Draft Data Summary Report for IHSS Group NE-1

IHSS NE-142.1 – Pond A-1
IHSS NE-142.2 – Pond A-2
IHSS NE-142.3 – Pond A-3
IHSS NE-142.4 – Pond A-4
IHSS NE-142.12 – Pond A-5
IHSS NE-142.8 – Pond B-4
IHSS NE-142.9 – Pond B-5
IHSS SE-142.10 – Pond C-1
IHSS SE-142.11 – Pond C-2

Approval received from the U.S. Environmental Protection Agency
( ).

Approval letter contained in the Administrative Record.

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ADMIN RECORD

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Appendix A – Ecological Screening Summary

ENCLOSURE

Compact Disc Containing Standardized Real and QC Data

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ACRONYMS AND ABBREVIATIONS

AEU	Aquatic Exposure Unit
AL	action level
AR	Administrative Record
ASD	Analytical Services Division
AT	alternative toxicity threshold
bgs	below ground surface
BZ	Buffer Zone
CAS	Chemical Abstracts Service
CD	compact disc
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
CSU	Colorado State University
dpm/g	disintegrations per minute per gram
dpm/L	disintegrations per minute per liter
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	data quality objective
ECOPC	ecological chemical of potential concern
EP	Extraction Procedure
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ER	Environmental Restoration
ESLs	ecological screening level
EU	Exposure Unit
ft	foot
FY	Fiscal Year
HEC	Hydraulic Engineering Center
HpCDD	heptachlorodibenzo-p-dioxin
HpCDF	heptachlorodibenzofuran
HQ	hazard quotient
HRR	Historical Release Report
HxCDD	hexachlorodibenzo-p-dioxin
HxCDF	hexachlorodibenzofuran
IA	Industrial Area
IABZSAP	Industrial Area and Buffer Zone Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
ISOCS	In-Situ Counting System
K-H	Kaiser-Hill Company, L.L.C.
LCS	laboratory control sample

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µCi	microcurie
µg/kg	micrograms per kilogram (may be found as ug/kg)
µg/L	micrograms per liter (may be found as ug/kg)
MDC	maximum detected concentration
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
N/A	not applicable
NFAA	No Further Accelerated Action
NW AEU	North Walnut Creek Aquatic Exposure Unit
OPWL	Original Process Waste Lines
OU	Operable Unit
PAC	Potential Area of Concern
PAH	polycyclic aromatic hydrocarbon
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
pCi/L	picocuries per liter
PeCDD	pentachlorodibenzo-p-dioxin
PeCDF	pentachlorodibenzofuran
pg/g	picograms per gram
OCDD	octachlorodibenzo-p-dioxin
OCDF	octachlorodibenzofuran
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
ft^2	square feet
SAP	Sampling and Analysis Plan
SEP	Solar Evaporation Ponds
SID	South Interceptor Ditch
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
SW AEU	South Walnut Creek Aquatic Exposure Unit
SWD	Soil Water Database
TCDD	tetrachlorodibenzodioxin
TCDF	tetrachlorodibenzofuran

TCLP	Toxicity Characteristic Leaching Procedure
UCL	upper confidence limit
USDA	U.S. Department of Agriculture
UTL	upper tolerance limit
V&V	verification and validation
VOC	volatile organic compound
WC AEU	Woman Creek Aquatic Exposure Unit
WEPP	Water Erosion Prediction Project
WRW	wildlife refuge worker
%REC	percent recovery

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1.0 INTRODUCTION

This Data Summary Report summarizes characterization activities conducted at Individual Hazardous Substance Site (IHSS) Group NE-1 at the Rocky Flats Environmental Technology Site (RFETS or Site) near Golden, Colorado. Results are compared to wildlife refuge worker (WRW) action levels (ALs) described in the Rocky Flats Cleanup Agreement (RFCA) (DOE et al. 2003). Ecological risk is summarized in this report, by pond, and detailed in Appendix A. Ecological risk of the ponds in the context of the Aquatic Exposure Units (EUs) (AEUs) will be further evaluated in the ecological portion of the Comprehensive Risk Assessment (CRA).

The locations of the IHSSs addressed in this report are shown on Figure 1. IHSS Group NE-1 consists of the 13 IHSSs and Potential Areas of Concern (PACs) listed in Table 1. Sites addressed in this report are shown in bold and labeled on Figure 1. This Data Summary Report does not include information on IHSSs NE-142.5 (Pond B-1), NE-142.6 (Pond B-2), NE-142.7 (Pond B-3), and PAC NE-1404 (Northeast Buffer Zone Gas Line Break). IHSSs NE-142.5, NE-142.6, and NE-142.7 were remediated, and these activities are described in the Closeout Report for Ponds B-1, B-2, and B-3 (DOE 2005a). PAC NW-1505 received No Further Accelerated Action (NFAA) approval in 2005 (DOE 2005b). Pond C-1 (IHSS SE-142.10) received NFAA approval in 2004 and is described in an NFAA Justification (DOE 2004a); however, Pond C-1 data are included here for completeness.

Table 1
IHSS Group NE-1 Disposition Documents

IHSS or PAC	Disposition Document
IHSS NE-142.1 – Pond A-1	**Data Summary Report for IHSS Group NE-1**
IHSS NE-142.2 – Pond A-2	**Data Summary Report for IHSS Group NE-1**
IHSS NE-142.3 – Pond A-3	**Data Summary Report for IHSS Group NE-1**
IHSS NE-142.4 – Pond A-4	**Data Summary Report for IHSS Group NE-1**
IHSS NE-142.12 – Pond A-5	**Data Summary Report for IHSS Group NE-1**
IHSS NE-142.5 – Pond B-1	Closeout Report for IHSS Group NE-1, Ponds B-1, B-2, and B-3 (DOE 2005a)
IHSS NE-142.6 – Pond B-2	Closeout Report for IHSS Group NE-1, Ponds B-1, B-2, and B-3 (DOE 2005a)
IHSS NE-142.7 – Pond B-3	Closeout Report for IHSS Group NE-1, Ponds B-1, B-2, and B-3 (DOE 2005a)
IHSS NE-142.8 – Pond B-4	**Data Summary Report for IHSS Group NE-1**
IHSS NE-142.9 – Pond B-5	**Data Summary Report for IHSS Group NE-1**

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IHSS or PAC	Disposition Document
IHSS SE-142.10 – Pond C-1	**NFAA Justification, 2004 HRR (DOE 2004a)**
IHSS SE-142.11 – Pond C-2	**Data Summary Report for IHSS Group NE-1**
NE-1404 – Diesel Spill at Pond B-2 Spillway	NFAA Justification, HRR 1998 (DOE 1998)
PAC NW-1505 – North Firing Range	Closeout Report for IHSS Group NE-1, PAC NW-1505, North Firing Range (DOE 2005b)

This Data Summary Report includes a description of historical information regarding the IHSSs and analytical data collected from July 1991 to present. Sediment and soil analytical data were evaluated, in accordance with the Industrial Area (IA) and Buffer Zone (BZ) Sampling and Analysis Plan (SAP) (IABZSAP) data quality objectives (DQOs), to determine whether an accelerated action was required at any of these IHSSs. Data are compared to RFCA WRW soil ALs (DOE et al. 2003) on a point-by-point basis. A human health risk assessment is not included in this evaluation; rather, it is presented in the CRA on an EU basis.

Because these IHSSs also include ponds, which are of ecological interest, an ecological screening is also presented. The ecological screen was used to determine whether an accelerated action was required at these IHSSs because of potential impacts to ecological receptors. The results of the ecological screen are summarized in Section 5.0 and detailed in Appendix A.

Approval of this Data Summary Report constitutes regulatory agency determination that IHSSs included in this report are NFAA Sites. Approval of the closeout report and NFAA determination will be documented in the Fiscal Year (FY) 2005 (05) Historical Release Report (HRR).

2.0 SITE CHARACTERIZATION

IHSS Group NE-1 information consists of historical knowledge (DOE 1992-2004) and sampling data. Historical information is summarized in Section 2.1. Characterization data, collected in accordance with the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) Work Plan for the Walnut Creek Priority Drainage, Operable Unit (OU) 6 (DOE 1992), the IABZSAP (DOE 2004b), CRA SAP Addendum #05-01 – Phase 2 Targeted Sampling (DOE 2004c), and IABZSAP Addendum #IABZ05-06 (DOE 2005c), are presented in Section 2.2.

2.1 Historical Information

The following sections contain historical information on the ponds included in this Data Summary Report. The history is summarized from the HRRs (DOE 1992-2004) and the RFETS Storm Water Pollution Prevention Plan (DOE 2003).

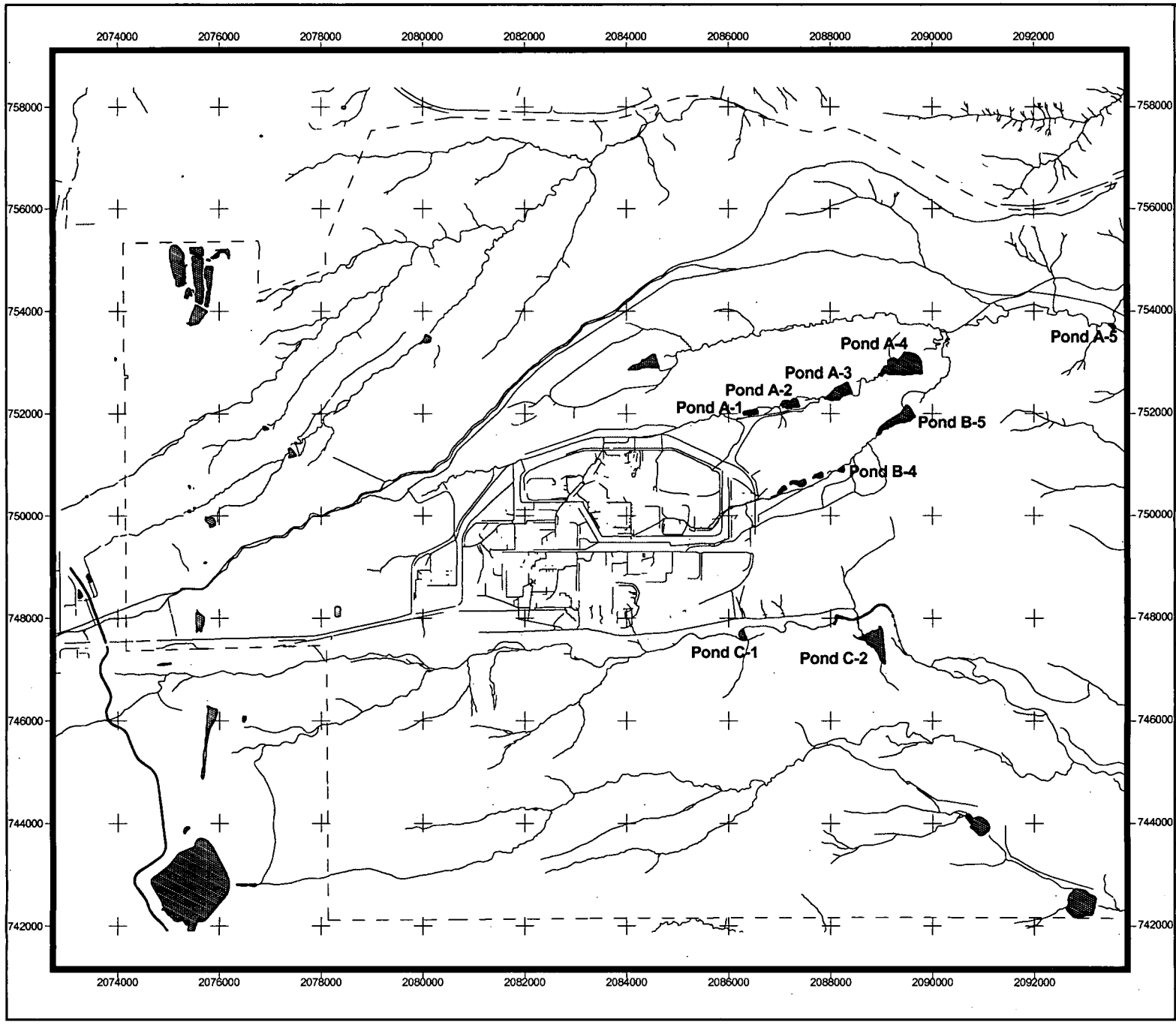

Figure 1
IHSS Group NE-1
Pond Locations

KEY

Site boundary

Stream

Pond

N
W
E
S

1000 0 1000 2000 3000 Feet

Scale 1:34,000
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

Date: 051105

RADMS

Prepared for:

KAISER•HILL COMPANY

File: W:\Projects\FY2005\CRA\Ponds\ponds.apr

2.1.1 Pond History and Management

The A-Series Ponds are located in the North Walnut Creek drainage, downstream of the 900 Area, and include Pond A-1 (IHSS NE-142.1), Pond A-2 (IHSS NE-142.2), Pond A-3 (IHSS NE-142.3), Pond A-4 (IHSS NE-142.4), and Pond A-5 (IHSS NE-142.12). The B-Series Ponds are located in the South Walnut Creek drainage, downstream of the 900 Area, and include Pond B-1 (IHSS NE-142.5), Pond B-2 (IHSS NE-142.6), Pond B-3 (IHSS NE-142.7), Pond B-4 (IHSS NE-142.8), and Pond B-5 (IHSS NE-142.9). The C-Series Ponds are located in the Woman Creek Drainage, southeast of the 800 Area, and include Pond C-1 (IHSS SE-142.10) and Pond C-2 (IHSS SE-142.11).

The A-, B-, and C-Series Ponds were designed and constructed to collect surface runoff and allow for management and controlled off-site discharge of water. The ponds serve three main purposes: stormwater management, holding water for sampling and treatment (if necessary), and emergency spill control in those instances where a spill could not be adequately managed without use of the ponds. Some of the pond sediments were contaminated because of releases from industrial processes. All sediment was removed from Ponds B-1, B-2, and B-3 because of this concern.

The ponds farthest downstream within the Site boundaries (Ponds A-4, B-5, and C-2) are referred to as the "Terminal Ponds." The Terminal Ponds are designed to provide additional volume for sedimentation and flood control and are monitored before discharge.

Ponds A-1, A-2, B-1, and B-2 were reserved for emergency spill control when other options were not available. Water that accumulates in these ponds from runoff generally is transferred to Pond A-2. Pond B-3 received treated effluent from the Waste Water Treatment Plant, while the remaining A- and B- Series Ponds receive runoff from the stormwater management system and their drainage basins. Pond C-1 receives flow from Woman Creek and Pond C-2 collects diverted flow from the South Interceptor Ditch (SID).

Between the mid-1950s and 1962, the Site pond network consisted of Ponds A-1, B-2, B-3, B-4, and C-1. Pond B-1 was added in 1962. The ponds within each drainage operated in series with the flow from one pond entering the next pond downstream until the final pond was reached and the water was discharged off site. In June 1973, construction was completed on the three drainages to provide additional detention capacity and the capability of bypassing flows around particular ponds. By mid-1974, Ponds A-1, A-2, A-3, B-1, B-2, B-3, B-4, and C-1 existed. The A Ponds operated in series and the B Ponds operated in a separate series until December 1973 when Ponds A-2 and B-2 were connected by pipeline, allowing for water transfer between the two ponds and isolation from the rest of the flow system. Construction of the current Terminal Ponds A-4, B-5, and C-2 was completed in 1980. After construction of Pond C-2 and the SID, Pond C-2 become the pond on the C-Series drainage available for emergency spill control.

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A-Series Ponds

In the A-Series Ponds, Ponds A-1 and A-2 were considered nondischarge ponds and water from them was seldom released. During periods of heavy rain, or if water was needed downstream, there was an occasional movement of water. North Walnut Creek was routed around the upper A-Series Ponds so flow went into Pond A-3 and then into Pond A-4. Pond A-4 is the largest of the surface water ponds on Rocky Flats, and discharge occurs on a regular basis. The ponds currently operate in this configuration.

Pond A-5 is a small pond where Walnut Creek crosses Indiana Street. Pond A-5 retains several thousand gallons but is not a Site retention pond in the same sense as Pond A-4 or B-5 because it cannot be used to retain a storm surge and regulate discharge.

The general types of materials that were directly or indirectly released to the A-Series drainage (nonemergency and nonspill-related) during the history of RFETS included untreated wastewater from Building 771, cooling tower and roof drain water from Building 774, Building 774 evaporator condensate water, and footing drain flows. The Building 771 wastewater primarily consisted of decontamination laundry wastewater; however, it also contained water from the analytical laboratory, radiography operations, personnel decontamination room, and runoff. Building 771 waste discharged to a storm drain north (PAC 700-143) and west of Building 771, and flowed to the A-Series drainage. In 1971, it was reported that the Building 774 evaporator condensate drain typically released 20,000 gallons of water per day at 100 disintegrations per minute per liter (dpm/L), with 5 milligrams per liter (mg/L) of nitrate.

In 1973, it was estimated that 14 microcuries (μCi) of plutonium-239/240 were present in Pond A-1 sediment. In response to this problem, a series of pipes and pumps to collect contaminated groundwater and seepage was constructed between the Solar Evaporation Ponds (SEP) (PAC 000-101) and the A-Series drainage. Other response actions to contamination in the A-Series drainage included the removal of contamination near the Building 771 outfall (PAC 700-143), rerouting of discharges to other facilities, and elimination of flows from Building 774.

Results of the routine predischarge sampling for Pond A-4 on November 3, 2004, yielded elevated americium-241 activities. These elevated activities were seen in samples collected by both the U.S. Department of Energy (DOE) and the Colorado Department of Public Health and Environment (CDPHE). These activities exceeded the RFCA surface water ALs for americium-241, and as a result the pond water was not discharged.

In early December 2004, DOE collected a number of surface water samples in the North Walnut Creek drainage to investigate the source of elevated americium-241 activity noted in Ponds A-4. The sampling was concentrated in the area where Buildings 771/774 formerly stood. One sample, collected from a pool of water in an Original Process Waste Line (OPWL) (PAC 000-121) manway, northwest of former Building 771, contained elevated americium-241 activities without significant plutonium-239/240 activity, which is the same radionuclide signature observed in Ponds A-3 and A-4. This manway receives the outfall from former Building 771 area.

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Based on this sampling result, actions to stop any additional water from this source from entering North Walnut Creek were taken. The manway, which had been covered with soil as a result of the site grading activities at former Building 771, was excavated and flows from the incoming pipes were intercepted, analyzed, and treated as needed. All pipes at the manway were removed, as well as the manway itself. Pipe ends were plugged. Subsequently, the water in Pond A-4 was treated using a co-precipitation and filtration process and met stream standards for discharge.

B-Series Ponds

In the B-Series Ponds, Ponds B-1 and B-2, were the nondischarge ponds and water from them was seldom released. Flow in South Walnut Creek was diverted around the first three ponds directly to Pond B-4, which flowed through to Pond B-5, the Terminal Pond in the B-Series. Pond B-3 formerly received discharge from the Rocky Flats wastewater treatment plant, and was allowed to discharge into Pond B-4. For a number of years, water from Pond B-5 was pumped to Pond A-4, where all the water was sampled and held until the results demonstrated compliance with applicable stream standards. In 1998, direct discharge of Pond B-5 was allowed under an agreement reached with the neighboring cities and other stakeholders. Currently, Ponds B-1, B-2 and B-3 are not configured to receive water or to discharge. These ponds have been reshaped into wetlands after the accelerated action sediment removal activities that concluded in 2005. Pond B-4 is still connected to the bypass and South Walnut Creek flows continue to go through Ponds B-4 and B-5.

A sediment study conducted by Colorado State University (CSU) found radioactive contamination in sediments in the B-Series drainage. Pond reconstruction activities from 1971 to 1973 caused resuspension and downstream migration of contaminated sediment. This resulted in an increase in plutonium-239/240 activity in Pond B-1 sediment from 0.085 curie in 1971 to 2.9 curies in 1973. Based on the CSU sampling, plutonium-239/240 activities in Pond B-1 sediment in June 1973 ranged from 10 to 502 picocuries per gram (pCi/g) of dry sediment.

A Rocky Flats study completed in June 1973 indicated radioactive contamination of sediments upstream from the drainage ponds. This study found an average activity of 40 disintegrations per minute per gram (dpm/g) from the "west culvert" (the culvert west of the Building 995 outfall) to the "east culvert" (the culvert immediately east of the Building 995 outfall). The area of contaminated soil/sediment was estimated to cover approximately 3,900 square feet (ft^2).

