1.73E+03	0.00E+00	modeled	1.80E-04	0.00E+00	0.00E+00	1.80E-04
Phenol	8.30E-02	0.00E+00	4.40E-01	1.71E+01	0.00E+00	actual	7.47E-05	1.98E-02	0.00E+00	1.99E-02
VOCS										
Acetophenone	1.20E-01	0.00E+00	--	5.33E+00	0.00E+00	modeled	1.08E-04	0.00E+00	0.00E+00	1.08E-04

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Table A-36
Wildlife Exposure Modeling of 95UCLM Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.86E+02	1.52E-01	2.64E+01	1.60E+01	2.43E+00	actual	1.67E-01	1.19E+00	6.84E-03	1.36E+00
Beryllium	6.00E-01	0.00E+00	8.40E-02	2.48E+02	0.00E+00	actual	5.40E-04	3.78E-03	0.00E+00	4.32E-03
Lead	9.84E+00	1.80E-03	2.20E+00	1.80E+02	3.24E-01	actual	8.85E-03	9.90E-02	8.10E-05	1.08E-01
Manganese	4.34E+02	1.26E-01	1.24E+02	1.60E+03	2.02E+02	actual	3.91E-01	5.58E+00	5.67E-03	5.98E+00
Selenium	2.10E-01	7.70E-04	9.20E-01	9.68E+02	7.45E-01	actual	1.89E-04	4.14E-02	3.47E-05	4.16E-02
Vanadium	1.80E+01	1.11E-02	6.40E+00	4.00E+00	4.44E-02	actual	1.62E-02	2.88E-01	5.00E-04	3.05E-01
PCBS										
Aroclor-1221	2.10E-03	0.00E+00	--	2.17E+03	0.00E+00	modeled	1.89E-06	0.00E+00	0.00E+00	1.89E-06
Aroclor-1242	1.70E-01	0.00E+00	--	1.01E+05	0.00E+00	modeled	1.53E-04	0.00E+00	0.00E+00	1.53E-04
Aroclor-1248	1.00E-03	0.00E+00	--	8.83E+04	0.00E+00	modeled	9.00E-07	0.00E+00	0.00E+00	9.00E-07
Aroclor-1254	1.37E+00	0.00E+00	3.03E+00	2.16E+05	0.00E+00	actual	1.24E-03	1.36E-01	0.00E+00	1.38E-01
Aroclor-1260	1.17E-02	0.00E+00	--	1.10E+05	0.00E+00	modeled	1.05E-05	0.00E+00	0.00E+00	1.05E-05
Total PCB Congeners	2.71E+00	5.81E-06	2.04E+01	1.01E+05	5.88E-01	actual	2.44E-03	9.18E-01	2.61E-07	9.20E-01
Total PCB Aroclors	1.05E+00	1.50E-05	2.80E+00	1.01E+05	1.52E+00	actual	9.44E-04	1.26E-01	6.75E-07	1.27E-01
PESTICIDES										
DDTr	4.02E-02	0.00E+00	7.68E-01	6.74E+04	0.00E+00	actual	3.62E-05	3.46E-02	0.00E+00	3.46E-02
Dieldrin	7.90E-03	0.00E+00	1.96E-02	5.01E+03	0.00E+00	actual	7.11E-06	8.82E-04	0.00E+00	8.89E-04
Endosulfan I	2.10E-03	0.00E+00	1.08E-02	6.25E+02	0.00E+00	actual	1.89E-06	4.86E-04	0.00E+00	4.88E-04
Endosulfan II	3.02E-03	0.00E+00	4.80E-03	6.25E+02	0.00E+00	actual	2.72E-06	2.16E-04	0.00E+00	2.19E-04
Endrin	5.20E-03	0.00E+00	3.16E-01	5.01E+03	0.00E+00	actual	4.68E-06	1.42E-02	0.00E+00	1.42E-02
Endrin aldehyde	4.18E-03	0.00E+00	2.76E-02	2.75E+03	0.00E+00	actual	3.76E-06	1.24E-03	0.00E+00	1.25E-03
gamma-Chlordane	1.14E-02	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	1.03E-05	4.50E-03	0.00E+00	4.51E-03
Heptachlor epoxide	4.24E-03	0.00E+00	1.08E-02	3.59E+03	0.00E+00	actual	3.82E-06	4.86E-04	0.00E+00	4.90E-04

Table A-36
Wildlife Exposure Modeling of 95UCLM Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs										
Total LMW PAHs	9.36E-01	0.00E+00	--	1.43E+04	0.00E+00	modeled	8.42E-04	0.00E+00	0.00E+00	8.42E-04
Total HMW PAHs	2.74E+00	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.47E-03	0.00E+00	0.00E+00	2.47E-03
SVOCS										
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	6.03E-04	0.00E+00	0.00E+00	6.03E-04
Carbazole	8.60E-02	0.00E+00	--	5.28E+02	0.00E+00	modeled	7.74E-05	0.00E+00	0.00E+00	7.74E-05
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	1.73E+03	0.00E+00	modeled	1.80E-04	0.00E+00	0.00E+00	1.80E-04
Phenol	8.30E-02	0.00E+00	4.40E-01	1.71E+01	0.00E+00	actual	7.47E-05	1.98E-02	0.00E+00	1.99E-02
VOCS										
Acetophenone	1.20E-01	0.00E+00	--	5.33E+00	0.00E+00	modeled	1.08E-04	0.00E+00	0.00E+00	1.08E-04

Table A-37
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	2.72E+02	1.52E-01	1.50E-01	4.08E+01	2.31E-01	1.73E+00	1.48E-01	2.11E+00
Beryllium	6.00E-01	0.00E+00	1.00E-02	6.00E-03	5.09E-04	2.54E-04	0.00E+00	7.63E-04
Lead	1.27E+01	1.80E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.10E+00	1.08E-02	4.68E-02	1.76E-03	5.93E-02
Manganese	6.95E+02	1.26E-01	2.50E-01	1.74E+02	5.90E-01	7.37E+00	1.23E-01	8.08E+00
Selenium	2.10E-01	7.70E-04	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	9.06E-02	1.78E-04	3.84E-03	7.51E-04	4.77E-03
Vanadium	2.17E+01	1.11E-02	5.50E-03	1.19E-01	1.84E-02	5.06E-03	1.08E-02	3.43E-02
PCBS								
Aroclor-1221	2.10E-03	0.00E+00	1.11E-01	2.32E-04	1.78E-06	9.85E-06	0.00E+00	1.16E-05
Aroclor-1242	1.70E-01	0.00E+00	8.44E-03	1.43E-03	1.44E-04	6.09E-05	0.00E+00	2.05E-04
Aroclor-1248	1.00E-03	0.00E+00	8.44E-03	8.44E-06	8.48E-07	3.58E-07	0.00E+00	1.21E-06
Aroclor-1254	1.10E+01	0.00E+00	3.58E-03	3.94E-02	9.33E-03	1.67E-03	0.00E+00	1.10E-02
Aroclor-1260	1.80E-01	0.00E+00	6.44E-04	1.16E-04	1.53E-04	4.92E-06	0.00E+00	1.58E-04
Total PCB Congeners	6.10E+00	2.60E-05	8.44E-03	5.15E-02	5.17E-03	2.18E-03	2.54E-05	7.38E-03
Total PCB Aroclors	1.10E+01	1.50E-05	8.44E-03	9.28E-02	9.33E-03	3.94E-03	1.46E-05	1.33E-02
PESTICIDES								
DDTr	7.80E-02	0.00E+00	1.97E-02	1.54E-03	6.62E-05	6.52E-05	0.00E+00	1.31E-04
Dieldrin	1.90E-02	0.00E+00	2.75E-02	5.22E-04	1.61E-05	2.22E-05	0.00E+00	3.83E-05
Endosulfan I	2.10E-03	0.00E+00	3.69E-01	7.75E-04	1.78E-06	3.29E-05	0.00E+00	3.46E-05
Endosulfan II	6.10E-03	0.00E+00	3.69E-01	2.25E-03	5.17E-06	9.54E-05	0.00E+00	1.01E-04
Endrin	8.60E-03	0.00E+00	2.75E-02	2.36E-04	7.29E-06	1.00E-05	0.00E+00	1.73E-05
Endrin aldehyde	6.50E-03	0.00E+00	6.47E-02	4.21E-04	5.51E-06	1.78E-05	0.00E+00	2.34E-05
gamma-Chlordane	1.80E-02	0.00E+00	3.48E-03	6.27E-05	1.53E-05	2.66E-06	0.00E+00	1.79E-05
Heptachlor epoxide	8.60E-03	0.00E+00	8.92E-02	7.67E-04	7.29E-06	3.25E-05	0.00E+00	3.98E-05

Table A-37
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs								
Total LMW PAHs	9.36E-01	0.00E+00	1.01E-01	9.48E-02	7.94E-04	4.02E-03	0.00E+00	4.81E-03
Total HMW PAHs	2.74E+00	0.00E+00	1.01E-01	2.77E-01	2.32E-03	1.18E-02	0.00E+00	1.41E-02
SVOCS								
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	5.48E-04	3.67E-04	5.68E-04	1.56E-05	0.00E+00	5.84E-04
Carbazole	8.60E-02	0.00E+00	5.26E-01	4.52E-02	7.29E-05	1.92E-03	0.00E+00	1.99E-03
Di-n-butyl phthalate	2.00E-01	0.00E+00	8.38E-02	1.68E-02	1.70E-04	7.11E-04	0.00E+00	8.81E-04
Phenol	8.30E-02	0.00E+00	5.19E+00	4.31E-01	7.04E-05	1.83E-02	0.00E+00	1.83E-02
VOCS								
Acetophenone	1.20E-01	0.00E+00	4.18E+00	5.01E-01	1.02E-04	2.12E-02	0.00E+00	2.13E-02

Table A-38
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.86E+02	1.52E-01	1.50E-01	2.79E+01	1.58E-01	1.18E+00	1.48E-01	1.49E+00
Beryllium	6.00E-01	0.00E+00	1.00E-02	6.00E-03	5.09E-04	2.54E-04	0.00E+00	7.63E-04
Lead	9.84E+00	1.80E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	9.55E-01	8.34E-03	4.05E-02	1.76E-03	5.06E-02
Manganese	4.34E+02	1.26E-01	2.50E-01	1.09E+02	3.68E-01	4.60E+00	1.23E-01	5.10E+00
Selenium	2.10E-01	7.70E-04	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	9.06E-02	1.78E-04	3.84E-03	7.51E-04	4.77E-03
Vanadium	1.80E+01	1.11E-02	5.50E-03	9.91E-02	1.53E-02	4.20E-03	1.08E-02	3.03E-02
PCBS								
Aroclor-1221	2.10E-03	0.00E+00	1.11E-01	2.32E-04	1.78E-06	9.85E-06	0.00E+00	1.16E-05
Aroclor-1242	1.70E-01	0.00E+00	8.44E-03	1.43E-03	1.44E-04	6.09E-05	0.00E+00	2.05E-04
Aroclor-1248	1.00E-03	0.00E+00	8.44E-03	8.44E-06	8.48E-07	3.58E-07	0.00E+00	1.21E-06
Aroclor-1254	1.37E+00	0.00E+00	3.58E-03	4.91E-03	1.16E-03	2.08E-04	0.00E+00	1.37E-03
Aroclor-1260	1.17E-02	0.00E+00	6.44E-04	7.53E-06	9.92E-06	3.20E-07	0.00E+00	1.02E-05
Total PCB Congeners	2.71E+00	5.81E-06	8.44E-03	2.29E-02	2.30E-03	9.70E-04	5.66E-06	3.28E-03
Total PCB Aroclors	1.05E+00	1.50E-05	8.44E-03	8.85E-03	8.90E-04	3.76E-04	1.46E-05	1.28E-03
PESTICIDES								
DDTr	4.02E-02	0.00E+00	1.97E-02	7.92E-04	3.41E-05	3.36E-05	0.00E+00	6.77E-05
Dieldrin	7.90E-03	0.00E+00	2.75E-02	2.17E-04	6.70E-06	9.21E-06	0.00E+00	1.59E-05
Endosulfan I	2.10E-03	0.00E+00	3.69E-01	7.75E-04	1.78E-06	3.29E-05	0.00E+00	3.46E-05
Endosulfan II	3.02E-03	0.00E+00	3.69E-01	1.11E-03	2.56E-06	4.72E-05	0.00E+00	4.98E-05
Endrin	5.20E-03	0.00E+00	2.75E-02	1.43E-04	4.41E-06	6.06E-06	0.00E+00	1.05E-05
Endrin aldehyde	4.18E-03	0.00E+00	6.47E-02	2.70E-04	3.55E-06	1.15E-05	0.00E+00	1.50E-05
gamma-Chlordane	1.14E-02	0.00E+00	3.48E-03	3.97E-05	9.67E-06	1.68E-06	0.00E+00	1.14E-05
Heptachlor epoxide	4.24E-03	0.00E+00	8.92E-02	3.78E-04	3.60E-06	1.60E-05	0.00E+00	1.96E-05

Table A-38
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs								
Total LMW PAHs	9.36E-01	0.00E+00	1.01E-01	9.48E-02	7.94E-04	4.02E-03	0.00E+00	4.81E-03
Total HMW PAHs	2.74E+00	0.00E+00	1.01E-01	2.77E-01	2.32E-03	1.18E-02	0.00E+00	1.41E-02
SVOCS								
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	5.48E-04	3.67E-04	5.68E-04	1.56E-05	0.00E+00	5.84E-04
Carbazole	8.60E-02	0.00E+00	5.26E-01	4.52E-02	7.29E-05	1.92E-03	0.00E+00	1.99E-03
Di-n-butyl phthalate	2.00E-01	0.00E+00	8.38E-02	1.68E-02	1.70E-04	7.11E-04	0.00E+00	8.81E-04
Phenol	8.30E-02	0.00E+00	5.19E+00	4.31E-01	7.04E-05	1.83E-02	0.00E+00	1.83E-02
VOCS								
Acetophenone	1.20E-01	0.00E+00	4.18E+00	5.01E-01	1.02E-04	2.12E-02	0.00E+00	2.13E-02

Table A-39
Wildlife Exposure Modeling of Maximum Doses to Aquatic Carnivorous Mammals (Raccoon) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	2.72E+02	1.52E-01	--	1.00E+00	Uptake Factor	2.72E+02	modeled	1.23E+00	1.31E+01	1.25E-02	1.43E+01
Beryllium	6.00E-01	0.00E+00	--	1.00E+00	Uptake Factor	6.00E-01	modeled	2.71E-03	2.88E-02	0.00E+00	3.15E-02
Lead	1.27E+01	1.80E-03	--	6.60E-02	Uptake Factor	8.38E-01	modeled	5.73E-02	4.02E-02	1.49E-04	9.77E-02
Manganese	6.95E+02	1.26E-01	--	1.00E+00	Uptake Factor	6.95E+02	modeled	3.14E+00	3.34E+01	1.04E-02	3.65E+01
Selenium	2.10E-01	7.70E-04	--	1.00E+00	Uptake Factor	2.10E-01	modeled	9.48E-04	1.01E-02	6.35E-05	1.11E-02
Vanadium	2.17E+01	1.11E-02	--	1.00E+00	Uptake Factor	2.17E+01	modeled	9.79E-02	1.04E+00	9.16E-04	1.14E+00
PCBS											
Aroclor-1221	2.10E-03	0.00E+00	--	3.38E+00	BSAF	8.51E-02	modeled	9.48E-06	4.08E-03	0.00E+00	4.09E-03
Aroclor-1242	1.70E-01	0.00E+00	--	3.38E+00	BSAF	6.89E+00	modeled	7.67E-04	3.31E-01	0.00E+00	3.31E-01
Aroclor-1248	1.00E-03	0.00E+00	--	3.38E+00	BSAF	4.05E-02	modeled	4.51E-06	1.94E-03	0.00E+00	1.95E-03
Aroclor-1254	1.10E+01	0.00E+00	7.60E-01	3.38E+00	BSAF	4.46E+02	actual	4.96E-02	3.65E-02	0.00E+00	8.61E-02
Aroclor-1260	1.80E-01	0.00E+00	--	3.38E+00	BSAF	7.29E+00	modeled	8.12E-04	3.50E-01	0.00E+00	3.51E-01
Total PCB Congeners	6.10E+00	2.60E-05	2.80E+00	3.38E+00	BSAF	2.47E+02	actual	2.75E-02	1.34E-01	2.15E-06	1.62E-01
Total PCB Aroclors	1.10E+01	1.50E-05	7.60E-01	3.38E+00	BSAF	4.46E+02	actual	4.96E-02	3.65E-02	1.24E-06	8.61E-02
PESTICIDES											
DDTr	7.80E-02	0.00E+00	--	5.22E+00	BSAF	4.89E+00	modeled	3.52E-04	2.35E-01	0.00E+00	2.35E-01
Dieldrin	1.90E-02	0.00E+00	--	2.06E+00	BSAF	4.69E-01	modeled	8.57E-05	2.25E-02	0.00E+00	2.26E-02
Endosulfan I	2.10E-03	0.00E+00	--	4.00E+00	BSAF	1.01E-01	modeled	9.48E-06	4.84E-03	0.00E+00	4.85E-03
Endosulfan II	6.10E-03	0.00E+00	--	4.00E+00	BSAF	2.93E-01	modeled	2.75E-05	1.41E-02	0.00E+00	1.41E-02
Endrin	8.60E-03	0.00E+00	--	2.83E-02	BSAF	2.92E-03	modeled	3.88E-05	1.40E-04	0.00E+00	1.79E-04
Endrin aldehyde	6.50E-03	0.00E+00	--	4.00E+00	BSAF	3.12E-01	modeled	2.93E-05	1.50E-02	0.00E+00	1.50E-02
gamma-Chlordane	1.80E-02	0.00E+00	--	1.08E+00	BSAF	2.34E-01	modeled	8.12E-05	1.12E-02	0.00E+00	1.13E-02
Heptachlor epoxide	8.60E-03	0.00E+00	--	6.77E+00	BSAF	6.99E-01	modeled	3.88E-05	3.35E-02	0.00E+00	3.36E-02
PAHs											
Total LMW PAHs	9.36E-01	0.00E+00	--	5.66E-02	BSAF	6.36E-01	modeled	4.22E-03	3.05E-02	0.00E+00	3.48E-02
Total HMW PAHs	2.74E+00	0.00E+00	--	1.78E-02	BSAF	5.84E-01	modeled	1.24E-02	2.81E-02	0.00E+00	4.04E-02
SVOCS											
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	4.00E+00	BSAF	3.22E+01	modeled	3.02E-03	1.54E+00	0.00E+00	1.55E+00
Carbazole	8.60E-02	0.00E+00	--	4.00E+00	BSAF	4.13E+00	modeled	3.88E-04	1.98E-01	0.00E+00	1.99E-01
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	4.00E+00	BSAF	9.60E+00	modeled	9.02E-04	4.61E-01	0.00E+00	4.62E-01
Phenol	8.30E-02	0.00E+00	--	4.00E+00	BSAF	3.98E+00	modeled	3.74E-04	1.91E-01	0.00E+00	1.92E-01
VOCS											
Acetophenone	1.20E-01	0.00E+00	--	4.00E+00	BSAF	5.76E+00	modeled	5.41E-04	2.76E-01	0.00E+00	2.77E-01

Table A-40
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Carnivorous Mammals (Raccoon) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake: BSAF/Uptake Factor		Modeled Food Item (Benthos) Uptake: Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses: Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.86E+02	1.52E-01	--	1.00E+00	Uptake Factor	1.86E+02	modeled	8.40E-01	8.93E+00	1.25E-02	9.79E+00
Beryllium	6.00E-01	0.00E+00	--	1.00E+00	Uptake Factor	6.00E-01	modeled	2.71E-03	2.88E-02	0.00E+00	3.15E-02
Lead	9.84E+00	1.80E-03	--	6.60E-02	Uptake Factor	6.49E-01	modeled	4.44E-02	3.12E-02	1.49E-04	7.57E-02
Manganese	4.34E+02	1.26E-01	--	1.00E+00	Uptake Factor	4.34E+02	modeled	1.96E+00	2.08E+01	1.04E-02	2.28E+01
Selenium	2.10E-01	7.70E-04	--	1.00E+00	Uptake Factor	2.10E-01	modeled	9.48E-04	1.01E-02	6.35E-05	1.11E-02
Vanadium	1.80E+01	1.11E-02	--	1.00E+00	Uptake Factor	1.80E+01	modeled	8.13E-02	8.65E-01	9.16E-04	9.47E-01
PCBS											
Aroclor-1221	2.10E-03	0.00E+00	--	3.38E+00	BSAF	8.51E-02	modeled	9.48E-06	4.08E-03	0.00E+00	4.09E-03
Aroclor-1242	1.70E-01	0.00E+00	--	3.38E+00	BSAF	6.89E+00	modeled	7.67E-04	3.31E-01	0.00E+00	3.31E-01
Aroclor-1248	1.00E-03	0.00E+00	--	3.38E+00	BSAF	4.05E-02	modeled	4.51E-06	1.94E-03	0.00E+00	1.95E-03
Aroclor-1254	1.37E+00	0.00E+00	3.38E-01	3.38E+00	BSAF	5.56E+01	actual	6.19E-03	1.62E-02	0.00E+00	2.24E-02
Aroclor-1260	1.17E-02	0.00E+00	--	3.38E+00	BSAF	4.74E-01	modeled	5.28E-05	2.28E-02	0.00E+00	2.28E-02
Total PCB Congeners	2.71E+00	5.81E-06	1.79E+00	3.38E+00	BSAF	1.10E+02	actual	1.22E-02	8.58E-02	4.79E-07	9.81E-02
Total PCB Aroclors	1.05E+00	1.50E-05	3.38E-01	3.38E+00	BSAF	4.25E+01	actual	4.73E-03	1.62E-02	1.24E-06	2.10E-02
PESTICIDES											
DDTr	4.02E-02	0.00E+00	--	5.22E+00	BSAF	2.52E+00	modeled	1.81E-04	1.21E-01	0.00E+00	1.21E-01
Dieldrin	7.90E-03	0.00E+00	--	2.06E+00	BSAF	1.95E-01	modeled	3.56E-05	9.37E-03	0.00E+00	9.40E-03
Endosulfan I	2.10E-03	0.00E+00	--	4.00E+00	BSAF	1.01E-01	modeled	9.48E-06	4.84E-03	0.00E+00	4.85E-03
Endosulfan II	3.02E-03	0.00E+00	--	4.00E+00	BSAF	1.45E-01	modeled	1.36E-05	6.96E-03	0.00E+00	6.97E-03
Endrin	5.20E-03	0.00E+00	--	2.83E-02	BSAF	1.77E-03	modeled	2.35E-05	8.48E-05	0.00E+00	1.08E-04
Endrin aldehyde	4.18E-03	0.00E+00	--	4.00E+00	BSAF	2.01E-01	modeled	1.89E-05	9.63E-03	0.00E+00	9.65E-03
gamma-Chlordane	1.14E-02	0.00E+00	--	1.08E+00	BSAF	1.48E-01	modeled	5.14E-05	7.10E-03	0.00E+00	7.15E-03
Heptachlor epoxide	4.24E-03	0.00E+00	--	6.77E+00	BSAF	3.45E-01	modeled	1.91E-05	1.65E-02	0.00E+00	1.66E-02
PAHs											
Total LMW PAHs	9.36E-01	0.00E+00	--	5.66E-02	BSAF	6.36E-01	modeled	4.22E-03	3.05E-02	0.00E+00	3.48E-02
Total HMW PAHs	2.74E+00	0.00E+00	--	1.78E-02	BSAF	5.84E-01	modeled	1.24E-02	2.81E-02	0.00E+00	4.04E-02
SVOCS											
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	4.00E+00	BSAF	3.22E+01	modeled	3.02E-03	1.54E+00	0.00E+00	1.55E+00
Carbazole	8.60E-02	0.00E+00	--	4.00E+00	BSAF	4.13E+00	modeled	3.88E-04	1.98E-01	0.00E+00	1.99E-01
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	4.00E+00	BSAF	9.60E+00	modeled	9.02E-04	4.61E-01	0.00E+00	4.62E-01
Phenol	8.30E-02	0.00E+00	--	4.00E+00	BSAF	3.98E+00	modeled	3.74E-04	1.91E-01	0.00E+00	1.92E-01
VOCS											
Acetophenone	1.20E-01	0.00E+00	--	4.00E+00	BSAF	5.76E+00	modeled	5.41E-04	2.76E-01	0.00E+00	2.77E-01