Releases to the B-Series drainage included a sodium hydroxide discharge from a bulk caustic storage tank that was diverted to Pond B-1 for temporary holding, a steam condensate line break in the Building 707 area that discharged to Pond B-4 and South Walnut Creek downgradient of Pond B-4, release of approximately 155 gallons of a 25 percent solution of ethylene glycol (antifreeze), and a release of chromic acid to Pond B-3 from the Sewage Treatment Plant (Building 995) that occurred on February 22 and 23, 1989. It is believed that approximately 4.7 pounds of chromium were released to Pond B-3. The water from Pond B-3 was then sprayed on the East Spray Fields (PACs NE-216.1 - 216.3). Analysis of soil/sediment samples indicated that the concentrations

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of leachable chromium were far below the RCRA Extraction Procedure (EP) Toxicity limits.

In response to the 1973 identification of plutonium-239/240 contamination in the drainage sediments, a study was conducted to ascertain the source of the plutonium-239/240 contamination present in the B-Series drainage. This study indicated that approximately 88 percent of the total activity released by Building 995 was due to the release of laundry decontamination water to the sanitary sewer. After December 21, 1973, laundry water was only discharged to Pond B-2, and some may have been diverted to Pond A-2. In fall and winter 1973, contaminated soil/sediment removal operations were conducted in the streambed below the Building 995 outfall.

In the early 1980s, actions were taken at Pond B-5 to reduce the potential for off-site movement of contaminated sediments. The discharge structure for this pond was modified by adding a vertical standpipe and a perforated pipe along the bottom of the pond surrounded by granular material. Some sediment present in Pond B-5 was also removed from the drainage and deposited in the Soil Dump Area in the northeastern BZ (PAC NE-156.2 which received NFAA approval in 1999 [EPA and CDPHE 1999]). These activities helped minimize the off-site transport of contaminated sediments (DOE 1992).

In summary, based on historical data pertaining to the B-Series Ponds, the types of contaminants that were detected included plutonium-239/240, americium-241, arsenic, beryllium, gamma-BHC, and methylene chloride. Pond B-1 appeared to have the greatest amount of contamination, with a number of sediment sample results that exceeded the corresponding RFCA WRW soil ALs for plutonium-239/240 and americium-241. Several sediment samples in Ponds B-2 and B-3 also exceeded RFCA WRW soil ALs for plutonium-239/240 and americium-241. Historical sample results from Pond B-4 and Pond B-5 were less than RFCA WRW soil ALs. In 2005, sediment from Ponds B-1, B-2, and B-3 was excavated, and the ponds were backfilled (DOE 2005a).

C-Series Ponds

In Woman Creek, Pond C-1 was once an actively managed pond; however, it was recently reconfigured to be a flow-through pond. The dam was notched and the gap filled with a stop log structure that allows for adjusting the water level in the pond as conditions dictate. Woman Creek flows through Pond C-1, as it always has, and is diverted around Pond C-2. The southern portion of the Site drains into the SID, which flows to Pond C-2. Pond C-2 is off-channel and does not normally receive flow from Woman Creek. Pond C-2 water is released into the creek as it flows off site toward the Woman Creek Reservoir on the east side of Indiana Street.

Pond C-1 was built in 1955 to provide temporary holding and monitoring of Woman Creek water and water discharged from RFETS Pond 6, Pond 7 (PAC SE-1600), and Pond 8 (PAC SE-1601). These ponds are no longer in existence. Pond C-2 and the SID were built in 1979. The SID was built to reroute runoff from the southern portions of the RFETS IA to Pond C-2. Water from the SID was the only input to Pond C-2, allowing

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Pond C-2 to serve as a surface water retention and spill control pond. Discharges from Pond C-1 are routed around Pond C-2 and back into the natural Woman Creek channel.

Releases into the Woman Creek drainage included water treatment plant (Building 124) backwash (PAC SW-196); 2,700 gallons of steam condensate from the Building 881 cooling towers (PAC SE-1600); sanitary sewer overflow and discharge of untreated sanitary sewage (PAC 800-145); Building 881 cooling tower overflow/blowdown (PAC SE-1601); ash from the Plant incinerator (PACs SW-133, SW-1701, and SW-1702); dumping of graphite, used caustic drums, and general trash at the Original Landfill (PAC SW-115); resuspended soil and runoff from the 903 Pad area (IHSS Group 900-11); fuel/oil discharge from an overturned armored vehicle; leakage from the SID to Woman Creek; direct runoff from the East Spray Fields (PACs NE-216.1 - NE-216.3); spill of waste acid into the SID; and measurable quantities of atrazine in Pond C-2. No sediment samples collected from Pond C-1 and Pond C-2 exceeded RFCA WRW ALs. Pond C-1 received NFAA approval in 2004 (EPA 2004). Additional accelerated actions included removal of the 903 Pad, radioactively contaminated soil under and around the 903 Pad, and radioactively contaminated soil downwind from the 903 Pad (PAC 900-155).

2.2 Characterization Data

Ponds A-1, A-2, A-3, A-4, A-5, B-4, B-5, C-1, and C-2 were sampled in accordance with IABZSAP Addendum #IABZ05-06 (DOE 2005c), approved by the U.S. Environmental Protection Agency (EPA) on July 20, 2005. The 2005 sampling postdated the completion of nearly demolition and accelerated actions in the Industrial Area. CRA targeted samples were collected in accordance with CRA SAP Addendum #05-01, Phase 2 Targeted Sampling (DOE 2004c), approved by EPA on December 2, 2004. Previous samples were collected as part of the OU 6 investigation (DOE 1992). Additional samples were collected at previously sampled locations in 1994 and tested for polychlorinated biphenyls (PCBs). The sampling summary is presented in Table 2.

Sampling locations for the recent sampling in accordance with IABZSAP Addendum #05-06 were determined based on the consultative process taking into account pond topography and field conditions. Sometimes this resulted in samples outside of what is portrayed as the pond or IHSS boundary on figures in this report. Both the pond and IHSS boundaries are representations of pond extent at the time the feature was mapped. Changes over time in the depth and extent of the ponds are likely and the maps are not necessarily up-to-date with regard to pond boundaries.

Analytical results for IHSS Group NE-1 sediment samples are summarized in Table 3. Data presented include all data collected since July 1991 until present. Data include results from recent pond sampling, CRA targeted sampling at the Ponds, and past OU sampling. By agreement of the RFCA parties, sediment results are compared to RFCA WRW soil ALs (DOE et al. 2003) except for dioxin and furan congeners, which do not have WRW ALs.

In accordance with the IABZSAP (DOE 2004b) DQOs, only results greater than background means plus two standard deviations (for inorganics) or reporting limits (RLs)

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Table 2
Ponds Sampling Specifications

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond A-1	CR53-000	5-Jul-05	752005.129	2086315.282	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-1	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxins/Furans
Pond A-1	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	Subsurface Soil	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxins/Furans
Pond A-1	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Subsurface Soil	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxins/Furans
Pond A-1	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	Subsurface Soil	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxins/Furans
Pond A-1	CS53-001	5-Jul-05	752025.903	2086537.320	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-1	CS53-002	5-Jul-05	752014.737	2086473.525	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-1	CS53-002	5-Jul-05	752014.737	2086473.525	0.5	2.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-1	CS53-003	5-Jul-05	751997.169	2086380.879	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-1	CS53-003	5-Jul-05	751997.169	2086380.879	0.5	2.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-1	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-1	SED60092	6-Jun-94	752021.870	2086548.620	0	0.5	Surface Sediment	Radionuclides, PCBs
Pond A-1	SED60192	2-Nov-92	751985.810	2086278.370	0	1.17	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-1	SED60192	6-Jun-94	751985.810	2086278.370	0	0.5	Surface Sediment	Radionuclides, PCBs

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond A-1	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-1	SED60292	6-Jun-94	751974.500	2086478.120	0	0.5	Surface Sediment	Radionuclides, PCBs
Pond A-1	SED60392	29-Oct-92	752038.370	2086502.500	0	1.25	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-1	SED60392	6-Jun-94	752038.370	2086502.500	0	0.5	Surface Sediment	Radionuclides, PCBs
Pond A-2	CV54-000	19-Jul-05	752132.906	2087012.03	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs
Pond A-2	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-2	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-2	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond A-2	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxin/Furan
Pond A-2	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxins/Furans
Pond A-2	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxins/Furans
Pond A-2	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	Subsurface soil	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxins/Furans
Pond A-2	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	Subsurface soil	Radionuclides, Metals, PCBs, SVOCs, VOCs, Dioxins/Furans
Pond A-2	SED60692	12-Nov-92	752108.560	2087257.000	0	0.83	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-2	SED60692	1-Jun-94	752108.560	2087257.000	0	0.5	Surface Sediment	Radionuclides, PCBs

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond A-2	SED60792	12-Nov-92	752173.870	2087291.120	0	1	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-2	SED60792	1-Jun-94	752173.870	2087291.120	0	0.5	Surface Sediment	Radionuclides, PCBs
Pond A-2	SED60892	12-Nov-92	752175.370	2087329.120	0	1.33	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-2	SED60892	1-Jun-94	752175.370	2087329.120	0	0.5	Surface Sediment	Radionuclides
Pond A-3	DA54-000	29-Jul-05	752283.517	2087983.836	0	0.8	Surface Sediment	Radionuclides, Metals
Pond A-3	DA55-001	29-Jul-05	752331.359	2088104.614	0	0.9	Surface Sediment	Radionuclides, Metals
Pond A-3	DB55-000	28-Jul-05	752563.216	2088328.103	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-3	DC55-000	29-Jul-05	752403.172	2088400.517	0	0.9	Surface Sediment	Radionuclides, Metals
Pond A-3	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-3	SED61092	21-Jun-94	752377.930	2088256.750	0	0.5	Surface Sediment	PCBs
Pond A-3	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-3	SED61192	21-Jun-94	752367.120	2088213.000	0	0.5	Surface Sediment	PCBs
Pond A-3	SED61292	22-Oct-92	752289.250	2088051.750	0	1	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-3	SED61292	21-Jun-94	752289.250	2088051.750	0	0.5	Surface Sediment	PCBs
Pond A-3	SED61392	21-Oct-92	752518.750	2088293.870	0	1.33	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond A-3	SED61392	21-Jun-94	752518.750	2088293.870	0	0.5	Surface Sediment	PCBs
Pond A-4	DF57-000	21-Jul-05	752948.912	2089306.276	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-4	DF57-000	21-Jul-05	752948.912	2089306.276	0	2	Subsurface Sediment	Radionuclides, Metals
Pond A-4	DG57-000	21-Jul-05	752985.248	2089521.445	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-4	DG57-000	21-Jul-05	752985.248	2089521.445	0.5	1.3	Subsurface Sediment	Radionuclides, Metals
Pond A-4	DG58-000	21-Jul-05	752859.330	2089342.488	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-4	DG58-000	21-Jul-05	752859.330	2089342.488	0.5	1.5	Subsurface Sediment	Radionuclides, Metals
Pond A-4	DI57-000	21-Jul-05	752874.281	2089750.202	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-4	DI58-000	21-Jul-05	753150.536	2089579.320	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-4	SED61592	14-Oct-92	752864.120	2089474.370	0	0.67	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-4	SED61592	5-Jul-94	752864.120	2089474.370	0	0.5	Surface Sediment	PCBs
Pond A-4	SED61692	14-Oct-92	752957.620	2089755.750	0	0.33	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-4	SED61692	5-Jul-94	752957.620	2089755.750	0	0.5	Surface Sediment	PCBs
Pond A-4	SED61792	15-Oct-92	752938.430	2089465.500	0	0.67	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-4	SED61792	6-Jul-94	752938.430	2089465.500	0	0.5	Surface Sediment	PCBs

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond A-4	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-4	SED61892	5-Jul-94	753000.430	2089699.500	0	0.5	Surface Sediment	PCBs
Pond A-5	A50102	14-Jan-02	753646.978	2093596.835	0.083	0.167	Surface Soil	Radionuclides, Metals, VOCs
Pond A-5	A50202	14-Jan-02	753661.228	2093604.27	0.083	0.167	Surface Soil	Radionuclides, Metals, VOCs
Pond A-5	A50302	14-Jan-02	753737.746	2093577.628	0.083	0.167	Surface Soil	Metals, VOCs
Pond A-5	A50402	14-Jan-02	753725.355	2093603.65	0.083	0.167	Surface Soil	Metals, VOCs
Pond A-5	A50502	14-Jan-02	753708.006	2093622.857	0.083	0.167	Surface Soil	Metals, VOCs
Pond A-5	A50602	14-Jan-02	753681.365	2093640.205	0.083	0.167	Surface Soil	Metals, VOCs
Pond A-5	A50702	14-Jan-02	753654.723	2093656.934	0.083	0.167	Surface Soil	Metals, VOCs
Pond A-5	A50802	14-Jan-02	753628.701	2093666.847	0.083	0.167	Surface Soil	Metals, VOCs
Pond A-5	EB61-000	13-Jul-05	753731.921	2093482.234	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-5	EC61-000	13-Jul-05	753691.407	2093528.381	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-5	EC61-001	13-Jul-05	753650.537	2093583.011	0	0.5	Surface Sediment	Radionuclides, Metals
Pond A-5	EC61-001	13-Jul-05	753650.537	2093583.011	0.5	2.5	Subsurface Sediment	Radionuclides, Metals
Pond A-5	SED64692	19-Nov-92	753622.870	2093562.250	0	1.92	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond A-5	SED64592	19-Nov-92	753658.180	2093536.120	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-5	SED64792	19-Nov-92	753756.750	2093507.370	0	0.42	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-5	SED64892	19-Nov-92	753678.500	2093564.250	0	1	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-5	SED64992	19-Nov-92	753745.930	2093451.620	0	0.67	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-5	SED69392	10-Jun-93	753646.000	2093618.000	0	2	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond A-5	15197	21-Aug-97	753664.400	2093585.000	0	0.5	Surface Sediment	Radionuclides
Pond A-5	15297	21-Aug-97	753685.500	2093552.000	0	0.5	Surface Sediment	Radionuclides
Pond A-5	15397	21-Aug-97	753727.700	2093485.000	0	0.5	Surface Sediment	Radionuclides
Pond B-4	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-002	18-Jul-05	750894.214	2088143.452	4.5	6.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-002	18-Jul-05	750894.214	2088143.452	6.5	8.5	Subsurface Sediment	Radionuclides Metals, PCBs, SVOCs
Pond B-4	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-001	15-Jul-05	750897.247	2088017.927	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond B-4	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	DB47-005	7/15/2005	750895.601	2088102.267	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond B-4	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-4	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-4	SED63592	8-Jun-94	750911.310	2088161.750	0	0.5	Surface Sediment	PCBs
Pond B-4	SED63692	26-Oct-92	750932.310	2088212.870	0	1.33	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-4	SED63692	8-Jun-94	750932.310	2088212.870	0	0.5	Surface Sediment	PCBs
Pond B-4	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-4	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-4	SED63792	8-Jun-94	750880.810	2088254.750	0	0.5	Surface Sediment	PCBs

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond B-4	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-4	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-4	SED63892	8-Jun-94	750889.250	2088223.370	0	0.5	Surface Sediment	PCBs
Pond B-4	SED63992	26-Oct-92	750909.930	2088138.120	0	1.67	Subsurface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-4	SED63992	8-Jun-94	750909.930	2088138.120	0	0.5	Surface Sediment	PCBs
Pond B-5	DF51-000	27-Jul-05	751815.258	2089219.265	0	0.5	Surface Sediment	Radionuclides, Metals
Pond B-5	DF51-000	27-Jul-05	751815.258	2089219.265	0.5	2.5	Subsurface Sediment	Radionuclides, Metals
Pond B-5	DF51-000	27-Jul-05	751815.258	2089219.265	2.5	4.5	Subsurface Sediment	Radionuclides, Metals
Pond B-5	DG52-000	27-Jul-05	751864.462	2089417.365	0	0.8	Surface Sediment	Radionuclides, Metals
Pond B-5	DG52-001	27-Jul-05	751904.539	2089488.993	0	0.9	Surface Sediment	Radionuclides, Metals
Pond B-5	DH52-000	27-Jul-05	751942.137	2089531.175	0	0.8	Surface Sediment	Radionuclides, Metals
Pond B-5	DH53-000	26-Jul-05	752034.017	2089542.971	0	0.5	Surface Sediment	Radionuclides, Metals
Pond B-5	B5 Outlet(N)	13-Oct-97	752069.000	2089509.000	0	0.5	Surface Sediment	Metals, VOCs
Pond B-5	B5 Outlet(S)	13-Oct-97	751946.688	2089600.000	0	0.5	Surface Sediment	Metals, VOCs
Pond B-5	SED64292	20-Oct-92	752081.620	2089465.500	0	0.33	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond B-5	SED64292	20-Oct-92	752081.620	2089465.500	0	0.5	Surface Sediment	PCBs
Pond B-5	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-5	SED64392	20-Oct-92	751994.310	2089520.500	0	0.5	Surface Sediment	PCBs
Pond B-5	SED64192	19-Oct-92	751923.500	2089540.120	0	0.42	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-5	SED64192	15-Jun-94	751923.500	2089540.120	0	0.5	Surface Sediment	PCBs
Pond B-5	SED64092	19-Oct-92	751734.180	2089080.370	0	0.75	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-5	SED64092	10-Jun-94	751734.180	2089080.370	0	0.5	Surface Sediment	PCBs
Pond B-5	SED64492	20-Oct-92	751639.250	2088979.870	0	0.33	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond B-5	SED64492	10-Jun-94	751639.250	2088979.870	0	0.5	Surface Sediment	PCBs
Pond B-5	B5	4-May-92	752055.625	2089580.000	0	0.58	Surface Sediment	Pesticides
Pond C-1	C1	5-Jun-92	747697.625	2086319.000	0	0.5	Surface Sediment	Pesticides
Pond C-1	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Surface Sediment	Radionuclides, Metals
Pond C-1	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Subsurface Sediment	Radionuclides, Metals
Pond C-1	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Subsurface Sediment	Radionuclides, Metals
Pond C-1	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Surface Sediment	Radionuclides, Metals

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond C-1	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Subsurface Sediment	Radionuclides, Metals
Pond C-1	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Subsurface Sediment	Radionuclides, Metals
Pond C-1	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Surface Sediment	Radionuclides, Metals
Pond C-1	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Surface Sediment	Radionuclides, Metals
Pond C-1	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs
Pond C-1	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs
Pond C-1	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Subsurface Sediment	Radionuclides, Metals, PCBs
Pond C-1	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs
Pond C-1	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Surface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond C-1	CR31-008	20-Jul-05	747628.949	2086326.739	0.5	1.8	Subsurface Sediment	Radionuclides, Metals, PCBs, SVOCs
Pond C-1	SED509	9-Nov-92	747611.000	2086226.250	0	0.83	Surface Sediment	Radionuclides, Metals
Pond C-1	SED509	9-Nov-92	747611.000	2086226.250	0.5	1	Surface Sediment	Radionuclides
Pond C-1	SED510	9-Nov-92	747647.930	2086293.000	0	0.92	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond C-1	SED510	9-Nov-92	747647.930	2086293.000	0.5	1	Surface Sediment	Radionuclides
Pond C-2	C2	4-Jun-92	747571.870	2089025.000	0	0.67	Surface Sediment	PCBs, Pesticides

Pond	Location Code	Collection Date	Northing	Easting	Starting Depth (ft)	Ending Depth (ft)	Media	Analytes
Pond C-2	DD31-000	12-Jul-05	747619.303	2088681.197	0	0.5	Surface Sediment	Radionuclides, Metals
Pond C-2	DD31-000	12-Jul-05	747619.303	2088681.197	0.5	1	Surface Sediment	Radionuclides, Metals
Pond C-2	DE30-000	12-Jul-05	747548.320	2088808.071	0	0.5	Surface Sediment	Radionuclides, Metals
Pond C-2	DE30-000	12-Jul-05	747548.320	2088808.071	0.5	2.5	Subsurface Sediment	Radionuclides, Metals
Pond C-2	DE31-000	12-Jul-05	747684.510	2088966.097	0	0.5	Surface Sediment	Radionuclides, Metals
Pond C-2	DE31-000	12-Jul-05	747684.510	2088966.097	0.5	1.7	Subsurface Sediment	Radionuclides, Metals
Pond C-2	DF29-000	12-Jul-05	747385.391	2088944.987	0	0.5	Surface Sediment	Radionuclides, Metals
Pond C-2	DF30-000	12-Jul-05	747515.288	2088895.438	0	0.5	Surface Sediment	Radionuclides, Metals
Pond C-2	SED511	10-Nov-92	747717.120	2088621.000	0	0.42	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond C-2	SED512	10-Nov-92	747570.560	2088928.000	0	0.33	Surface Sediment	Radionuclides, Metals, PCBs, Pesticides, SVOCs, VOCs
Pond C-2	SED513	10-Nov-92	747499.250	2088999.870	0	0.42	Surface Sediment	Radionuclides, Metals, VOCs

Table 3
IHSS Group NE-1 Soil and Sediment Results Greater Than Background Means Plus Two Standard Deviations or RLs

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
Pond A-1												
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Aluminum	23000	-	15713.07	228000	mg/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Americium-241	1.01	-	0.27	76	pCi/g
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Arsenic	7.9	-	7.24	22.2	mg/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Barium	210	-	188.17	26400	mg/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Benzo(a)anthracene	120	25	-	34900	ug/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Benzo(a)pyrene	150	25	-	3490	ug/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Benzo(b)fluoranthene	180	66	-	34900	ug/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Benzo(k)fluoranthene	100	50	-	349000	ug/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Chrysene	150	34	-	3490000	ug/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Fluoranthene	300	45	-	27200000	ug/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Indeno(1,2,3-cd)pyrene	90	28	-	34900	ug/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Iron	22000	-	21379.01	307000	mg/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Nickel	20	-	17.89	20400	mg/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Plutonium-239/240	3.44	-	1.35	50	pCi/g
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Vanadium	48	-	46.83	7150	mg/kg
SED	CR53-000	07-Jul-05	752005.129	2086315.282	0	0.5	Zinc	130	-	104.4	307000	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	1,2,3,4,6,7,8-HpCDF	29.8	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	1,2,3,6,7,8-HxCDD	4.55	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	1,2,3,7,8,9-HxCDD	3.29	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	1,2,3,7,8-PeCDF	1.97	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	1,2,3,7,8-PeCDD	1.84	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	1234678-HpCDD	94.6	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	1234789-HpCDF	2.43	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	123478-HxCDD	1.26	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	123478-HxCDF	3.71	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	123678-HxCDF	2.5	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	123789-HxCDF	1.84	1.84	-	-	pg/g

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	2,3,4,6,7,8-HxCDF	1.99	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	2,3,7,8-TCDF	6.12	0.735	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	23478-PeCDF	4.29	1.84	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Acetone	11	7.2	-	102000000	ug/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Aluminum	29000	-	15713.07	228000	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Americium-241	5.97	-	0.27	76	pCi/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Aroclor-1260	150	2.2	-	12400	ug/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Arsenic	7.7	-	7.24	22.2	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Barium	230	-	188.17	26400	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Cadmium	2	-	1.88	962	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Chromium	28	-	23.23	268	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Copper	43	-	27.27	40900	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Dioxin	2.78	0.735	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Indeno(1,2,3-cd)pyrene	210	34	-	34900	ug/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Iron	23000	-	21379.01	307000	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Methylene chloride	3.7	1.3	-	2530000	ug/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Nickel	22	-	17.89	20400	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	O8CDD	539	3.68	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	OCDF	40.9	3.68	-	-	pg/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Phenol	54	53	-	613000000	ug/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Plutonium-239/240	16.2	-	1.35	50	pCi/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Uranium-235	0.352	-	0.15	8	pCi/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Uranium-238	4.06	-	3.46	351	pCi/g
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Vanadium	57	-	46.83	7150	mg/kg
SED	CS53-000	21-Dec-04	752020.308	2086557.898	1.5	3	Zinc	120	-	104.4	307000	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	1,2,3,4,6,7,8-HpCDF	0.501	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	1,2,3,6,7,8-HxCDD	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	1,2,3,7,8,9-HxCDD	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	1,2,3,7,8-PeCDF	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	1,2,3,7,8-PeCDD	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	1234678-HpCDD	0.708	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	1234789-HpCDF	0.182	1.4	-	-	pg/g

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	123478-HxCDD	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	123478-HxCDF	0.256	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	123678-HxCDF	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	123789-HxCDF	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	2,3,4,6,7,8-HxCDF	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	2,3,7,8-TCDF	0.559	0.559	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	23478-PeCDF	1.4	1.4	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	2-Butanone	9.8	5.6	-	192000000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	Acetone	94	5.5	-	102000000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	Cadmium	1.8	-	1.7	962	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	Carbon Disulfide	2.5	1.1	-	15100000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	Dioxin	0.226	0.559	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	Iron	85000	-	41046.52	307000	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	Methylene chloride	2.3	0.95	-	2530000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	O8CDD	3.79	2.8	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	3	5	OCDF	0.65	2.8	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	1,2,3,4,6,7,8-HpCDF	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	1,2,3,6,7,8-HxCDD	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	1,2,3,7,8,9-HxCDD	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	1,2,3,7,8-PeCDF	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	1,2,3,7,8-PeCDD	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	1234678-HpCDD	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	1234789-HpCDF	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	123478-HxCDD	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	123478-HxCDF	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	123678-HxCDF	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	123789-HxCDF	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	2,3,4,6,7,8-HxCDF	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	2,3,7,8-TCDF	0.552	0.552	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	23478-PeCDF	1.38	1.38	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Acetone	21	5.3	-	102000000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Cadmium	2.3	-	1.7	962	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Cobalt	55	-	29.04	1550	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Dioxin	0.552	0.552	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Iron	110000	-	41046.52	307000	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Manganese	1400	-	901.62	3480	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Methylene chloride	2.7	0.93	-	2530000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Nickel	190	-	62.21	20400	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	O8CDD	2.76	2.76	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	OCDF	2.76	2.76	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Toluene	0.98	0.91	-	31300000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Uranium, Total	5.7	-	3.04	2750	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	5	7	Zinc	300	-	139.1	307000	mg/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	1,2,3,4,6,7,8-HPCDF	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	1,2,3,6,7,8-HxCDD	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	1,2,3,7,8,9-HxCDD	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	1,2,3,7,8-PeCDF	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	1,2,3,7,8-PeCDD	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	1234678-HpCDD	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	1234789-HpCDF	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	123478-HxCDD	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	123478-HxCDF	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	123678-HxCDF	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	123789-HxCDF	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	2,3,4,6,7,8-HxCDF	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	2,3,7,8-TCDF	0.54	0.54	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	23478-PeCDF	1.35	1.35	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	Acetone	15	5.3	-	102000000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	Dioxin	0.54	0.54	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	Methylene chloride	2.4	0.93	-	2530000	ug/kg
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	O8CDD	0.518	2.7	-	-	pg/g
Soil	CS53-000	21-Dec-04	752020.308	2086557.898	7	9	OCDF	2.7	2.7	-	-	pg/g
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Aluminum	25000	-	15713.07	228000	mg/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Americium-241	2.71	-	0.27	76	pCi/g

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Arsenic	8.9	-	7.24	22.2	mg/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Barium	220	-	188.17	26400	mg/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Benzo(a)anthracene	92	31	-	34900	ug/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Benzo(a)pyrene	110	31	-	3490	ug/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Benzo(b)fluoranthene	120	81	-	34900	ug/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Benzo(k)fluoranthene	72	61	-	349000	ug/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Chromium	25	-	23.23	268	mg/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Chrysene	110	41	-	3490000	ug/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Fluoranthene	200	55	-	27200000	ug/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Indeno(1,2,3-cd)pyrene	62	34	-	34900	ug/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Iron	22000	-	21379.01	307000	mg/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Nickel	22	-	17.89	20400	mg/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Plutonium-239/240	7.91	-	1.35	50	pCi/g
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Selenium	1.8	-	1.55	5110	mg/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Vanadium	50	-	46.83	7150	mg/kg
SED	CS53-001	07-Jul-05	752025.903	2086537.320	0	0.5	Zinc	140	-	104.4	307000	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0	0.5	Americium-241	0.927	-	0.27	76	pCi/g
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0	0.5	Benzo(a)anthracene	73	29	-	34900	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0	0.5	Benzo(b)fluoranthene	130	78	-	34900	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0	0.5	Chrysene	82	40	-	3490000	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0	0.5	Fluoranthene	170	53	-	27200000	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0	0.5	Plutonium-239/240	3.35	-	1.35	50	pCi/g
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Aluminum	22000	-	15713.07	228000	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Americium-241	3.64	-	0.27	76	pCi/g
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Anthracene	52	26	-	204000000	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Aroclor-1254	5200	8.5	-	12400	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Arsenic	7.5	-	7.24	22.2	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Barium	190	-	188.17	26400	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Benzo(a)anthracene	190	30	-	34900	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Benzo(a)pyrene	210	30	-	3490	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Benzo(b)fluoranthene	260	80	-	34900	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Benzo(k)fluoranthene	120	60	-	349000	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	bis(2-Ethylhexyl)phthalate	230	47	-	1970000	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Cadmium	8.3	-	1.88	962	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Chromium	30	-	23.23	268	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Chrysene	220	41	-	3490000	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Copper	33	-	27.27	40900	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Fluoranthene	510	54	-	27200000	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Indeno(1,2,3-cd)pyrene	140	33	-	34900	ug/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Mercury	0.47	-	0.34	25200	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Nickel	24	-	17.89	20400	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Plutonium-239/240	8.86	-	1.35	50	pCi/g
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Selenium	1.6	-	1.55	5110	mg/kg
SED	CS53-002	07-Jul-05	752014.737	2086473.525	0.5	2.5	Zinc	140	-	104.4	307000	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Aluminum	25000	-	15713.07	228000	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Americium-241	6.89	-	0.27	76	pCi/g
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Arsenic	9.3	-	7.24	22.2	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Barium	210	-	188.17	26400	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Benzo(a)anthracene	75	28	-	34900	ug/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Benzo(a)pyrene	83	28	-	3490	ug/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Benzo(b)fluoranthene	83	75	-	34900	ug/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Benzo(k)fluoranthene	63	57	-	349000	ug/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Chromium	24	-	23.23	268	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Chrysene	87	38	-	3490000	ug/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Fluoranthene	190	51	-	27200000	ug/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Indeno(1,2,3-cd)pyrene	50	31	-	34900	ug/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Iron	24000	-	21379.01	307000	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Nickel	21	-	17.89	20400	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Plutonium-239/240	22.4	-	1.35	50	pCi/g
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Vanadium	52	-	46.83	7150	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0	0.5	Zinc	120	-	104.4	307000	mg/kg
SED	CS53-003	07-Jul-05	751997.169	2086380.879	0.5	2.5	Aroclor-1254	55	8.3	-	12400	ug/kg
SED	SED60092	06-Jun-94	752021.870	2086548.620	0	0.5	Americium-241	0.9057	-	0.27	76	pCi/g
SED	SED60092	06-Jun-94	752021.870	2086548.620	0	0.5	Plutonium-239/240	3.3833	-	1.35	50	pCi/g

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED60092	06-Jun-94	752021.870	2086548.620	0	0.5	Uranium-235	0.193	-	0.15	8	pCi/g
SED	SED60092	06-Jun-94	752021.870	2086548.620	0	0.5	Uranium-238	4.033	-	3.46	351	pCi/g
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Americium-241	12.25	-	0.27	76	pCi/g
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Antimony	29.6	-	13.01	409	mg/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Aroclor-1254	590	350	-	12400	ug/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Barium	193	-	188.17	26400	mg/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Cadmium	3.4	-	1.88	962	mg/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Copper	28.7	-	27.27	40900	mg/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Fluoranthene	790	660	-	27200000	ug/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Mercury	0.36	-	0.34	25200	mg/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Plutonium-239/240	35.47	-	1.35	50	pCi/g
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Pyrene	710	660	-	22100000	ug/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Toluene	200	5	-	31300000	ug/kg
SED	SED60092	29-Oct-92	752021.870	2086548.620	0	1.5	Zinc	110	-	104.4	307000	mg/kg
SED	SED60192	06-Jun-94	751985.810	2086278.370	0	0.5	Americium-241	0.6233	-	0.27	76	pCi/g
SED	SED60192	06-Jun-94	751985.810	2086278.370	0	0.5	Plutonium-239/240	1.8398	-	1.35	50	pCi/g
SED	SED60192	02-Nov-92	751985.810	2086278.370	0	1.17	Americium-241	7.5	-	0.27	76	pCi/g
SED	SED60192	02-Nov-92	751985.810	2086278.370	0	1.17	Nickel	26.4	-	17.89	20400	mg/kg
SED	SED60192	02-Nov-92	751985.810	2086278.370	0	1.17	Plutonium-239/240	17.67	-	1.35	50	pCi/g
SED	SED60192	02-Nov-92	751985.810	2086278.370	0	1.17	Toluene	120	5	-	31300000	ug/kg
SED	SED60292	06-Jun-94	751974.500	2086478.120	0	0.5	Plutonium-239/240	2.304	-	1.35	50	pCi/g
SED	SED60292	06-Jun-94	751974.500	2086478.120	0	0.5	Uranium-238	5.352	-	3.46	351	pCi/g
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Americium-241	13.23	-	0.27	76	pCi/g
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Antimony	30.4	-	13.01	409	mg/kg
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Aroclor-1254	460	350	-	12400	ug/kg
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Barium	190	-	188.17	26400	mg/kg
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Cobalt	13	-	12.3	1550	mg/kg
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Copper	27.6	-	27.27	40900	mg/kg
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Mercury	0.47	-	0.34	25200	mg/kg
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Plutonium-239/240	36.2	-	1.35	50	pCi/g
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Toluene	97	5	-	31300000	ug/kg
SED	SED60292	29-Oct-92	751974.500	2086478.120	0	1.42	Zinc	107	-	104.4	307000	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED60392	06-Jun-94	752038.370	2086502.500	0	0.5	Americium-241	0.9365	-	0.27	76	pCi/g
SED	SED60392	06-Jun-94	752038.370	2086502.500	0	0.5	Plutonium-239/240	2.429	-	1.35	50	pCi/g
SED	SED60392	06-Jun-94	752038.370	2086502.500	0	0.5	Uranium-238	3.535	-	3.46	351	pCi/g
SED	SED60392	29-Oct-92	752038.370	2086502.500	0	1.25	Americium-241	11.48	-	0.27	76	pCi/g
SED	SED60392	29-Oct-92	752038.370	2086502.500	0	1.25	Aroclor-1254	350	350	-	12400	ug/kg
SED	SED60392	29-Oct-92	752038.370	2086502.500	0	1.25	Mercury	0.35	-	0.34	25200	mg/kg
SED	SED60392	29-Oct-92	752038.370	2086502.500	0	1.25	Plutonium-239/240	25.67	-	1.35	50	pCi/g
SED	SED60392	29-Oct-92	752038.370	2086502.500	0	1.25	Toluene	280	5	-	31300000	ug/kg
Pond A-2												
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Acenaphthene	180	18	-	40800000	ug/kg
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Americium-241	1.12	-	0.27	76	pCi/g
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Anthracene	210	18	-	204000000	ug/kg
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Benzo(a)anthracene	52	21	-	34900	ug/kg
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Benzo(a)pyrene	51	21	-	3490	ug/kg
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Benzo(b)fluoranthene	64	56	-	34900	ug/kg
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Chrysene	60	28	-	3490000	ug/kg
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Fluoranthene	89	38	-	27200000	ug/kg
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Indeno(1,2,3-cd)pyrene	210	23	-	34900	ug/kg
SED	CV54-000	19-Jul-05	752132.906	2087012.030	0	0.5	Plutonium-239/240	2.2	-	1.35	50	pCi/g
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Aluminum	26000	-	15713.07	228000	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Americium-241	1.33	-	0.27	76	pCi/g
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Arsenic	10	-	7.24	22.2	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Barium	250	-	188.17	26400	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	bis(2-Ethylhexyl)phthalate	270	78	-	1970000	ug/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Chromium	26	-	23.23	268	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Copper	30	-	27.27	40900	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Iron	24000	-	21379.01	307000	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Nickel	21	-	17.89	20400	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Plutonium-239/240	4.51	-	1.35	50	pCi/g
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Uranium-238	4.24	-	3.46	351	pCi/g
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Vanadium	58	-	46.83	7150	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0	0.5	Zinc	110	-	104.4	307000	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Aluminum	25000	-	15713.07	228000	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Americium-241	3.47	-	0.27	76	pCi/g
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Arsenic	8.5	-	7.24	22.2	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Barium	260	-	188.17	26400	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Benzo(a)pyrene	80	48	-	3490	ug/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	bis(2-Ethylhexyl)phthalate	47000	300	-	1970000	ug/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Chromium	38	-	23.23	268	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Chrysene	81	65	-	3490000	ug/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Copper	32	-	27.27	40900	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Fluoranthene	140	87	-	27200000	ug/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Iron	26000	-	21379.01	307000	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Manganese	750	-	659.22	3480	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Nickel	23	-	17.89	20400	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Plutonium-239/240	10.5	-	1.35	50	pCi/g
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Silver	3.9	-	2.28	5110	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Vanadium	55	-	46.83	7150	mg/kg
SED	CW53-000	18-Jul-05	752155.424	2087165.037	0.5	1.8	Zinc	130	-	104.4	307000	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	1,2,3,4,6,7,8-HpCDF	2.51	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	1,2,3,6,7,8-HxCDD	1.22	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	1,2,3,7,8,9-HxCDD	1.06	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	1,2,3,7,8-PeCDF	2.86	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	1,2,3,7,8-PeCDD	2.86	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	1234678-HpCDD	19.9	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	1234789-HpCDF	2.86	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	123478-HxCDD	2.86	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	123478-HxCDF	0.566	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	123678-HxCDF	2.86	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	123789-HxCDF	2.86	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	2,3,4,6,7,8-HxCDF	2.86	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	2,3,7,8-TCDF	1.14	1.14	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	23478-PeCDF	2.86	2.86	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	2-Butanone	34	20	-	192000000	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	Acetone	230	20	-	102000000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	Americium-241	1.06	-	0.27	76	pCi/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	bis(2-Ethylhexyl)phthalate	1000	300	-	1970000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	Dioxin	1.14	1.14	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	Methylene chloride	9.3	3.5	-	2530000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	O8CDD	161	5.71	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	OCDF	8.83	5.71	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	Plutonium-239/240	2.99	-	1.35	50	pCi/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0	0.5	Uranium-238	6.1	-	3.46	351	pCi/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	1,2,3,4,6,7,8-HpCDF	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	1,2,3,6,7,8-HxCDD	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	1,2,3,7,8,9-HxCDD	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	1,2,3,7,8-PeCDF	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	1,2,3,7,8-PeCDD	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	1234678-HpCDD	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	1234789-HpCDF	0.74	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	123478-HxCDD	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	123478-HxCDF	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	123678-HxCDF	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	123789-HxCDF	0.553	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	2,3,4,6,7,8-HxCDF	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	2,3,7,8-TCDF	1.68	1.68	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	23478-PeCDF	4.19	4.19	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	2-Butanone	71	14	-	192000000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Acetone	400	14	-	102000000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Aluminum	28000	-	15713.07	228000	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Americium-241	1.44	-	0.27	76	pCi/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Aroclor-1254	34	20	-	12400	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Arsenic	12	-	7.24	22.2	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Barium	300	-	188.17	26400	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	bis(2-Ethylhexyl)phthalate	420	210	-	1970000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Cadmium	3.2	-	1.88	962	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Chromium	29	-	23.23	268	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Copper	56	-	27.27	40900	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Dioxin	1.68	1.68	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Iron	27000	-	21379.01	307000	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Methylene chloride	5.6	2.4	-	2530000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Nickel	25	-	17.89	20400	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	O8CDD	17.8	8.38	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	OCDF	8.38	8.38	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Plutonium-239/240	4.25	-	1.35	50	pCi/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Vanadium	57	-	46.83	7150	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	0.5	2.5	Zinc	160	-	104.4	307000	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	1,2,3,4,6,7,8-HpCDF	2.83	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	1,2,3,6,7,8-HxCDD	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	1,2,3,7,8,9-HxCDD	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	1,2,3,7,8-PeCDF	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	1,2,3,7,8-PeCDD	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	1234678-HpCDD	19.8	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	1234789-HpCDF	0.77	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	123478-HxCDD	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	123478-HxCDF	0.55	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	123678-HxCDF	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	123789-HxCDF	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	2,3,4,6,7,8-HxCDF	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	2,3,7,8-TCDF	1.9	1.9	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	23478-PeCDF	4.74	4.74	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Acetone	77	21	-	102000000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Aluminum	49000	-	15713.07	228000	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Americium-241	1.32	-	0.27	76	pCi/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Aroclor-1254	36	30	-	12400	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Arsenic	11	-	7.24	22.2	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Barium	390	-	188.17	26400	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Benzoic Acid	2700	1300	-	100000000	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	bis(2-Ethylhexyl)phthalate	490	320	-	1970000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Chromium	44	-	23.23	268	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Cobalt	15	-	12.3	1550	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Copper	49	-	27.27	40900	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Dioxin	1.9	1.9	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Iron	39000	-	21379.01	307000	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Lithium	37	-	29.67	20400	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Manganese	900	-	659.22	3480	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Methylene chloride	7.7	3.7	-	2530000	ug/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Nickel	34	-	17.89	20400	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	O8CDD	114	9.48	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	OCDF	5.83	9.48	-	-	pg/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Plutonium-239/240	3.59	-	1.35	50	pCi/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Strontium	220	-	201.44	613000	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Uranium-238	4.53	-	3.46	351	pCi/g
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Vanadium	96	-	46.83	7150	mg/kg
SED	CW54-000	22-Dec-04	752172.691	2087344.578	2.5	4.5	Zinc	170	-	104.4	307000	mg/kg
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	1,2,3,4,6,7,8-HpCDF	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	1,2,3,6,7,8-HxCDD	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	1,2,3,7,8,9-HxCDD	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	1,2,3,7,8-PeCDF	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	1,2,3,7,8-PeCDD	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	1234678-HpCDD	1.56	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	1234789-HpCDF	0.34	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	123478-HxCDD	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	123478-HxCDF	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	123678-HxCDF	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	123789-HxCDF	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	2,3,4,6,7,8-HxCDF	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	2,3,7,8-TCDF	0.666	0.666	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	23478-PeCDF	1.66	1.66	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	2-Butanone	12	6.4	-	192000000	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	Acetone	52	6.3	-	102000000	ug/kg
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	Americium-241	1.4	-	0.02	76	pCi/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	bis(2-Ethylhexyl)phthalate	250	96	-	1970000	ug/kg
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	Dioxin	0.666	0.666	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	Methylene chloride	2.6	1.1	-	2530000	ug/kg
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	O8CDD	8.35	3.33	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	OCDF	3.33	3.33	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	Plutonium-239/240	2.61	-	0.02	50	pCi/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	4.5	6.5	Uranium-238	2.07	-	1.49	351	pCi/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	1,2,3,4,6,7,8-HpCDF	0.139	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	1,2,3,6,7,8-HxCDD	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	1,2,3,7,8,9-HxCDD	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	1,2,3,7,8-PeCDF	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	1,2,3,7,8-PeCDD	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	1234678-HpCDD	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	1234789-HpCDF	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	123478-HxCDD	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	123478-HxCDF	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	123678-HxCDF	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	123789-HxCDF	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	2,3,4,6,7,8-HxCDF	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	2,3,7,8-TCDF	0.55	0.55	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	23478-PeCDF	1.38	1.38	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	Acetone	34	5.2	-	102000000	ug/kg
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	Dioxin	0.55	0.55	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	Methylene chloride	2.7	0.9	-	2530000	ug/kg
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	O8CDD	2.75	2.75	-	-	pg/g
Soil	CW54-000	22-Dec-04	752172.691	2087344.578	6.5	8.5	OCDF	2.75	2.75	-	-	pg/g
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Aluminum	22000	-	15713.07	228000	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Americium-241	1.37	-	0.27	76	pCi/g
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Arsenic	11	-	7.24	22.2	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Barium	260	-	188.17	26400	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	bis(2-Ethylhexyl)phthalate	470	170	-	1970000	ug/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Chromium	24	-	23.23	268	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Copper	28	-	27.27	40900	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Iron	28000	-	21379.01	307000	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Manganese	1100	-	659.22	3480	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Nickel	22	-	17.89	20400	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Plutonium-239/240	4.07	-	1.35	50	pCi/g
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Strontium	220	-	201.44	613000	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Uranium-235	0.285	-	0.15	8	pCi/g
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Uranium-238	3.68	-	3.46	351	pCi/g
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Vanadium	55	-	46.83	7150	mg/kg
SED	CW54-002	18-Jul-05	752161.044	2087330.500	0	0.5	Zinc	110	-	104.4	307000	mg/kg
SED	SED60692	01-Jun-94	752108.560	2087257.000	0	0.5	Americium-241	1.987	-	0.27	76	pCi/g
SED	SED60692	01-Jun-94	752108.560	2087257.000	0	0.5	Plutonium-239/240	7.4262	-	1.35	50	pCi/g
SED	SED60692	01-Jun-94	752108.560	2087257.000	0	0.5	Uranium-235	0.1963	-	0.15	8	pCi/g
SED	SED60692	01-Jun-94	752108.560	2087257.000	0	0.5	Uranium-238	5.151	-	3.46	351	pCi/g
SED	SED60692	12-Nov-92	752108.560	2087257.000	0	0.83	Toluene	650	5	-	31300000	ug/kg
SED	SED60792	01-Jun-94	752173.870	2087291.120	0	0.5	Americium-241	1.514	-	0.27	76	pCi/g
SED	SED60792	01-Jun-94	752173.870	2087291.120	0	0.5	Plutonium-239/240	4.7466	-	1.35	50	pCi/g
SED	SED60792	01-Jun-94	752173.870	2087291.120	0	0.5	Uranium-235	0.1608	-	0.15	8	pCi/g
SED	SED60792	01-Jun-94	752173.870	2087291.120	0	0.5	Uranium-238	5.792	-	3.46	351	pCi/g
SED	SED60792	12-Nov-92	752173.870	2087291.120	0	1	Americium-241	1.74	-	0.27	76	pCi/g
SED	SED60792	12-Nov-92	752173.870	2087291.120	0	1	bis(2-Ethylhexyl)phthalate	4200	660	-	1970000	ug/kg
SED	SED60792	12-Nov-92	752173.870	2087291.120	0	1	Plutonium-239/240	5.65	-	1.35	50	pCi/g
SED	SED60792	12-Nov-92	752173.870	2087291.120	0	1	Toluene	860	5	-	31300000	ug/kg
SED	SED60892	01-Jun-94	752175.370	2087329.120	0	0.5	Americium-241	1.073	-	0.27	76	pCi/g
SED	SED60892	01-Jun-94	752175.370	2087329.120	0	0.5	Plutonium-239/240	3.0805	-	1.35	50	pCi/g
SED	SED60892	01-Jun-94	752175.370	2087329.120	0	0.5	Uranium-238	5.9482	-	3.46	351	pCi/g
SED	SED60892	12-Nov-92	752175.370	2087329.120	0	1.33	Acetone	260	100	-	102000000	ug/kg
SED	SED60892	12-Nov-92	752175.370	2087329.120	0	1.33	bis(2-Ethylhexyl)phthalate	7800	660	-	1970000	ug/kg
SED	SED60892	12-Nov-92	752175.370	2087329.120	0	1.33	Nickel	28.3	-	17.89	20400	mg/kg
SED	SED60892	12-Nov-92	752175.370	2087329.120	0	1.33	Plutonium-239/240	2.58	-	1.35	50	pCi/g