Table A-41
Wildlife Exposure Modeling of Maximum Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.72E+02	1.52E-01	2.64E+01	1.60E+01	2.43E+00	actual	2.61E-01	1.27E+00	1.23E-02	1.54E+00
Beryllium	6.00E-01	0.00E+00	8.40E-02	2.48E+02	0.00E+00	actual	5.76E-04	4.03E-03	0.00E+00	4.61E-03
Lead	1.27E+01	1.80E-03	2.20E+00	1.80E+02	3.24E-01	actual	1.22E-02	1.06E-01	1.46E-04	1.18E-01
Manganese	6.95E+02	1.26E-01	1.24E+02	1.60E+03	2.02E+02	actual	6.67E-01	5.95E+00	1.02E-02	6.63E+00
Selenium	2.10E-01	7.70E-04	9.20E-01	9.68E+02	7.45E-01	actual	2.02E-04	4.42E-02	6.24E-05	4.44E-02
Vanadium	2.17E+01	1.11E-02	6.40E+00	4.00E+00	4.44E-02	actual	2.08E-02	3.07E-01	8.99E-04	3.29E-01
PCBS										
Aroclor-1221	2.10E-03	0.00E+00	--	2.17E+03	0.00E+00	modeled	2.02E-06	0.00E+00	0.00E+00	2.02E-06
Aroclor-1242	1.70E-01	0.00E+00	--	1.01E+05	0.00E+00	modeled	1.63E-04	0.00E+00	0.00E+00	1.63E-04
Aroclor-1248	1.00E-03	0.00E+00	--	8.83E+04	0.00E+00	modeled	9.60E-07	0.00E+00	0.00E+00	9.60E-07
Aroclor-1254	1.10E+01	0.00E+00	4.40E+00	2.16E+05	0.00E+00	actual	1.06E-02	2.11E-01	0.00E+00	2.22E-01
Aroclor-1260	1.80E-01	0.00E+00	--	1.10E+05	0.00E+00	modeled	1.73E-04	0.00E+00	0.00E+00	1.73E-04
Total PCB Congeners	6.10E+00	2.60E-05	2.04E+01	1.01E+05	2.63E+00	actual	5.86E-03	9.79E-01	2.11E-06	9.85E-01
Total PCB Aroclors	1.10E+01	1.50E-05	4.40E+00	1.01E+05	1.52E+00	actual	1.06E-02	2.11E-01	1.22E-06	2.22E-01
PESTICIDES										
DDTr	7.80E-02	0.00E+00	7.68E-01	6.74E+04	0.00E+00	actual	7.49E-05	3.69E-02	0.00E+00	3.70E-02
Dieldrin	1.90E-02	0.00E+00	1.96E-02	5.01E+03	0.00E+00	actual	1.82E-05	9.41E-04	0.00E+00	9.59E-04
Endosulfan I	2.10E-03	0.00E+00	1.08E-02	6.25E+02	0.00E+00	actual	2.02E-06	5.18E-04	0.00E+00	5.20E-04
Endosulfan II	6.10E-03	0.00E+00	4.80E-03	6.25E+02	0.00E+00	actual	5.86E-06	2.30E-04	0.00E+00	2.36E-04
Endrin	8.60E-03	0.00E+00	3.16E-01	5.01E+03	0.00E+00	actual	8.26E-06	1.52E-02	0.00E+00	1.52E-02
Endrin aldehyde	6.50E-03	0.00E+00	2.76E-02	2.75E+03	0.00E+00	actual	6.24E-06	1.32E-03	0.00E+00	1.33E-03
gamma-Chlordane	1.80E-02	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	1.73E-05	4.80E-03	0.00E+00	4.82E-03
Heptachlor epoxide	8.60E-03	0.00E+00	1.08E-02	3.59E+03	0.00E+00	actual	8.26E-06	5.18E-04	0.00E+00	5.27E-04

Table A-41
Wildlife Exposure Modeling of Maximum Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs										
Total LMW PAHs	9.36E-01	0.00E+00	--	1.43E+04	0.00E+00	modeled	8.99E-04	0.00E+00	0.00E+00	8.99E-04
Total HMW PAHs	2.74E+00	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.63E-03	0.00E+00	0.00E+00	2.63E-03
SVOCS										
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	6.43E-04	0.00E+00	0.00E+00	6.43E-04
Carbazole	8.60E-02	0.00E+00	--	5.28E+02	0.00E+00	modeled	8.26E-05	0.00E+00	0.00E+00	8.26E-05
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	1.73E+03	0.00E+00	modeled	1.92E-04	0.00E+00	0.00E+00	1.92E-04
Phenol	8.30E-02	0.00E+00	4.40E-01	1.71E+01	0.00E+00	actual	7.97E-05	2.11E-02	0.00E+00	2.12E-02
VOCS										
Acetophenone	1.20E-01	0.00E+00	--	5.33E+00	0.00E+00	modeled	1.15E-04	0.00E+00	0.00E+00	1.15E-04

Table A-41
Wildlife Exposure Modeling of Maximum Doses to Piscivorous Mammals (River Otter) from Media
for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.72E+02	1.52E-01	2.64E+01	1.60E+01	2.43E+00	actual	2.61E-01	1.27E+00	1.23E-02	1.54E+00
Beryllium	6.00E-01	0.00E+00	8.40E-02	2.48E+02	0.00E+00	actual	5.76E-04	4.03E-03	0.00E+00	4.61E-03
Lead	1.27E+01	1.80E-03	2.20E+00	1.80E+02	3.24E-01	actual	1.22E-02	1.06E-01	1.46E-04	1.18E-01
Manganese	6.95E+02	1.26E-01	1.24E+02	1.60E+03	2.02E+02	actual	6.67E-01	5.95E+00	1.02E-02	6.63E+00
Selenium	2.10E-01	7.70E-04	9.20E-01	9.68E+02	7.45E-01	actual	2.02E-04	4.42E-02	6.24E-05	4.44E-02
Vanadium	2.17E+01	1.11E-02	6.40E+00	4.00E+00	4.44E-02	actual	2.08E-02	3.07E-01	8.99E-04	3.29E-01
PCBS										
Aroclor-1221	2.10E-03	0.00E+00	--	2.17E+03	0.00E+00	modeled	2.02E-06	0.00E+00	0.00E+00	2.02E-06
Aroclor-1242	1.70E-01	0.00E+00	--	1.01E+05	0.00E+00	modeled	1.63E-04	0.00E+00	0.00E+00	1.63E-04
Aroclor-1248	1.00E-03	0.00E+00	--	8.83E+04	0.00E+00	modeled	9.60E-07	0.00E+00	0.00E+00	9.60E-07
Aroclor-1254	1.10E+01	0.00E+00	4.40E+00	2.16E+05	0.00E+00	actual	1.06E-02	2.11E-01	0.00E+00	2.22E-01
Aroclor-1260	1.80E-01	0.00E+00	--	1.10E+05	0.00E+00	modeled	1.73E-04	0.00E+00	0.00E+00	1.73E-04
Total PCB Congeners	6.10E+00	2.60E-05	2.04E+01	1.01E+05	2.63E+00	actual	5.86E-03	9.79E-01	2.11E-06	9.85E-01
Total PCB Aroclors	1.10E+01	1.50E-05	4.40E+00	1.01E+05	1.52E+00	actual	1.06E-02	2.11E-01	1.22E-06	2.22E-01
PESTICIDES										
DDTr	7.80E-02	0.00E+00	7.68E-01	6.74E+04	0.00E+00	actual	7.49E-05	3.69E-02	0.00E+00	3.70E-02
Dieldrin	1.90E-02	0.00E+00	1.96E-02	5.01E+03	0.00E+00	actual	1.82E-05	9.41E-04	0.00E+00	9.59E-04
Endosulfan I	2.10E-03	0.00E+00	1.08E-02	6.25E+02	0.00E+00	actual	2.02E-06	5.18E-04	0.00E+00	5.20E-04
Endosulfan II	6.10E-03	0.00E+00	4.80E-03	6.25E+02	0.00E+00	actual	5.86E-06	2.30E-04	0.00E+00	2.36E-04
Endrin	8.60E-03	0.00E+00	3.16E-01	5.01E+03	0.00E+00	actual	8.26E-06	1.52E-02	0.00E+00	1.52E-02
Endrin aldehyde	6.50E-03	0.00E+00	2.76E-02	2.75E+03	0.00E+00	actual	6.24E-06	1.32E-03	0.00E+00	1.33E-03
gamma-Chlordane	1.80E-02	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	1.73E-05	4.80E-03	0.00E+00	4.82E-03
Heptachlor epoxide	8.60E-03	0.00E+00	1.08E-02	3.59E+03	0.00E+00	actual	8.26E-06	5.18E-04	0.00E+00	5.27E-04

Table A-41
Wildlife Exposure Modeling of Maximum Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 3: LWMCU at the Siphon Exit

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs										
Total LMW PAHs	9.36E-01	0.00E+00	--	1.43E+04	0.00E+00	modeled	8.99E-04	0.00E+00	0.00E+00	8.99E-04
Total HMW PAHs	2.74E+00	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.63E-03	0.00E+00	0.00E+00	2.63E-03
SVOCS										
Bis(2-ethylhexyl)phthalate	6.70E-01	0.00E+00	--	6.84E+03	0.00E+00	modeled	6.43E-04	0.00E+00	0.00E+00	6.43E-04
Carbazole	8.60E-02	0.00E+00	--	5.28E+02	0.00E+00	modeled	8.26E-05	0.00E+00	0.00E+00	8.26E-05
Di-n-butyl phthalate	2.00E-01	0.00E+00	--	1.73E+03	0.00E+00	modeled	1.92E-04	0.00E+00	0.00E+00	1.92E-04
Phenol	8.30E-02	0.00E+00	4.40E-01	1.71E+01	0.00E+00	actual	7.97E-05	2.11E-02	0.00E+00	2.12E-02
VOCS										
Acetophenone	1.20E-01	0.00E+00	--	5.33E+00	0.00E+00	modeled	1.15E-04	0.00E+00	0.00E+00	1.15E-04

Table A-43
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	2.10E+02	1.46E-01	1.50E-01	3.15E+01	1.33E-01	2.44E-01	6.46E-03	3.84E-01
Lead	1.56E+01	1.60E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.24E+00	9.91E-03	9.59E-03	7.08E-05	1.96E-02
Manganese	5.42E+02	1.14E-01	2.50E-01	1.36E+02	3.44E-01	1.05E+00	5.04E-03	1.40E+00
Vanadium	2.57E+01	1.06E-02	5.50E-03	1.41E-01	1.63E-02	1.10E-03	4.69E-04	1.79E-02
PCBS								
Aroclor-1254	1.10E-01	0.00E+00	3.58E-03	3.94E-04	6.99E-05	3.05E-06	0.00E+00	7.30E-05
Total PCB Congeners	3.50E-02	0.00E+00	8.44E-03	2.95E-04	2.22E-05	2.29E-06	0.00E+00	2.45E-05
Total PCB Aroclors	1.10E-01	0.00E+00	8.44E-03	9.28E-04	6.99E-05	7.20E-06	0.00E+00	7.71E-05
PESTICIDES								
DDTr	1.87E-02	7.40E-05	1.97E-02	3.68E-04	1.19E-05	2.85E-06	3.27E-06	1.80E-05
gamma-Chlordane	4.40E-03	0.00E+00	3.48E-03	1.53E-05	2.80E-06	1.19E-07	0.00E+00	2.91E-06

Table A-44
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Birds (Canada Goose) from Media
for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.81E+02	1.46E-01	1.50E-01	2.72E+01	1.15E-01	2.11E-01	6.46E-03	3.32E-01
Lead	1.26E+01	1.60E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.10E+00	8.02E-03	8.52E-03	7.08E-05	1.66E-02
Manganese	4.37E+02	1.14E-01	2.50E-01	1.09E+02	2.77E-01	8.46E-01	5.04E-03	1.13E+00
Vanadium	2.15E+01	1.06E-02	5.50E-03	1.18E-01	1.37E-02	9.17E-04	4.69E-04	1.51E-02
PCBS								
Aroclor-1254	5.10E-02	0.00E+00	3.58E-03	1.83E-04	3.24E-05	1.41E-06	0.00E+00	3.38E-05
Total PCB Congeners	3.50E-02	0.00E+00	8.44E-03	2.95E-04	2.22E-05	2.29E-06	0.00E+00	2.45E-05
Total PCB Aroclors	5.68E-02	0.00E+00	8.44E-03	4.79E-04	3.61E-05	3.72E-06	0.00E+00	3.98E-05
PESTICIDES								
DDTr	1.20E-02	7.40E-05	1.97E-02	2.36E-04	7.63E-06	1.83E-06	3.27E-06	1.27E-05
gamma-Chlordane	2.42E-03	0.00E+00	3.48E-03	8.42E-06	1.54E-06	6.53E-08	0.00E+00	1.60E-06

Table A-45
Wildlife Exposure Modeling of Maximum Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	2.10E+02	1.46E-01	--	1.00E+00	Uptake Factor	2.10E+02	modeled	1.85E+00	1.02E+01	8.32E-03	1.21E+01
Lead	1.56E+01	1.60E-03	--	6.60E-02	Uptake Factor	1.03E+00	modeled	1.37E-01	5.02E-02	9.12E-05	1.88E-01
Manganese	5.42E+02	1.14E-01	--	1.00E+00	Uptake Factor	5.42E+02	modeled	4.78E+00	2.64E+01	6.50E-03	3.12E+01
Vanadium	2.57E+01	1.06E-02	--	1.00E+00	Uptake Factor	2.57E+01	modeled	2.26E-01	1.25E+00	6.04E-04	1.48E+00
PCBS											
Aroclor-1254	1.10E-01	0.00E+00	2.64E-01	3.38E+00	BSAF	4.46E+00	actual	9.69E-04	1.29E-02	0.00E+00	1.38E-02
Total PCB Congeners	3.50E-02	0.00E+00	6.40E-01	3.38E+00	BSAF	1.42E+00	actual	3.08E-04	3.12E-02	0.00E+00	3.15E-02
Total PCB Aroclors	1.10E-01	0.00E+00	2.64E-01	3.38E+00	BSAF	4.46E+00	actual	9.69E-04	1.29E-02	0.00E+00	1.38E-02
PESTICIDES											
DDTr	1.87E-02	7.40E-05	--	5.22E+00	BSAF	1.17E+00	modeled	1.65E-04	5.71E-02	4.22E-06	5.73E-02
gamma-Chlordane	4.40E-03	0.00E+00	--	1.08E+00	BSAF	5.71E-02	modeled	3.88E-05	2.78E-03	0.00E+00	2.82E-03

Table A-46
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media
for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.81E+02	1.46E-01	--	1.00E+00	Uptake Factor	1.81E+02	modeled	1.60E+00	8.83E+00	8.32E-03	1.04E+01
Lead	1.26E+01	1.60E-03	--	6.60E-02	Uptake Factor	8.33E-01	modeled	1.11E-01	4.06E-02	9.12E-05	1.52E-01
Manganese	4.37E+02	1.14E-01	--	1.00E+00	Uptake Factor	4.37E+02	modeled	3.85E+00	2.13E+01	6.50E-03	2.51E+01
Vanadium	2.15E+01	1.06E-02	--	1.00E+00	Uptake Factor	2.15E+01	modeled	1.90E-01	1.05E+00	6.04E-04	1.24E+00
PCBS											
Aroclor-1254	5.10E-02	0.00E+00	2.64E-01	3.38E+00	BSAF	2.07E+00	actual	4.49E-04	1.29E-02	0.00E+00	1.33E-02
Total PCB Congeners	3.50E-02	0.00E+00	6.40E-01	3.38E+00	BSAF	1.42E+00	actual	3.08E-04	3.12E-02	0.00E+00	3.15E-02
Total PCB Aroclors	5.68E-02	0.00E+00	2.64E-01	3.38E+00	BSAF	2.30E+00	actual	5.00E-04	1.29E-02	0.00E+00	1.34E-02
PESTICIDES											
DDTr	1.20E-02	7.40E-05	--	5.22E+00	BSAF	7.52E-01	modeled	1.06E-04	3.67E-02	4.22E-06	3.68E-02
gamma-Chlordane	2.42E-03	0.00E+00	--	1.08E+00	BSAF	3.14E-02	modeled	2.13E-05	1.53E-03	0.00E+00	1.55E-03

Table A-47
Wildlife Exposure Modeling of Maximum Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.10E+02	1.46E-01	2.64E+01	1.60E+01	2.34E+00	actual	5.25E-01	3.30E+00	1.61E-02	3.84E+00
Lead	1.56E+01	1.60E-03	2.20E+00	1.80E+02	2.88E-01	actual	3.90E-02	2.75E-01	1.76E-04	3.14E-01
Manganese	5.42E+02	1.14E-01	1.24E+02	1.60E+03	1.82E+02	actual	1.36E+00	1.55E+01	1.25E-02	1.69E+01
Vanadium	2.57E+01	1.06E-02	6.40E+00	4.00E+00	4.24E-02	actual	6.43E-02	8.00E-01	1.17E-03	8.65E-01
PCBS										
Aroclor-1254	1.10E-01	0.00E+00	4.40E+00	2.16E+05	0.00E+00	actual	2.75E-04	5.50E-01	0.00E+00	5.50E-01
Total PCB Congeners	3.50E-02	0.00E+00	2.04E+01	1.01E+05	0.00E+00	actual	8.75E-05	2.55E+00	0.00E+00	2.55E+00
Total PCB Aroclors	1.10E-01	0.00E+00	4.40E+00	1.01E+05	0.00E+00	actual	2.75E-04	5.50E-01	0.00E+00	5.50E-01
PESTICIDES										
DDTr	1.87E-02	7.40E-05	7.68E-01	6.74E+04	4.98E+00	actual	4.68E-05	9.61E-02	8.14E-06	9.61E-02
gamma-Chlordane	4.40E-03	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	1.10E-05	1.25E-02	0.00E+00	1.25E-02

Table A-48
Wildlife Exposure Modeling of 95UCLM Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.81E+02	1.46E-01	2.64E+01	1.60E+01	2.34E+00	actual	4.53E-01	3.30E+00	1.61E-02	3.77E+00
Lead	1.26E+01	1.60E-03	2.20E+00	1.80E+02	2.88E-01	actual	3.16E-02	2.75E-01	1.76E-04	3.07E-01
Manganese	4.37E+02	1.14E-01	1.24E+02	1.60E+03	1.82E+02	actual	1.09E+00	1.55E+01	1.25E-02	1.66E+01
Vanadium	2.15E+01	1.06E-02	6.40E+00	4.00E+00	4.24E-02	actual	5.38E-02	8.00E-01	1.17E-03	8.55E-01
PCBS										
Aroclor-1254	5.10E-02	0.00E+00	3.03E+00	2.16E+05	0.00E+00	actual	1.28E-04	3.79E-01	0.00E+00	3.79E-01
Total PCB Congeners	3.50E-02	0.00E+00	2.04E+01	1.01E+05	0.00E+00	actual	8.75E-05	2.55E+00	0.00E+00	2.55E+00
Total PCB Aroclors	5.68E-02	0.00E+00	2.80E+00	1.01E+05	0.00E+00	actual	1.42E-04	3.50E-01	0.00E+00	3.50E-01
PESTICIDES										
DDTr	1.20E-02	7.40E-05	7.68E-01	6.74E+04	4.98E+00	actual	3.00E-05	9.61E-02	8.14E-06	9.61E-02
gamma-Chlordane	2.42E-03	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	6.05E-06	1.25E-02	0.00E+00	1.25E-02

Table A-49
Wildlife Exposure Modeling of Maximum Doses to Large Piscivorous Birds (Great Blue Heron) from Media
for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.10E+02	1.46E-01	2.64E+01	1.60E+01	2.34E+00	actual	1.89E-01	1.19E+00	6.57E-03	1.38E+00
Lead	1.56E+01	1.60E-03	2.20E+00	1.80E+02	2.88E-01	actual	1.40E-02	9.90E-02	7.20E-05	1.13E-01
Manganese	5.42E+02	1.14E-01	1.24E+02	1.60E+03	1.82E+02	actual	4.88E-01	5.58E+00	5.13E-03	6.07E+00
Vanadium	2.57E+01	1.06E-02	6.40E+00	4.00E+00	4.24E-02	actual	2.31E-02	2.88E-01	4.77E-04	3.12E-01
PCBS										
Aroclor-1254	1.10E-01	0.00E+00	4.40E+00	2.16E+05	0.00E+00	actual	9.90E-05	1.98E-01	0.00E+00	1.98E-01
Total PCB Congeners	3.50E-02	0.00E+00	2.04E+01	1.01E+05	0.00E+00	actual	3.15E-05	9.18E-01	0.00E+00	9.18E-01
Total PCB Aroclors	1.10E-01	0.00E+00	4.40E+00	1.01E+05	0.00E+00	actual	9.90E-05	1.98E-01	0.00E+00	1.98E-01
PESTICIDES										
DDTr	1.87E-02	7.40E-05	7.68E-01	6.74E+04	4.98E+00	actual	1.68E-05	3.46E-02	3.33E-06	3.46E-02
gamma-Chlordane	4.40E-03	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	3.96E-06	4.50E-03	0.00E+00	4.50E-03

Table A-50
Wildlife Exposure Modeling of 95UCLM Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.81E+02	1.46E-01	2.64E+01	1.60E+01	2.34E+00	actual	1.63E-01	1.19E+00	6.57E-03	1.36E+00
Lead	1.26E+01	1.60E-03	2.20E+00	1.80E+02	2.88E-01	actual	1.14E-02	9.90E-02	7.20E-05	1.10E-01
Manganese	4.37E+02	1.14E-01	1.24E+02	1.60E+03	1.82E+02	actual	3.93E-01	5.58E+00	5.13E-03	5.98E+00
Vanadium	2.15E+01	1.06E-02	6.40E+00	4.00E+00	4.24E-02	actual	1.94E-02	2.88E-01	4.77E-04	3.08E-01
PCBS										
Aroclor-1254	5.10E-02	0.00E+00	3.03E+00	2.16E+05	0.00E+00	actual	4.59E-05	1.36E-01	0.00E+00	1.36E-01
Total PCB Congeners	3.50E-02	0.00E+00	2.04E+01	1.01E+05	0.00E+00	actual	3.15E-05	9.18E-01	0.00E+00	9.18E-01
Total PCB Aroclors	5.68E-02	0.00E+00	2.80E+00	1.01E+05	0.00E+00	actual	5.11E-05	1.26E-01	0.00E+00	1.26E-01
PESTICIDES										
DDTr	1.20E-02	7.40E-05	7.68E-01	6.74E+04	4.98E+00	actual	1.08E-05	3.46E-02	3.33E-06	3.46E-02
gamma-Chlordane	2.42E-03	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	2.18E-06	4.50E-03	0.00E+00	4.50E-03