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
Pond A-3												
SED	DA54-000	29-Jul-05	752283.517	2087983.836	0	0.8	Americium-241	0.365	-	0.27	76	pCi/g
SED	DA54-000	29-Jul-05	752283.517	2087983.836	0	0.8	Aluminum	23000	-	15713.07	228000	mg/kg
SED	DA54-000	29-Jul-05	752283.517	2087983.836	0	0.8	Iron	22000	-	21379.01	307000	mg/kg
SED	DA54-000	29-Jul-05	752283.517	2087983.836	0	0.8	Nickel	21	-	17.89	20400	mg/kg
SED	DA54-000	29-Jul-05	752283.517	2087983.836	0	0.8	Arsenic	7.6	-	7.24	22.2	mg/kg
SED	DA54-000	29-Jul-05	752283.517	2087983.836	0	0.8	Vanadium	49	-	46.83	7150	mg/kg
SED	DA54-000	29-Jul-05	752283.517	2087983.836	0	0.8	Zinc	170	-	104.4	307000	mg/kg
SED	DA55-001	29-Jul-05	752331.359	2088104.614	0	0.9	Zinc	120	-	104.4	307000	mg/kg
SED	DA55-001	29-Jul-05	752331.359	2088104.614	0	0.9	Nickel	19	-	17.89	20400	mg/kg
SED	DA55-001	29-Jul-05	752331.359	2088104.614	0	0.9	Aluminum	19000	-	15713.07	228000	mg/kg
SED	DA55-001	29-Jul-05	752331.359	2088104.614	0	0.9	Americium-241	0.477	-	0.27	76	pCi/g
SED	DB55-000	28-Jul-05	752563.216	2088328.103	0	0.5	Aluminum	25000	-	15713.07	228000	mg/kg
SED	DB55-000	28-Jul-05	752563.216	2088328.103	0	0.5	Nickel	20	-	17.89	20400	mg/kg
SED	DB55-000	28-Jul-05	752563.216	2088328.103	0	0.5	Arsenic	7.5	-	7.24	22.2	mg/kg
SED	DB55-000	28-Jul-05	752563.216	2088328.103	0	0.5	Barium	200	-	188.17	26400	mg/kg
SED	DB55-000	28-Jul-05	752563.216	2088328.103	0	0.5	Chromium	25	-	23.23	268	mg/kg
SED	DB55-000	28-Jul-05	752563.216	2088328.103	0	0.5	Vanadium	53	-	46.83	7150	mg/kg
SED	DB55-000	28-Jul-05	752563.216	2088328.103	0	0.5	Zinc	540	-	104.4	307000	mg/kg
SED	DC55-000	29-Jul-05	752403.172	2088400.517	0	0.9	Selenium	1.8	-	1.55	5110	mg/kg
SED	DC55-000	29-Jul-05	752403.172	2088400.517	0	0.9	Zinc	150	-	104.4	307000	mg/kg
SED	DC55-000	29-Jul-05	752403.172	2088400.517	0	0.9	Nickel	18	-	17.89	20400	mg/kg
SED	DC55-000	29-Jul-05	752403.172	2088400.517	0	0.9	Aluminum	20000	-	15713.07	228000	mg/kg
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Plutonium-239/240	2.053	-	1.35	50	pCi/g
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Toluene	6	5	-	31300000	ug/kg
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Americium-241	0.6663	-	0.27	76	pCi/g
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Aluminum	27400	-	15713.07	228000	mg/kg
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Iron	25000	-	21379.01	307000	mg/kg
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Nickel	25.6	-	17.89	20400	mg/kg
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Arsenic	7.5	-	7.24	22.2	mg/kg
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Barium	192	-	188.17	26400	mg/kg
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Chromium	29.9	-	23.23	268	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Vanadium	62.7	-	46.83	7150	mg/kg
SED	SED61092	21-Oct-92	752377.930	2088256.750	0	2	Zinc	122	-	104.4	307000	mg/kg
SED	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Zinc	155	-	104.4	307000	mg/kg
SED	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Vanadium	60.1	-	46.83	7150	mg/kg
SED	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Chromium	25.9	-	23.23	268	mg/kg
SED	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Nickel	19.7	-	17.89	20400	mg/kg
SED	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Iron	24400	-	21379.01	307000	mg/kg
SED	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Aluminum	25800	-	15713.07	228000	mg/kg
SED	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Americium-241	0.3328	-	0.27	76	pCi/g
SED	SED61192	21-Oct-92	752367.120	2088213.000	0	1.33	Toluene	45	5	-	31300000	ug/kg
SED	SED61292	22-Oct-92	752289.250	2088051.750	0	1	Toluene	17	5	-	31300000	ug/kg
SED	SED61292	22-Oct-92	752289.250	2088051.750	0	1	Americium-241	0.4222	-	0.27	76	pCi/g
SED	SED61292	22-Oct-92	752289.250	2088051.750	0	1	Antimony	26	-	13.01	409	mg/kg
SED	SED61292	22-Oct-92	752289.250	2088051.750	0	1	Cobalt	13.9	-	12.3	1550	mg/kg
SED	SED61292	22-Oct-92	752289.250	2088051.750	0	1	Zinc	132	-	104.4	307000	mg/kg
SED	SED61392	21-Oct-92	752518.750	2088293.870	0	1.33	Zinc	146	-	104.4	307000	mg/kg
SED	SED61392	21-Oct-92	752518.750	2088293.870	0	1.33	Vanadium	47.6	-	46.83	7150	mg/kg
SED	SED61392	21-Oct-92	752518.750	2088293.870	0	1.33	Cobalt	15.5	-	12.3	1550	mg/kg
SED	SED61392	21-Oct-92	752518.750	2088293.870	0	1.33	Arsenic	7.8	-	7.24	22.2	mg/kg
SED	SED61392	21-Oct-92	752518.750	2088293.870	0	1.33	Aluminum	19900	-	15713.07	228000	mg/kg
SED	SED61392	21-Oct-92	752518.750	2088293.870	0	1.33	Iron	22600	-	21379.01	307000	mg/kg
SED	SED61392	21-Oct-92	752518.750	2088293.870	0	1.33	Toluene	62	5	-	31300000	ug/kg
Pond A-4												
SED	DF57-000	21-Jul-05	752948.912	2089306.276	0	2	Arsenic	7.3	-	7.24	22.2	mg/kg
SED	DF57-000	21-Jul-05	752948.912	2089306.276	0	2	Barium	200	-	188.17	26400	mg/kg
SED	DF57-000	21-Jul-05	752948.912	2089306.276	0	2	Iron	55000	-	21379.01	307000	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0	0.5	Aluminum	26000	-	15713.07	228000	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0	0.5	Barium	200	-	188.17	26400	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0	0.5	Chromium	27	-	23.23	268	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0	0.5	Iron	22000	-	21379.01	307000	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0	0.5	Nickel	20	-	17.89	20400	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0	0.5	Vanadium	59	-	46.83	7150	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0.5	1.3	Aluminum	23000	-	15713.07	228000	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0.5	1.3	Barium	190	-	188.17	26400	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0.5	1.3	Chromium	25	-	23.23	268	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0.5	1.3	Nickel	18	-	17.89	20400	mg/kg
SED	DG57-000	21-Jul-05	752985.248	2089521.445	0.5	1.3	Vanadium	53	-	46.83	7150	mg/kg
SED	DG58-000	21-Jul-05	752859.330	2089342.488	0	0.5	Aluminum	17000	-	15713.07	228000	mg/kg
SED	DI57-000	21-Jul-05	752874.281	2089750.202	0	0.5	Aluminum	16000	-	15713.07	228000	mg/kg
SED	DI57-000	21-Jul-05	752874.281	2089750.202	0	0.5	Selenium	1.6	-	1.55	5110	mg/kg
SED	DI58-000	21-Jul-05	753150.536	2089579.320	0	0.5	Aluminum	19000	-	15713.07	228000	mg/kg
SED	DI58-000	21-Jul-05	753150.536	2089579.320	0	0.5	Barium	200	-	188.17	26400	mg/kg
SED	DI58-000	21-Jul-05	753150.536	2089579.320	0	0.5	Selenium	1.7	-	1.55	5110	mg/kg
SED	DI58-000	21-Jul-05	753150.536	2089579.320	0	0.5	Zinc	110	-	104.4	307000	mg/kg
SED	SED61592	14-Oct-92	752864.120	2089474.370	0	0.67	Antimony	27.5	-	13.01	409	mg/kg
SED	SED61592	14-Oct-92	752864.120	2089474.370	0	0.67	Cobalt	13.1	-	12.3	1550	mg/kg
SED	SED61592	14-Oct-92	752864.120	2089474.370	0	0.67	Nickel	23.2	-	17.89	20400	mg/kg
SED	SED61692	15-Oct-92	752957.620	2089755.750	0	0.33	Aluminum	17900	-	15713.07	228000	mg/kg
SED	SED61692	15-Oct-92	752957.620	2089755.750	0	0.33	Antimony	41.4	-	13.01	409	mg/kg
SED	SED61692	15-Oct-92	752957.620	2089755.750	0	0.33	Arsenic	8.8	-	7.24	22.2	mg/kg
SED	SED61692	15-Oct-92	752957.620	2089755.750	0	0.33	Nickel	25.5	-	17.89	20400	mg/kg
SED	SED61692	15-Oct-92	752957.620	2089755.750	0	0.33	Toluene	5	5	-	31300000	ug/kg
SED	SED61692	15-Oct-92	752957.620	2089755.750	0	0.33	Zinc	115	-	104.4	307000	mg/kg
SED	SED61792	15-Oct-92	752938.430	2089465.500	0	0.67	Antimony	27.1	-	13.01	409	mg/kg
SED	SED61792	15-Oct-92	752938.430	2089465.500	0	0.67	Nickel	21	-	17.89	20400	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Aluminum	22900	-	15713.07	228000	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Arsenic	10.2	-	7.24	22.2	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Barium	206	-	188.17	26400	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	bis(2-Ethylhexyl)phthalate	950	660	-	1970000	ug/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Cadmium	3.1	-	1.88	962	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Chromium	23.8	-	23.23	268	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Cobalt	13.9	-	12.3	1550	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Copper	33.4	-	27.27	40900	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Iron	22900	-	21379.01	307000	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Selenium	1.9	-	1.55	5110	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Toluene	8	5	-	31300000	ug/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Vanadium	57.7	-	46.83	7150	mg/kg
SED	SED61892	19-Oct-92	753000.430	2089699.500	0	0.42	Zinc	169	-	104.4	307000	mg/kg
Pond A-5												
Soil	A50102	14-Jan-02	753646.978	2093596.835	0.08	0.17	Iron	20800	-	18037.000	307000	mg/kg
Soil	A50102	14-Jan-02	753646.978	2093596.835	0.08	0.17	Nickel	17.2	-	14.910	20400	mg/kg
Soil	A50102	14-Jan-02	753646.978	2093596.835	0.08	0.17	Plutonium-239/240	0.285	-	0.066	50	pCi/g
Soil	A50102	09-Jan-02	753646.978	2093596.835	2	6	Americium-241	0.0757	-	0.020	76	pCi/g
Soil	A50102	09-Jan-02	753646.978	2093596.835	2	6	Plutonium-239/240	0.0654	-	0.020	50	pCi/g
Soil	A50202	14-Jan-02	753661.228	2093604.270	0.08	0.17	Americium-241	0.122	-	0.023	76	pCi/g
Soil	A50202	14-Jan-02	753661.228	2093604.270	0.08	0.17	Cadmium	1.63	-	1.612	962	mg/kg
Soil	A50202	14-Jan-02	753661.228	2093604.270	0.08	0.17	Lithium	11.9	-	11.550	20400	mg/kg
Soil	A50202	14-Jan-02	753661.228	2093604.270	0.08	0.17	Plutonium-239/240	0.239	-	0.066	50	pCi/g
Soil	A50202	09-Jan-02	753661.228	2093604.270	2	6	Americium-241	0.0319	-	0.020	76	pCi/g
Soil	A50202	09-Jan-02	753661.228	2093604.270	2	6	Plutonium-239/240	0.0401	-	0.020	50	pCi/g
Soil	A50302	09-Jan-02	753737.746	2093577.628	2	6	Uranium, Total	10.5	-	3.040	2750	mg/kg
Soil	A50402	14-Jan-02	753725.355	2093603.650	0.08	0.17	Lithium	13.1	-	11.550	20400	mg/kg
Soil	A50502	14-Jan-02	753708.006	2093622.857	0.08	0.17	Lithium	11.8	-	11.550	20400	mg/kg
Soil	A50502	14-Jan-02	753708.006	2093622.857	0.08	0.17	Nickel	18.2	-	14.910	20400	mg/kg
Soil	A50502	14-Jan-02	753708.006	2093622.857	0.08	0.17	Strontium	56	-	48.940	613000	mg/kg
Soil	A50602	14-Jan-02	753681.365	2093640.205	0.08	0.17	Nickel	15.6	-	14.910	20400	mg/kg
Soil	A50702	14-Jan-02	753654.723	2093656.934	0.08	0.17	Cadmium	1.7	-	1.612	962	mg/kg
Soil	A50702	14-Jan-02	753654.723	2093656.934	0.08	0.17	Lithium	11.6	-	11.550	20400	mg/kg
Soil	A50802	14-Jan-02	753628.701	2093666.847	0.08	0.17	Strontium	52.7	-	48.940	613000	mg/kg
SED	EC61-000	13-Jul-05	753691.407	2093528.381	0	0.5	Aluminum	21000	-	15713.070	228000	mg/kg
SED	EC61-000	13-Jul-05	753691.407	2093528.381	0	0.5	Barium	220	-	188.170	26400	mg/kg
SED	EC61-000	13-Jul-05	753691.407	2093528.381	0	0.5	Iron	22000	-	21379.010	307000	mg/kg
SED	EC61-000	13-Jul-05	753691.407	2093528.381	0	0.5	Nickel	19	-	17.890	20400	mg/kg
SED	EC61-000	13-Jul-05	753691.407	2093528.381	0	0.5	Zinc	130	-	104.400	307000	mg/kg
SED	EC61-001	13-Jul-05	753650.537	2093583.011	0	0.5	Aluminum	17000	-	15713.070	228000	mg/kg
SED	EC61-001	13-Jul-05	753650.537	2093583.011	0.5	2.5	Aluminum	17000	-	15713.070	228000	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED64592	19-Nov-92	753658.180	2093536.120	0	0.5	Acetone	210	100	-	102000000	ug/kg
SED	SED64592	19-Nov-92	753658.180	2093536.120	0	0.5	Toluene	18	5	-	31300000	ug/kg
SED	SED64692	19-Nov-92	753622.870	2093562.250	0	1.92	Toluene	16	5	-	31300000	ug/kg
SED	SED64792	19-Nov-92	753756.750	2093507.370	0	0.42	Toluene	18	5	-	31300000	ug/kg
SED	SED64892	19-Nov-92	753678.500	2093564.250	0	1	Toluene	13	5	-	31300000	ug/kg
SED	SED64992	19-Nov-92	753745.930	2093451.620	0	0.67	Cobalt	13.3	-	12.300	1550	mg/kg
SED	SED64992	19-Nov-92	753745.930	2093451.620	0	0.67	Nickel	18.1	-	17.890	20400	mg/kg
Pond B-4												
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Aluminum	29000	-	15713.07	228000	mg/kg
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Americium-241	0.573	-	0.27	76	pCi/g
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Arsenic	8.2	-	7.24	22.2	mg/kg
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Barium	220	-	188.17	26400	mg/kg
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	bis(2-Ethylhexyl)phthalate	440	110	-	1970000	ug/kg
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Chromium	29	-	23.23	268	mg/kg
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Iron	24000	-	21379.01	307000	mg/kg
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Nickel	23	-	17.89	20400	mg/kg
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Vanadium	63	-	46.83	7150	mg/kg
SED	DB47-000	14-Jul-05	750852.199	2087964.334	0	0.5	Zinc	130	-	104.4	307000	mg/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0	0.5	Zinc	160	-	104.4	307000	mg/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Anthracene	60	23	-	204000000	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Aroclor-1254	210	9	-	12400	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Benzo(a)anthracene	330	27	-	34900	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Benzo(a)pyrene	430	27	-	3490	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Benzo(b)fluoranthene	810	73	-	34900	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	bis(2-Ethylhexyl)phthalate	300	42	-	1970000	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Cadmium	2.7	-	1.88	962	mg/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Chrysene	470	37	-	3490000	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Fluoranthene	880	49	-	27200000	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Indeno(1,2,3-cd)pyrene	250	30	-	34900	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Pyrene	870	180	-	22100000	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	0.5	2.5	Zinc	110	-	104.4	307000	mg/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Anthracene	420	72	-	204000000	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Benzo(a)anthracene	330	85	-	34900	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Benzo(a)pyrene	450	85	-	3490	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Benzo(b)fluoranthene	630	230	-	34900	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Chrysene	480	110	-	3490000	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Fluoranthene	1000	150	-	27200000	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Pyrene	920	550	-	22100000	ug/kg
SED	DB47-001	15-Jul-05	750897.247	2088017.927	2.5	4.5	Silver	13	-	2.28	5110	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Aluminum	16000	-	15713.07	228000	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Americium-241	0.46	-	0.27	76	pCi/g
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Anthracene	73	32	-	204000000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Aroclor-1254	160	12	-	12400	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Arsenic	8.7	-	7.24	22.2	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Barium	200	-	188.17	26400	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Benzo(a)anthracene	240	38	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Benzo(a)pyrene	290	38	-	3490	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Benzo(b)fluoranthene	270	100	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Benzo(k)fluoranthene	270	75	-	349000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	bis(2-Ethylhexyl)phthalate	710	58	-	1970000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Chrysene	330	51	-	3490000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Copper	31	-	27.27	40900	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Dibenz(a,h)anthracene	65	36	-	3490	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Fluoranthene	580	68	-	27200000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Indeno(1,2,3-cd)pyrene	150	41	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Iron	23000	-	21379.01	307000	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Nickel	18	-	17.89	20400	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Pyrene	580	250	-	22100000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Silver	3.1	-	2.28	5110	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0	0.5	Zinc	510	-	104.4	307000	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Aluminum	20000	-	15713.07	228000	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Americium-241	12.5	-	0.27	76	pCi/g
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Anthracene	75	28	-	204000000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Aroclor-1254	220	11	-	12400	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Arsenic	7.4	-	7.24	22.2	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Barium	190	-	188.17	26400	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Benzo(a)anthracene	360	33	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Benzo(a)pyrene	490	33	-	3490	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Benzo(b)fluoranthene	560	87	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Benzo(k)fluoranthene	540	65	-	349000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	bis(2-Ethylhexyl)phthalate	6500	51	-	1970000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Chromium	25	-	23.23	268	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Chrysene	610	44	-	3490000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Copper	39	-	27.27	40900	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Dibenz(a,h)anthracene	110	31	-	3490	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Fluoranthene	1200	59	-	27200000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Indeno(1,2,3-cd)pyrene	280	36	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Nickel	18	-	17.89	20400	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Plutonium-239/240	47.1	-	1.35	50	pCi/g
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Pyrene	1000	210	-	22100000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Silver	7.4	-	2.28	5110	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	0.5	2.5	Zinc	240	-	104.4	307000	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Americium-241	17	-	0.27	76	pCi/g
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Aroclor-1254	3100	100	-	12400	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Arsenic	8.8	-	7.24	22.2	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Benzo(a)anthracene	98	32	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Benzo(a)pyrene	150	32	-	3490	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Benzo(b)fluoranthene	180	84	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Benzo(k)fluoranthene	200	63	-	349000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	bis(2-Ethylhexyl)phthalate	8000	98	-	1970000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Chrysene	210	43	-	3490000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Fluoranthene	450	57	-	27200000	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Indeno(1,2,3-cd)pyrene	84	35	-	34900	ug/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Plutonium-239/240	32.8	-	1.35	50	pCi/g
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Pyrene	310	210	-	22100000	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Silver	7.4	-	2.28	5110	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Uranium-234	5.34	-	3.98	300	pCi/g
SED	DB47-002	18-Jul-05	750894.214	2088143.452	2.5	4.5	Uranium-238	5.76	-	3.46	351	pCi/g
SED	DB47-002	18-Jul-05	750894.214	2088143.452	4.5	6.5	Aluminum	18000	-	15713.07	228000	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	4.5	6.5	Nickel	18	-	17.89	20400	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	6.5	8.5	Aluminum	17000	-	15713.07	228000	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	6.5	8.5	Barium	190	-	188.17	26400	mg/kg
SED	DB47-002	18-Jul-05	750894.214	2088143.452	6.5	8.5	Nickel	18	-	17.89	20400	mg/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Aluminum	18000	-	15713.07	228000	mg/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Americium-241	1.19	-	0.27	76	pCi/g
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Benzo(a)anthracene	100	33	-	34900	ug/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Benzo(a)pyrene	100	33	-	3490	ug/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Benzo(b)fluoranthene	180	88	-	34900	ug/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	bis(2-Ethylhexyl)phthalate	370	51	-	1970000	ug/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Chrysene	110	45	-	3490000	ug/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Fluoranthene	230	60	-	27200000	ug/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Indeno(1,2,3-cd)pyrene	74	36	-	34900	ug/kg
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Plutonium-239/240	2.92	-	1.35	50	pCi/g
SED	DB47-003	14-Jul-05	750967.875	2088256.475	0	0.5	Zinc	220	-	104.4	307000	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Aluminum	21000	-	15713.07	228000	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Americium-241	0.76	-	0.27	76	pCi/g
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Arsenic	7.3	-	7.24	22.2	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Barium	210	-	188.17	26400	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Benzo(a)anthracene	80	42	-	34900	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	bis(2-Ethylhexyl)phthalate	380	66	-	1970000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Chromium	27	-	23.23	268	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Chrysene	74	57	-	3490000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Copper	32	-	27.27	40900	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Fluoranthene	170	76	-	27200000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Nickel	19	-	17.89	20400	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Plutonium-239/240	2.06	-	1.35	50	pCi/g
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Selenium	1.8	-	1.55	5110	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Vanadium	51	-	46.83	7150	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0	0.5	Zinc	420	-	104.4	307000	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Aluminum	23000	-	15713.07	228000	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Americium-241	2.57	-	0.27	76	pCi/g
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Arsenic	7.8	-	7.24	22.2	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Benzo(a)anthracene	200	33	-	34900	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Benzo(a)pyrene	270	33	-	3490	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Benzo(b)fluoranthene	530	87	-	34900	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	bis(2-Ethylhexyl)phthalate	1600	51	-	1970000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Chromium	25	-	23.23	268	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Chrysene	340	44	-	3490000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Copper	28	-	27.27	40900	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Fluoranthene	690	59	-	27200000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Indeno(1,2,3-cd)pyrene	190	36	-	34900	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Nickel	18	-	17.89	20400	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Plutonium-239/240	7.88	-	1.35	50	pCi/g
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Pyrene	450	210	-	22100000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Vanadium	55	-	46.83	7150	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	0.5	2.5	Zinc	160	-	104.4	307000	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Aluminum	29000	-	15713.07	228000	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Americium-241	56.5	-	0.27	76	pCi/g
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Aroclor-1254	820	18	-	12400	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Arsenic	9.1	-	7.24	22.2	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Barium	230	-	188.17	26400	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Benzo(a)anthracene	220	54	-	34900	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Benzo(a)pyrene	300	54	-	3490	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Benzo(b)fluoranthene	720	140	-	34900	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	bis(2-Ethylhexyl)phthalate	25000	330	-	1970000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Cadmium	44	-	1.88	962	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Chromium	140	-	23.23	268	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Chrysene	460	72	-	3490000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Copper	120	-	27.27	40900	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Fluoranthene	1100	96	-	27200000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Indeno(1,2,3-cd)pyrene	260	59	-	34900	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Iron	22000	-	21379.01	307000	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Lead	110	-	95.6	1000	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Mercury	1.7	-	0.34	25200	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Nickel	31	-	17.89	20400	mg/kg
SED	**DB47-004**	**14-Jul-05**	**750950.860**	**2088251.874**	**2.5**	**3.9**	**Plutonium-239/240**	**217**	**-**	**1.35**	**50**	**pCi/g**
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Pyrene	530	350	-	22100000	ug/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Selenium	3.6	-	1.55	5110	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Silver	3100	-	2.28	5110	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Uranium-234	6.04	-	3.98	300	pCi/g
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Uranium-238	8.51	-	3.46	351	pCi/g
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Vanadium	55	-	46.83	7150	mg/kg
SED	DB47-004	14-Jul-05	750950.860	2088251.874	2.5	3.9	Zinc	410	-	104.4	307000	mg/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Acenaphthene	110	38	-	40800000	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Anthracene	140	38	-	204000000	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Benzo(a)anthracene	300	45	-	34900	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Benzo(a)pyrene	320	45	-	3490	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Benzo(b)fluoranthene	230	120	-	34900	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Benzo(k)fluoranthene	310	90	-	349000	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	bis(2-Ethylhexyl)phthalate	310	70	-	1970000	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Chrysene	350	61	-	3490000	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Dibenz(a,h)anthracene	92	43	-	3490	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Fluoranthene	750	81	-	27200000	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Fluorene	94	41	-	40800000	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Indeno(1,2,3-cd)pyrene	200	50	-	34900	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Pyrene	700	290	-	22100000	ug/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Silver	2.7	-	2.28	5110	mg/kg
SED	DB47-005	15-Jul-05	750895.601	2088102.267	0	0.5	Zinc	220	-	104.4	307000	mg/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Americium-241	2.177	-	0.27	76	pCi/g
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Antimony	24.7	-	13.01	409	mg/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Benzo(b)fluoranthene	660	660	-	34900	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	bis(2-Ethylhexyl)phthalate	980	660	-	1970000	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Fluoranthene	1100	660	-	27200000	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Plutonium-239/240	8.37	-	1.35	50	pCi/g
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Pyrene	890	660	-	22100000	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Toluene	18	5	-	31300000	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	2	Zinc	127	-	104.4	307000	mg/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Americium-241	3.457	-	0.27	76	pCi/g
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Benzo(b)fluoranthene	740	660	-	34900	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Benzo(k)fluoranthene	350	330	-	349000	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	bis(2-Ethylhexyl)phthalate	1100	660	-	1970000	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Fluoranthene	1200	660	-	27200000	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Plutonium-239/240	11.16	-	1.35	50	pCi/g
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Pyrene	1000	660	-	22100000	ug/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Silver	2.7	-	2.28	5110	mg/kg
SED	SED63592	22-Oct-92	750911.310	2088161.750	0	3.17	Zinc	135	-	104.4	307000	mg/kg
SED	SED63692	26-Oct-92	750932.310	2088212.870	0	1.33	Americium-241	0.4584	-	0.27	76	pCi/g
SED	SED63692	26-Oct-92	750932.310	2088212.870	0	1.33	Fluoranthene	750	660	-	27200000	ug/kg
SED	SED63692	26-Oct-92	750932.310	2088212.870	0	1.33	Zinc	153	-	104.4	307000	mg/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Americium-241	0.5881	-	0.27	76	pCi/g
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Aroclor-1254	440	350	-	12400	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Arsenic	7.4	-	7.24	22.2	mg/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Benzo(b)fluoranthene	1000	660	-	34900	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	bis(2-Ethylhexyl)phthalate	2600	660	-	1970000	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Copper	29.9	-	27.27	40900	mg/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Fluoranthene	1100	660	-	27200000	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Nickel	19	-	17.89	20400	mg/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Pyrene	860	660	-	22100000	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Toluene	360	5	-	31300000	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2	Zinc	319	-	104.4	307000	mg/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Americium-241	2.56	-	0.27	76	pCi/g
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Aroclor-1254	560	350	-	12400	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Benzo(b)fluoranthene	1500	660	-	34900	ug/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Benzo(k)fluoranthene	350	330	-	349000	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	bis(2-Ethylhexyl)phthalate	3200	660	-	1970000	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Copper	32.2	-	27.27	40900	mg/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Fluoranthene	1400	660	-	27200000	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	gamma-BHC	25	8	-	25500	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Nickel	22	-	17.89	20400	mg/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Plutonium-239/240	9.577	-	1.35	50	pCi/g
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Pyrene	1200	660	-	22100000	ug/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Silver	19.6	-	2.28	5110	mg/kg
SED	SED63792	26-Oct-92	750880.810	2088254.750	0	2.5	Zinc	197	-	104.4	307000	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Americium-241	0.4847	-	0.27	76	pCi/g
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Antimony	25.6	-	13.01	409	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Arsenic	8.8	-	7.24	22.2	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Barium	196	-	188.17	26400	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Benzo(b)fluoranthene	660	660	-	34900	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	bis(2-Ethylhexyl)phthalate	2100	660	-	1970000	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Cadmium	3.2	-	1.88	962	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Copper	30.2	-	27.27	40900	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Fluoranthene	950	660	-	27200000	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Pyrene	820	660	-	22100000	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Toluene	17	5	-	31300000	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2	Zinc	303	-	104.4	307000	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Americium-241	7.452	-	0.27	76	pCi/g
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Aroclor-1254	1100	350	-	12400	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Arsenic	7.3	-	7.24	22.2	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Barium	190	-	188.17	26400	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Benzo(b)fluoranthene	770	660	-	34900	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Benzo(k)fluoranthene	360	330	-	349000	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	bis(2-Ethylhexyl)phthalate	5000	660	-	1970000	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Cadmium	1.9	-	1.88	962	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Chromium	26.1	-	23.23	268	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Copper	38.4	-	27.27	40900	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Fluoranthene	1100	660	-	27200000	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Plutonium-239/240	24.09	-	1.35	50	pCi/g
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Pyrene	1000	660	-	22100000	ug/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Silver	102	-	2.28	5110	mg/kg
SED	SED63892	22-Oct-92	750889.250	2088223.370	0	2.75	Zinc	194	-	104.4	307000	mg/kg
SED	SED63992	26-Oct-92	750909.930	2088138.120	0	1.67	Americium-241	0.5077	-	0.27	76	pCi/g
SED	SED63992	26-Oct-92	750909.930	2088138.120	0	1.67	Benzo(b)fluoranthene	710	660	-	34900	ug/kg
SED	SED63992	26-Oct-92	750909.930	2088138.120	0	1.67	bis(2-Ethylhexyl)phthalate	900	660	-	1970000	ug/kg
SED	SED63992	26-Oct-92	750909.930	2088138.120	0	1.67	Fluoranthene	1100	660	-	27200000	ug/kg
SED	SED63992	26-Oct-92	750909.930	2088138.120	0	1.67	Nickel	22.3	-	17.89	20400	mg/kg
SED	SED63992	26-Oct-92	750909.930	2088138.120	0	1.67	Pyrene	970	660	-	22100000	ug/kg
SED	SED63992	26-Oct-92	750909.930	2088138.120	0	1.67	Zinc	196	-	104.4	307000	mg/kg
Pond B-5												
SED	B5 Outlet(N)	13-Oct-97	752069.000	2089509.000	0	0.5	Carbon Tetrachloride	440	5	-	81500	ug/kg
SED	B5 Outlet(N)	13-Oct-97	752069.000	2089509.000	0	0.5	Methylene chloride	420	5	-	2530000	ug/kg
SED	B5 Outlet(S)	13-Oct-97	751946.688	2089600.000	0	0.5	Carbon Tetrachloride	390	5	-	81500	ug/kg
SED	B5 Outlet(S)	13-Oct-97	751946.688	2089600.000	0	0.5	Methylene chloride	410	5	-	2530000	ug/kg
SED	DF51-000	27-Jul-05	751815.258	2089219.265	0.5	2.5	Americium-241	0.145	-	0.02	76	pCi/g
SED	DF51-000	27-Jul-05	751815.258	2089219.265	0.5	2.5	Plutonium-239/240	0.338	-	0.02	50	pCi/g
SED	DF51-000	27-Jul-05	751815.258	2089219.265	0.5	2.5	Uranium-235	0.243	-	0.12	8	pCi/g
SED	DF51-000	27-Jul-05	751815.258	2089219.265	0.5	2.5	Uranium-238	1.52	-	1.49	351	pCi/g
SED	DG52-000	27-Jul-05	751864.462	2089417.365	0	0.8	Americium-241	0.337	-	0.02	76	pCi/g
SED	DG52-000	27-Jul-05	751864.462	2089417.365	0	0.8	Lead	27	-	24.97	1000	mg/kg
SED	DG52-000	27-Jul-05	751864.462	2089417.365	0	0.8	Plutonium-239/240	0.372	-	0.02	50	pCi/g
SED	DG52-000	27-Jul-05	751864.462	2089417.365	0	0.8	Uranium-238	1.53	-	1.49	351	pCi/g
SED	DG52-000	27-Jul-05	751864.462	2089417.365	0	0.8	Zinc	240	-	139.1	307000	mg/kg
SED	DG52-001	27-Jul-05	751904.539	2089488.993	0	0.9	Lead	30	-	24.97	1000	mg/kg
SED	DG52-001	27-Jul-05	751904.539	2089488.993	0	0.9	Plutonium-239/240	0.326	-	0.02	50	pCi/g