Table A-51
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	2.10E+02	1.46E-01	1.50E-01	3.15E+01	1.78E-01	1.34E+00	1.42E-01	1.66E+00
Lead	1.56E+01	1.60E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.24E+00	1.32E-02	5.25E-02	1.56E-03	6.73E-02
Manganese	5.42E+02	1.14E-01	2.50E-01	1.36E+02	4.60E-01	5.75E+00	1.11E-01	6.32E+00
Vanadium	2.57E+01	1.06E-02	5.50E-03	1.41E-01	2.18E-02	5.99E-03	1.03E-02	3.81E-02
PCBS								
Aroclor-1254	1.10E-01	0.00E+00	3.58E-03	3.94E-04	9.33E-05	1.67E-05	0.00E+00	1.10E-04
Total PCB Congeners	3.50E-02	0.00E+00	8.44E-03	2.95E-04	2.97E-05	1.25E-05	0.00E+00	4.22E-05
Total PCB Aroclors	1.10E-01	0.00E+00	8.44E-03	9.28E-04	9.33E-05	3.94E-05	0.00E+00	1.33E-04
PESTICIDES								
DDTr	1.87E-02	7.40E-05	1.97E-02	3.68E-04	1.59E-05	1.56E-05	7.22E-05	1.04E-04
gamma-Chlordane	4.40E-03	0.00E+00	3.48E-03	1.53E-05	3.73E-06	6.50E-07	0.00E+00	4.38E-06

Table A-52
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.81E+02	1.46E-01	1.50E-01	2.72E+01	1.54E-01	1.15E+00	1.42E-01	1.45E+00
Lead	1.26E+01	1.60E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.10E+00	1.07E-02	4.66E-02	1.56E-03	5.89E-02
Manganese	4.37E+02	1.14E-01	2.50E-01	1.09E+02	3.70E-01	4.63E+00	1.11E-01	5.11E+00
Vanadium	2.15E+01	1.06E-02	5.50E-03	1.18E-01	1.82E-02	5.02E-03	1.03E-02	3.36E-02
PCBS								
Aroclor-1254	5.10E-02	0.00E+00	3.58E-03	1.83E-04	4.33E-05	7.74E-06	0.00E+00	5.10E-05
Total PCB Congeners	3.50E-02	0.00E+00	8.44E-03	2.95E-04	2.97E-05	1.25E-05	0.00E+00	4.22E-05
Total PCB Aroclors	5.68E-02	0.00E+00	8.44E-03	4.79E-04	4.82E-05	2.03E-05	0.00E+00	6.85E-05
PESTICIDES								
DDTr	1.20E-02	7.40E-05	1.97E-02	2.36E-04	1.02E-05	1.00E-05	7.22E-05	9.24E-05
gamma-Chlordane	2.42E-03	0.00E+00	3.48E-03	8.42E-06	2.05E-06	3.57E-07	0.00E+00	2.41E-06

Table A-53
Wildlife Exposure Modeling of Maximum Doses to Aquatic Carnivorous Mammals (Raccoon) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	2.10E+02	1.46E-01	--	1.00E+00	Uptake Factor	2.10E+02	modeled	9.48E-01	1.01E+01	1.20E-02	1.10E+01
Lead	1.56E+01	1.60E-03	--	6.60E-02	Uptake Factor	1.03E+00	modeled	7.04E-02	4.94E-02	1.32E-04	1.20E-01
Manganese	5.42E+02	1.14E-01	--	1.00E+00	Uptake Factor	5.42E+02	modeled	2.45E+00	2.60E+01	9.41E-03	2.85E+01
Vanadium	2.57E+01	1.06E-02	--	1.00E+00	Uptake Factor	2.57E+01	modeled	1.16E-01	1.23E+00	8.75E-04	1.35E+00
PCBS											
Aroclor-1254	1.10E-01	0.00E+00	2.64E-01	3.38E+00	BSAF	4.46E+00	actual	4.96E-04	1.27E-02	0.00E+00	1.32E-02
Total PCB Congeners	3.50E-02	0.00E+00	6.40E-01	3.38E+00	BSAF	1.42E+00	actual	1.58E-04	3.07E-02	0.00E+00	3.09E-02
Total PCB Aroclors	1.10E-01	0.00E+00	2.64E-01	3.38E+00	BSAF	4.46E+00	actual	4.96E-04	1.27E-02	0.00E+00	1.32E-02
PESTICIDES											
DDTr	1.87E-02	7.40E-05	--	5.22E+00	BSAF	1.17E+00	modeled	8.44E-05	5.63E-02	6.11E-06	5.63E-02
gamma-Chlordane	4.40E-03	0.00E+00	--	1.08E+00	BSAF	5.71E-02	modeled	1.99E-05	2.74E-03	0.00E+00	2.76E-03

Table A-54
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Carnivorous Mammals (Raccoon) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Barium	1.81E+02	1.46E-01	--	1.00E+00	Uptake Factor	1.81E+02	modeled	8.17E-01	8.69E+00	1.20E-02	9.52E+00
Lead	1.26E+01	1.60E-03	--	6.60E-02	Uptake Factor	8.33E-01	modeled	5.69E-02	4.00E-02	1.32E-04	9.71E-02
Manganese	4.37E+02	1.14E-01	--	1.00E+00	Uptake Factor	4.37E+02	modeled	1.97E+00	2.10E+01	9.41E-03	2.29E+01
Vanadium	2.15E+01	1.06E-02	--	1.00E+00	Uptake Factor	2.15E+01	modeled	9.71E-02	1.03E+00	8.75E-04	1.13E+00
PCBS											
Aroclor-1254	5.10E-02	0.00E+00	2.64E-01	3.38E+00	BSAF	2.07E+00	actual	2.30E-04	1.27E-02	0.00E+00	1.29E-02
Total PCB Congeners	3.50E-02	0.00E+00	6.40E-01	3.38E+00	BSAF	1.42E+00	actual	1.58E-04	3.07E-02	0.00E+00	3.09E-02
Total PCB Aroclors	5.68E-02	0.00E+00	2.64E-01	3.38E+00	BSAF	2.30E+00	actual	2.56E-04	1.27E-02	0.00E+00	1.29E-02
PESTICIDES											
DDTr	1.20E-02	7.40E-05	--	5.22E+00	BSAF	7.52E-01	modeled	5.41E-05	3.61E-02	6.11E-06	3.62E-02
gamma-Chlordane	2.42E-03	0.00E+00	--	1.08E+00	BSAF	3.14E-02	modeled	1.09E-05	1.51E-03	0.00E+00	1.52E-03

Table A-55
Wildlife Exposure Modeling of Maximum Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	2.10E+02	1.46E-01	2.64E+01	1.60E+01	2.34E+00	actual	2.02E-01	1.27E+00	1.18E-02	1.48E+00
Lead	1.56E+01	1.60E-03	2.20E+00	1.80E+02	2.88E-01	actual	1.50E-02	1.06E-01	1.30E-04	1.21E-01
Manganese	5.42E+02	1.14E-01	1.24E+02	1.60E+03	1.82E+02	actual	5.20E-01	5.95E+00	9.23E-03	6.48E+00
Vanadium	2.57E+01	1.06E-02	6.40E+00	4.00E+00	4.24E-02	actual	2.47E-02	3.07E-01	8.59E-04	3.33E-01
PCBS										
Aroclor-1254	1.10E-01	0.00E+00	4.40E+00	2.16E+05	0.00E+00	actual	1.06E-04	2.11E-01	0.00E+00	2.11E-01
Total PCB Congeners	3.50E-02	0.00E+00	2.04E+01	1.01E+05	0.00E+00	actual	3.36E-05	9.79E-01	0.00E+00	9.79E-01
Total PCB Aroclors	1.10E-01	0.00E+00	4.40E+00	1.01E+05	0.00E+00	actual	1.06E-04	2.11E-01	0.00E+00	2.11E-01
PESTICIDES										
DDTr	1.87E-02	7.40E-05	7.68E-01	6.74E+04	4.98E+00	actual	1.80E-05	3.69E-02	5.99E-06	3.69E-02
gamma-Chlordane	4.40E-03	0.00E+00	1.08E-02	5.32E+04	0.00E+00	actual	4.22E-06	5.18E-04	0.00E+00	5.23E-04

Table A-56
Wildlife Exposure Modeling of 95UCLM Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 4: LWMCU Downstream of the Siphon

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Barium	1.81E+02	1.46E-01	2.64E+01	1.60E+01	2.34E+00	actual	1.74E-01	1.27E+00	1.18E-02	1.45E+00
Lead	1.26E+01	1.60E-03	2.20E+00	1.80E+02	2.88E-01	actual	1.21E-02	1.06E-01	1.30E-04	1.18E-01
Manganese	4.37E+02	1.14E-01	1.24E+02	1.60E+03	1.82E+02	actual	4.19E-01	5.95E+00	9.23E-03	6.38E+00
Vanadium	2.15E+01	1.06E-02	6.40E+00	4.00E+00	4.24E-02	actual	2.06E-02	3.07E-01	8.59E-04	3.29E-01
PCBS										
Aroclor-1254	5.10E-02	0.00E+00	3.03E+00	2.16E+05	0.00E+00	actual	4.90E-05	1.46E-01	0.00E+00	1.46E-01
Total PCB Congeners	3.50E-02	0.00E+00	2.04E+01	1.01E+05	0.00E+00	actual	3.36E-05	9.79E-01	0.00E+00	9.79E-01
Total PCB Aroclors	5.68E-02	0.00E+00	2.80E+00	1.01E+05	0.00E+00	actual	5.45E-05	1.34E-01	0.00E+00	1.34E-01
PESTICIDES										
DDTr	1.20E-02	7.40E-05	7.68E-01	6.74E+04	4.98E+00	actual	1.15E-05	3.69E-02	5.99E-06	3.69E-02
gamma-Chlordane	2.42E-03	0.00E+00	1.00E-01	5.32E+04	0.00E+00	actual	2.32E-06	4.80E-03	0.00E+00	4.80E-03

Table A-57
Wildlife Exposure Modeling of Maximum Doses to Herbivorous Birds (Northern Bobwhite) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.00E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	Maximum Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	3.59E+02	1.54E-01	1.50E-01	5.39E+01	2.34E+00	3.77E+00	1.69E-02	6.12E+00
Chromium	1.61E+01	7.60E-04	7.50E-03	1.21E-01	1.05E-01	8.45E-03	8.36E-05	1.13E-01
Manganese	7.79E+02	1.15E-01	2.50E-01	1.95E+02	5.07E+00	1.36E+01	1.27E-02	1.87E+01
Vanadium	3.14E+01	1.05E-02	5.50E-03	1.73E-01	2.04E-01	1.21E-02	1.16E-03	2.18E-01
Zinc	1.60E+02	8.10E-03	ln(dry plant conc, mg/kg) = (1.575+0.555*ln(soil conc))	8.08E+01	1.04E+00	5.65E+00	8.91E-04	6.69E+00
PCBS								
Aroclor-1016	3.40E-03	0.00E+00	1.99E-02	6.77E-05	2.21E-05	4.73E-06	0.00E+00	2.69E-05
Aroclor-1254	1.10E-02	0.00E+00	3.58E-03	3.94E-05	7.16E-05	2.76E-06	0.00E+00	7.43E-05
Aroclor-1260	1.00E-02	0.00E+00	6.44E-04	6.44E-06	6.51E-05	4.51E-07	0.00E+00	6.55E-05
Total PCB Congeners	4.50E-02	1.10E-05	8.44E-03	3.80E-04	2.93E-04	2.66E-05	1.21E-06	3.21E-04
Total PCB Aroclors	1.76E-02	0.00E+00	8.44E-03	1.49E-04	1.15E-04	1.04E-05	0.00E+00	1.25E-04
PESTICIDES								
DDTr	8.14E-02	3.10E-05	1.97E-02	1.60E-03	5.30E-04	1.12E-04	3.41E-06	6.45E-04
alpha-Chlordane	2.30E-03	0.00E+00	9.33E-03	2.15E-05	1.50E-05	1.50E-06	0.00E+00	1.65E-05
delta-BHC	NO COPC	2.80E-05	1.34E-01	0.00E+00	0.00E+00	0.00E+00	3.08E-06	3.08E-06
Dieldrin	1.40E-02	0.00E+00	2.75E-02	3.85E-04	9.11E-05	2.69E-05	0.00E+00	1.18E-04
Endosulfan I	7.50E-04	0.00E+00	3.69E-01	2.77E-04	4.88E-06	1.94E-05	0.00E+00	2.42E-05
Endosulfan II	1.70E-02	0.00E+00	3.69E-01	6.27E-03	1.11E-04	4.39E-04	0.00E+00	5.49E-04
Endosulfan sulfate	1.30E-02	0.00E+00	3.06E-01	3.98E-03	8.46E-05	2.79E-04	0.00E+00	3.63E-04
Endrin	6.90E-03	0.00E+00	2.75E-02	1.90E-04	4.49E-05	1.33E-05	0.00E+00	5.82E-05
Endrin aldehyde	3.50E-02	0.00E+00	6.47E-02	2.26E-03	2.28E-04	1.58E-04	0.00E+00	3.86E-04
Endrin ketone	2.10E-03	0.00E+00	5.08E-02	1.07E-04	1.37E-05	7.46E-06	0.00E+00	2.11E-05

Table A-57
Wildlife Exposure Modeling of Maximum Doses to Herbivorous Birds (Northern Bobwhite) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.00E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	Maximum Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
gamma-Chlordane	1.40E-03	0.00E+00	3.48E-03	4.87E-06	9.11E-06	3.41E-07	0.00E+00	9.45E-06
Heptachlor epoxide	1.10E-03	0.00E+00	8.92E-02	9.81E-05	7.16E-06	6.87E-06	0.00E+00	1.40E-05
Methoxychlor	1.10E-02	0.00E+00	2.05E-02	2.26E-04	7.16E-05	1.58E-05	0.00E+00	8.74E-05
Toxaphene	5.60E-01	0.00E+00	4.58E-03	2.56E-03	3.64E-03	1.79E-04	0.00E+00	3.82E-03
SVOCS								
Bis(2-ethylhexyl)phthalate	5.20E+00	3.10E-03	5.48E-04	2.85E-03	3.38E-02	1.99E-04	3.41E-04	3.44E-02
Butylbenzylphthalate	4.70E-01	0.00E+00	6.17E-02	2.90E-02	3.06E-03	2.03E-03	0.00E+00	5.09E-03
VOCS								
Acetone	1.71E-02	0.00E+00	5.29E+01	9.05E-01	1.11E-04	6.34E-02	0.00E+00	6.35E-02
Methylene chloride	3.60E-03	0.00E+00	6.51E+00	2.34E-02	2.34E-05	1.64E-03	0.00E+00	1.66E-03

Table A-58
Wildlife Exposure Modeling of 95UCLM Doses to Herbivorous Birds (Northern Bobwhite) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.00E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.91E+02	1.39E-01	1.50E-01	2.87E+01	1.24E+00	2.00E+00	1.53E-02	3.26E+00
Chromium	1.21E+01	7.60E-04	7.50E-03	9.08E-02	7.87E-02	6.35E-03	8.36E-05	8.52E-02
Manganese	3.96E+02	8.82E-02	2.50E-01	9.90E+01	2.58E+00	6.92E+00	9.70E-03	9.51E+00
Vanadium	2.33E+01	1.00E-02	5.50E-03	1.28E-01	1.52E-01	8.96E-03	1.10E-03	1.62E-01
Zinc	6.03E+01	5.43E-03	ln(dry plant conc, mg/kg) = (1.575+0.555*ln(soil conc))	4.70E+01	3.93E-01	3.29E+00	5.97E-04	3.68E+00
PCBS								
Aroclor-1016	3.40E-03	0.00E+00	1.99E-02	6.77E-05	2.21E-05	4.73E-06	0.00E+00	2.69E-05
Aroclor-1254	1.10E-02	0.00E+00	3.58E-03	3.94E-05	7.16E-05	2.76E-06	0.00E+00	7.43E-05
Aroclor-1260	2.67E-03	0.00E+00	6.44E-04	1.72E-06	1.74E-05	1.20E-07	0.00E+00	1.75E-05
Total PCB Congeners	1.02E-02	1.10E-05	8.44E-03	8.61E-05	6.64E-05	6.02E-06	1.21E-06	7.36E-05
Total PCB Aroclors	6.23E-03	0.00E+00	8.44E-03	5.26E-05	4.05E-05	3.68E-06	0.00E+00	4.42E-05
PESTICIDES								
DDTr	2.10E-02	3.10E-05	1.97E-02	4.14E-04	1.37E-04	2.89E-05	3.41E-06	1.69E-04
alpha-Chlordane	2.30E-03	0.00E+00	9.33E-03	2.15E-05	1.50E-05	1.50E-06	0.00E+00	1.65E-05
delta-BHC	NO COPC	2.80E-05	1.34E-01	0.00E+00	0.00E+00	0.00E+00	3.08E-06	3.08E-06
Dieldrin	1.40E-02	0.00E+00	2.75E-02	3.85E-04	9.11E-05	2.69E-05	0.00E+00	1.18E-04
Endosulfan I	7.50E-04	0.00E+00	3.69E-01	2.77E-04	4.88E-06	1.94E-05	0.00E+00	2.42E-05
Endosulfan II	2.36E-03	0.00E+00	3.69E-01	8.71E-04	1.54E-05	6.09E-05	0.00E+00	7.63E-05
Endosulfan sulfate	1.30E-02	0.00E+00	3.06E-01	3.98E-03	8.46E-05	2.79E-04	0.00E+00	3.63E-04
Endrin	6.90E-03	0.00E+00	2.75E-02	1.90E-04	4.49E-05	1.33E-05	0.00E+00	5.82E-05
Endrin aldehyde	4.14E-03	0.00E+00	6.47E-02	2.68E-04	2.69E-05	1.87E-05	0.00E+00	4.57E-05
Endrin ketone	2.10E-03	0.00E+00	5.08E-02	1.07E-04	1.37E-05	7.46E-06	0.00E+00	2.11E-05
gamma-Chlordane	1.40E-03	0.00E+00	3.48E-03	4.87E-06	9.11E-06	3.41E-07	0.00E+00	9.45E-06
Heptachlor epoxide	1.10E-03	0.00E+00	8.92E-02	9.81E-05	7.16E-06	6.87E-06	0.00E+00	1.40E-05
Methoxychlor	1.10E-02	0.00E+00	2.05E-02	2.26E-04	7.16E-05	1.58E-05	0.00E+00	8.74E-05
Toxaphene	5.60E-01	0.00E+00	4.58E-03	2.56E-03	3.64E-03	1.79E-04	0.00E+00	3.82E-03

Table A-58
Wildlife Exposure Modeling of 95UCLM Doses to Herbivorous Birds (Northern Bobwhite) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.00E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
SVOCS								
Bis(2-ethylhexyl)phthalate	4.75E-01	3.10E-03	5.48E-04	2.60E-04	3.09E-03	1.82E-05	3.41E-04	3.45E-03
Butylbenzylphthalate	4.70E-01	0.00E+00	6.17E-02	2.90E-02	3.06E-03	2.03E-03	0.00E+00	5.09E-03
VOCS								
Acetone	1.35E-02	0.00E+00	5.29E+01	7.15E-01	8.79E-05	5.00E-02	0.00E+00	5.01E-02
Methylene chloride	3.52E-03	0.00E+00	6.51E+00	2.29E-02	2.29E-05	1.60E-03	0.00E+00	1.63E-03

Table A-59
Wildlife Exposure Modeling of Maximum Doses to Omnivorous Birds (American Robin) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.34E-02	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	2.23E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.40E-01	L/kg-day

Chemical	Maximum Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Insect/Worm) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	3.59E+02	1.54E-01	1.60E-01	5.74E+01	8.39E+00	1.28E+01	2.16E-02	2.12E+01
Chromium	1.61E+01	7.60E-04	ln(dry worm conc, mg/kg) = (2.481+-0.067*ln(soil conc))	9.92E+00	3.76E-01	2.21E+00	1.06E-04	2.58E+00
Manganese	7.79E+02	1.15E-01	ln(dry worm conc, mg/kg) = (-0.809+0.682*ln(soil conc))	4.18E+01	1.82E+01	9.29E+00	1.61E-02	2.75E+01
Vanadium	3.14E+01	1.05E-02	8.80E-01	2.76E+01	7.34E-01	6.15E+00	1.47E-03	6.88E+00
Zinc	1.60E+02	8.10E-03	ln(dry worm conc, mg/kg) = (4.449+0.328*ln(soil conc))	4.52E+02	3.74E+00	1.01E+02	1.13E-03	1.04E+02
PCBS								
Aroclor-1016	3.40E-03	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	1.79E-03	7.94E-05	3.98E-04	0.00E+00	4.78E-04
Aroclor-1254	1.10E-02	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	8.84E-03	2.57E-04	1.97E-03	0.00E+00	2.22E-03
Aroclor-1260	1.00E-02	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	7.77E-03	2.34E-04	1.73E-03	0.00E+00	1.96E-03
Total PCB Congeners	4.50E-02	1.10E-05	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	6.02E-02	1.05E-03	1.34E-02	1.54E-06	1.44E-02
Total PCB Aroclors	1.76E-02	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	1.68E-02	4.11E-04	3.73E-03	0.00E+00	4.14E-03
PESTICIDES								
DDTr	8.14E-02	3.10E-05	9.00E+00	7.33E-01	1.90E-03	1.63E-01	4.34E-06	1.65E-01
alpha-Chlordane	2.30E-03	0.00E+00	1.00E+00	2.30E-03	5.37E-05	5.12E-04	0.00E+00	5.65E-04
delta-BHC	NO COPC	2.80E-05	1.00E+00	0.00E+00	0.00E+00	0.00E+00	3.92E-06	3.92E-06
Dieldrin	1.40E-02	0.00E+00	1.79E+00	2.51E-02	3.27E-04	5.58E-03	0.00E+00	5.90E-03
Endosulfan I	7.50E-04	0.00E+00	1.00E+00	7.50E-04	1.75E-05	1.67E-04	0.00E+00	1.84E-04
Endosulfan II	1.70E-02	0.00E+00	1.00E+00	1.70E-02	3.97E-04	3.78E-03	0.00E+00	4.18E-03
Endosulfan sulfate	1.30E-02	0.00E+00	3.50E+00	4.55E-02	3.04E-04	1.01E-02	0.00E+00	1.04E-02
Endrin	6.90E-03	0.00E+00	3.50E+00	2.42E-02	1.61E-04	5.37E-03	0.00E+00	5.53E-03