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	DH52-000	27-Jul-05	751942.137	2089531.175	0	0.8	Americium-241	0.224	-	0.02	76	pCi/g
SED	DH52-000	27-Jul-05	751942.137	2089531.175	0	0.8	Lead	31	-	24.97	1000	mg/kg
SED	DH52-000	27-Jul-05	751942.137	2089531.175	0	0.8	Plutonium-239/240	0.895	-	0.02	50	pCi/g
SED	DH52-000	27-Jul-05	751942.137	2089531.175	0	0.8	Zinc	160	-	139.1	307000	mg/kg
SED	DH53-000	26-Jul-05	752034.017	2089542.971	0	0.5	Americium-241	0.107	-	0.02	76	pCi/g
SED	DH53-000	26-Jul-05	752034.017	2089542.971	0	0.5	Plutonium-239/240	0.627	-	0.02	50	pCi/g
SED	SED64092	19-Oct-92	751734.180	2089080.370	0	0.75	Nickel	18.6	-	17.89	20400	mg/kg
SED	SED64092	19-Oct-92	751734.180	2089080.370	0	0.75	Toluene	21	5	-	31300000	ug/kg
SED	SED64192	19-Oct-92	751923.500	2089540.120	0	0.42	Aluminum	20400	-	15713.07	228000	mg/kg
SED	SED64192	19-Oct-92	751923.500	2089540.120	0	0.42	Arsenic	8.3	-	7.24	22.2	mg/kg
SED	SED64192	19-Oct-92	751923.500	2089540.120	0	0.42	Nickel	19.2	-	17.89	20400	mg/kg
SED	SED64192	19-Oct-92	751923.500	2089540.120	0	0.42	Toluene	12	5	-	31300000	ug/kg
SED	SED64192	19-Oct-92	751923.500	2089540.120	0	0.42	Vanadium	47.8	-	46.83	7150	mg/kg
SED	SED64292	20-Oct-92	752081.620	2089465.500	0	0.33	Aluminum	16500	-	15713.07	228000	mg/kg
SED	SED64292	20-Oct-92	752081.620	2089465.500	0	0.33	Nickel	19.7	-	17.89	20400	mg/kg
SED	SED64292	20-Oct-92	752081.620	2089465.500	0	0.33	Toluene	17	5	-	31300000	ug/kg
SED	SED64292	20-Oct-92	752081.620	2089465.500	0	0.33	Zinc	112	-	104.4	307000	mg/kg
SED	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Aluminum	17900	-	15713.07	228000	mg/kg
SED	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Americium-241	0.3054	-	0.27	76	pCi/g
SED	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Arsenic	8.6	-	7.24	22.2	mg/kg
SED	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Barium	194	-	188.17	26400	mg/kg
SED	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Copper	29.9	-	27.27	40900	mg/kg
SED	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Nickel	23.8	-	17.89	20400	mg/kg
SED	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Toluene	25	5	-	31300000	ug/kg
SED	SED64392	20-Oct-92	751994.310	2089520.500	0	1	Zinc	174	-	104.4	307000	mg/kg
SED	SED64492	20-Oct-92	751639.250	2088979.870	0	0.33	Aluminum	15900	-	15713.07	228000	mg/kg
SED	SED64492	20-Oct-92	751639.250	2088979.870	0	0.33	Tin	39.5	-	29.27	613000	mg/kg
SED	SED64492	20-Oct-92	751639.250	2088979.870	0	0.33	Toluene	47	5	-	31300000	ug/kg
Pond C-1												
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Barium	788	-	188.17	26400	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Chromium	35.9	-	23.23	268	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Copper	50.9	-	27.27	40900	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Iron	42200	-	21379.01	307000	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Manganese	745	-	659.22	3480	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Nickel	41.7	-	17.89	20400	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Selenium	3.46	-	1.55	5110	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Strontium	250	-	201.44	613000	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Uranium-234	5.7	-	3.98	300	pCi/g
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Uranium-235	0.51	-	0.15	8	pCi/g
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Uranium-238	5.7	-	3.46	351	pCi/g
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Vanadium	105	-	46.83	7150	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0	0.5	Zinc	137	-	104.4	307000	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Arsenic	7.72	-	7.24	22.2	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Barium	880	-	188.17	26400	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Chromium	40.8	-	23.23	268	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Copper	51.5	-	27.27	40900	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Iron	37100	-	21379.01	307000	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Nickel	41.6	-	17.89	20400	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Selenium	2.24	-	1.55	5110	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Strontium	217	-	201.44	613000	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Uranium-234	13	-	3.98	300	pCi/g
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Uranium-235	0.44	-	0.15	8	pCi/g
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Uranium-238	13	-	3.46	351	pCi/g
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Vanadium	150	-	46.83	7150	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	0.5	1.5	Zinc	152	-	104.4	307000	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Arsenic	10.2	-	7.24	22.2	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Barium	737	-	188.17	26400	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Chromium	34.2	-	23.23	268	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Copper	50.4	-	27.27	40900	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Iron	36300	-	21379.01	307000	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Nickel	41.2	-	17.89	20400	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Strontium	202	-	201.44	613000	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Uranium-234	8.7	-	3.98	300	pCi/g
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Uranium-235	0.48	-	0.15	8	pCi/g