Table A-59
Wildlife Exposure Modeling of Maximum Doses to Omnivorous Birds (American Robin) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.34E-02	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	2.23E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.40E-01	L/kg-day

			Food Item (Insect/Worm) Uptake		Maximum Case Scenario Doses			
Chemical	Maximum Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Endrin aldehyde	3.50E-02	0.00E+00	3.50E+00	1.23E-01	8.18E-04	2.73E-02	0.00E+00	2.81E-02
Endrin ketone	2.10E-03	0.00E+00	1.00E+00	2.10E-03	4.91E-05	4.67E-04	0.00E+00	5.16E-04
gamma-Chlordane	1.40E-03	0.00E+00	1.00E+00	1.40E-03	3.27E-05	3.12E-04	0.00E+00	3.44E-04
Heptachlor epoxide	1.10E-03	0.00E+00	4.00E-02	4.40E-05	2.57E-05	9.79E-06	0.00E+00	3.55E-05
Methoxychlor	1.10E-02	0.00E+00	1.00E+00	1.10E-02	2.57E-04	2.45E-03	0.00E+00	2.70E-03
Toxaphene	5.60E-01	0.00E+00	1.00E+00	5.60E-01	1.31E-02	1.25E-01	0.00E+00	1.38E-01
SVOCS								
Bis(2-ethylhexyl)phthalate	5.20E+00	3.10E-03	1.00E+00	5.20E+00	1.21E-01	1.16E+00	4.34E-04	1.28E+00
Butylbenzylphthalate	4.70E-01	0.00E+00	1.00E+00	4.70E-01	1.10E-02	1.05E-01	0.00E+00	1.16E-01
VOCS								
Acetone	1.71E-02	0.00E+00	1.00E+00	1.71E-02	3.99E-04	3.80E-03	0.00E+00	4.20E-03
Methylene chloride	3.60E-03	0.00E+00	1.00E+00	3.60E-03	8.41E-05	8.01E-04	0.00E+00	8.85E-04

Table A-60
Wildlife Exposure Modeling of 95UCLM Doses to Omnivorous Birds (American Robin) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.34E-02	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	2.23E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.40E-01	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Insect/Worm) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.91E+02	1.39E-01	1.60E-01	3.06E+01	4.46E+00	6.80E+00	1.95E-02	1.13E+01
Chromium	1.21E+01	7.60E-04	ln(dry worm conc, mg/kg) = (2.481+-0.067*ln(soil conc))	1.01E+01	2.83E-01	2.25E+00	1.06E-04	2.53E+00
Manganese	3.96E+02	8.82E-02	ln(dry worm conc, mg/kg) = (-0.809+0.682*ln(soil conc))	2.63E+01	9.25E+00	5.85E+00	1.23E-02	1.51E+01
Vanadium	2.33E+01	1.00E-02	8.80E-01	2.05E+01	5.44E-01	4.56E+00	1.40E-03	5.11E+00
Zinc	6.03E+01	5.43E-03	ln(dry worm conc, mg/kg) = (4.449+0.328*ln(soil conc))	3.28E+02	1.41E+00	7.30E+01	7.60E-04	7.44E+01
PCBS								
Aroclor-1016	3.40E-03	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	1.79E-03	7.94E-05	3.98E-04	0.00E+00	4.78E-04
Aroclor-1254	1.10E-02	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	8.84E-03	2.57E-04	1.97E-03	0.00E+00	2.22E-03
Aroclor-1260	2.67E-03	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	1.29E-03	6.24E-05	2.87E-04	0.00E+00	3.49E-04
Total PCB Congeners	1.02E-02	1.10E-05	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	7.98E-03	2.38E-04	1.78E-03	1.54E-06	2.02E-03
Total PCB Aroclors	6.23E-03	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	4.08E-03	1.46E-04	9.08E-04	0.00E+00	1.05E-03
PESTICIDES								
DDTr	2.10E-02	3.10E-05	9.00E+00	1.89E-01	4.91E-04	4.21E-02	4.34E-06	4.25E-02
alpha-Chlordane	2.30E-03	0.00E+00	1.00E+00	2.30E-03	5.37E-05	5.12E-04	0.00E+00	5.65E-04
delta-BHC	NO COPC	2.80E-05	1.00E+00	0.00E+00	0.00E+00	0.00E+00	3.92E-06	3.92E-06
Dieldrin	1.40E-02	0.00E+00	1.79E+00	2.51E-02	3.27E-04	5.58E-03	0.00E+00	5.90E-03
Endosulfan I	7.50E-04	0.00E+00	1.00E+00	7.50E-04	1.75E-05	1.67E-04	0.00E+00	1.84E-04
Endosulfan II	2.36E-03	0.00E+00	1.00E+00	2.36E-03	5.51E-05	5.25E-04	0.00E+00	5.80E-04
Endosulfan sulfate	1.30E-02	0.00E+00	3.50E+00	4.55E-02	3.04E-04	1.01E-02	0.00E+00	1.04E-02
Endrin	6.90E-03	0.00E+00	3.50E+00	2.42E-02	1.61E-04	5.37E-03	0.00E+00	5.53E-03

Table A-60
Wildlife Exposure Modeling of 95UCLM Doses to Omnivorous Birds (American Robin) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.34E-02	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	2.23E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.40E-01	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Insect/Worm) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Endrin aldehyde	4.14E-03	0.00E+00	3.50E+00	1.45E-02	9.67E-05	3.22E-03	0.00E+00	3.32E-03
Endrin ketone	2.10E-03	0.00E+00	1.00E+00	2.10E-03	4.91E-05	4.67E-04	0.00E+00	5.16E-04
gamma-Chlordane	1.40E-03	0.00E+00	1.00E+00	1.40E-03	3.27E-05	3.12E-04	0.00E+00	3.44E-04
Heptachlor epoxide	1.10E-03	0.00E+00	4.00E-02	4.40E-05	2.57E-05	9.79E-06	0.00E+00	3.55E-05
Methoxychlor	1.10E-02	0.00E+00	1.00E+00	1.10E-02	2.57E-04	2.45E-03	0.00E+00	2.70E-03
Toxaphene	5.60E-01	0.00E+00	1.00E+00	5.60E-01	1.31E-02	1.25E-01	0.00E+00	1.38E-01
SVOCS								
Bis(2-ethylhexyl)phthalate	4.75E-01	3.10E-03	1.00E+00	4.75E-01	1.11E-02	1.06E-01	4.34E-04	1.17E-01
Butylbenzylphthalate	4.70E-01	0.00E+00	1.00E+00	4.70E-01	1.10E-02	1.05E-01	0.00E+00	1.16E-01
VOCS								
Acetone	1.35E-02	0.00E+00	1.00E+00	1.35E-02	3.15E-04	3.00E-03	0.00E+00	3.32E-03
Methylene chloride	3.52E-03	0.00E+00	1.00E+00	3.52E-03	8.22E-05	7.83E-04	0.00E+00	8.65E-04

Table A-61
Wildlife Exposure Modeling of Maximum Doses to Predatory Birds (Red-Tailed Hawk) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	0.00E+00	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	5.86E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	Maximum Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Dose to Small Mammal (mg/kg bw-day)	Food Item (Small Mammal) Uptake		Maximum Case Scenario Doses			
				Uptake Factor (mg/kg dry wt./mg/kg dry wt.) or Small Mammal Biotransfer Factor (mg/kg bw-day to mg/kg)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals									
Barium	3.59E+02	1.54E-01	2.40E+00	ln(dry mammal conc, mg/kg) = (-1.412+0.7*ln(soil conc))	1.50E+01	0.00E+00	8.78E-01	8.78E-03	8.87E-01
Chromium	1.61E+01	7.60E-04	1.73E-02	ln(dry mammal conc, mg/kg) = (-1.4599+0.7338*ln(soil conc))	1.78E+00	0.00E+00	1.05E-01	4.33E-05	1.05E-01
Manganese	7.79E+02	1.15E-01	8.16E+00	5.87E-02	4.57E+01	0.00E+00	2.68E+00	6.56E-03	2.69E+00
Vanadium	3.14E+01	1.05E-02	3.41E-02	7.32E-02	2.30E+00	0.00E+00	1.35E-01	5.99E-04	1.35E-01
Zinc	1.60E+02	8.10E-03	3.25E+00	ln(dry mammal conc, mg/kg) = (4.4713+0.0738*ln(soil conc))	1.27E+02	0.00E+00	7.46E+00	4.62E-04	7.46E+00
PCBS									
Aroclor-1016	3.40E-03	0.00E+00	5.24E-06	4.93E-02	1.68E-04	0.00E+00	9.82E-06	0.00E+00	9.82E-06
Aroclor-1254	1.10E-02	0.00E+00	1.00E-05	9.58E-01	1.05E-02	0.00E+00	6.18E-04	0.00E+00	6.18E-04
Aroclor-1260	1.00E-02	0.00E+00	7.98E-06	1.86E+01	1.86E-01	0.00E+00	1.09E-02	0.00E+00	1.09E-02
Total PCB Congeners	4.50E-02	1.10E-05	5.27E-05	2.17E-01	9.78E-03	0.00E+00	5.73E-04	6.27E-07	5.74E-04
Total PCB Aroclors	1.76E-02	0.00E+00	1.93E-05	2.17E-01	3.82E-03	0.00E+00	2.24E-04	0.00E+00	2.24E-04
PESTICIDES									
DDTr	8.14E-02	3.10E-05	1.34E-04	6.20E-01	5.04E-02	0.00E+00	2.96E-03	1.77E-06	2.96E-03
alpha-Chlordane	2.30E-03	0.00E+00	2.61E-06	1.83E-01	4.20E-04	0.00E+00	2.46E-05	0.00E+00	2.46E-05
delta-BHC	NO COPC	2.80E-05	8.40E-06	1.82E-03	0.00E+00	0.00E+00	0.00E+00	1.60E-06	1.60E-06
Dieldrin	1.40E-02	0.00E+00	2.57E-05	2.82E-02	3.94E-04	0.00E+00	2.31E-05	0.00E+00	2.31E-05
Endosulfan I	7.50E-04	0.00E+00	1.13E-05	3.15E-04	2.36E-07	0.00E+00	1.39E-08	0.00E+00	1.39E-08
Endosulfan II	1.70E-02	0.00E+00	2.55E-04	3.15E-04	5.36E-06	0.00E+00	3.14E-07	0.00E+00	3.14E-07
Endosulfan sulfate	1.30E-02	0.00E+00	1.64E-04	4.35E-04	5.66E-06	0.00E+00	3.32E-07	0.00E+00	3.32E-07
Endrin	6.90E-03	0.00E+00	1.27E-05	2.82E-02	1.94E-04	0.00E+00	1.14E-05	0.00E+00	1.14E-05
Endrin aldehyde	3.50E-02	0.00E+00	1.15E-04	6.41E-03	2.24E-04	0.00E+00	1.31E-05	0.00E+00	1.31E-05
Endrin ketone	2.10E-03	0.00E+00	5.74E-06	9.74E-03	2.04E-05	0.00E+00	1.20E-06	0.00E+00	1.20E-06
gamma-Chlordane	1.40E-03	0.00E+00	1.27E-06	1.01E+00	1.41E-03	0.00E+00	8.26E-05	0.00E+00	8.26E-05
Heptachlor epoxide	1.10E-03	0.00E+00	4.64E-06	3.68E-03	4.04E-06	0.00E+00	2.37E-07	0.00E+00	2.37E-07
Methoxychlor	1.10E-02	0.00E+00	1.72E-05	4.67E-02	5.14E-04	0.00E+00	3.01E-05	0.00E+00	3.01E-05
Toxaphene	5.60E-01	0.00E+00	5.32E-04	6.27E-01	3.51E-01	0.00E+00	2.06E-02	0.00E+00	2.06E-02
SVOCS									
Bis(2-ethylhexyl)phthalate	5.20E+00	3.10E-03	5.06E-03	2.47E+01	1.28E+02	0.00E+00	7.52E+00	1.77E-04	7.52E+00
Butylbenzylphthalate	4.70E-01	0.00E+00	1.48E-03	6.95E-03	3.27E-03	0.00E+00	1.92E-04	0.00E+00	1.92E-04
VOCS									
Acetone	1.71E-02	0.00E+00	3.50E-02	5.85E-08	1.00E-09	0.00E+00	5.86E-11	0.00E+00	5.86E-11
Methylene chloride	3.60E-03	0.00E+00	9.08E-04	2.20E-06	7.91E-09	0.00E+00	4.64E-10	0.00E+00	4.64E-10

Table A-62
Wildlife Exposure Modeling of 95UCLM Doses to Predatory Birds (Red-Tailed Hawk) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	0.00E+00	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	5.86E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Dose to Small Mammal (mg/kg bw-day)	Food Item (Small Mammal) Uptake		95UCLM Case Scenario Doses			
				Uptake Factor (mg/kg dry wt./mg/kg dry wt.) or Small Mammal Biotransfer Factor (mg/kg bw-day to mg/kg)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals									
Barium	1.91E+02	1.39E-01	1.30E+00	ln(dry mammal conc, mg/kg) = (-1.412+0.7*ln(soil conc))	9.63E+00	0.00E+00	5.64E-01	7.94E-03	5.72E-01
Chromium	1.21E+01	7.60E-04	1.31E-02	ln(dry mammal conc, mg/kg) = (-1.4599+0.7338*ln(soil conc))	1.45E+00	0.00E+00	8.48E-02	4.33E-05	8.49E-02
Manganese	3.96E+02	8.82E-02	4.16E+00	5.87E-02	2.32E+01	0.00E+00	1.36E+00	5.03E-03	1.37E+00
Vanadium	2.33E+01	1.00E-02	2.59E-02	7.32E-02	1.70E+00	0.00E+00	9.99E-02	5.71E-04	1.01E-01
Zinc	6.03E+01	5.43E-03	1.86E+00	ln(dry mammal conc, mg/kg) = (4.4713+0.0738*ln(soil conc))	1.18E+02	0.00E+00	6.94E+00	3.09E-04	6.94E+00
PCBS									
Aroclor-1016	3.40E-03	0.00E+00	5.24E-06	4.93E-02	1.68E-04	0.00E+00	9.82E-06	0.00E+00	9.82E-06
Aroclor-1254	1.10E-02	0.00E+00	1.00E-05	9.58E-01	1.05E-02	0.00E+00	6.18E-04	0.00E+00	6.18E-04
Aroclor-1260	2.67E-03	0.00E+00	2.13E-06	1.86E+01	4.98E-02	0.00E+00	2.92E-03	0.00E+00	2.92E-03
Total PCB Congeners	1.02E-02	1.10E-05	1.45E-05	2.17E-01	2.22E-03	0.00E+00	1.30E-04	6.27E-07	1.31E-04
Total PCB Aroclors	6.23E-03	0.00E+00	6.85E-06	2.17E-01	1.35E-03	0.00E+00	7.94E-05	0.00E+00	7.94E-05
PESTICIDES									
DDTr	2.10E-02	3.10E-05	4.15E-05	6.20E-01	1.30E-02	0.00E+00	7.63E-04	1.77E-06	7.64E-04
alpha-Chlordane	2.30E-03	0.00E+00	2.61E-06	1.83E-01	4.20E-04	0.00E+00	2.46E-05	0.00E+00	2.46E-05
delta-BHC	NO COPC	2.80E-05	8.40E-06	1.82E-03	0.00E+00	0.00E+00	0.00E+00	1.60E-06	1.60E-06
Dieldrin	1.40E-02	0.00E+00	2.57E-05	2.82E-02	3.94E-04	0.00E+00	2.31E-05	0.00E+00	2.31E-05
Endosulfan I	7.50E-04	0.00E+00	1.13E-05	3.15E-04	2.36E-07	0.00E+00	1.39E-08	0.00E+00	1.39E-08
Endosulfan II	2.36E-03	0.00E+00	3.55E-05	3.15E-04	7.44E-07	0.00E+00	4.36E-08	0.00E+00	4.36E-08
Endosulfan sulfate	1.30E-02	0.00E+00	1.64E-04	4.35E-04	5.66E-06	0.00E+00	3.32E-07	0.00E+00	3.32E-07
Endrin	6.90E-03	0.00E+00	1.27E-05	2.82E-02	1.94E-04	0.00E+00	1.14E-05	0.00E+00	1.14E-05
Endrin aldehyde	4.14E-03	0.00E+00	1.35E-05	6.41E-03	2.65E-05	0.00E+00	1.55E-06	0.00E+00	1.55E-06
Endrin ketone	2.10E-03	0.00E+00	5.74E-06	9.74E-03	2.04E-05	0.00E+00	1.20E-06	0.00E+00	1.20E-06
gamma-Chlordane	1.40E-03	0.00E+00	1.27E-06	1.01E+00	1.41E-03	0.00E+00	8.26E-05	0.00E+00	8.26E-05
Heptachlor epoxide	1.10E-03	0.00E+00	4.64E-06	3.68E-03	4.04E-06	0.00E+00	2.37E-07	0.00E+00	2.37E-07
Methoxychlor	1.10E-02	0.00E+00	1.72E-05	4.67E-02	5.14E-04	0.00E+00	3.01E-05	0.00E+00	3.01E-05
Toxaphene	5.60E-01	0.00E+00	5.32E-04	6.27E-01	3.51E-01	0.00E+00	2.06E-02	0.00E+00	2.06E-02

Table A-62
Wildlife Exposure Modeling of 95UCLM Doses to Predatory Birds (Red-Tailed Hawk) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	0.00E+00	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	5.86E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Dose to Small Mammal (mg/kg bw-day)	Food Item (Small Mammal) Uptake		95UCLM Case Scenario Doses			
				Uptake Factor (mg/kg dry wt./mg/kg dry wt.) or Small Mammal Biotransfer Factor (mg/kg bw-day to mg/kg)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
SVOCS									
Bis(2-ethylhexyl)phthalate	4.75E-01	3.10E-03	1.31E-03	2.47E+01	1.17E+01	0.00E+00	6.87E-01	1.77E-04	6.87E-01
Butylbenzylphthalate	4.70E-01	0.00E+00	1.48E-03	6.95E-03	3.27E-03	0.00E+00	1.92E-04	0.00E+00	1.92E-04
VOCS									
Acetone	1.35E-02	0.00E+00	2.76E-02	5.85E-08	7.90E-10	0.00E+00	4.63E-11	0.00E+00	4.63E-11
Methylene chloride	3.52E-03	0.00E+00	8.88E-04	2.20E-06	7.74E-09	0.00E+00	4.54E-10	0.00E+00	4.54E-10

Table A-63
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Arsenic	2.51E+01	4.90E-03	ln(dry plant conc, mg/kg) = (-1.992+0.564*ln(soil conc))	8.40E-01	1.60E-02	6.51E-03	2.17E-04	2.27E-02
Barium	2.14E+02	1.54E-01	1.50E-01	3.21E+01	1.36E-01	2.49E-01	6.81E-03	3.92E-01
Beryllium	1.00E+00	0.00E+00	1.00E-02	1.00E-02	6.36E-04	7.75E-05	0.00E+00	7.13E-04
Copper	7.59E+03	2.64E-01	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	6.60E+01	4.82E+00	5.11E-01	1.17E-02	5.35E+00
Lead	4.09E+01	2.00E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	2.13E+00	2.60E-02	1.65E-02	8.85E-05	4.26E-02
Manganese	5.09E+02	1.15E-01	2.50E-01	1.27E+02	3.23E-01	9.86E-01	5.09E-03	1.31E+00
Selenium	4.80E-01	1.80E-03	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	2.26E-01	3.05E-04	1.75E-03	7.97E-05	2.13E-03
Vanadium	3.58E+01	1.05E-02	5.50E-03	1.97E-01	2.28E-02	1.53E-03	4.65E-04	2.47E-02
PCBS								
Aroclor-1254	2.30E-02	0.00E+00	3.58E-03	8.23E-05	1.46E-05	6.38E-07	0.00E+00	1.53E-05
Aroclor-1260	2.80E-03	0.00E+00	6.44E-04	1.80E-06	1.78E-06	1.40E-08	0.00E+00	1.79E-06
Total PCB Congeners	2.10E-02	1.10E-05	8.44E-03	1.77E-04	1.33E-05	1.37E-06	4.87E-07	1.52E-05
Total PCB Aroclors	2.30E-02	0.00E+00	8.44E-03	1.94E-04	1.46E-05	1.50E-06	0.00E+00	1.61E-05
PESTICIDES								
DDTr	9.67E-02	3.10E-05	1.97E-02	1.90E-03	6.15E-05	1.48E-05	1.37E-06	7.76E-05
delta-BHC	3.00E-03	2.80E-05	1.34E-01	4.01E-04	1.91E-06	3.11E-06	1.24E-06	6.26E-06
Dieldrin	7.50E-03	0.00E+00	2.75E-02	2.06E-04	4.77E-06	1.60E-06	0.00E+00	6.36E-06
Endosulfan II	6.00E-03	0.00E+00	3.69E-01	2.21E-03	3.81E-06	1.72E-05	0.00E+00	2.10E-05
Endosulfan sulfate	1.70E-03	0.00E+00	3.06E-01	5.21E-04	1.08E-06	4.03E-06	0.00E+00	5.11E-06
Endrin aldehyde	5.60E-03	0.00E+00	6.47E-02	3.62E-04	3.56E-06	2.81E-06	0.00E+00	6.37E-06
Endrin ketone	2.10E-02	0.00E+00	5.08E-02	1.07E-03	1.33E-05	8.27E-06	0.00E+00	2.16E-05
Heptachlor	3.90E-03	0.00E+00	1.58E-02	6.16E-05	2.48E-06	4.77E-07	0.00E+00	2.96E-06
Methoxychlor	3.00E-02	0.00E+00	2.05E-02	6.16E-04	1.91E-05	4.77E-06	0.00E+00	2.38E-05
PAHs								
Total LMW PAHs	2.77E+01	0.00E+00	1.01E-01	2.81E+00	1.76E-02	2.18E-02	0.00E+00	3.94E-02
Total HMW PAHs	2.38E+02	0.00E+00	1.01E-01	2.41E+01	1.51E-01	1.87E-01	0.00E+00	3.38E-01

Table A-63
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
SVOCS								
Benzaldehyde	0.00E+00	2.00E-03	3.98E+00	0.00E+00	0.00E+00	0.00E+00	8.85E-05	8.85E-05
Bis(2-ethylhexyl)phthalate	8.10E+00	3.10E-03	5.48E-04	4.44E-03	5.15E-03	3.44E-05	1.37E-04	5.32E-03
Butylbenzylphthalate	9.90E-01	0.00E+00	6.17E-02	6.11E-02	6.29E-04	4.74E-04	0.00E+00	1.10E-03
Caprolactam	0.00E+00	3.10E-03	1.61E+01	0.00E+00	0.00E+00	0.00E+00	1.37E-04	1.37E-04
Carbazole	2.40E+00	0.00E+00	5.26E-01	1.26E+00	1.53E-03	9.79E-03	0.00E+00	1.13E-02
Dibenzofuran	3.50E-01	0.00E+00	2.76E-01	9.66E-02	2.22E-04	7.49E-04	0.00E+00	9.71E-04