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Uranium-238	8.7	-	3.46	351	pCi/g
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Vanadium	148	-	46.83	7150	mg/kg
SED	CR31-000	24-Sep-02	747595.140	2086237.150	1.5	2.5	Zinc	144	-	104.4	307000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Barium	857	-	188.17	26400	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Chromium	45.3	-	23.23	268	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Copper	71	-	27.27	40900	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Iron	36800	-	21379.01	307000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Nickel	39.2	-	17.89	20400	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Selenium	3.93	-	1.55	5110	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Strontium	368	-	201.44	613000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Uranium-234	8.9	-	3.98	300	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Uranium-235	0.48	-	0.15	8	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Uranium-238	8.9	-	3.46	351	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Vanadium	147	-	46.83	7150	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0	0.5	Zinc	152	-	104.4	307000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Arsenic	14.5	-	7.24	22.2	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Barium	757	-	188.17	26400	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Chromium	36.6	-	23.23	268	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Copper	59.3	-	27.27	40900	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Iron	36100	-	21379.01	307000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Nickel	46	-	17.89	20400	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Selenium	1.82	-	1.55	5110	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Strontium	205	-	201.44	613000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Uranium-234	11	-	3.98	300	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Uranium-235	0.5	-	0.15	8	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Uranium-238	11	-	3.46	351	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Vanadium	150	-	46.83	7150	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	0.5	1.5	Zinc	157	-	104.4	307000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Arsenic	12.9	-	7.24	22.2	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Barium	754	-	188.17	26400	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Chromium	40.2	-	23.23	268	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Copper	47	-	27.27	40900	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Iron	34800	-	21379.01	307000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Nickel	41.2	-	17.89	20400	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Strontium	207	-	201.44	613000	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Uranium-234	5.7	-	3.98	300	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Uranium-235	0.47	-	0.15	8	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Uranium-238	5.7	-	3.46	351	pCi/g
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Vanadium	155	-	46.83	7150	mg/kg
SED	CR31-001	25-Sep-02	747724.580	2086262.200	1.5	2	Zinc	135	-	104.4	307000	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Barium	846	-	188.17	26400	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Chromium	44.9	-	23.23	268	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Copper	53.5	-	27.27	40900	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Iron	32700	-	21379.01	307000	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Manganese	749	-	659.22	3480	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Nickel	33	-	17.89	20400	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Selenium	2.07	-	1.55	5110	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Strontium	378	-	201.44	613000	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Uranium-234	4.1	-	3.98	300	pCi/g
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Uranium-238	4.1	-	3.46	351	pCi/g
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Vanadium	119	-	46.83	7150	mg/kg
SED	CR31-002	24-Sep-02	747597.863	2086311.578	0	0.5	Zinc	115	-	104.4	307000	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Arsenic	10.1	-	7.24	22.2	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Barium	756	-	188.17	26400	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Chromium	44.9	-	23.23	268	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Copper	83.5	-	27.27	40900	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Iron	43400	-	21379.01	307000	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Nickel	49.4	-	17.89	20400	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Selenium	3.44	-	1.55	5110	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Strontium	215	-	201.44	613000	mg/kg
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Uranium-234	8.3	-	3.98	300	pCi/g
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Uranium-235	0.59	-	0.15	8	pCi/g
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Uranium-238	8.3	-	3.46	351	pCi/g
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Vanadium	198	-	46.83	7150	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CR31-003	24-Sep-02	747673.609	2086234.789	0	0.5	Zinc	176	-	104.4	307000	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	2,4-Dinitrophenol	890	270	-	2040000	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	4,6-Dinitro-2-methylphenol	750	350	-	1020000	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Aluminum	31000	-	15713.07	228000	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Anthracene	440	37	-	204000000	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Barium	320	-	188.17	26400	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Benzo(a)anthracene	190	43	-	34900	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Benzo(a)pyrene	170	43	-	3490	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Benzo(b)fluoranthene	170	120	-	34900	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Benzo(k)fluoranthene	150	87	-	349000	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Chromium	30	-	23.23	268	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Chrysene	190	59	-	3490000	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Cobalt	13	-	12.3	1550	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Copper	30	-	27.27	40900	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Dibenz(a,h)anthracene	530	41	-	3490	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Fluoranthene	120	78	-	27200000	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Indeno(1,2,3-cd)pyrene	500	48	-	34900	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Iron	28000	-	21379.01	307000	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Nickel	24	-	17.89	20400	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Pentachlorophenol	950	240	-	162000	ug/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Selenium	2.8	-	1.55	5110	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Uranium-235	0.405	-	0.15	8	pCi/g
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Vanadium	56	-	46.83	7150	mg/kg
SED	CR31-005	19-Jul-05	747761.433	2086268.068	0	0.5	Zinc	140	-	104.4	307000	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Aluminum	23000	-	15713.07	228000	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Americium-241	0.442	-	0.27	76	pCi/g
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Anthracene	450	41	-	204000000	ug/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Barium	330	-	188.17	26400	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Chromium	29	-	23.23	268	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Iron	31000	-	21379.01	307000	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Nickel	20	-	17.89	20400	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Plutonium-239/240	2.2	-	1.35	50	pCi/g
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0	0.5	Selenium	2.7	-	1.55	5110	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Acenaphthene	360	35	-	40800000	ug/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Aluminum	32000	-	15713.07	228000	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Americium-241	0.275	-	0.27	76	pCi/g
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Anthracene	410	35	-	204000000	ug/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Barium	270	-	188.17	26400	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Benzo(a)anthracene	83	41	-	34900	ug/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Benzo(a)pyrene	79	41	-	3490	ug/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Chromium	26	-	23.23	268	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Chrysene	81	56	-	3490000	ug/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Fluoranthene	130	75	-	27200000	ug/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Indeno(1,2,3-cd)pyrene	400	46	-	34900	ug/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Iron	27000	-	21379.01	307000	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Nickel	22	-	17.89	20400	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Uranium-235	0.341	-	0.15	8	pCi/g
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Vanadium	47	-	46.83	7150	mg/kg
SED	CR31-006	19-Jul-05	747595.098	2086246.573	0.5	2	Zinc	110	-	104.4	307000	mg/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Acenaphthene	320	31	-	40800000	ug/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Aluminum	23000	-	15713.07	228000	mg/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Anthracene	350	31	-	204000000	ug/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Arsenic	8.9	-	7.24	22.2	mg/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Barium	250	-	188.17	26400	mg/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Benzo(a)anthracene	69	36	-	34900	ug/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Benzo(a)pyrene	66	36	-	3490	ug/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Chrysene	65	49	-	3490000	ug/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Cobalt	13	-	12.3	1550	mg/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Fluoranthene	120	66	-	27200000	ug/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Indeno(1,2,3-cd)pyrene	340	40	-	34900	ug/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Iron	29000	-	21379.01	307000	mg/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Manganese	970	-	659.22	3480	mg/kg
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Nickel	21	-	17.89	20400	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	CR31-007	19-Jul-05	747623.150	2086198.663	0	0.5	Vanadium	47	-	46.83	7150	mg/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Acenaphthene	74	36	-	40800000	ug/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Aluminum	28000	-	15713.07	228000	mg/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Anthracene	90	36	-	204000000	ug/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Aroclor-1254	94	14	-	12400	ug/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Barium	280	-	188.17	26400	mg/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Benzo(a)anthracene	140	42	-	34900	ug/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Benzo(b)fluoranthene	180	110	-	34900	ug/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Chromium	25	-	23.23	268	mg/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Chrysene	130	57	-	3490000	ug/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Copper	28	-	27.27	40900	mg/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Fluoranthene	330	76	-	27200000	ug/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Iron	25000	-	21379.01	307000	mg/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Nickel	21	-	17.89	20400	mg/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Pyrene	310	270	-	22100000	ug/kg
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Uranium-235	0.257	-	0.15	8	pCi/g
SED	CR31-008	20-Jul-05	747628.949	2086326.739	0	0.5	Zinc	110	-	104.4	307000	mg/kg
SED	SED509	09-Nov-92	747611.000	2086226.250	0	0.83	Barium	262	-	188.17	26400	mg/kg
SED	SED509	09-Nov-92	747611.000	2086226.250	0	0.83	Copper	27.4	-	27.27	40900	mg/kg
SED	SED509	09-Nov-92	747611.000	2086226.250	0	0.83	Iron	23500	-	21379.01	307000	mg/kg
SED	SED509	09-Nov-92	747611.000	2086226.250	0	0.83	Mercury	1.3	-	0.34	25200	mg/kg
SED	SED509	09-Nov-92	747611.000	2086226.250	0	0.83	Toluene	520	5	-	31300000	ug/kg
SED	SED509	09-Nov-92	747611.000	2086226.250	0	0.83	Zinc	106	-	104.4	307000	mg/kg
SED	SED509	09-Nov-92	747611.000	2086226.250	0.5	1	Plutonium-239/240	1.4	-	1.35	50	pCi/g
SED	SED510	09-Nov-92	747647.930	2086293.000	0	0.92	Barium	208	-	188.17	26400	mg/kg
SED	SED510	09-Nov-92	747647.930	2086293.000	0	0.92	Mercury	1.6	-	0.34	25200	mg/kg
SED	SED510	09-Nov-92	747647.930	2086293.000	0	0.92	Nickel	19.1	-	17.89	20400	mg/kg
SED	SED510	09-Nov-92	747647.930	2086293.000	0	0.92	Toluene	380	5	-	31300000	ug/kg
Pond C-2												
SED	DD31-000	12-Jul-05	747619.303	2088681.197	0	0.5	Americium-241	0.727	-	0.27	76	pCi/g
SED	DD31-000	12-Jul-05	747619.303	2088681.197	0	0.5	Arsenic	7.7	-	7.24	22.2	mg/kg
SED	DD31-000	12-Jul-05	747619.303	2088681.197	0	0.5	Iron	29000	-	21379.01	307000	mg/kg

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	DD31-000	12-Jul-05	747619.303	2088681.197	0	0.5	Nickel	18	-	17.89	20400	mg/kg
SED	DD31-000	12-Jul-05	747619.303	2088681.197	0	0.5	Plutonium-239/240	2.96	-	1.35	50	pCi/g
SED	DE30-000	12-Jul-05	747548.320	2088808.071	0	0.5	Americium-241	0.287	-	0.27	76	pCi/g
SED	DE30-000	12-Jul-05	747548.320	2088808.071	0	0.5	Plutonium-239/240	1.91	-	1.35	50	pCi/g
SED	DE30-000	12-Jul-05	747548.320	2088808.071	0.5	2.5	Americium-241	0.305	-	0.27	76	pCi/g
SED	DE30-000	12-Jul-05	747548.320	2088808.071	0.5	2.5	Plutonium-239/240	1.64	-	1.35	50	pCi/g
SED	DE31-000	12-Jul-05	747684.510	2088966.097	0	0.5	Americium-241	0.272	-	0.27	76	pCi/g
SED	DE31-000	12-Jul-05	747684.510	2088966.097	0	0.5	Nickel	18	-	17.89	20400	mg/kg
SED	DE31-000	12-Jul-05	747684.510	2088966.097	0	0.5	Uranium-235	0.219	-	0.15	8	pCi/g
SED	DE31-000	12-Jul-05	747684.510	2088966.097	0.5	1.7	Aluminum	21000	-	15713.07	228000	mg/kg
SED	DE31-000	12-Jul-05	747684.510	2088966.097	0.5	1.7	Nickel	20	-	17.89	20400	mg/kg
SED	DF29-000	12-Jul-05	747385.391	2088944.987	0	0.5	Aluminum	22000	-	15713.07	228000	mg/kg
SED	DF29-000	12-Jul-05	747385.391	2088944.987	0	0.5	Chromium	25	-	23.23	268	mg/kg
SED	DF29-000	12-Jul-05	747385.391	2088944.987	0	0.5	Nickel	21	-	17.89	20400	mg/kg
SED	DF29-000	12-Jul-05	747385.391	2088944.987	0	0.5	Plutonium-239/240	1.66	-	1.35	50	pCi/g
SED	DF29-000	12-Jul-05	747385.391	2088944.987	0	0.5	Vanadium	50	-	46.83	7150	mg/kg
SED	DF30-000	12-Jul-05	747515.288	2088895.438	0	0.5	Aluminum	22000	-	15713.07	228000	mg/kg
SED	DF30-000	12-Jul-05	747515.288	2088895.438	0	0.5	Barium	220	-	188.17	26400	mg/kg
SED	DF30-000	12-Jul-05	747515.288	2088895.438	0	0.5	Iron	22000	-	21379.01	307000	mg/kg
SED	DF30-000	12-Jul-05	747515.288	2088895.438	0	0.5	Nickel	19	-	17.89	20400	mg/kg
SED	DF30-000	12-Jul-05	747515.288	2088895.438	0	0.5	Zinc	140	-	104.4	307000	mg/kg
SED	SED511	11-Nov-92	747717.120	2088621.000	0	0.42	Americium-241	0.32	-	0.27	76	pCi/g
SED	SED511	11-Nov-92	747717.120	2088621.000	0	0.42	Mercury	0.65	-	0.34	25200	mg/kg
SED	SED511	11-Nov-92	747717.120	2088621.000	0	0.42	Plutonium-239/240	1.5	-	1.35	50	pCi/g
SED	SED511	11-Nov-92	747717.120	2088621.000	0	0.42	Toluene	410	5	-	31300000	ug/kg
SED	SED512	11-Nov-92	747570.560	2088928.000	0	0.33	Americium-241	0.42	-	0.27	76	pCi/g
SED	SED512	11-Nov-92	747570.560	2088928.000	0	0.33	Mercury	0.65	-	0.34	25200	mg/kg
SED	SED512	11-Nov-92	747570.560	2088928.000	0	0.33	Nickel	18.1	-	17.89	20400	mg/kg
SED	SED512	11-Nov-92	747570.560	2088928.000	0	0.33	Plutonium-239/240	2.1	-	1.35	50	pCi/g
SED	SED512	11-Nov-92	747570.560	2088928.000	0	0.33	Toluene	340	5	-	31300000	ug/kg
SED	SED512	11-Nov-92	747570.560	2088928.000	0	0.33	Zinc	150	-	104.4	307000	mg/kg
SED	SED513	11-Nov-92	747499.250	2088999.870	0	0.42	Americium-241	0.34	-	0.27	76	pCi/g

Media	Location Code	Sample Date	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	RL or MDL	Back-ground	WRW AL	Unit
SED	SED513	11-Nov-92	747499.250	2088999.870	0	0.42	Arsenic	9.8	-	7.24	22.2	mg/kg
SED	SED513	11-Nov-92	747499.250	2088999.870	0	0.42	Barium	226	-	188.17	26400	mg/kg
SED	SED513	11-Nov-92	747499.250	2088999.870	0	0.42	Copper	35.9	-	27.27	40900	mg/kg
SED	SED513	11-Nov-92	747499.250	2088999.870	0	0.42	Mercury	0.68	-	0.34	25200	mg/kg
SED	SED513	11-Nov-92	747499.250	2088999.870	0	0.42	Plutonium-239/240	2.4	-	1.35	50	pCi/g
SED	SED513	11-Nov-92	747499.250	2088999.870	0	0.42	Toluene	370	5	-	31300000	ug/kg
SED	SED513	11-Nov-92	747499.250	2088999.870	0	0.42	Zinc	201	-	104.4	307000	mg/kg

Table 4
Locations With All Non-Detected Analytes

Pond	Location	Collection Date	Medium	Northing	Easting	Starting Depth (ft bgs)	Ending Depth (ft bgs)	Analytes
Pond A-1	SED60092	Jun-94	Sed	752021.870	2086548.620	0	0.5	PCBs
Pond A-1	SED60392	Jun-94	Sed	752038.370	2086502.500	0	0.5	PCBs
Pond A-2	SED60792	Jun-94	Sed	752173.870	2087291.120	0	0.5	PCBs
Pond A-2	SED61092	Jun-94	Sed	752377.930	2088256.750	0	0.5	PCBs
Pond A-3	SED61192	Jun-94	Sed	752367.120	2088213.000	0	0.5	PCBs
Pond A-3	SED61292	Jun-94	Sed	752289.250	2088051.750	0	0.5	PCBs
Pond A-3	SED61392	Jun-94	Sed	752518.750	2088293.870	0	0.5	PCBs
Pond A-4	SED61592	Jul-94	Sed	752864.120	2089474.370	0	0.5	PCBs
Pond A-4	SED61692	Jul-94	Sed	752957.620	2089755.750	0	0.5	PCBs
Pond A-4	SED61792	Jul-94	Sed	752938.430	2089465.500	0	0.5	PCBs
Pond A-4	SED61892	Jul-94	Sed	753000.430	2089699.500	0	0.5	PCBs
Pond B-4	SED63692	Jun-94	Sed	750932.310	2088212.870	0	0.5	PCBs
Pond B-4	SED63792	Jun-94	Sed	750880.810	2088254.750	0	0.5	PCBs
Pond B-4	SED63892	Jun-94	Sed	750889.250	2088223.370	0	0.5	PCBs
Pond B-5	SED64092	Jun-94	Sed	751734.180	2089080.370	0	0.5	PCBs
Pond B-5	SED64192	Jun-94	Sed	751923.500	2089540.120	0	0.5	PCBs
Pond B-5	SED64292	Jun-94	Sed	752081.620	2089465.500	0	0.5	PCBs
Pond B-5	SED64392	Jun-94	Sed	751994.310	2089520.500	0	0.5	PCBs
Pond B-5	SED64492	Jun-94	Sed	751639.250	2088979.870	0	0.5	PCBs

(for organics) are presented in tables and figures. Nondetected analytes are not presented on the figures or in tables. Sampling locations and dates with all results less than RLs or background means plus two standard deviations are listed in Table 4.