Table A-64
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/L dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Arsenic	7.65E+00	4.90E-03	ln(dry plant conc, mg/kg) = (-1.992+0.564*ln(soil conc))	4.30E-01	4.86E-03	3.33E-03	2.17E-04	8.41E-03
Barium	1.77E+02	1.39E-01	1.50E-01	2.66E+01	1.13E-01	2.06E-01	6.16E-03	3.25E-01
Beryllium	8.95E-01	0.00E+00	1.00E-02	8.95E-03	5.69E-04	6.94E-05	0.00E+00	6.38E-04
Copper	4.62E+03	1.19E-01	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	5.43E+01	2.94E+00	4.20E-01	5.28E-03	3.36E+00
Lead	1.84E+01	1.35E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.36E+00	1.17E-02	1.05E-02	5.96E-05	2.22E-02
Manganese	4.40E+02	8.82E-02	2.50E-01	1.10E+02	2.80E-01	8.53E-01	3.90E-03	1.14E+00
Selenium	3.57E-01	1.22E-03	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	1.63E-01	2.27E-04	1.26E-03	5.38E-05	1.54E-03
Vanadium	2.47E+01	1.00E-02	5.50E-03	1.36E-01	1.57E-02	1.05E-03	4.43E-04	1.72E-02
PCBS								
Aroclor-1254	6.08E-03	0.00E+00	3.58E-03	2.18E-05	3.86E-06	1.69E-07	0.00E+00	4.03E-06
Aroclor-1260	2.20E-03	0.00E+00	6.44E-04	1.42E-06	1.40E-06	1.10E-08	0.00E+00	1.41E-06
Total PCB Congeners	1.32E-02	1.10E-05	8.44E-03	1.11E-04	8.39E-06	8.63E-07	4.87E-07	9.74E-06
Total PCB Aroclors	1.33E-02	0.00E+00	8.44E-03	1.12E-04	8.45E-06	8.70E-07	0.00E+00	9.32E-06
PESTICIDES								
DDTr	4.51E-02	3.10E-05	1.97E-02	8.88E-04	2.87E-05	6.88E-06	1.37E-06	3.69E-05
delta-BHC	3.00E-03	2.80E-05	1.34E-01	4.01E-04	1.91E-06	3.11E-06	1.24E-06	6.26E-06
Dieldrin	7.50E-03	0.00E+00	2.75E-02	2.06E-04	4.77E-06	1.60E-06	0.00E+00	6.36E-06
Endosulfan II	6.00E-03	0.00E+00	3.69E-01	2.21E-03	3.81E-06	1.72E-05	0.00E+00	2.10E-05
Endosulfan sulfate	1.70E-03	0.00E+00	3.06E-01	5.21E-04	1.08E-06	4.03E-06	0.00E+00	5.11E-06
Endrin aldehyde	5.60E-03	0.00E+00	6.47E-02	3.62E-04	3.56E-06	2.81E-06	0.00E+00	6.37E-06
Endrin ketone	2.10E-02	0.00E+00	5.08E-02	1.07E-03	1.33E-05	8.27E-06	0.00E+00	2.16E-05
Heptachlor	3.90E-03	0.00E+00	1.58E-02	6.16E-05	2.48E-06	4.77E-07	0.00E+00	2.96E-06
Methoxychlor	3.00E-02	0.00E+00	2.05E-02	6.16E-04	1.91E-05	4.77E-06	0.00E+00	2.38E-05

Table A-64
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Birds (Canada Goose) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	6.36E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	7.75E-03	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.43E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake: BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item (Plant) Uptake: 95UCLM Food Item Tissue Concentration (mg/L dry wt.)	95UCLM Case Scenario Doses: Dose from Sediment (mg/kg bw-day)	95UCLM Case Scenario Doses: Dose from Food (mg/kg bw-day)	95UCLM Case Scenario Doses: Dose from Water (mg/kg bw-day)	95UCLM Case Scenario Doses: Total Dose (mg/kg bw-day)
PAHs								
Total LMW PAHs	2.77E+01	0.00E+00	1.01E-01	2.81E+00	1.76E-02	2.18E-02	0.00E+00	3.94E-02
Total HMW PAHs	2.38E+02	0.00E+00	1.01E-01	2.41E+01	1.51E-01	1.87E-01	0.00E+00	3.38E-01
SVOCS								
Benzaldehyde	0.00E+00	2.00E-03	3.98E+00	0.00E+00	0.00E+00	0.00E+00	8.85E-05	8.85E-05
Bis(2-ethylhexyl)phthalate	3.41E+00	3.10E-03	5.48E-04	1.87E-03	2.17E-03	1.45E-05	1.37E-04	2.32E-03
Butylbenzylphthalate	9.90E-01	0.00E+00	6.17E-02	6.11E-02	6.29E-04	4.74E-04	0.00E+00	1.10E-03
Caprolactam	0.00E+00	3.10E-03	1.61E+01	0.00E+00	0.00E+00	0.00E+00	1.37E-04	1.37E-04
Carbazole	2.40E+00	0.00E+00	5.26E-01	1.26E+00	1.53E-03	9.79E-03	0.00E+00	1.13E-02
Dibenzofuran	3.50E-01	0.00E+00	2.76E-01	9.66E-02	2.22E-04	7.49E-04	0.00E+00	9.71E-04

Table A-65
Wildlife Exposure Modeling of Maximum Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Arsenic	2.51E+01	4.90E-03	--	1.27E-01	Uptake Factor	3.19E+00	modeled	2.21E-01	1.55E-01	2.79E-04	3.77E-01
Barium	2.14E+02	1.54E-01	--	1.00E+00	Uptake Factor	2.14E+02	modeled	1.89E+00	1.04E+01	8.78E-03	1.23E+01
Beryllium	1.00E+00	0.00E+00	--	1.00E+00	Uptake Factor	1.00E+00	modeled	8.81E-03	4.88E-02	0.00E+00	5.76E-02
Copper	7.59E+03	2.64E-01	--	5.25E+00	Uptake Factor	3.98E+04	modeled	6.69E+01	1.94E+03	1.50E-02	2.01E+03
Lead	4.09E+01	2.00E-03	--	6.60E-02	Uptake Factor	2.70E+00	modeled	3.60E-01	1.32E-01	1.14E-04	4.92E-01
Manganese	5.09E+02	1.15E-01	--	1.00E+00	Uptake Factor	5.09E+02	modeled	4.49E+00	2.48E+01	6.56E-03	2.93E+01
Selenium	4.80E-01	1.80E-03	--	1.00E+00	Uptake Factor	4.80E-01	modeled	4.23E-03	2.34E-02	1.03E-04	2.77E-02
Vanadium	3.58E+01	1.05E-02	--	1.00E+00	Uptake Factor	3.58E+01	modeled	3.15E-01	1.75E+00	5.99E-04	2.06E+00
PCBS											
Aroclor-1254	2.30E-02	0.00E+00	--	3.38E+00	BSAF	9.32E-01	modeled	2.03E-04	4.54E-02	0.00E+00	4.56E-02
Aroclor-1260	2.80E-03	0.00E+00	--	3.38E+00	BSAF	1.13E-01	modeled	2.47E-05	5.53E-03	0.00E+00	5.55E-03
Total PCB Congeners	2.10E-02	1.10E-05	--	3.38E+00	BSAF	8.51E-01	modeled	1.85E-04	4.15E-02	6.27E-07	4.17E-02
Total PCB Aroclors	2.30E-02	0.00E+00	--	3.38E+00	BSAF	9.32E-01	modeled	2.03E-04	4.54E-02	0.00E+00	4.56E-02
PESTICIDES											
DDTr	9.67E-02	3.10E-05	--	5.22E+00	BSAF	6.06E+00	modeled	8.52E-04	2.95E-01	1.77E-06	2.96E-01
delta-BHC	3.00E-03	2.80E-05	--	4.00E+00	BSAF	1.44E-01	modeled	2.64E-05	7.02E-03	1.60E-06	7.05E-03
Dieldrin	7.50E-03	0.00E+00	--	2.06E+00	BSAF	1.85E-01	modeled	6.61E-05	9.03E-03	0.00E+00	9.10E-03
Endosulfan II	6.00E-03	0.00E+00	--	4.00E+00	BSAF	2.88E-01	modeled	5.29E-05	1.40E-02	0.00E+00	1.41E-02
Endosulfan sulfate	1.70E-03	0.00E+00	--	4.00E+00	BSAF	8.16E-02	modeled	1.50E-05	3.98E-03	0.00E+00	3.99E-03
Endrin aldehyde	5.60E-03	0.00E+00	--	4.00E+00	BSAF	2.69E-01	modeled	4.93E-05	1.31E-02	0.00E+00	1.32E-02
Endrin ketone	2.10E-02	0.00E+00	--	4.00E+00	BSAF	1.01E+00	modeled	1.85E-04	4.91E-02	0.00E+00	4.93E-02
Heptachlor	3.90E-03	0.00E+00	--	1.26E+01	BSAF	5.89E-01	modeled	3.44E-05	2.87E-02	0.00E+00	2.88E-02
Methoxychlor	3.00E-02	0.00E+00	--	4.00E+00	BSAF	1.44E+00	modeled	2.64E-04	7.02E-02	0.00E+00	7.05E-02
PAHs											
Total LMW PAHs	2.77E+01	0.00E+00	--	5.66E-02	BSAF	1.88E+01	modeled	2.44E-01	9.19E-01	0.00E+00	1.16E+00
Total HMW PAHs	2.38E+02	0.00E+00	--	1.78E-02	BSAF	5.07E+01	modeled	2.09E+00	2.47E+00	0.00E+00	4.57E+00
SVOCS											
Benzaldehyde	0.00E+00	2.00E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.14E-04	1.14E-04
Bis(2-ethylhexyl)phthalate	8.10E+00	3.10E-03	--	4.00E+00	BSAF	3.89E+02	modeled	7.14E-02	1.90E+01	1.77E-04	1.90E+01
Butylbenzylphthalate	9.90E-01	0.00E+00	--	4.00E+00	BSAF	4.75E+01	modeled	8.72E-03	2.32E+00	0.00E+00	2.33E+00
Caprolactam	0.00E+00	3.10E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.77E-04	1.77E-04
Carbazole	2.40E+00	0.00E+00	--	4.00E+00	BSAF	1.15E+02	modeled	2.11E-02	5.62E+00	0.00E+00	5.64E+00
Dibenzofuran	3.50E-01	0.00E+00	--	2.59E-02	BSAF	1.09E-01	modeled	3.08E-03	5.31E-03	0.00E+00	8.39E-03

Table A-66
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Insectivorous Birds (Laughing Gull) from Media
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.81E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.88E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	5.70E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		95UCLM Food Item Tissue Concentration (mg/L dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Arsenic	7.65E+00	4.90E-03	--	1.27E-01	Uptake Factor	9.71E-01	modeled	6.74E-02	4.74E-02	2.79E-04	1.15E-01
Barium	1.77E+02	1.39E-01	--	1.00E+00	Uptake Factor	1.77E+02	modeled	1.56E+00	8.64E+00	7.94E-03	1.02E+01
Beryllium	8.95E-01	0.00E+00	--	1.00E+00	Uptake Factor	8.95E-01	modeled	7.89E-03	4.36E-02	0.00E+00	5.15E-02
Copper	4.62E+03	1.19E-01	--	5.25E+00	Uptake Factor	2.43E+04	modeled	4.07E+01	1.18E+03	6.80E-03	1.22E+03
Lead	1.84E+01	1.35E-03	--	6.60E-02	Uptake Factor	1.21E+00	modeled	1.62E-01	5.91E-02	7.68E-05	2.21E-01
Manganese	4.40E+02	8.82E-02	--	1.00E+00	Uptake Factor	4.40E+02	modeled	3.88E+00	2.15E+01	5.03E-03	2.53E+01
Selenium	3.57E-01	1.22E-03	--	1.00E+00	Uptake Factor	3.57E-01	modeled	3.15E-03	1.74E-02	6.93E-05	2.06E-02
Vanadium	2.47E+01	1.00E-02	--	1.00E+00	Uptake Factor	2.47E+01	modeled	2.18E-01	1.20E+00	5.71E-04	1.42E+00
PCBS											
Aroclor-1254	6.08E-03	0.00E+00	--	3.38E+00	BSAF	2.46E-01	modeled	5.36E-05	1.20E-02	0.00E+00	1.21E-02
Aroclor-1260	2.20E-03	0.00E+00	--	3.38E+00	BSAF	8.91E-02	modeled	1.94E-05	4.34E-03	0.00E+00	4.36E-03
Total PCB Congeners	1.32E-02	1.10E-05	--	3.38E+00	BSAF	5.35E-01	modeled	1.16E-04	2.61E-02	6.27E-07	2.62E-02
Total PCB Aroclors	1.33E-02	0.00E+00	--	3.38E+00	BSAF	5.39E-01	modeled	1.17E-04	2.63E-02	0.00E+00	2.64E-02
PESTICIDES											
DDTr	4.51E-02	3.10E-05	--	5.22E+00	BSAF	2.83E+00	modeled	3.97E-04	1.38E-01	1.77E-06	1.38E-01
delta-BHC	3.00E-03	2.80E-05	--	4.00E+00	BSAF	1.44E-01	modeled	2.64E-05	7.02E-03	1.60E-06	7.05E-03
Dieldrin	7.50E-03	0.00E+00	--	2.06E+00	BSAF	1.85E-01	modeled	6.61E-05	9.03E-03	0.00E+00	9.10E-03
Endosulfan II	6.00E-03	0.00E+00	--	4.00E+00	BSAF	2.88E-01	modeled	5.29E-05	1.40E-02	0.00E+00	1.41E-02
Endosulfan sulfate	1.70E-03	0.00E+00	--	4.00E+00	BSAF	8.16E-02	modeled	1.50E-05	3.98E-03	0.00E+00	3.99E-03
Endrin aldehyde	5.60E-03	0.00E+00	--	4.00E+00	BSAF	2.69E-01	modeled	4.93E-05	1.31E-02	0.00E+00	1.32E-02
Endrin ketone	2.10E-02	0.00E+00	--	4.00E+00	BSAF	1.01E+00	modeled	1.85E-04	4.91E-02	0.00E+00	4.93E-02
Heptachlor	3.90E-03	0.00E+00	--	1.26E+01	BSAF	5.89E-01	modeled	3.44E-05	2.87E-02	0.00E+00	2.88E-02
Methoxychlor	3.00E-02	0.00E+00	--	4.00E+00	BSAF	1.44E+00	modeled	2.64E-04	7.02E-02	0.00E+00	7.05E-02
PAHs											
Total LMW PAHs	2.77E+01	0.00E+00	--	5.66E-02	BSAF	1.88E+01	modeled	2.44E-01	9.19E-01	0.00E+00	1.16E+00
Total HMW PAHs	2.38E+02	0.00E+00	--	1.78E-02	BSAF	5.07E+01	modeled	2.09E+00	2.47E+00	0.00E+00	4.57E+00
SVOCS											
Benzaldehyde	0.00E+00	2.00E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.14E-04	1.14E-04
Bis(2-ethylhexyl)phthalate	3.41E+00	3.10E-03	--	4.00E+00	BSAF	1.64E+02	modeled	3.01E-02	7.98E+00	1.77E-04	8.01E+00
Butylbenzylphthalate	9.90E-01	0.00E+00	--	4.00E+00	BSAF	4.75E+01	modeled	8.72E-03	2.32E+00	0.00E+00	2.33E+00
Caprolactam	0.00E+00	3.10E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.77E-04	1.77E-04
Carbazole	2.40E+00	0.00E+00	--	4.00E+00	BSAF	1.15E+02	modeled	2.11E-02	5.62E+00	0.00E+00	5.64E+00
Dibenzofuran	3.50E-01	0.00E+00	--	2.59E-02	BSAF	1.09E-01	modeled	3.08E-03	5.31E-03	0.00E+00	8.39E-03

Table A-67
Wildlife Exposure Modeling of Maximum Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Arsenic	2.51E+01	4.90E-03	--	1.60E+01	7.84E-02	modeled	6.28E-02	9.80E-03	5.39E-04	7.31E-02
Barium	2.14E+02	1.54E-01	2.76E+01	1.60E+01	2.46E+00	actual	5.35E-01	3.45E+00	1.69E-02	4.00E+00
Beryllium	1.00E+00	0.00E+00	--	2.48E+02	0.00E+00	modeled	2.50E-03	0.00E+00	0.00E+00	2.50E-03
Copper	7.59E+03	2.64E-01	3.80E+00	1.86E+03	4.90E+02	actual	1.90E+01	4.75E-01	2.90E-02	1.95E+01
Lead	4.09E+01	2.00E-03	2.80E-01	1.80E+02	3.60E-01	actual	1.02E-01	3.50E-02	2.20E-04	1.37E-01
Manganese	5.09E+02	1.15E-01	3.16E+01	1.60E+03	1.84E+02	actual	1.27E+00	3.95E+00	1.27E-02	5.24E+00
Selenium	4.80E-01	1.80E-03	1.12E+00	9.68E+02	1.74E+00	actual	1.20E-03	1.40E-01	1.98E-04	1.41E-01
Vanadium	3.58E+01	1.05E-02	2.12E+00	4.00E+00	4.20E-02	actual	8.95E-02	2.65E-01	1.16E-03	3.56E-01
PCBS										
Aroclor-1254	2.30E-02	0.00E+00	1.16E+00	2.16E+05	0.00E+00	actual	5.75E-05	1.45E-01	0.00E+00	1.45E-01
Aroclor-1260	2.80E-03	0.00E+00	--	1.10E+05	0.00E+00	modeled	7.00E-06	0.00E+00	0.00E+00	7.00E-06
Total PCB Congeners	2.10E-02	1.10E-05	4.79E-01	1.01E+05	1.11E+00	actual	5.25E-05	5.99E-02	1.21E-06	5.99E-02
Total PCB Aroclors	2.30E-02	0.00E+00	1.16E+00	1.01E+05	0.00E+00	actual	5.75E-05	1.45E-01	0.00E+00	1.45E-01
PESTICIDES										
DDTr	9.67E-02	3.10E-05	2.27E-01	6.74E+04	2.09E+00	actual	2.42E-04	2.84E-02	3.41E-06	2.86E-02
delta-BHC	3.00E-03	2.80E-05	--	1.00E+03	2.80E-02	modeled	7.50E-06	3.51E-03	3.08E-06	3.52E-03
Dieldrin	7.50E-03	0.00E+00	--	5.01E+03	0.00E+00	modeled	1.88E-05	0.00E+00	0.00E+00	1.88E-05
Endosulfan II	6.00E-03	0.00E+00	--	6.25E+02	0.00E+00	modeled	1.50E-05	0.00E+00	0.00E+00	1.50E-05
Endosulfan sulfate	1.70E-03	0.00E+00	2.12E-03	4.83E+02	0.00E+00	actual	4.25E-06	2.65E-04	0.00E+00	2.69E-04
Endrin aldehyde	5.60E-03	0.00E+00	3.56E-03	2.75E+03	0.00E+00	actual	1.40E-05	4.45E-04	0.00E+00	4.59E-04
Endrin ketone	2.10E-02	0.00E+00	8.00E-03	3.62E+03	0.00E+00	actual	5.25E-05	1.00E-03	0.00E+00	1.05E-03
Heptachlor	3.90E-03	0.00E+00	--	7.55E+03	0.00E+00	modeled	9.75E-06	0.00E+00	0.00E+00	9.75E-06
Methoxychlor	3.00E-02	0.00E+00	2.36E-02	4.18E+03	0.00E+00	actual	7.50E-05	2.95E-03	0.00E+00	3.03E-03
PAHs										
Total LMW PAHs	2.77E+01	0.00E+00	--	1.43E+04	0.00E+00	modeled	6.93E-02	0.00E+00	0.00E+00	6.93E-02
Total HMW PAHs	2.38E+02	0.00E+00	--	1.43E+04	0.00E+00	modeled	5.94E-01	0.00E+00	0.00E+00	5.94E-01
SVOCS										
Benzaldehyde	0.00E+00	2.00E-03	2.48E-01	1.76E+01	3.52E-02	actual	0.00E+00	3.10E-02	2.20E-04	3.12E-02
Bis(2-ethylhexyl)phthalate	8.10E+00	3.10E-03	--	6.84E+03	2.12E+01	modeled	2.03E-02	2.65E+00	3.41E-04	2.67E+00
Butylbenzylphthalate	9.90E-01	0.00E+00	--	2.46E+03	0.00E+00	modeled	2.48E-03	0.00E+00	0.00E+00	2.48E-03
Caprolactam	0.00E+00	3.10E-03	--	1.26E+01	3.92E-02	modeled	0.00E+00	4.90E-03	3.41E-04	5.24E-03
Carbazole	2.40E+00	0.00E+00	--	5.28E+02	0.00E+00	modeled	6.00E-03	0.00E+00	0.00E+00	6.00E-03
Dibenzofuran	3.50E-01	0.00E+00	--	9.72E+02	0.00E+00	modeled	8.75E-04	0.00E+00	0.00E+00	8.75E-04

Table A-68
Wildlife Exposure Modeling of 95UCLM Doses to Small Piscivorous Birds (Belted Kingfisher) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.50E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.25E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	1.10E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/L dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Arsenic	7.65E+00	4.90E-03	--	1.60E+01	7.83E-02	modeled	1.91E-02	9.79E-03	5.38E-04	2.94E-02
Barium	1.77E+02	1.39E-01	2.76E+01	1.60E+01	2.23E+00	actual	4.43E-01	3.45E+00	1.53E-02	3.91E+00
Beryllium	8.95E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	2.24E-03	0.00E+00	0.00E+00	2.24E-03
Copper	4.62E+03	1.19E-01	3.80E+00	1.86E+03	2.21E+02	actual	1.16E+01	4.75E-01	1.31E-02	1.20E+01
Lead	1.84E+01	1.35E-03	2.80E-01	1.80E+02	2.43E-01	actual	4.59E-02	3.50E-02	1.48E-04	8.10E-02
Manganese	4.40E+02	8.82E-02	3.16E+01	1.60E+03	1.41E+02	actual	1.10E+00	3.95E+00	9.70E-03	5.06E+00
Selenium	3.57E-01	1.22E-03	1.12E+00	9.68E+02	1.18E+00	actual	8.93E-04	1.40E-01	1.34E-04	1.41E-01
Vanadium	2.47E+01	1.00E-02	2.12E+00	4.00E+00	4.00E-02	actual	6.18E-02	2.65E-01	1.10E-03	3.28E-01
PCBS										
Aroclor-1254	6.08E-03	0.00E+00	4.80E-01	2.16E+05	0.00E+00	actual	1.52E-05	6.00E-02	0.00E+00	6.00E-02
Aroclor-1260	2.20E-03	0.00E+00	--	1.10E+05	0.00E+00	modeled	5.50E-06	0.00E+00	0.00E+00	5.50E-06
Total PCB Congeners	1.32E-02	1.10E-05	4.79E-01	1.01E+05	1.11E+00	actual	3.30E-05	5.99E-02	1.21E-06	5.99E-02
Total PCB Aroclors	1.33E-02	0.00E+00	9.56E-01	1.01E+05	0.00E+00	actual	3.33E-05	1.20E-01	0.00E+00	1.20E-01
PESTICIDES										
DDTr	4.51E-02	3.10E-05	2.27E-01	6.74E+04	2.09E+00	actual	1.13E-04	2.84E-02	3.41E-06	2.85E-02
delta-BHC	3.00E-03	2.80E-05	--	1.00E+03	2.80E-02	modeled	7.50E-06	3.51E-03	3.08E-06	3.52E-03
Dieldrin	7.50E-03	0.00E+00	--	5.01E+03	0.00E+00	modeled	1.88E-05	0.00E+00	0.00E+00	1.88E-05
Endosulfan II	6.00E-03	0.00E+00	--	6.25E+02	0.00E+00	modeled	1.50E-05	0.00E+00	0.00E+00	1.50E-05
Endosulfan sulfate	1.70E-03	0.00E+00	2.12E-03	4.83E+02	0.00E+00	actual	4.25E-06	2.65E-04	0.00E+00	2.69E-04
Endrin aldehyde	5.60E-03	0.00E+00	3.56E-03	2.75E+03	0.00E+00	actual	1.40E-05	4.45E-04	0.00E+00	4.59E-04
Endrin ketone	2.10E-02	0.00E+00	8.00E-03	3.62E+03	0.00E+00	actual	5.25E-05	1.00E-03	0.00E+00	1.05E-03
Heptachlor	3.90E-03	0.00E+00	--	7.55E+03	0.00E+00	modeled	9.75E-06	0.00E+00	0.00E+00	9.75E-06
Methoxychlor	3.00E-02	0.00E+00	2.36E-02	4.18E+03	0.00E+00	actual	7.50E-05	2.95E-03	0.00E+00	3.03E-03
PAHs										
Total LMW PAHs	2.77E+01	0.00E+00	--	1.43E+04	0.00E+00	modeled	6.93E-02	0.00E+00	0.00E+00	6.93E-02
Total HMW PAHs	2.38E+02	0.00E+00	--	1.43E+04	0.00E+00	modeled	5.94E-01	0.00E+00	0.00E+00	5.94E-01
SVOCS										
Benzaldehyde	0.00E+00	2.00E-03	2.48E-01	1.76E+01	3.52E-02	actual	0.00E+00	3.10E-02	2.20E-04	3.12E-02
Bis(2-ethylhexyl)phthalate	3.41E+00	3.10E-03	--	6.84E+03	2.12E+01	modeled	8.53E-03	2.65E+00	3.41E-04	2.66E+00
Butylbenzylphthalate	9.90E-01	0.00E+00	--	2.46E+03	0.00E+00	modeled	2.48E-03	0.00E+00	0.00E+00	2.48E-03
Caprolactam	0.00E+00	3.10E-03	--	1.26E+01	3.92E-02	modeled	0.00E+00	4.90E-03	3.41E-04	5.24E-03
Carbazole	2.40E+00	0.00E+00	--	5.28E+02	0.00E+00	modeled	6.00E-03	0.00E+00	0.00E+00	6.00E-03
Dibenzofuran	3.50E-01	0.00E+00	--	9.72E+02	0.00E+00	modeled	8.75E-04	0.00E+00	0.00E+00	8.75E-04

Table A-69
Wildlife Exposure Modeling of Maximum Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Arsenic	2.51E+01	4.90E-03	--	1.60E+01	7.84E-02	modeled	2.26E-02	3.53E-03	2.21E-04	2.63E-02
Barium	2.14E+02	1.54E-01	2.76E+01	1.60E+01	2.46E+00	actual	1.93E-01	1.24E+00	6.93E-03	1.44E+00
Beryllium	1.00E+00	0.00E+00	--	2.48E+02	0.00E+00	modeled	9.00E-04	0.00E+00	0.00E+00	9.00E-04
Copper	7.59E+03	2.64E-01	3.80E+00	1.86E+03	4.90E+02	actual	6.83E+00	1.71E-01	1.19E-02	7.01E+00
Lead	4.09E+01	2.00E-03	2.80E-01	1.80E+02	3.60E-01	actual	3.68E-02	1.26E-02	9.00E-05	4.95E-02
Manganese	5.09E+02	1.15E-01	3.16E+01	1.60E+03	1.84E+02	actual	4.58E-01	1.42E+00	5.18E-03	1.89E+00
Selenium	4.80E-01	1.80E-03	1.12E+00	9.68E+02	1.74E+00	actual	4.32E-04	5.04E-02	8.10E-05	5.09E-02
Vanadium	3.58E+01	1.05E-02	2.12E+00	4.00E+00	4.20E-02	actual	3.22E-02	9.54E-02	4.73E-04	1.28E-01
PCBS										
Aroclor-1254	2.30E-02	0.00E+00	1.16E+00	2.16E+05	0.00E+00	actual	2.07E-05	5.22E-02	0.00E+00	5.22E-02
Aroclor-1260	2.80E-03	0.00E+00	--	1.10E+05	0.00E+00	modeled	2.52E-06	0.00E+00	0.00E+00	2.52E-06
Total PCB Congeners	2.10E-02	1.10E-05	4.79E-01	1.01E+05	1.11E+00	actual	1.89E-05	2.16E-02	4.95E-07	2.16E-02
Total PCB Aroclors	2.30E-02	0.00E+00	1.16E+00	1.01E+05	0.00E+00	actual	2.07E-05	5.22E-02	0.00E+00	5.22E-02
PESTICIDES										
DDTr	9.67E-02	3.10E-05	2.27E-01	6.74E+04	2.09E+00	actual	8.70E-05	1.02E-02	1.40E-06	1.03E-02
delta-BHC	3.00E-03	2.80E-05	--	1.00E+03	2.80E-02	modeled	2.70E-06	1.26E-03	1.26E-06	1.27E-03
Dieldrin	7.50E-03	0.00E+00	--	5.01E+03	0.00E+00	modeled	6.75E-06	0.00E+00	0.00E+00	6.75E-06
Endosulfan II	6.00E-03	0.00E+00	--	6.25E+02	0.00E+00	modeled	5.40E-06	0.00E+00	0.00E+00	5.40E-06
Endosulfan sulfate	1.70E-03	0.00E+00	2.12E-03	4.83E+02	0.00E+00	actual	1.53E-06	9.54E-05	0.00E+00	9.69E-05
Endrin aldehyde	5.60E-03	0.00E+00	3.56E-03	2.75E+03	0.00E+00	actual	5.04E-06	1.60E-04	0.00E+00	1.65E-04
Endrin ketone	2.10E-02	0.00E+00	8.00E-03	3.62E+03	0.00E+00	actual	1.89E-05	3.60E-04	0.00E+00	3.79E-04
Heptachlor	3.90E-03	0.00E+00	--	7.55E+03	0.00E+00	modeled	3.51E-06	0.00E+00	0.00E+00	3.51E-06
Methoxychlor	3.00E-02	0.00E+00	2.36E-02	4.18E+03	0.00E+00	actual	2.70E-05	1.06E-03	0.00E+00	1.09E-03
PAHs										
Total LMW PAHs	2.77E+01	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.50E-02	0.00E+00	0.00E+00	2.50E-02
Total HMW PAHs	2.38E+02	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.14E-01	0.00E+00	0.00E+00	2.14E-01
SVOCS										
Benzaldehyde	0.00E+00	2.00E-03	2.48E-01	1.76E+01	3.52E-02	actual	0.00E+00	1.12E-02	9.00E-05	1.13E-02
Bis(2-ethylhexyl)phthalate	8.10E+00	3.10E-03	--	6.84E+03	2.12E+01	modeled	7.29E-03	9.54E-01	1.40E-04	9.62E-01
Butylbenzylphthalate	9.90E-01	0.00E+00	--	2.46E+03	0.00E+00	modeled	8.91E-04	0.00E+00	0.00E+00	8.91E-04
Caprolactam	0.00E+00	3.10E-03	--	1.26E+01	3.92E-02	modeled	0.00E+00	1.76E-03	1.40E-04	1.90E-03
Carbazole	2.40E+00	0.00E+00	--	5.28E+02	0.00E+00	modeled	2.16E-03	0.00E+00	0.00E+00	2.16E-03
Dibenzofuran	3.50E-01	0.00E+00	--	9.72E+02	0.00E+00	modeled	3.15E-04	0.00E+00	0.00E+00	3.15E-04

Table A-70
Wildlife Exposure Modeling of 95UCLM Doses to Large Piscivorous Birds (Great Blue Heron) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.00E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.50E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	4.50E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/L dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Arsenic	7.65E+00	4.90E-03	--	1.60E+01	7.83E-02	modeled	6.88E-03	3.52E-03	2.20E-04	1.06E-02
Barium	1.77E+02	1.39E-01	2.76E+01	1.60E+01	2.23E+00	actual	1.60E-01	1.24E+00	6.27E-03	1.41E+00
Beryllium	8.95E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	8.06E-04	0.00E+00	0.00E+00	8.06E-04
Copper	4.62E+03	1.19E-01	3.80E+00	1.86E+03	2.21E+02	actual	4.16E+00	1.71E-01	5.37E-03	4.34E+00
Lead	1.84E+01	1.35E-03	2.80E-01	1.80E+02	2.43E-01	actual	1.65E-02	1.26E-02	6.07E-05	2.92E-02
Manganese	4.40E+02	8.82E-02	3.16E+01	1.60E+03	1.41E+02	actual	3.96E-01	1.42E+00	3.97E-03	1.82E+00
Selenium	3.57E-01	1.22E-03	1.12E+00	9.68E+02	1.18E+00	actual	3.21E-04	5.04E-02	5.47E-05	5.08E-02
Vanadium	2.47E+01	1.00E-02	2.12E+00	4.00E+00	4.00E-02	actual	2.22E-02	9.54E-02	4.50E-04	1.18E-01
PCBS										
Aroclor-1254	6.08E-03	0.00E+00	4.80E-01	2.16E+05	0.00E+00	actual	5.47E-06	2.16E-02	0.00E+00	2.16E-02
Aroclor-1260	2.20E-03	0.00E+00	--	1.10E+05	0.00E+00	modeled	1.98E-06	0.00E+00	0.00E+00	1.98E-06
Total PCB Congeners	1.32E-02	1.10E-05	4.79E-01	1.01E+05	1.11E+00	actual	1.19E-05	2.16E-02	4.95E-07	2.16E-02
Total PCB Aroclors	1.33E-02	0.00E+00	9.56E-01	1.01E+05	0.00E+00	actual	1.20E-05	4.30E-02	0.00E+00	4.30E-02
PESTICIDES										
DDTr	4.51E-02	3.10E-05	2.27E-01	6.74E+04	2.09E+00	actual	4.06E-05	1.02E-02	1.40E-06	1.02E-02
delta-BHC	3.00E-03	2.80E-05	--	1.00E+03	2.80E-02	modeled	2.70E-06	1.26E-03	1.26E-06	1.27E-03
Dieldrin	7.50E-03	0.00E+00	--	5.01E+03	0.00E+00	modeled	6.75E-06	0.00E+00	0.00E+00	6.75E-06
Endosulfan II	6.00E-03	0.00E+00	--	6.25E+02	0.00E+00	modeled	5.40E-06	0.00E+00	0.00E+00	5.40E-06
Endosulfan sulfate	1.70E-03	0.00E+00	2.12E-03	4.83E+02	0.00E+00	actual	1.53E-06	9.54E-05	0.00E+00	9.69E-05
Endrin aldehyde	5.60E-03	0.00E+00	3.56E-03	2.75E+03	0.00E+00	actual	5.04E-06	1.60E-04	0.00E+00	1.65E-04
Endrin ketone	2.10E-02	0.00E+00	8.00E-03	3.62E+03	0.00E+00	actual	1.89E-05	3.60E-04	0.00E+00	3.79E-04
Heptachlor	3.90E-03	0.00E+00	--	7.55E+03	0.00E+00	modeled	3.51E-06	0.00E+00	0.00E+00	3.51E-06
Methoxychlor	3.00E-02	0.00E+00	2.36E-02	4.18E+03	0.00E+00	actual	2.70E-05	1.06E-03	0.00E+00	1.09E-03
PAHs										
Total LMW PAHs	2.77E+01	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.50E-02	0.00E+00	0.00E+00	2.50E-02
Total HMW PAHs	2.38E+02	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.14E-01	0.00E+00	0.00E+00	2.14E-01
SVOCS										
Benzaldehyde	0.00E+00	2.00E-03	2.48E-01	1.76E+01	3.52E-02	actual	0.00E+00	1.12E-02	9.00E-05	1.13E-02
Bis(2-ethylhexyl)phthalate	3.41E+00	3.10E-03	--	6.84E+03	2.12E+01	modeled	3.07E-03	9.54E-01	1.40E-04	9.57E-01
Butylbenzylphthalate	9.90E-01	0.00E+00	--	2.46E+03	0.00E+00	modeled	8.91E-04	0.00E+00	0.00E+00	8.91E-04
Caprolactam	0.00E+00	3.10E-03	--	1.26E+01	3.92E-02	modeled	0.00E+00	1.76E-03	1.40E-04	1.90E-03
Carbazole	2.40E+00	0.00E+00	--	5.28E+02	0.00E+00	modeled	2.16E-03	0.00E+00	0.00E+00	2.16E-03
Dibenzofuran	3.50E-01	0.00E+00	--	9.72E+02	0.00E+00	modeled	3.15E-04	0.00E+00	0.00E+00	3.15E-04

Table A-71
Wildlife Exposure Modeling of Maximum Doses to Herbivorous Mammals (White-Footed Mouse) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	7.73E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	3.86E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	3.00E-01	L/kg-day

Chemical	Maximum Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	3.59E+02	1.54E-01	1.50E-01	5.39E+01	2.77E-01	2.08E+00	4.62E-02	2.40E+00
Chromium	1.61E+01	7.60E-04	7.50E-03	1.21E-01	1.24E-02	4.67E-03	2.28E-04	1.73E-02
Manganese	7.79E+02	1.15E-01	2.50E-01	1.95E+02	6.02E-01	7.52E+00	3.45E-02	8.16E+00
Vanadium	3.14E+01	1.05E-02	5.50E-03	1.73E-01	2.43E-02	6.67E-03	3.15E-03	3.41E-02
Zinc	1.60E+02	8.10E-03	ln(dry plant conc, mg/kg) = (1.575+0.555*ln(soil conc))	8.08E+01	1.24E-01	3.12E+00	2.43E-03	3.25E+00
PCBS								
Aroclor-1016	3.40E-03	0.00E+00	1.99E-02	6.77E-05	2.63E-06	2.61E-06	0.00E+00	5.24E-06
Aroclor-1254	1.10E-02	0.00E+00	3.58E-03	3.94E-05	8.50E-06	1.52E-06	0.00E+00	1.00E-05
Aroclor-1260	1.00E-02	0.00E+00	6.44E-04	6.44E-06	7.73E-06	2.49E-07	0.00E+00	7.98E-06
Total PCB Congeners	4.50E-02	1.10E-05	8.44E-03	3.80E-04	3.48E-05	1.47E-05	3.30E-06	5.27E-05
Total PCB Aroclors	1.76E-02	0.00E+00	8.44E-03	1.49E-04	1.36E-05	5.74E-06	0.00E+00	1.93E-05
PESTICIDES								
DDTr	8.14E-02	3.10E-05	1.97E-02	1.60E-03	6.29E-05	6.19E-05	9.30E-06	1.34E-04
delta-BHC	NO COPC	2.80E-05	1.34E-01	0.00E+00	0.00E+00	0.00E+00	8.40E-06	8.40E-06
Dieldrin	1.40E-02	0.00E+00	2.75E-02	3.85E-04	1.08E-05	1.49E-05	0.00E+00	2.57E-05
Endosulfan II	1.70E-02	0.00E+00	3.69E-01	6.27E-03	1.31E-05	2.42E-04	0.00E+00	2.55E-04
Endosulfan sulfate	1.30E-02	0.00E+00	3.06E-01	3.98E-03	1.00E-05	1.54E-04	0.00E+00	1.64E-04
Endrin aldehyde	3.50E-02	0.00E+00	6.47E-02	2.26E-03	2.70E-05	8.75E-05	0.00E+00	1.15E-04
Endrin ketone	2.10E-03	0.00E+00	5.08E-02	1.07E-04	1.62E-06	4.12E-06	0.00E+00	5.74E-06
Heptachlor	NO COPC	0.00E+00	1.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methoxychlor	1.10E-02	0.00E+00	2.05E-02	2.26E-04	8.50E-06	8.72E-06	0.00E+00	1.72E-05
SVOCS								
Bis(2-ethylhexyl)phthalate	5.20E+00	3.10E-03	5.48E-04	2.85E-03	4.02E-03	1.10E-04	9.30E-04	5.06E-03
Butylbenzylphthalate	4.70E-01	0.00E+00	6.17E-02	2.90E-02	3.63E-04	1.12E-03	0.00E+00	1.48E-03
VOCS								
Acetone	1.71E-02	0.00E+00	5.29E+01	9.05E-01	1.32E-05	3.50E-02	0.00E+00	3.50E-02
Methylene chloride	3.60E-03	0.00E+00	6.51E+00	2.34E-02	2.78E-06	9.05E-04	0.00E+00	9.08E-04

Table A-72
Wildlife Exposure Modeling of 95UCLM Doses to Herbivorous Mammals (White-Footed Mouse) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	7.73E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	3.86E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	3.00E-01	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.91E+02	1.39E-01	1.50E-01	2.87E+01	1.48E-01	1.11E+00	4.18E-02	1.30E+00
Chromium	1.21E+01	7.60E-04	7.50E-03	9.08E-02	9.35E-03	3.51E-03	2.28E-04	1.31E-02
Manganese	3.96E+02	8.82E-02	2.50E-01	9.90E+01	3.06E-01	3.82E+00	2.65E-02	4.16E+00
Vanadium	2.33E+01	1.00E-02	5.50E-03	1.28E-01	1.80E-02	4.95E-03	3.00E-03	2.59E-02
Zinc	6.03E+01	5.43E-03	ln(dry plant conc, mg/kg) = (1.575+0.555*ln(soil conc))	4.70E+01	4.66E-02	1.82E+00	1.63E-03	1.86E+00
PCBS								
Aroclor-1016	3.40E-03	0.00E+00	1.99E-02	6.77E-05	2.63E-06	2.61E-06	0.00E+00	5.24E-06
Aroclor-1254	1.10E-02	0.00E+00	3.58E-03	3.94E-05	8.50E-06	1.52E-06	0.00E+00	1.00E-05
Aroclor-1260	2.67E-03	0.00E+00	6.44E-04	1.72E-06	2.06E-06	6.64E-08	0.00E+00	2.13E-06
Total PCB Congeners	1.02E-02	1.10E-05	8.44E-03	8.61E-05	7.88E-06	3.33E-06	3.30E-06	1.45E-05
Total PCB Aroclors	6.23E-03	0.00E+00	8.44E-03	5.26E-05	4.81E-06	2.03E-06	0.00E+00	6.85E-06
PESTICIDES								
DDTr	2.10E-02	3.10E-05	1.97E-02	4.14E-04	1.62E-05	1.60E-05	9.30E-06	4.15E-05
delta-BHC	NO COPC	2.80E-05	1.34E-01	0.00E+00	0.00E+00	0.00E+00	8.40E-06	8.40E-06
Dieldrin	1.40E-02	0.00E+00	2.75E-02	3.85E-04	1.08E-05	1.49E-05	0.00E+00	2.57E-05
Endosulfan II	2.36E-03	0.00E+00	3.69E-01	8.71E-04	1.82E-06	3.36E-05	0.00E+00	3.55E-05
Endosulfan sulfate	1.30E-02	0.00E+00	3.06E-01	3.98E-03	1.00E-05	1.54E-04	0.00E+00	1.64E-04
Endrin aldehyde	4.14E-03	0.00E+00	6.47E-02	2.68E-04	3.20E-06	1.03E-05	0.00E+00	1.35E-05
Endrin ketone	2.10E-03	0.00E+00	5.08E-02	1.07E-04	1.62E-06	4.12E-06	0.00E+00	5.74E-06
Heptachlor	NO COPC	0.00E+00	1.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methoxychlor	1.10E-02	0.00E+00	2.05E-02	2.26E-04	8.50E-06	8.72E-06	0.00E+00	1.72E-05
SVOCS								
Bis(2-ethylhexyl)phthalate	4.75E-01	3.10E-03	5.48E-04	2.60E-04	3.67E-04	1.01E-05	9.30E-04	1.31E-03
Butylbenzylphthalate	4.70E-01	0.00E+00	6.17E-02	2.90E-02	3.63E-04	1.12E-03	0.00E+00	1.48E-03
VOCS								
Acetone	1.35E-02	0.00E+00	5.29E+01	7.15E-01	1.04E-05	2.76E-02	0.00E+00	2.76E-02
Methylene chloride	3.52E-03	0.00E+00	6.51E+00	2.29E-02	2.72E-06	8.85E-04	0.00E+00	8.88E-04

Table A-73
Wildlife Exposure Modeling of Maximum Doses to Insectivorous Mammals (Least Shrew) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.55E-02	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.96E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	2.23E-01	L/kg-day

Chemical	Maximum Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Insect/Worm) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	3.59E+02	1.54E-01	1.60E-01	5.74E+01	9.14E+00	1.12E+01	3.43E-02	2.04E+01
Chromium	1.61E+01	7.60E-04	ln(dry worm conc, mg/kg) = (2.481+-0.067*ln(soil conc))	9.92E+00	4.10E-01	1.94E+00	1.69E-04	2.35E+00
Manganese	7.79E+02	1.15E-01	ln(dry worm conc, mg/kg) = (-0.809+0.682*ln(soil conc))	4.18E+01	1.98E+01	8.18E+00	2.56E-02	2.80E+01
Vanadium	3.14E+01	1.05E-02	8.80E-01	2.76E+01	7.99E-01	5.41E+00	2.34E-03	6.21E+00
Zinc	1.60E+02	8.10E-03	ln(dry worm conc, mg/kg) = (4.449+0.328*ln(soil conc))	4.52E+02	4.07E+00	8.85E+01	1.81E-03	9.26E+01
PCBS								
Aroclor-1016	3.40E-03	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	1.79E-03	8.66E-05	3.50E-04	0.00E+00	4.37E-04
Aroclor-1254	1.10E-02	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	8.84E-03	2.80E-04	1.73E-03	0.00E+00	2.01E-03
Aroclor-1260	1.00E-02	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	7.77E-03	2.55E-04	1.52E-03	0.00E+00	1.78E-03
Total PCB Congeners	4.50E-02	1.10E-05	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	6.02E-02	1.15E-03	1.18E-02	2.45E-06	1.29E-02
Total PCB Aroclors	1.76E-02	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	1.68E-02	4.48E-04	3.28E-03	0.00E+00	3.73E-03
PESTICIDES								
DDTr	8.14E-02	3.10E-05	9.00E+00	7.33E-01	2.07E-03	1.43E-01	6.91E-06	1.46E-01
delta-BHC	NO COPC	2.80E-05	1.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-06	6.24E-06
Dieldrin	1.40E-02	0.00E+00	1.79E+00	2.51E-02	3.56E-04	4.91E-03	0.00E+00	5.26E-03
Endosulfan II	1.70E-02	0.00E+00	1.00E+00	1.70E-02	4.33E-04	3.33E-03	0.00E+00	3.76E-03
Endosulfan sulfate	1.30E-02	0.00E+00	3.50E+00	4.55E-02	3.31E-04	8.91E-03	0.00E+00	9.24E-03
Endrin aldehyde	3.50E-02	0.00E+00	3.50E+00	1.23E-01	8.91E-04	2.40E-02	0.00E+00	2.49E-02
Endrin ketone	2.10E-03	0.00E+00	1.00E+00	2.10E-03	5.35E-05	4.11E-04	0.00E+00	4.65E-04
Heptachlor	NO COPC	0.00E+00	4.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methoxychlor	1.10E-02	0.00E+00	1.00E+00	1.10E-02	2.80E-04	2.15E-03	0.00E+00	2.43E-03
SVOCS								
Bis(2-ethylhexyl)phthalate	5.20E+00	3.10E-03	1.00E+00	5.20E+00	1.32E-01	1.02E+00	6.91E-04	1.15E+00
Butylbenzylphthalate	4.70E-01	0.00E+00	1.00E+00	4.70E-01	1.20E-02	9.20E-02	0.00E+00	1.04E-01
VOCS								
Acetone	1.71E-02	0.00E+00	1.00E+00	1.71E-02	4.35E-04	3.35E-03	0.00E+00	3.78E-03
Methylene chloride	3.60E-03	0.00E+00	1.00E+00	3.60E-03	9.16E-05	7.05E-04	0.00E+00	7.97E-04