In the Ecological Screening Summary (Appendix A), all data from recent pond sampling, CRA targeted sampling at the ponds, and past OU sampling are included in the ecological summary statistics (Attachment 1 to Appendix A). One-half the reported result (RL or detection limit) is used as a proxy for nondetected analytes. In addition, results are not screened out based on a Background means plus two standard deviations comparison. A comparison to ecological, based screening values is summarized in Section 5.0 and detailed in Appendix A. The data, retrieved from the RFETS Soil Water Database (SWD) on August 11, 2005, are provided on the enclosed compact disc (CD). The CD contains standardized real and quality control (QC) data, including Chemical Abstracts Service (CAS) numbers, analyte names, and units.

2.2.1 Pond A-1

Eight surface sediment and seven subsurface sediment samples were collected at Pond A-1. In addition, three subsurface soil samples were collected beneath the sediment column at one location. Samples were typically analyzed for radionuclides, metals, PCBs, SVOCs, and VOCs, but four surface sediment samples were only analyzed for radionuclides and PCBs and, while on subsurface sediment and all three subsurface soil samples were analyzed for dioxins and furans in addition to radionuclides, metals, SVOCs, and VOCs. Results are summarized in Table 3 and shown on Figure 2. All analytical results for sediment and soil samples from Pond A-1 were less than applicable WRW ALs.

Americium-241 and plutonium-239/240 activities exceeded background levels in more than 85% of the surface and subsurface sediment samples analyzed. The maximum observed plutonium activities were 22.4 pCi/g in surface sediment and 36.2 pCi/g in subsurface sediment. These levels approach the WRW AL of 50 pCi/g. Observed americium-241 activities were lower, with up to 6.89 pCi/g in surface sediment and 13.23 pCi/g in subsurface sediment. The only radionuclide detected above background levels in subsurface soil was total uranium.

Concentrations of aluminum, arsenic, barium, chromium, iron, nickel, selenium, vanadium, and zinc exceeded background ranges in at least half of all surface sediment samples collected, but only aluminum and arsenic were detected at concentrations greater than one-tenth of the WRW AL. In subsurface sediment, barium, copper, mercury and zinc exceeded background in at least half of all samples analyzed, and in subsurface soil, only cadmium and iron exceeded background levels in at least half of samples. Aluminum and arsenic concentrations were similar to those in surface sediment and exceeded 10% of the WRW AL.

All samples associated with Pond A-1 were analyzed for PCBs, but PCBs were only detected in subsurface sediment samples. Aroclor-1254 was detected in five of seven subsurface sediment samples that were analyzed, and Aroclor-1260 was detected in one

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sample. The maximum concentration of Aroclor-1254 was less than half of the WRW AL.

All of the organics detected in surface sediment were PAHs, while all of the organics detected in subsurface soil were VOCs. Numerous SVOCs were detected in subsurface sediment, but detections of individual compounds were sporadic. The PAHs detected in surface and subsurface sediment included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene. All detected concentrations were at least two orders of magnitude lower than WRW ALs. Dioxins and furans were detected in subsurface sediment and subsurface soil samples. There are no WRW ALs for these compounds.

2.2.2 Pond A-2

Nine surface sediment, four subsurface sediment, and two subsurface soil samples were collected at Pond A-2. Samples were typically analyzed for radionuclides, metals, PCBs, and SVOCs. Five accelerated action samples collected in 2004 were also analyzed for VOCs and dioxins/furans. Results are summarized in Table 3 and shown on Figure 3. All analytical results for sediment and soil samples from Pond A-2 were less than WRW ALs.

Americium-241, plutonium-239/240, and uranium-238 were present at activities slightly exceeding background in a majoritiy of surface and subsurface sediment samples and in one of the two subsurface soil samples that were collected beneath the sediment column at one location. The maximum detected plutonium-239 activities in surface and subsurface sediment were greater than 10% of the WRW AL.

A number of metals were detected sporadically at concentrations exceeding background levels in surface sediment samples but no single metal was present above background in more than one third of the samples. The metals exceeding background included aluminum, arsenic, barium, chromium, copper, iron, nickel, vanadium, and zinc. The only metals detected in surface soil at concentrations exceeding one-tenth of the WRW AL were aluminum and arsenic.

Metals were more frequently detected in subsurface sediment at concentrations exceeding background, with aluminum, arsenic, barium, chromium, copper, iron, vanadium, and zinc exceeding background levels in three quarters of the subsurface sediment samples analyzed. Maximum detected concentrations for aluminum, arsenic, chromium, and iron were greater than one-tenth the applicable WRW ALs.

There were no metals detected at greater than background levels in the two subsurface soil samples collected beneath the sediment column in Pond A-2.

One or more groups of organic analytes were analyzed in each of eight surface sediment, four subsurface sediment, and two subsurface soil samples. The only VOCs detected in any of the samples were 2-butanone, acetone, methylene chloride, and toluene, which were present at very low levels. The most frequenly detected SVOC was bis(2-ethylhexyl)phthalate. Several PAHs were sporadically detected, including benzo(a)pyrene, but concentrations were at least two orders of magnitude less than WRW ALs for all sediment and soil samples analyzed. PCBs were analyzed in all except one of the samples associated with Pond A-2 and were never detected. Samples collected at several depths from a single location were analyzed for dioxins and furans. 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin, octa-8-chlorodibenzo-p-dioxin were detected. There are no WRW ALs for these compounds.

2.2.3 Pond A-3

Nine surface and three subsurface sediment samples were collected at Pond A-3. No soil samples were collected. Three subsurface and one surface sediment sample were analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Four surfacesediment samples were analyzed only for PCBs, and four other surface sediment samples were analyzed for radionuclides and metals. Results are summarized in Table 3 and shown in Figure 4. All analytical results for sediment samples from Pond A-3 were less than WRW ALs.

Americium-241 was detected in both surface and subsurface sediment at activities slightly exceeding background. Plutonium activities did not exceed background levels in surface sediment, but slightly exceeded background in 25 percent of the subsurface sediment samples analyzed.

Aluminum, arsenic, nickel, and zinc were detected at levels slightly greater than background levels in at least half of all surface sediment samples. Of these, only aluminum and arsenic had maximum detected concentrations exceeding 10 percent of the applicable WRW ALs. Metal detections exceeding background concentrations were more numerous in subsurface soil, with aluminum, arsenic, chromium, cobalt, iron, nickel, vanadium, and zinc being detected at concentrations greater than background levels in at least half of the samples analyzed.

PCBs were analyzed in five surface sediment samples and three subsurface sediment sample but were never detected. Pesticides, SVOCs, and VOCs were analyzed in one surface sediment and three subsurface sediment sample but the only analyte from these groups that was detected was toluene in subsurface sediment at a relatively low concentration.

2.2.4 Pond A-4

Thirteen surface sediment and three subsurface sediment samples were collected at Pond A-4. No soil samples were collected. Four of the surface sediment samples were analyzed for PCBs only, and four others were analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. The remaining five surface sediment samples and 3 subsurface sediment samples were analyzed for radionuclides and metals. Results are summarized in Table 3 and shown in Figure 5. All analytical results for sediment samples from Pond A-4 were less than WRW ALs.

Radionuclides were analyzed in nine surface sediment and three subsurface sediment samples, but were never detected at activities exceeding background levels.

Several metals were detected in surface sediment at concentrations slightly exceeding background. Aluminum concentrations exceeded background in two-thirds of all surface sediment samples, and antimony, barium, nickel, selenium, and zinc exceeded their background levels in one-third of all surface sediment samples. The maximum detected concentrations of aluminum, antimony, arsenic, and chromium in surface sediment

exceeded 10% of the applicable WRW ALs for those metals. Metal results for subsurface sediments were very similar to the results for surface sediments. Aluminum, arsenic, barium, chromium, iron, nickel, and vanadium levels in subsurface sediment samples exceeded background levels in one-third or more of the samples analyzed. The maximum detected concentrations of aluminum, arsenic, and iron in subsurface sediment exceeded 10% of the applicable WRW ALs.

Four surface sediment samples from Pond A-4 were analyzed for organics, including PCBs, pesticides, SVOCs, and VOCs, and four additional subsurface soil samples were analyzed for PCBs alone. The only organics that were detected in any of the samples were bis(2-ethylhexyl)phthalate and toluene. These were detected at concentrations slightly exceeding the detection limit and three or more orders of magnitude below the applicable WRW ALs.

2.2.5 Pond A-5

Ten surface and 3 subsurface sediment samples were collected at Pond A-5. In addition, 8 surface soil samples were colleted from an area adjacent of the pond's northeast side. Four surface and two subsurface sediment samples were analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Three surface sediment samples and one subsurface sediment sample were analyzed for radionuclides and metals, and three surface sediment samples were analyzed for radionuclides only. Eight surface soil samples were analyzed for metals and VOC. Two of the eight surface soil samples were also analyzed for radionuclides. Results are summarized in Table 3 and shown on Figure 6. All analytical results for sediment and soil samples from Pond A-5 were less than WRW ALs.

Radionuclides were analyzed in all surface and subsurface sediment samples collected from Pond A-5, but were not detected above background levels. Both americium-241 and plutonium-239/240 were detected in surface soil samples collected adjacent to Pond A-5 at activities slightly exceeding background but well below the WRW ALs.

Aluminum, barium, cobalt, iron, nickel, and zinc were detected in surface sediment at concentrations slightly exceeding background but well below WRW ALs. Aluminum was the only metal that exceeded background in subsurface sediment. Metals detected slightly above background levels in surface soil in an area adjacent to Pond A-5 included cadmium, iron, lithium, nickel, plutonium-239/240, and strontium. All concentrations were at least an order of magnitude less than applicable WRW ALs.

Although SVOCs, PCBs, and pesticides were analyzed in four surface and two subsurface sediment samples from Pond A-5, none of these analytes were detected in any of the samples. The only VOCs that were detected in surface or subsurface sediment were acetone and toluene at very low concentrations. VOCs were analyzed but not detected in any of the surface soil samples collected adjacent to Pond A-5.

2.2.6 Pond B-4

Eleven surface and 16 subsurface sediment samples were collected at Pond B-4. No soil samples were collected. Six surface and eight subsurface samples were analyzed for radionuclides, metals, PCBs, and SVOCs. The remaining five surface sediment samples were analyzed for PCBs only. The remaining eight subsurface sediment samples were analyzed for radionuclides, metals, PCBs, pesticides, SVOCs, and VOCs. Results are summarized in Table 3 and shown in Figure 7.

Both americium-241 and plutonium-239/240 activities exceeded background in more than half of subsurface sediment samples analyzed. Americium-241 activities also exceeded background in more that half of surface sediment samples, but plutonium-239/240 was only present in 1 out of 5 samples analyzed at activities greater than background. The maximum observed activity of americium-241 was 56.6 pCi/g, which is below the 76 pCi/g WRW AL. The maximum observed activity of plutonium-239/240 in subsurface sediment was 217 pCi/g, which exceeds the WRW AL of 50 pCi/g. This was the only WRW AL exceedence in Pond B-4 and the only WRW AL exceedence identified in the ponds covered in this Data Summary Report. Uranium isotopes were present at greater-than-background levels in only 12% of subsurface sediment samples and in none of the surface sediment samples.

Metals that exceeded background in at least 60% of the surface sediment samples included arsenic, barium, nickel, and zinc. Zinc exceeded background in all of the surface sediment samples analyzed. Metals concentrations were less elevated relative to background in subsurface sediments. Zinc was the only metal that was detected above background levels in more than half of the samples analyzed. None of the metals results for Pond B-4 exceeded the WRW AL, but maximum detected results for arsenic, chromium, lead, silver, and aluminum exceeded 10% of the applicable WRW soil ALs.

One pesticide (Lindane), and one VOC (toluene), were detected at low concentrations in subsurface sediment. Aroclor-1254 was detected in 10% of all surface sediment samples and 41% of all subsurface sediment samples. The remaining organics detected in surface and subsurface sediment were SVOCs, principally bis(2-ethylhexyl)phthalate, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, and pyrene. The PAHs were somewhat more frequently detected in subsurface than in surface sediment. All concentrations of organics were well below the WRW ALs. The only organic analytes detected at levels greater than 10% of the WRW AL were Aroclor-1254 and benzo(a)pyrene.

2.2.7 Pond B-5

Eighteen surface and two subsurface sediment samples were collected at Pond B-5. No soil samples were collected. Five surface and two subsurface sediment samples were analyzed for radionuclides and metals. Two surface samples were analyzed for metals and VOCs; five surface samples were analyzed for radionuclides, metals, VOCs, SVOCs, PCBs and pesticides; five surface samples were analyzed for PCBs; and one surface

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sample was analyzed for pesticides. Results are summarized in Table 3 and shown on Figure 8. All analytical results for sediment samples from Pond B-5 were less than WRW ALs.

Americium-241 was detected in two surface sediment samples, at activities slightly exceeding background. Americium-241 was not detected above background levels in subsurface sediment, and plutonium-239/240 was not detected above background levels in surface and subsurface sediment. Uranium-235 was only detected above background levels in one subsurface sediment sample.

Several metals were detected above background levels in surface sediment samples, but only aluminum was detected at levels greater than background levels in more than have of the surface sediment samples. All of the metal concentrations were significantly below the WRW ALs. No metals were detected above background in subsurface sediment samples.

Carbon tetrachloride, methylene chloride and toluene were detected above RLs in some surface sediment samples but at levels significantly below the WRW ALs. SVOCs, PCBs and pesticides were not detected above RLs in any of the surface sediment samples.

2.2.8 Pond C-1

Thirteen surface and six subsurface sediment samples were collected at Pond C-1. No soil samples were collected. Five surface and four subsurface sediment samples were analyzed for radionuclides and metals. One surface sediment sample was analyzed for pesticides; one surface sediment sample was analyzed for radionuclides, metals, SVOCs and PCBs; one surface sediment sample was analyzed for radionuclides, metals, VOCs, SVOCs, PCBs and pesticides; two surface sediment samples were analyzed for radionuclides; and three surface sediment samples were analyzed for radionuclides, metals and PCBs. One subsurface sediment sample was analyzed for radionuclides, metals and PCBs; and one subsurface sediment sample was analyzed for radionuclides, metals, SVOCs and PCBs. Results are summarized in Table 3 and shown on Figure 9. All analytical results for sediment samples from Pond C-1 were less than WRW Als.

Americium-241 and plutonium-239/240 were detected above background in one surface sediment sample and in one subsurface sediment sample, at activities significantly less than WRW ALs. The uranium isotopes (-234, -235 and -238) were detected above background in less than half of the surface sediment samples analyzed for radionuclides, and activities were significantly less than WRW ALs. The uranium isotopes were detected above background in more than half of the subsurface sediment samples analyzed for radionuclides, and activities were also significantly less than WRW ALs.

Several metals were detected above background levels in surface and subsurface sediment samples, and most of the metals were detected in more than half of the samples analyzed for metals. The maximum metal concentrations were significantly less than the WRW ALs.

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Several SVOCs were detected above RLs in surface sediment samples, but most of the SVOCs were detected in less than half of the samples analyzed for SVOCs. Also, concentrations greater than RLs were significantly less than WRW ALs. Toluene, a VOC, was detected above the RL in two surface sediment samples at concentrations significantly less than the WRW AL. PCBs were detected above the RL in one surface sediment sample at a concentration significantly less than the WRW AL. No pesticides were detected above RLs in surface sediment samples. Some SVOCs were detected above RLs in subsurface sediment samples but at concentrations significantly less than WRW ALs. No VOCs were detected above RLs in subsurface sediment samples. PCBs were detected in one subsurface sediment sample at a concentration significantly less than the WRW AL.

2.2.9 Pond C-2

Ten surface and two subsurface sediment samples were collected at Pond C-2. No soil samples were collected. Six surface and two subsurface sediment samples were analyzed for radionuclides and metals. One surface sediment sample was analyzed for radionuclides, metals and VOCs; one surface sediment sample was analyzed for PCBs and pesticides; and one surface sediment sample was analyzed for radionuclides, metals, VOCs, SVOCs, PCBs and pesticides. Results are summarized in Table 3 and shown on Figure 10. All analytical results for sediment samples from Pond C-2 were less than WRW ALs.

Americium-241 and plutonium-239/240 were detected above background in six surface sediment samples and in one subsurface sediment sample, at activities significantly less than WRW ALs. Uranium-235 was detected above background in one surface sediment sample, and the detected activity was significantly less than the WRW AL. Uranium isotopes were not detected above background in any of the other surface or subsurface sediment samples analyzed for radionuclides.

Several metals were detected above background levels in surface sediment samples; however, most of the metals were detected in less than half of the samples analyzed for metals. The maximum metal concentrations were significantly less than the WRW ALs. Aluminum was detected above background in one subsurface sediment sample, and the detected concentration was significantly less than the WRW AL. No other metals were detected above background in subsurface sediment samples analyzed for metals.

No SVOCs, PCBs or pesticides were detected above RLs in any of the surface sediment samples analyzed for these contaminants. Toluene was detected above RL in the three surface sediment samples analyzed for VOCs; however, detected concentrations were significantly less than the WRW AL. No other VOCs were detected in the three samples analyzed for VOCs.

2.3 Sums of Ratios

In accordance with IABZSAP (DOE 2004b) DQOs, RFCA sums of ratios (SORs) were calculated for the IHSS Group NE-1 sampling locations based on the analytical data.

Radionuclide SOR calculations include americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238 when results were greater than background means plus two standard deviations. Table 5 presents the radionuclide SORs by pond. All SORs for radionuclides in surface (0 to 3 feet) soil were less than 1.

Table 5
RFCA Radionuclide SORs

Location	Sample Starting Depth (ft)	Sample Ending Depth (ft)	SOR
Pond A-1			
CR53-000	0	0.5	0.04
CS53-000	1.5	3	0.27
CS53-001	0	0.5	0.10
CS53-002	0	0.5	0.04
CS53-002	0.5	2.5	0.12
CS53-003	0	0.5	0.28
SED60092	0	0.5	0.08
SED60092	0	1.5	0.47
SED60192	0	0.5	0.02
SED60192	0	1.17	0.25
SED60292	0	0.5	0.04
SED60292	0	1.42	0.49
SED60392	0	0.5	0.04
SED60392	0	1.25	0.37
Pond A-2			
CV54-000	0	0.5	0.03
CW53-000	0	0.5	0.07
CW53-000	0.5	1.8	0.14
CW54-000	0	0.5	0.06
CW54-000	0.5	2.5	0.06
CW54-000	2.5	4.5	0.06
CW54-000	4.5	6.5	0.05
CW54-002	0	0.5	0.10
SED60692	0	0.5	0.13
SED60792	0	0.5	0.10
SED60792	0	1	0.07
SED60892	0	0.5	0.06
SED60892	0	1.33	0.02
Pond A-3			
DA54-000	0	0.8	0.005
DA55-001	0	0.9	0.006
SED61092	0	2	0.026
SED61192	0	1.33	0.004
SED61292	0	1	0.006
Pond A-4			
Pond A-5			
A50102	0.08	0.17	0.002

Location	Sample Starting Depth (ft)	Sample Ending Depth (ft)	SOR
A50102	2	6	0.002
A50202	0.08	0.17	0.004
A50202	2	6	0.001
Pond B-4			
DB47-000	0	0.5	0.01
DB47-002	0	0.5	0.01
DB47-002	0.5	2.5	0.57
DB47-003	0	0.5	0.04
DB47-004	0	0.5	0.03
DB47-004	0.5	2.5	0.10
SED63592	0	2	0.10
SED63692	0	1.33	0.01
SED63792	0	2	0.01
SED63792	0	2.5	0.12
SED63892	0	2	0.01
SED63892	0	2.75	0.31
SED63992	0	1.67	0.01
Pond B-5			
DF51-000	0.5	2.5	0.030
DG52-000	0	0.8	0.004
SED64392	0	1	0.004
Pond C-1			
CR31-000	0	0.5	0.10
CR31-000	0.5	1.5	0.14
CR31-000	1.5	2.5	0.11
CR31-001	0	0.5	0.12
CR31-001	0.5	1.5	0.13
CR31-001	1.5	2	0.09
CR31-002	0	0.5	0.03
CR31-003	0	0.5	0.13
CR31-005	0	0.5	0.05
CR31-006	0	0.5	0.02
CR31-006	0.5	2	0.05
CR31-008	0	0.5	0.03
SED509	0.5	1	0.01
Pond C-2			
DD31-000	0	0.5	0.04
DE30-000	0	0.5	0.02
DE30-000	0.5	2.5	0.02
DE31-000	0	0.5	0.03
DF29-000	0	0.5	0.01
SED511	0	0.42	0.02
SED512	0	0.33	0.02
SED513	0	0.42	0.03

Nonradionuclide SORs, shown in Table 6, were calculated for all locations with analytical results greater than 10 percent of the WRW ALs, where aluminum, arsenic, iron, manganese, and polycyclic aromatic hydrocarbons (PAHs) are exempted from the 10 percent criterion and the calculation. These analytes are exempted from the calculation because they are ubiquitous across the Site. All nonradionuclide SORs were less than 1.