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Table A-74
Wildlife Exposure Modeling of 95UCLM Doses to Insectivorous Mammals (Least Shrew) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	2.55E-02	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.96E-01	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	2.23E-01	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Insect/Worm) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Barium	1.91E+02	1.39E-01	1.60E-01	3.06E+01	4.86E+00	5.98E+00	3.11E-02	1.09E+01
Chromium	1.21E+01	7.60E-04	ln(dry worm conc, mg/kg) = (2.481+-0.067*ln(soil conc))	1.01E+01	3.08E-01	1.98E+00	1.69E-04	2.29E+00
Manganese	3.96E+02	8.82E-02	ln(dry worm conc, mg/kg) = (-0.809+0.682*ln(soil conc))	2.63E+01	1.01E+01	5.15E+00	1.97E-02	1.52E+01
Vanadium	2.33E+01	1.00E-02	8.80E-01	2.05E+01	5.93E-01	4.01E+00	2.23E-03	4.61E+00
Zinc	6.03E+01	5.43E-03	ln(dry worm conc, mg/kg) = (4.449+0.328*ln(soil conc))	3.28E+02	1.54E+00	6.43E+01	1.21E-03	6.58E+01
PCBS								
Aroclor-1016	3.40E-03	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	1.79E-03	8.66E-05	3.50E-04	0.00E+00	4.37E-04
Aroclor-1254	1.10E-02	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	8.84E-03	2.80E-04	1.73E-03	0.00E+00	2.01E-03
Aroclor-1260	2.67E-03	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	1.29E-03	6.80E-05	2.52E-04	0.00E+00	3.20E-04
Total PCB Congeners	1.02E-02	1.10E-05	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	7.98E-03	2.60E-04	1.56E-03	2.45E-06	1.82E-03
Total PCB Aroclors	6.23E-03	0.00E+00	ln(dry worm conc, mg/kg) = (1.410+1.361*LN(soil conc))	4.08E-03	1.59E-04	7.99E-04	0.00E+00	9.58E-04
PESTICIDES								
DDTr	2.10E-02	3.10E-05	9.00E+00	1.89E-01	5.35E-04	3.70E-02	6.91E-06	3.76E-02
delta-BHC	NO COPC	2.80E-05	1.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-06	6.24E-06
Dieldrin	1.40E-02	0.00E+00	1.79E+00	2.51E-02	3.56E-04	4.91E-03	0.00E+00	5.26E-03
Endosulfan II	2.36E-03	0.00E+00	1.00E+00	2.36E-03	6.01E-05	4.62E-04	0.00E+00	5.22E-04
Endosulfan sulfate	1.30E-02	0.00E+00	3.50E+00	4.55E-02	3.31E-04	8.91E-03	0.00E+00	9.24E-03
Endrin aldehyde	4.14E-03	0.00E+00	3.50E+00	1.45E-02	1.05E-04	2.84E-03	0.00E+00	2.94E-03
Endrin ketone	2.10E-03	0.00E+00	1.00E+00	2.10E-03	5.35E-05	4.11E-04	0.00E+00	4.65E-04
Heptachlor	NO COPC	0.00E+00	4.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methoxychlor	1.10E-02	0.00E+00	1.00E+00	1.10E-02	2.80E-04	2.15E-03	0.00E+00	2.43E-03
SVOCS								
Bis(2-ethylhexyl)phthalate	4.75E-01	3.10E-03	1.00E+00	4.75E-01	1.21E-02	9.30E-02	6.91E-04	1.06E-01
Butylbenzylphthalate	4.70E-01	0.00E+00	1.00E+00	4.70E-01	1.20E-02	9.20E-02	0.00E+00	1.04E-01
VOCS								
Acetone	1.35E-02	0.00E+00	1.00E+00	1.35E-02	3.44E-04	2.64E-03	0.00E+00	2.99E-03
Methylene chloride	3.52E-03	0.00E+00	1.00E+00	3.52E-03	8.96E-05	6.89E-04	0.00E+00	7.79E-04

Table A-75
Wildlife Exposure Modeling of Maximum Doses to Predatory Mammals (Coyote) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.83E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.73E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.50E-02	L/kg-day

Chemical	Maximum Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Dose to Small Mammal (mg/kg bw-day)	Food Item (Small Mammal) Uptake		Maximum Case Scenario Doses			
				Uptake Factor (mg/kg dry wt./mg/kg dry wt.) or Small Mammal Biotransfer Factor (mg/kg bw-day to mg/kg)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals									
Barium	3.59E+02	1.54E-01	2.40E+00	ln(dry mammal conc, mg/kg) = (-1.412+0.7*ln(soil conc))	1.50E+01	1.73E-01	2.58E-01	1.31E-02	4.45E-01
Chromium	1.61E+01	7.60E-04	1.73E-02	ln(dry mammal conc, mg/kg) = (-1.4599+0.7338*ln(soil conc))	1.78E+00	7.78E-03	3.08E-02	6.46E-05	3.86E-02
Manganese	7.79E+02	1.15E-01	8.16E+00	5.87E-02	4.57E+01	3.76E-01	7.89E-01	9.78E-03	1.17E+00
Vanadium	3.14E+01	1.05E-02	3.41E-02	7.32E-02	2.30E+00	1.52E-02	3.96E-02	8.93E-04	5.57E-02
Zinc	1.60E+02	8.10E-03	3.25E+00	ln(dry mammal conc, mg/kg) = (4.4713+0.0738*ln(soil conc))	1.27E+02	7.73E-02	2.19E+00	6.89E-04	2.27E+00
PCBS									
Aroclor-1016	3.40E-03	0.00E+00	5.24E-06	4.93E-02	1.68E-04	1.64E-06	2.89E-06	0.00E+00	4.53E-06
Aroclor-1254	1.10E-02	0.00E+00	1.00E-05	9.58E-01	1.05E-02	5.31E-06	1.82E-04	0.00E+00	1.87E-04
Aroclor-1260	1.00E-02	0.00E+00	7.98E-06	1.86E+01	1.86E-01	4.83E-06	3.22E-03	0.00E+00	3.22E-03
Total PCB Congeners	4.50E-02	1.10E-05	5.27E-05	2.17E-01	9.78E-03	2.17E-05	1.69E-04	9.35E-07	1.91E-04
Total PCB Aroclors	1.76E-02	0.00E+00	1.93E-05	2.17E-01	3.82E-03	8.50E-06	6.60E-05	0.00E+00	7.45E-05
PESTICIDES									
DDTr	8.14E-02	3.10E-05	1.34E-04	6.20E-01	5.04E-02	3.93E-05	8.70E-04	2.64E-06	9.12E-04
delta-BHC	NO COPC	2.80E-05	8.40E-06	1.82E-03	0.00E+00	0.00E+00	0.00E+00	2.38E-06	2.38E-06
Dieldrin	1.40E-02	0.00E+00	2.57E-05	2.82E-02	3.94E-04	6.76E-06	6.80E-06	0.00E+00	1.36E-05
Endosulfan II	1.70E-02	0.00E+00	2.55E-04	3.15E-04	5.36E-06	8.21E-06	9.25E-08	0.00E+00	8.30E-06
Endosulfan sulfate	1.30E-02	0.00E+00	1.64E-04	4.35E-04	5.66E-06	6.28E-06	9.76E-08	0.00E+00	6.38E-06
Endrin aldehyde	3.50E-02	0.00E+00	1.15E-04	6.41E-03	2.24E-04	1.69E-05	3.87E-06	0.00E+00	2.08E-05
Endrin ketone	2.10E-03	0.00E+00	5.74E-06	9.74E-03	2.04E-05	1.01E-06	3.53E-07	0.00E+00	1.37E-06
Heptachlor	NO COPC	0.00E+00	0.00E+00	7.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methoxychlor	1.10E-02	0.00E+00	1.72E-05	4.67E-02	5.14E-04	5.31E-06	8.86E-06	0.00E+00	1.42E-05
SVOCS									
Bis(2-ethylhexyl)phthalate	5.20E+00	3.10E-03	5.06E-03	2.47E+01	1.28E+02	2.51E-03	2.21E+00	2.64E-04	2.22E+00
Butylbenzylphthalate	4.70E-01	0.00E+00	1.48E-03	6.95E-03	3.27E-03	2.27E-04	5.64E-05	0.00E+00	2.83E-04
VOCS									
Acetone	1.71E-02	0.00E+00	3.50E-02	5.85E-08	1.00E-09	8.26E-06	1.73E-11	0.00E+00	8.26E-06
Methylene chloride	3.60E-03	0.00E+00	9.08E-04	2.20E-06	7.91E-09	1.74E-06	1.37E-10	0.00E+00	1.74E-06

Table A-76
Wildlife Exposure Modeling of 95UCLM Doses to Predatory Mammals (Coyote) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.83E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	1.73E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.50E-02	L/kg-day

Chemical	95UCLM Soil Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Dose to Small Mammal (mg/kg bw-day)	Food Item (Small Mammal) Uptake		95UCLM Case Scenario Doses			
				Uptake Factor (mg/kg dry wt./mg/kg dry wt.) or Small Mammal Biotransfer Factor (mg/kg bw-day to mg/kg)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Soil (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals									
Barium	1.91E+02	1.39E-01	1.30E+00	ln(dry mammal conc, mg/kg) = (-1.412+0.7*ln(soil conc))	9.63E+00	9.23E-02	1.66E-01	1.18E-02	2.70E-01
Chromium	1.21E+01	7.60E-04	1.31E-02	ln(dry mammal conc, mg/kg) = (-1.4599+0.7338*ln(soil conc))	1.45E+00	5.84E-03	2.50E-02	6.46E-05	3.09E-02
Manganese	3.96E+02	8.82E-02	4.16E+00	5.87E-02	2.32E+01	1.91E-01	4.01E-01	7.50E-03	5.99E-01
Vanadium	2.33E+01	1.00E-02	2.59E-02	7.32E-02	1.70E+00	1.12E-02	2.94E-02	8.51E-04	4.15E-02
Zinc	6.03E+01	5.43E-03	1.86E+00	ln(dry mammal conc, mg/kg) = (4.4713+0.0738*ln(soil conc))	1.18E+02	2.91E-02	2.04E+00	4.61E-04	2.07E+00
PCBS									
Aroclor-1016	3.40E-03	0.00E+00		4.93E-02	1.68E-04	1.64E-06	2.89E-06	0.00E+00	4.53E-06
Aroclor-1254	1.10E-02	0.00E+00	1.00E-05	9.58E-01	1.05E-02	5.31E-06	1.82E-04	0.00E+00	1.87E-04
Aroclor-1260	2.67E-03	0.00E+00	2.13E-06	1.86E+01	4.98E-02	1.29E-06	8.59E-04	0.00E+00	8.60E-04
Total PCB Congeners	1.02E-02	1.10E-05	1.45E-05	2.17E-01	2.22E-03	4.93E-06	3.82E-05	9.35E-07	4.41E-05
Total PCB Aroclors	6.23E-03	0.00E+00	6.85E-06	2.17E-01	1.35E-03	3.01E-06	2.34E-05	0.00E+00	2.64E-05
PESTICIDES									
DDTr	2.10E-02	3.10E-05	4.15E-05	6.20E-01	1.30E-02	1.01E-05	2.24E-04	2.64E-06	2.37E-04
delta-BHC	NO COPC	2.80E-05	8.40E-06	1.82E-03	0.00E+00	0.00E+00	0.00E+00	2.38E-06	2.38E-06
Dieldrin	1.40E-02	0.00E+00	2.57E-05	2.82E-02	3.94E-04	6.76E-06	6.80E-06	0.00E+00	1.36E-05
Endosulfan II	2.36E-03	0.00E+00	3.55E-05	3.15E-04	7.44E-07	1.14E-06	1.28E-08	0.00E+00	1.15E-06
Endosulfan sulfate	1.30E-02	0.00E+00	1.64E-04	4.35E-04	5.66E-06	6.28E-06	9.76E-08	0.00E+00	6.38E-06
Endrin aldehyde	4.14E-03	0.00E+00	1.35E-05	6.41E-03	2.65E-05	2.00E-06	4.58E-07	0.00E+00	2.46E-06
Endrin ketone	2.10E-03	0.00E+00	5.74E-06	9.74E-03	2.04E-05	1.01E-06	3.53E-07	0.00E+00	1.37E-06
Heptachlor	NO COPC	0.00E+00	0.00E+00	7.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methoxychlor	1.10E-02	0.00E+00	1.72E-05	4.67E-02	5.14E-04	5.31E-06	8.86E-06	0.00E+00	1.42E-05
SVOCS									
Bis(2-ethylhexyl)phthalate	4.75E-01	3.10E-03	1.31E-03	2.47E+01	1.17E+01	2.29E-04	2.02E-01	2.64E-04	2.03E-01
Butylbenzylphthalate	4.70E-01	0.00E+00	1.48E-03	6.95E-03	3.27E-03	2.27E-04	5.64E-05	0.00E+00	2.83E-04
VOCS									
Acetone	1.35E-02	0.00E+00	2.76E-02	5.85E-08	7.90E-10	6.52E-06	1.36E-11	0.00E+00	6.52E-06
Methylene chloride	3.52E-03	0.00E+00	8.88E-04	2.20E-06	7.74E-09	1.70E-06	1.33E-10	0.00E+00	1.70E-06

Table A-77
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Arsenic	2.51E+01	4.90E-03	ln(dry plant conc, mg/kg) = (-1.992+0.564*ln(soil conc))	8.40E-01	2.13E-02	3.56E-02	4.78E-03	6.17E-02
Barium	2.14E+02	1.54E-01	1.50E-01	3.21E+01	1.82E-01	1.36E+00	1.50E-01	1.69E+00
Beryllium	1.00E+00	0.00E+00	1.00E-02	1.00E-02	8.48E-04	4.24E-04	0.00E+00	1.27E-03
Copper	7.59E+03	2.64E-01	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	6.60E+01	6.44E+00	2.80E+00	2.57E-01	9.49E+00
Lead	4.09E+01	2.00E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	2.13E+00	3.47E-02	9.01E-02	1.95E-03	1.27E-01
Manganese	5.09E+02	1.15E-01	2.50E-01	1.27E+02	4.32E-01	5.40E+00	1.12E-01	5.94E+00
Selenium	4.80E-01	1.80E-03	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	2.26E-01	4.07E-04	9.57E-03	1.76E-03	1.17E-02
Vanadium	3.58E+01	1.05E-02	5.50E-03	1.97E-01	3.04E-02	8.35E-03	1.02E-02	4.90E-02
PCBS								
Aroclor-1254	2.30E-02	0.00E+00	3.58E-03	8.23E-05	1.95E-05	3.49E-06	0.00E+00	2.30E-05
Aroclor-1260	2.80E-03	0.00E+00	6.44E-04	1.80E-06	2.38E-06	7.65E-08	0.00E+00	2.45E-06
Total PCB Congeners	2.10E-02	1.10E-05	8.44E-03	1.77E-04	1.78E-05	7.52E-06	1.07E-05	3.61E-05
Total PCB Aroclors	2.30E-02	0.00E+00	8.44E-03	1.94E-04	1.95E-05	8.23E-06	0.00E+00	2.77E-05
PESTICIDES								
DDTr	9.67E-02	3.10E-05	1.97E-02	1.90E-03	8.20E-05	8.08E-05	3.02E-05	1.93E-04
delta-BHC	3.00E-03	2.80E-05	1.34E-01	4.01E-04	2.54E-06	1.70E-05	2.73E-05	4.69E-05
Dieldrin	7.50E-03	0.00E+00	2.75E-02	2.06E-04	6.36E-06	8.74E-06	0.00E+00	1.51E-05
Endosulfan II	6.00E-03	0.00E+00	3.69E-01	2.21E-03	5.09E-06	9.39E-05	0.00E+00	9.90E-05
Endosulfan sulfate	1.70E-03	0.00E+00	3.06E-01	5.21E-04	1.44E-06	2.21E-05	0.00E+00	2.35E-05
Endrin aldehyde	5.60E-03	0.00E+00	6.47E-02	3.62E-04	4.75E-06	1.54E-05	0.00E+00	2.01E-05
Endrin ketone	2.10E-02	0.00E+00	5.08E-02	1.07E-03	1.78E-05	4.52E-05	0.00E+00	6.31E-05
Heptachlor	3.90E-03	0.00E+00	1.58E-02	6.16E-05	3.31E-06	2.61E-06	0.00E+00	5.92E-06
Methoxychlor	3.00E-02	0.00E+00	2.05E-02	6.16E-04	2.54E-05	2.61E-05	0.00E+00	5.16E-05

Table A-77
Wildlife Exposure Modeling of Maximum Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		Maximum Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs								
Total LMW PAHs	2.77E+01	0.00E+00	1.01E-01	2.81E+00	2.35E-02	1.19E-01	0.00E+00	1.43E-01
Total HMW PAHs	2.38E+02	0.00E+00	1.01E-01	2.41E+01	2.02E-01	1.02E+00	0.00E+00	1.22E+00
SVOCS								
Benzaldehyde	0.00E+00	2.00E-03	3.98E+00	0.00E+00	0.00E+00	0.00E+00	1.95E-03	1.95E-03
Bis(2-ethylhexyl)phthalate	8.10E+00	3.10E-03	5.48E-04	4.44E-03	6.87E-03	1.88E-04	3.02E-03	1.01E-02
Butylbenzylphthalate	9.90E-01	0.00E+00	6.17E-02	6.11E-02	8.40E-04	2.59E-03	0.00E+00	3.43E-03
Caprolactam	0.00E+00	3.10E-03	1.61E+01	0.00E+00	0.00E+00	0.00E+00	3.02E-03	3.02E-03
Carbazole	2.40E+00	0.00E+00	5.26E-01	1.26E+00	2.04E-03	5.35E-02	0.00E+00	5.56E-02
Dibenzofuran	3.50E-01	0.00E+00	2.76E-01	9.66E-02	2.97E-04	4.10E-03	0.00E+00	4.39E-03

Table A-78
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals								
Arsenic	7.65E+00	4.90E-03	ln(dry plant conc, mg/kg) = (-1.992+0.564*ln(soil conc))	4.30E-01	6.49E-03	1.82E-02	4.77E-03	2.95E-02
Barium	1.77E+02	1.39E-01	1.50E-01	2.66E+01	1.50E-01	1.13E+00	1.36E-01	1.41E+00
Beryllium	8.95E-01	0.00E+00	1.00E-02	8.95E-03	7.59E-04	3.80E-04	0.00E+00	1.14E-03
Copper	4.62E+03	1.19E-01	ln(dry plant conc, mg/kg) = (0.669+0.394*ln(soil conc))	5.43E+01	3.92E+00	2.30E+00	1.16E-01	6.34E+00
Lead	1.84E+01	1.35E-03	ln(dry plant conc, mg/kg) = (-1.328+0.561*ln(soil conc))	1.36E+00	1.56E-02	5.75E-02	1.31E-03	7.44E-02
Manganese	4.40E+02	8.82E-02	2.50E-01	1.10E+02	3.73E-01	4.67E+00	8.60E-02	5.12E+00
Selenium	3.57E-01	1.22E-03	ln(dry plant conc, mg/kg) = (-0.678+1.104*ln(soil conc))	1.63E-01	3.03E-04	6.91E-03	1.18E-03	8.39E-03
Vanadium	2.47E+01	1.00E-02	5.50E-03	1.36E-01	2.10E-02	5.76E-03	9.76E-03	3.65E-02
PCBS								
Aroclor-1254	6.08E-03	0.00E+00	3.58E-03	2.18E-05	5.16E-06	9.23E-07	0.00E+00	6.08E-06
Aroclor-1260	2.20E-03	0.00E+00	6.44E-04	1.42E-06	1.87E-06	6.01E-08	0.00E+00	1.93E-06
Total PCB Congeners	1.32E-02	1.10E-05	8.44E-03	1.11E-04	1.12E-05	4.73E-06	1.07E-05	2.66E-05
Total PCB Aroclors	1.33E-02	0.00E+00	8.44E-03	1.12E-04	1.13E-05	4.76E-06	0.00E+00	1.60E-05
PESTICIDES								
DDTr	4.51E-02	3.10E-05	1.97E-02	8.88E-04	3.83E-05	3.77E-05	3.02E-05	1.06E-04
delta-BHC	3.00E-03	2.80E-05	1.34E-01	4.01E-04	2.54E-06	1.70E-05	2.73E-05	4.69E-05
Dieldrin	7.50E-03	0.00E+00	2.75E-02	2.06E-04	6.36E-06	8.74E-06	0.00E+00	1.51E-05
Endosulfan II	6.00E-03	0.00E+00	3.69E-01	2.21E-03	5.09E-06	9.39E-05	0.00E+00	9.90E-05
Endosulfan sulfate	1.70E-03	0.00E+00	3.06E-01	5.21E-04	1.44E-06	2.21E-05	0.00E+00	2.35E-05
Endrin aldehyde	5.60E-03	0.00E+00	6.47E-02	3.62E-04	4.75E-06	1.54E-05	0.00E+00	2.01E-05
Endrin ketone	2.10E-02	0.00E+00	5.08E-02	1.07E-03	1.78E-05	4.52E-05	0.00E+00	6.31E-05
Heptachlor	3.90E-03	0.00E+00	1.58E-02	6.16E-05	3.31E-06	2.61E-06	0.00E+00	5.92E-06
Methoxychlor	3.00E-02	0.00E+00	2.05E-02	6.16E-04	2.54E-05	2.61E-05	0.00E+00	5.16E-05

Table A-78
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Herbivorous Mammals (Nutria) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	8.48E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.24E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	9.75E-01	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Food Item (Plant) Uptake		95UCLM Case Scenario Doses			
			BAF/Equation (mg/kg dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/kg dry wt.)	Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
PAHs								
Total LMW PAHs	2.77E+01	0.00E+00	1.01E-01	2.81E+00	2.35E-02	1.19E-01	0.00E+00	1.43E-01
Total HMW PAHs	2.38E+02	0.00E+00	1.01E-01	2.41E+01	2.02E-01	1.02E+00	0.00E+00	1.22E+00
SVOCS								
Benzaldehyde	0.00E+00	2.00E-03	3.98E+00	0.00E+00	0.00E+00	0.00E+00	1.95E-03	1.95E-03
Bis(2-ethylhexyl)phthalate	3.41E+00	3.10E-03	5.48E-04	1.87E-03	2.89E-03	7.93E-05	3.02E-03	6.00E-03
Butylbenzylphthalate	9.90E-01	0.00E+00	6.17E-02	6.11E-02	8.40E-04	2.59E-03	0.00E+00	3.43E-03
Caprolactam	0.00E+00	3.10E-03	1.61E+01	0.00E+00	0.00E+00	0.00E+00	3.02E-03	3.02E-03
Carbazole	2.40E+00	0.00E+00	5.26E-01	1.26E+00	2.04E-03	5.35E-02	0.00E+00	5.56E-02
Dibenzofuran	3.50E-01	0.00E+00	2.76E-01	9.66E-02	2.97E-04	4.10E-03	0.00E+00	4.39E-03

Table A-79
Wildlife Exposure Modeling of Maximum Doses to Aquatic Carnivorous Mammals (Raccoon) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Arsenic	2.51E+01	4.90E-03	--	1.27E-01	Uptake Factor	3.19E+00	modeled	1.13E-01	1.53E-01	4.04E-04	2.67E-01
Barium	2.14E+02	1.54E-01	--	1.00E+00	Uptake Factor	2.14E+02	modeled	9.66E-01	1.03E+01	1.27E-02	1.13E+01
Beryllium	1.00E+00	0.00E+00	--	1.00E+00	Uptake Factor	1.00E+00	modeled	4.51E-03	4.80E-02	0.00E+00	5.25E-02
Copper	7.59E+03	2.64E-01	--	5.25E+00	Uptake Factor	3.98E+04	modeled	3.42E+01	1.91E+03	2.18E-02	1.95E+03
Lead	4.09E+01	2.00E-03	--	6.60E-02	Uptake Factor	2.70E+00	modeled	1.85E-01	1.30E-01	1.65E-04	3.14E-01
Manganese	5.09E+02	1.15E-01	--	1.00E+00	Uptake Factor	5.09E+02	modeled	2.30E+00	2.44E+01	9.49E-03	2.67E+01
Selenium	4.80E-01	1.80E-03	--	1.00E+00	Uptake Factor	4.80E-01	modeled	2.17E-03	2.30E-02	1.49E-04	2.54E-02
Vanadium	3.58E+01	1.05E-02	--	1.00E+00	Uptake Factor	3.58E+01	modeled	1.62E-01	1.72E+00	8.66E-04	1.88E+00
PCBS											
Aroclor-1254	2.30E-02	0.00E+00	--	3.38E+00	BSAF	9.32E-01	modeled	1.04E-04	4.47E-02	0.00E+00	4.48E-02
Aroclor-1260	2.80E-03	0.00E+00	--	3.38E+00	BSAF	1.13E-01	modeled	1.26E-05	5.44E-03	0.00E+00	5.46E-03
Total PCB Congeners	2.10E-02	1.10E-05	--	3.38E+00	BSAF	8.51E-01	modeled	9.48E-05	4.08E-02	9.08E-07	4.09E-02
Total PCB Aroclors	2.30E-02	0.00E+00	--	3.38E+00	BSAF	9.32E-01	modeled	1.04E-04	4.47E-02	0.00E+00	4.48E-02
PESTICIDES											
DDTr	9.67E-02	3.10E-05	--	5.22E+00	BSAF	6.06E+00	modeled	4.36E-04	2.91E-01	2.56E-06	2.91E-01
delta-BHC	3.00E-03	2.80E-05	--	4.00E+00	BSAF	1.44E-01	modeled	1.35E-05	6.91E-03	2.31E-06	6.93E-03
Dieldrin	7.50E-03	0.00E+00	--	2.06E+00	BSAF	1.85E-01	modeled	3.38E-05	8.89E-03	0.00E+00	8.93E-03
Endosulfan II	6.00E-03	0.00E+00	--	4.00E+00	BSAF	2.88E-01	modeled	2.71E-05	1.38E-02	0.00E+00	1.39E-02
Endosulfan sulfate	1.70E-03	0.00E+00	--	4.00E+00	BSAF	8.16E-02	modeled	7.67E-06	3.92E-03	0.00E+00	3.92E-03
Endrin aldehyde	5.60E-03	0.00E+00	--	4.00E+00	BSAF	2.69E-01	modeled	2.53E-05	1.29E-02	0.00E+00	1.29E-02
Endrin ketone	2.10E-02	0.00E+00	--	4.00E+00	BSAF	1.01E+00	modeled	9.48E-05	4.84E-02	0.00E+00	4.85E-02
Heptachlor	3.90E-03	0.00E+00	--	1.26E+01	BSAF	5.89E-01	modeled	1.76E-05	2.83E-02	0.00E+00	2.83E-02
Methoxychlor	3.00E-02	0.00E+00	--	4.00E+00	BSAF	1.44E+00	modeled	1.35E-04	6.91E-02	0.00E+00	6.93E-02
PAHs											
Total LMW PAHs	2.77E+01	0.00E+00	--	5.66E-02	BSAF	1.88E+01	modeled	1.25E-01	9.05E-01	0.00E+00	1.03E+00
Total HMW PAHs	2.38E+02	0.00E+00	--	1.78E-02	BSAF	5.07E+01	modeled	1.07E+00	2.43E+00	0.00E+00	3.51E+00
SVOCS											
Benzaldehyde	0.00E+00	2.00E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.65E-04	1.65E-04
Bis(2-ethylhexyl)phthalate	8.10E+00	3.10E-03	--	4.00E+00	BSAF	3.89E+02	modeled	3.65E-02	1.87E+01	2.56E-04	1.87E+01
Butylbenzylphthalate	9.90E-01	0.00E+00	--	4.00E+00	BSAF	4.75E+01	modeled	4.47E-03	2.28E+00	0.00E+00	2.29E+00
Caprolactam	0.00E+00	3.10E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	2.56E-04	2.56E-04
Carbazole	2.40E+00	0.00E+00	--	4.00E+00	BSAF	1.15E+02	modeled	1.08E-02	5.53E+00	0.00E+00	5.54E+00
Dibenzofuran	3.50E-01	0.00E+00	--	2.59E-02	BSAF	1.09E-01	modeled	1.58E-03	5.23E-03	0.00E+00	6.81E-03

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Table A-80
Wildlife Exposure Modeling of 95UCLM Doses to Aquatic Carnivorous Mammals (Raccoon) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	4.51E-03	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.25E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Benthos Tissue Concentration (mg/kg dry wt.)	Modeled Food Item (Benthos) Uptake			Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BSAF/Uptake Factor		Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals											
Arsenic	7.65E+00	4.90E-03	--	1.27E-01	Uptake Factor	9.71E-01	modeled	3.45E-02	4.66E-02	4.04E-04	8.15E-02
Barium	1.77E+02	1.39E-01	--	1.00E+00	Uptake Factor	1.77E+02	modeled	8.00E-01	8.51E+00	1.15E-02	9.32E+00
Beryllium	8.95E-01	0.00E+00	--	1.00E+00	Uptake Factor	8.95E-01	modeled	4.04E-03	4.30E-02	0.00E+00	4.70E-02
Copper	4.62E+03	1.19E-01	--	5.25E+00	Uptake Factor	2.43E+04	modeled	2.08E+01	1.16E+03	9.84E-03	1.19E+03
Lead	1.84E+01	1.35E-03	--	6.60E-02	Uptake Factor	1.21E+00	modeled	8.28E-02	5.82E-02	1.11E-04	1.41E-01
Manganese	4.40E+02	8.82E-02	--	1.00E+00	Uptake Factor	4.40E+02	modeled	1.99E+00	2.11E+01	7.27E-03	2.31E+01
Selenium	3.57E-01	1.22E-03	--	1.00E+00	Uptake Factor	3.57E-01	modeled	1.61E-03	1.71E-02	1.00E-04	1.88E-02
Vanadium	2.47E+01	1.00E-02	--	1.00E+00	Uptake Factor	2.47E+01	modeled	1.11E-01	1.19E+00	8.26E-04	1.30E+00
PCBS											
Aroclor-1254	6.08E-03	0.00E+00	--	3.38E+00	BSAF	2.46E-01	modeled	2.74E-05	1.18E-02	0.00E+00	1.18E-02
Aroclor-1260	2.20E-03	0.00E+00	--	3.38E+00	BSAF	8.91E-02	modeled	9.93E-06	4.28E-03	0.00E+00	4.29E-03
Total PCB Congeners	1.32E-02	1.10E-05	--	3.38E+00	BSAF	5.35E-01	modeled	5.96E-05	2.57E-02	9.08E-07	2.57E-02
Total PCB Aroclors	1.33E-02	0.00E+00	--	3.38E+00	BSAF	5.39E-01	modeled	6.00E-05	2.59E-02	0.00E+00	2.59E-02
PESTICIDES											
DDTr	4.51E-02	3.10E-05	--	5.22E+00	BSAF	2.83E+00	modeled	2.03E-04	1.36E-01	2.56E-06	1.36E-01
delta-BHC	3.00E-03	2.80E-05	--	4.00E+00	BSAF	1.44E-01	modeled	1.35E-05	6.91E-03	2.31E-06	6.93E-03
Dieldrin	7.50E-03	0.00E+00	--	2.06E+00	BSAF	1.85E-01	modeled	3.38E-05	8.89E-03	0.00E+00	8.93E-03
Endosulfan II	6.00E-03	0.00E+00	--	4.00E+00	BSAF	2.88E-01	modeled	2.71E-05	1.38E-02	0.00E+00	1.39E-02
Endosulfan sulfate	1.70E-03	0.00E+00	--	4.00E+00	BSAF	8.16E-02	modeled	7.67E-06	3.92E-03	0.00E+00	3.92E-03
Endrin aldehyde	5.60E-03	0.00E+00	--	4.00E+00	BSAF	2.69E-01	modeled	2.53E-05	1.29E-02	0.00E+00	1.29E-02
Endrin ketone	2.10E-02	0.00E+00	--	4.00E+00	BSAF	1.01E+00	modeled	9.48E-05	4.84E-02	0.00E+00	4.85E-02
Heptachlor	3.90E-03	0.00E+00	--	1.26E+01	BSAF	5.89E-01	modeled	1.76E-05	2.83E-02	0.00E+00	2.83E-02
Methoxychlor	3.00E-02	0.00E+00	--	4.00E+00	BSAF	1.44E+00	modeled	1.35E-04	6.91E-02	0.00E+00	6.93E-02
PAHs											
Total LMW PAHs	2.77E+01	0.00E+00	--	5.66E-02	BSAF	1.88E+01	modeled	1.25E-01	9.05E-01	0.00E+00	1.03E+00
Total HMW PAHs	2.38E+02	0.00E+00	--	1.78E-02	BSAF	5.07E+01	modeled	1.07E+00	2.43E+00	0.00E+00	3.51E+00
SVOCS											
Benzaldehyde	0.00E+00	2.00E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	1.65E-04	1.65E-04
Bis(2-ethylhexyl)phthalate	3.41E+00	3.10E-03	--	4.00E+00	BSAF	1.64E+02	modeled	1.54E-02	7.86E+00	2.56E-04	7.88E+00
Butylbenzylphthalate	9.90E-01	0.00E+00	--	4.00E+00	BSAF	4.75E+01	modeled	4.47E-03	2.28E+00	0.00E+00	2.29E+00
Caprolactam	0.00E+00	3.10E-03	--	4.00E+00	BSAF	0.00E+00	modeled	0.00E+00	0.00E+00	2.56E-04	2.56E-04
Carbazole	2.40E+00	0.00E+00	--	4.00E+00	BSAF	1.15E+02	modeled	1.08E-02	5.53E+00	0.00E+00	5.54E+00
Dibenzofuran	3.50E-01	0.00E+00	--	2.59E-02	BSAF	1.09E-01	modeled	1.58E-03	5.23E-03	0.00E+00	6.81E-03

Table A-81
Wildlife Exposure Modeling of Maximum Doses to Piscivorous Mammals (River Otter) from Media
for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	Maximum Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	Maximum Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	Maximum Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	Maximum Food Item Tissue Concentration (mg/kg dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Arsenic	2.51E+01	4.90E-03	--	1.60E+01	7.84E-02	modeled	2.41E-02	3.76E-03	3.97E-04	2.83E-02
Barium	2.14E+02	1.54E-01	2.76E+01	1.60E+01	2.46E+00	actual	2.05E-01	1.32E+00	1.25E-02	1.54E+00
Beryllium	1.00E+00	0.00E+00	--	2.48E+02	0.00E+00	modeled	9.60E-04	0.00E+00	0.00E+00	9.60E-04
Copper	7.59E+03	2.64E-01	3.80E+00	1.86E+03	4.90E+02	actual	7.29E+00	1.82E-01	2.14E-02	7.49E+00
Lead	4.09E+01	2.00E-03	2.80E-01	1.80E+02	3.60E-01	actual	3.93E-02	1.34E-02	1.62E-04	5.29E-02
Manganese	5.09E+02	1.15E-01	3.16E+01	1.60E+03	1.84E+02	actual	4.89E-01	1.52E+00	9.32E-03	2.01E+00
Selenium	4.80E-01	1.80E-03	1.12E+00	9.68E+02	1.74E+00	actual	4.61E-04	5.38E-02	1.46E-04	5.44E-02
Vanadium	3.58E+01	1.05E-02	2.12E+00	4.00E+00	4.20E-02	actual	3.44E-02	1.02E-01	8.51E-04	1.37E-01
PCBS										
Aroclor-1254	2.30E-02	0.00E+00	1.16E+00	2.16E+05	0.00E+00	actual	2.21E-05	5.57E-02	0.00E+00	5.57E-02
Aroclor-1260	2.80E-03	0.00E+00	--	1.10E+05	0.00E+00	modeled	2.69E-06	0.00E+00	0.00E+00	2.69E-06
Total PCB Congeners	2.10E-02	1.10E-05	4.79E-01	1.01E+05	1.11E+00	actual	2.02E-05	2.30E-02	8.91E-07	2.30E-02
Total PCB Aroclors	2.30E-02	0.00E+00	1.16E+00	1.01E+05	0.00E+00	actual	2.21E-05	5.57E-02	0.00E+00	5.57E-02
PESTICIDES										
DDTr	9.67E-02	3.10E-05	2.27E-01	6.74E+04	2.09E+00	actual	9.28E-05	1.09E-02	2.51E-06	1.10E-02
delta-BHC	3.00E-03	2.80E-05	--	1.00E+03	2.80E-02	modeled	2.88E-06	1.35E-03	2.27E-06	1.35E-03
Dieldrin	7.50E-03	0.00E+00	--	5.01E+03	0.00E+00	modeled	7.20E-06	0.00E+00	0.00E+00	7.20E-06
Endosulfan II	6.00E-03	0.00E+00	--	6.25E+02	0.00E+00	modeled	5.76E-06	0.00E+00	0.00E+00	5.76E-06
Endosulfan sulfate	1.70E-03	0.00E+00	2.12E-03	4.83E+02	0.00E+00	actual	1.63E-06	1.02E-04	0.00E+00	1.03E-04
Endrin aldehyde	5.60E-03	0.00E+00	3.56E-03	2.75E+03	0.00E+00	actual	5.38E-06	1.71E-04	0.00E+00	1.76E-04
Endrin ketone	2.10E-02	0.00E+00	8.00E-03	3.62E+03	0.00E+00	actual	2.02E-05	3.84E-04	0.00E+00	4.04E-04
Heptachlor	3.90E-03	0.00E+00	--	7.55E+03	0.00E+00	modeled	3.74E-06	0.00E+00	0.00E+00	3.74E-06
Methoxychlor	3.00E-02	0.00E+00	2.36E-02	4.18E+03	0.00E+00	actual	2.88E-05	1.13E-03	0.00E+00	1.16E-03
PAHs										
Total LMW PAHs	2.77E+01	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.66E-02	0.00E+00	0.00E+00	2.66E-02
Total HMW PAHs	2.38E+02	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.28E-01	0.00E+00	0.00E+00	2.28E-01
SVOCS										
Benzaldehyde	0.00E+00	2.00E-03	2.48E-01	1.76E+01	3.52E-02	actual	0.00E+00	1.19E-02	1.62E-04	1.21E-02
Bis(2-ethylhexyl)phthalate	8.10E+00	3.10E-03	--	6.84E+03	2.12E+01	modeled	7.78E-03	1.02E+00	2.51E-04	1.03E+00
Butylbenzylphthalate	9.90E-01	0.00E+00	--	2.46E+03	0.00E+00	modeled	9.50E-04	0.00E+00	0.00E+00	9.50E-04
Caprolactam	0.00E+00	3.10E-03	--	1.26E+01	3.92E-02	modeled	0.00E+00	1.88E-03	2.51E-04	2.13E-03
Carbazole	2.40E+00	0.00E+00	--	5.28E+02	0.00E+00	modeled	2.30E-03	0.00E+00	0.00E+00	2.30E-03
Dibenzofuran	3.50E-01	0.00E+00	--	9.72E+02	0.00E+00	modeled	3.36E-04	0.00E+00	0.00E+00	3.36E-04

Table A-82
Wildlife Exposure Modeling of 95UCLM Doses to Piscivorous Mammals (River Otter) from Media for Exposure Area 5: Lined Canals, Reservoirs, and Soil

Exposure Parameters

Soil Ingestion Rate (kg dry wt./kg bw-day):	9.60E-04	kg/kg-day
Food Ingestion Rate (kg dry wt./kg bw-day):	4.80E-02	kg/kg-day
Water Ingestion Rate (L/kg bw-day):	8.10E-02	L/kg-day

Chemical	95UCLM Sediment Concentration (mg/kg dry wt.)	Maximum Total Water Concentration (mg/L)	95UCLM Fish Tissue Concentration (mg/kg dry wt.)	Food Item (Fish) Uptake		Actual tissue concentration or concentration modeled based on uptake factor?	95UCLM Case Scenario Doses			
				BAF/Equation (mg/L dry wt. to mg/kg dry wt.)	95UCLM Food Item Tissue Concentration (mg/L dry wt.)		Dose from Sediment (mg/kg bw-day)	Dose from Food (mg/kg bw-day)	Dose from Water (mg/kg bw-day)	Total Dose (mg/kg bw-day)
Metals										
Arsenic	7.65E+00	4.90E-03	--	1.60E+01	7.83E-02	modeled	7.34E-03	3.76E-03	3.96E-04	1.15E-02
Barium	1.77E+02	1.39E-01	2.76E+01	1.60E+01	2.23E+00	actual	1.70E-01	1.32E+00	1.13E-02	1.51E+00
Beryllium	8.95E-01	0.00E+00	--	2.48E+02	0.00E+00	modeled	8.59E-04	0.00E+00	0.00E+00	8.59E-04
Copper	4.62E+03	1.19E-01	3.80E+00	1.86E+03	2.21E+02	actual	4.44E+00	1.82E-01	9.66E-03	4.63E+00
Lead	1.84E+01	1.35E-03	2.80E-01	1.80E+02	2.43E-01	actual	1.76E-02	1.34E-02	1.09E-04	3.12E-02
Manganese	4.40E+02	8.82E-02	3.16E+01	1.60E+03	1.41E+02	actual	4.22E-01	1.52E+00	7.14E-03	1.95E+00
Selenium	3.57E-01	1.22E-03	1.12E+00	9.68E+02	1.18E+00	actual	3.43E-04	5.38E-02	9.84E-05	5.42E-02
Vanadium	2.47E+01	1.00E-02	2.12E+00	4.00E+00	4.00E-02	actual	2.37E-02	1.02E-01	8.11E-04	1.26E-01
PCBS										
Aroclor-1254	6.08E-03	0.00E+00	4.80E-01	2.16E+05	0.00E+00	actual	5.84E-06	2.30E-02	0.00E+00	2.30E-02
Aroclor-1260	2.20E-03	0.00E+00	--	1.10E+05	0.00E+00	modeled	2.11E-06	0.00E+00	0.00E+00	2.11E-06
Total PCB Congeners	1.32E-02	1.10E-05	4.79E-01	1.01E+05	1.11E+00	actual	1.27E-05	2.30E-02	8.91E-07	2.30E-02
Total PCB Aroclors	1.33E-02	0.00E+00	9.56E-01	1.01E+05	0.00E+00	actual	1.28E-05	4.59E-02	0.00E+00	4.59E-02
PESTICIDES										
DDTr	4.51E-02	3.10E-05	2.27E-01	6.74E+04	2.09E+00	actual	4.33E-05	1.09E-02	2.51E-06	1.09E-02
delta-BHC	3.00E-03	2.80E-05	--	1.00E+03	2.80E-02	modeled	2.88E-06	1.35E-03	2.27E-06	1.35E-03
Dieldrin	7.50E-03	0.00E+00	--	5.01E+03	0.00E+00	modeled	7.20E-06	0.00E+00	0.00E+00	7.20E-06
Endosulfan II	6.00E-03	0.00E+00	--	6.25E+02	0.00E+00	modeled	5.76E-06	0.00E+00	0.00E+00	5.76E-06
Endosulfan sulfate	1.70E-03	0.00E+00	2.12E-03	4.83E+02	0.00E+00	actual	1.63E-06	1.02E-04	0.00E+00	1.03E-04
Endrin aldehyde	5.60E-03	0.00E+00	3.56E-03	2.75E+03	0.00E+00	actual	5.38E-06	1.71E-04	0.00E+00	1.76E-04
Endrin ketone	2.10E-02	0.00E+00	8.00E-03	3.62E+03	0.00E+00	actual	2.02E-05	3.84E-04	0.00E+00	4.04E-04
Heptachlor	3.90E-03	0.00E+00	--	7.55E+03	0.00E+00	modeled	3.74E-06	0.00E+00	0.00E+00	3.74E-06
Methoxychlor	3.00E-02	0.00E+00	2.36E-02	4.18E+03	0.00E+00	actual	2.88E-05	1.13E-03	0.00E+00	1.16E-03
PAHs										
Total LMW PAHs	2.77E+01	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.66E-02	0.00E+00	0.00E+00	2.66E-02
Total HMW PAHs	2.38E+02	0.00E+00	--	1.43E+04	0.00E+00	modeled	2.28E-01	0.00E+00	0.00E+00	2.28E-01
SVOCS										
Benzaldehyde	0.00E+00	2.00E-03	2.48E-01	1.76E+01	3.52E-02	actual	0.00E+00	1.19E-02	1.62E-04	1.21E-02
Bis(2-ethylhexyl)phthalate	3.41E+00	3.10E-03	--	6.84E+03	2.12E+01	modeled	3.28E-03	1.02E+00	2.51E-04	1.02E+00
Butylbenzylphthalate	9.90E-01	0.00E+00	--	2.46E+03	0.00E+00	modeled	9.50E-04	0.00E+00	0.00E+00	9.50E-04
Caprolactam	0.00E+00	3.10E-03	--	1.26E+01	3.92E-02	modeled	0.00E+00	1.88E-03	2.51E-04	2.13E-03
Carbazole	2.40E+00	0.00E+00	--	5.28E+02	0.00E+00	modeled	2.30E-03	0.00E+00	0.00E+00	2.30E-03
Dibenzofuran	3.50E-01	0.00E+00	--	9.72E+02	0.00E+00	modeled	3.36E-04	0.00E+00	0.00E+00	3.36E-04