Table 6
RFCA Nonradionuclide SORs

Location Code	Sample Starting Depth (ft)	Sample Ending Depth (ft)	SOR
Pond A-1	N/A	N/A	N/A
Pond A-2	N/A	N/A	N/A
Pond A-3	N/A	N/A	N/A
Pond A-4			
DG57-000	0	0.5	0.10
SED61692	0	0.33	0.10
Pond A-5	N/A	N/A	N/A
Pond B-4			
DB47-000	0	0.5	0.11
DB47-004	0	0.5	0.10
Pond B-5	N/A	N/A	N/A
Pond C-1			
CR31-000	0	0.5	0.13
CR31-001	0	0.5	0.17
CR31-002	0	0.5	0.17
CR31-003	0	0.5	0.17
CR31-005	0	0.5	0.11
CR31-006	0	0.5	0.11
Pond C-2	N/A	N/A	N/A

2.4 Summary Statistics

Summary statistics for analytes detected at concentrations greater than background means plus two standard deviations or RLs were calculated by analyte and pond for IHSS Group NE-1 surface and subsurface sampling locations as presented in Tables 7 through 15. For radionuclides and metals, only detections greater than background means plus two standard deviations were used to calculate the detection frequency and average concentration. For other analytes, all detections above the RL are included. Summary statistics for the ecological screen are presented in Appendix A and include all results. (Results are not screened against background means plus two standard deviations.)

Table 7
Pond A-1 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Surface Sediment								
Aluminum	4	75.0%	24333.333	25000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	7	100.0%	2.000	6.890	N/A	0.270	76.0	pCi/g
Arsenic	4	75.0%	8.700	9.300	N/A	7.240	22.2	mg/kg
Barium	4	75.0%	213.333	220.000	N/A	188.170	26400.0	mg/kg
Benzo(a)anthracene	4	100.0%	90.000	120.000	28.250	N/A	34900.0	ug/kg
Benzo(a)pyrene	4	75.0%	114.333	150.000	28.000	N/A	3490.0	ug/kg
Benzo(b)fluoranthene	4	100.0%	128.250	180.000	75.000	N/A	34900.0	ug/kg
Benzo(k)fluoranthene	4	75.0%	78.333	100.000	56.000	N/A	349000.0	ug/kg
Chromium	4	50.0%	24.500	25.000	N/A	23.230	268.0	mg/kg
Chrysene	4	100.0%	107.250	150.000	38.250	N/A	3490000.0	ug/kg
Fluoranthene	4	100.0%	215.000	300.000	51.000	N/A	27200000.0	ug/kg
Indeno(1,2,3-cd)pyrene	4	75.0%	67.333	90.000	31.000	N/A	34900.0	ug/kg
Iron	4	75.0%	22666.667	24000.000	N/A	21379.010	307000.0	mg/kg
Nickel	4	75.0%	21.000	22.000	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	8	100.0%	5.882	22.400	N/A	1.350	50.0	pCi/g
Selenium	4	25.0%	1.800	1.800	N/A	1.550	5110.0	mg/kg
Uranium-235	8	12.5%	0.193	0.193	N/A	0.150	8.0	pCi/g
Uranium-238	8	37.5%	4.307	5.352	N/A	3.460	351.0	pCi/g
Vanadium	4	75.0%	50.000	52.000	N/A	46.830	7150.0	mg/kg
Zinc	4	75.0%	130.000	140.000	N/A	104.400	307000.0	mg/kg
Subsurface Sediment								
Acetone	5	20.0%	11.000	11.000	7.200	N/A	102000000.0	ug/kg
Aluminum	7	28.6%	25500.000	29000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	7	85.7%	9.012	13.230	N/A	0.270	76.0	pCi/g
Anthracene	7	14.3%	52.000	52.000	26.000	N/A	204000000.0	ug/kg
Antimony	7	28.6%	30.000	30.400	N/A	13.010	409.0	mg/kg
Aroclor-1254	7	71.4%	1331.000	5200.000	213.360	N/A	12400.0	ug/kg
Aroclor-1260	7	14.3%	150.000	150.000	2.200	N/A	12400.0	ug/kg
Arsenic	7	28.6%	7.600	7.700	N/A	7.240	22.2	mg/kg
Barium	7	57.1%	200.750	230.000	N/A	188.170	26400.0	mg/kg
Benzo(a)anthracene	7	14.3%	190.000	190.000	30.000	N/A	34900.0	ug/kg
Benzo(a)pyrene	7	14.3%	210.000	210.000	30.000	N/A	3490.0	ug/kg
Benzo(b)fluoranthene	7	14.3%	260.000	260.000	80.000	N/A	34900.0	ug/kg
Benzo(k)fluoranthene	7	14.3%	120.000	120.000	60.000	N/A	349000.0	ug/kg
bis(2-Ethylhexyl)phthalate	7	14.3%	230.000	230.000	47.000	N/A	1970000.0	ug/kg
Cadmium	7	42.9%	4.567	8.300	N/A	1.880	962.0	mg/kg
Chromium	7	28.6%	29.000	30.000	N/A	23.230	268.0	mg/kg
Chrysene	7	14.3%	220.000	220.000	41.000	N/A	3490000.0	ug/kg
Cobalt	7	14.3%	13.000	13.000	N/A	12.300	1550.0	mg/kg
Copper	7	57.1%	33.075	43.000	N/A	27.270	40900.0	mg/kg
Fluoranthene	7	28.6%	650.000	790.000	357.000	N/A	27200000.0	ug/kg
Indeno(1,2,3-cd)pyrene	7	28.6%	175.000	210.000	33.500	N/A	34900.0	ug/kg
Iron	7	14.3%	23000.000	23000.000	N/A	21379.010	307000.0	mg/kg

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Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Mercury	7	57.1%	0.413	0.470	N/A	0.340	25200.0	mg/kg
Methylene chloride	5	20.0%	3.700	3.700	1.300	N/A	2530000.0	ug/kg
Nickel	7	42.9%	24.133	26.400	N/A	17.890	20400.0	mg/kg
Phenol	7	14.3%	54.000	54.000	53.000	N/A	613000000.0	ug/kg
Plutonium-239/240	7	85.7%	23.345	36.200	N/A	1.350	50.0	pCi/g
Pyrene	7	14.3%	710.000	710.000	660.000	N/A	22100000.0	ug/kg
Selenium	7	14.3%	1.600	1.600	N/A	1.550	5110.0	mg/kg
Toluene	5	80.0%	174.250	280.000	5.000	N/A	31300000.0	ug/kg
Uranium-235	7	14.3%	0.352	0.352	N/A	0.150	8.0	pCi/g
Uranium-238	7	14.3%	4.060	4.060	N/A	3.460	351.0	pCi/g
Vanadium	7	14.3%	57.000	57.000	N/A	46.830	7150.0	mg/kg
Zinc	7	57.1%	119.250	140.000	N/A	104.400	307000.0	mg/kg
1,2,3,4,6,7,8-HpCDF	1	100.0%	29.800	29.800	1.840	N/A	N/A	pg/g
1,2,3,6,7,8-HxCDD	1	100.0%	4.550	4.550	1.840	N/A	N/A	pg/g
1,2,3,7,8,9-HxCDD	1	100.0%	3.290	3.290	1.840	N/A	N/A	pg/g
1,2,3,7,8-PeCDF	1	100.0%	1.970	1.970	1.840	N/A	N/A	pg/g
1234678-HpCDD	1	100.0%	94.600	94.600	1.840	N/A	N/A	pg/g
123478-HxCDF	1	100.0%	3.710	3.710	1.840	N/A	N/A	pg/g
1234789-HpCDF	1	100.0%	2.430	2.430	1.840	N/A	N/A	pg/g
123678-HxCDF	1	100.0%	2.500	2.500	1.840	N/A	N/A	pg/g
2,3,4,6,7,8-HxCDF	1	100.0%	1.990	1.990	1.840	N/A	N/A	pg/g
2,3,7,8-TCDF	1	100.0%	6.120	6.120	0.735	N/A	N/A	pg/g
23478-PeCDF	1	100.0%	4.290	4.290	1.840	N/A	N/A	pg/g
Dioxin	1	100.0%	2.780	2.780	0.735	N/A	N/A	pg/g
O8CDD	1	100.0%	539.000	539.000	3.680	N/A	N/A	pg/g
OCDF	1	100.0%	40.900	40.900	3.680	N/A	N/A	pg/g
Subsurface Soil								
2-Butanone	3	33.3%	9.800	9.800	5.600	N/A	192000000.0	ug/kg
Acetone	3	100.0%	43.333	94.000	5.367	N/A	102000000.0	ug/kg
Cadmium	3	66.7%	2.050	2.300	N/A	1.700	962.0	mg/kg
Carbon Disulfide	3	33.3%	2.500	2.500	1.100	N/A	15100000.0	ug/kg
Cobalt	3	33.3%	55.000	55.000	N/A	29.040	1550.0	mg/kg
Iron	3	66.7%	97500.000	110000.000	N/A	41046.520	307000.0	mg/kg
Manganese	3	33.3%	1400.000	1400.000	N/A	901.620	3480.0	mg/kg
Methylene chloride	3	100.0%	2.467	2.700	0.937	N/A	2530000.0	ug/kg
Nickel	3	33.3%	190.000	190.000	N/A	62.210	20400.0	mg/kg
Toluene	3	33.3%	0.980	0.980	0.910	N/A	31300000.0	ug/kg
Uranium, Total	3	33.3%	5.700	5.700	N/A	3.040	2750.0	mg/kg
Zinc	3	33.3%	300.000	300.000	N/A	139.100	307000.0	mg/kg
O8CDD	3	33.3%	3.790	3.790	2.800	N/A	N/A	pg/g

Table 8
Pond A-2 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Surface Sediment								
2-Butanone	3	33.3%	34.000	34.000	20.000	N/A	192000000.0	ug/kg
Acenaphthene	6	16.7%	180.000	180.000	18.000	N/A	40800000.0	ug/kg
Acetone	3	33.3%	230.000	230.000	20.000	N/A	102000000.0	ug/kg
Aluminum	6	33.3%	24000.000	26000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	9	88.9%	1.399	1.987	N/A	0.270	76.0	pCi/g
Anthracene	6	16.7%	210.000	210.000	18.000	N/A	204000000.0	ug/kg
Arsenic	6	33.3%	10.500	11.000	N/A	7.240	22.2	mg/kg
Barium	6	33.3%	255.000	260.000	N/A	188.170	26400.0	mg/kg
Benzo(a)anthracene	6	16.7%	52.000	52.000	21.000	N/A	34900.0	ug/kg
Benzo(a)pyrene	6	16.7%	51.000	51.000	21.000	N/A	3490.0	ug/kg
Benzo(b)fluoranthene	6	16.7%	64.000	64.000	56.000	N/A	34900.0	ug/kg
bis(2-Ethylhexyl)phthalate	6	66.7%	1485.000	4200.000	302.000	N/A	1970000.0	ug/kg
Chromium	6	33.3%	25.000	26.000	N/A	23.230	268.0	mg/kg
Chrysene	6	16.7%	60.000	60.000	28.000	N/A	3490000.0	ug/kg
Copper	6	33.3%	29.000	30.000	N/A	27.270	40900.0	mg/kg
Fluoranthene	6	16.7%	89.000	89.000	38.000	N/A	27200000.0	ug/kg
Indeno(1,2,3-cd)pyrene	6	16.7%	210.000	210.000	23.000	N/A	34900.0	ug/kg
Iron	6	33.3%	26000.000	28000.000	N/A	21379.010	307000.0	mg/kg
Manganese	6	16.7%	1100.000	1100.000	N/A	659.220	3480.0	mg/kg
Methylene chloride	3	33.3%	9.300	9.300	3.500	N/A	2530000.0	ug/kg
Nickel	6	33.3%	21.500	22.000	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	9	88.9%	4.334	7.426	N/A	1.350	50.0	pCi/g
Strontium	6	16.7%	220.000	220.000	N/A	201.440	613000.0	mg/kg
Toluene	3	66.7%	755.000	860.000	5.000	N/A	31300000.0	ug/kg
Uranium-235	9	33.3%	0.214	0.285	N/A	0.150	8.0	pCi/g
Uranium-238	9	66.7%	5.152	6.100	N/A	3.460	351.0	pCi/g
Vanadium	6	33.3%	56.500	58.000	N/A	46.830	7150.0	mg/kg
Zinc	6	33.3%	110.000	110.000	N/A	104.400	307000.0	mg/kg
1234678-HpCDD	1	100.0%	19.900	19.900	2.860	N/A	N/A	pg/g
O8CDD	1	100.0%	161.000	161.000	5.710	N/A	N/A	pg/g
OCDF	1	100.0%	8.830	8.830	5.710	N/A	N/A	pg/g
Subsurface Sediment								
2-Butanone	3	33.3%	71.000	71.000	14.000	N/A	192000000.0	ug/kg
Acetone	3	100.0%	245.667	400.000	45.000	N/A	102000000.0	ug/kg
Aluminum	4	75.0%	34000.000	49000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	3	100.0%	2.077	3.470	N/A	0.270	76.0	pCi/g
Aroclor-1254	4	50.0%	35.000	36.000	25.000	N/A	12400.0	ug/kg
Arsenic	4	75.0%	10.500	12.000	N/A	7.240	22.2	mg/kg
Barium	4	75.0%	316.667	390.000	N/A	188.170	26400.0	mg/kg
Benzo(a)pyrene	4	25.0%	80.000	80.000	48.000	N/A	3490.0	ug/kg
Benzoic Acid	4	25.0%	2700.000	2700.000	1300.000	N/A	1000000000.0	ug/kg

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Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
bis(2-Ethylhexyl)phthalate	4	100.0%	13927.500	47000.000	372.500	N/A	1970000.0	ug/kg
Cadmium	4	25.0%	3.200	3.200	N/A	1.880	962.0	mg/kg
Chromium	4	75.0%	37.000	44.000	N/A	23.230	268.0	mg/kg
Chrysene	4	25.0%	81.000	81.000	65.000	N/A	3490000.0	ug/kg
Cobalt	4	25.0%	15.000	15.000	N/A	12.300	1550.0	mg/kg
Copper	4	75.0%	45.667	56.000	N/A	27.270	40900.0	mg/kg
Fluoranthene	4	25.0%	140.000	140.000	87.000	N/A	27200000.0	ug/kg
Iron	4	75.0%	30666.667	39000.000	N/A	21379.010	307000.0	mg/kg
Lithium	4	25.0%	37.000	37.000	N/A	29.670	20400.0	mg/kg
Manganese	4	50.0%	825.000	900.000	N/A	659.220	3480.0	mg/kg
Methylene chloride	3	66.7%	6.650	7.700	3.050	N/A	2530000.0	ug/kg
Nickel	4	100.0%	27.575	34.000	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	4	100.0%	5.230	10.500	N/A	1.350	50.0	pCi/g
Silver	4	25.0%	3.900	3.900	N/A	2.280	5110.0	mg/kg
Strontium	4	25.0%	220.000	220.000	N/A	201.440	613000.0	mg/kg
Uranium-238	4	25.0%	4.530	4.530	N/A	3.460	351.0	pCi/g
Vanadium	4	75.0%	69.333	96.000	N/A	46.830	7150.0	mg/kg
Zinc	4	75.0%	153.333	170.000	N/A	104.400	307000.0	mg/kg
1234678-HpCDD	2	50.0%	19.800	19.800	4.740	N/A	N/A	pg/g
O8CDD	2	100.0%	65.900	114.000	8.930	N/A	N/A	pg/g
Subsurface Soil								
2-Butanone	2	50.0%	12.000	12.000	6.400	N/A	192000000.0	ug/kg
Acetone	2	100.0%	43.000	52.000	5.750	N/A	102000000.0	ug/kg
Americium-241	2	50.0%	1.400	1.400	N/A	0.020	76.0	pCi/g
bis(2-Ethylhexyl)phthalate	2	50.0%	250.000	250.000	96.000	N/A	1970000.0	ug/kg
Methylene chloride	2	100.0%	2.650	2.700	1.000	N/A	2530000.0	ug/kg
Plutonium-239/240	2	50.0%	2.610	2.610	N/A	0.020	50.0	pCi/g
Uranium-238	2	50.0%	2.070	2.070	N/A	1.490	351.0	pCi/g
O8CDD	2	50.0%	8.350	8.350	3.330	N/A	N/A	pg/g

Table 9
Pond A-3 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Surface Sediment								
Aluminum	4	100.0%	21750.000	25000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	4	50.0%	0.421	0.477	N/A	0.270	76.0	pCi/g
Arsenic	4	50.0%	7.550	7.600	N/A	7.240	22.2	mg/kg
Barium	4	25.0%	200.000	200.000	N/A	188.170	26400.0	mg/kg
Chromium	4	25.0%	25.000	25.000	N/A	23.230	268.0	mg/kg
Iron	4	25.0%	22000.000	22000.000	N/A	21379.010	307000.0	mg/kg
Nickel	4	100.0%	19.500	21.000	N/A	17.890	20400.0	mg/kg
Selenium	4	25.0%	1.800	1.800	N/A	1.550	5110.0	mg/kg
Vanadium	4	50.0%	51.000	53.000	N/A	46.830	7150.0	mg/kg

Zinc	4	100.0%	245.000	540.000	N/A	104.400	307000.0	mg/kg
Subsurface Sediment								
Aluminum	4	75.0%	24366.667	27400.000	N/A	15713.070	228000.0	mg/kg
Americium-241	4	75.0%	0.474	0.666	N/A	0.270	76.0	pCi/g
Antimony	3	33.3%	26.000	26.000	N/A	13.010	409.0	mg/kg
Arsenic	4	50.0%	7.650	7.800	N/A	7.240	22.2	mg/kg
Barium	4	25.0%	192.000	192.000	N/A	188.170	26400.0	mg/kg
Chromium	4	50.0%	27.900	29.900	N/A	23.230	268.0	mg/kg
Cobalt	4	50.0%	14.700	15.500	N/A	12.300	1550.0	mg/kg
Iron	4	75.0%	24000.000	25000.000	N/A	21379.010	307000.0	mg/kg
Nickel	4	50.0%	22.650	25.600	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	4	25.0%	2.053	2.053	N/A	1.350	50.0	pCi/g
Toluene	4	100.0%	32.500	62.000	5.000	N/A	31300000.0	ug/kg
Vanadium	4	75.0%	56.800	62.700	N/A	46.830	7150.0	mg/kg
Zinc	4	100.0%	138.750	155.000	N/A	104.400	307000.0	mg/kg

Table 10
Pond A-4 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Surface Sediment								
Aluminum	9	66.7%	19800.000	26000.000	N/A	15713.070	228000.0	mg/kg
Antimony	9	33.3%	32.000	41.400	N/A	13.010	409.0	mg/kg
Arsenic	9	22.2%	9.500	10.200	N/A	7.240	22.2	mg/kg
Barium	9	33.3%	202.000	206.000	N/A	188.170	26400.0	mg/kg
bis(2-Ethylhexyl)phthalate	4	25.0%	950.000	950.000	660.000	N/A	1970000.0	ug/kg
Cadmium	9	11.1%	3.100	3.100	N/A	1.880	962.0	mg/kg
Chromium	9	22.2%	25.400	27.000	N/A	23.230	268.0	mg/kg
Cobalt	9	22.2%	13.500	13.900	N/A	12.300	1550.0	mg/kg
Copper	9	11.1%	33.400	33.400	N/A	27.270	40900.0	mg/kg
Iron	9	22.2%	22450.000	22900.000	N/A	21379.010	307000.0	mg/kg
Nickel	9	44.4%	22.425	25.500	N/A	17.890	20400.0	mg/kg
Selenium	9	33.3%	1.733	1.900	N/A	1.550	5110.0	mg/kg
Toluene	4	50.0%	6.500	8.000	5.000	N/A	31300000.0	ug/kg
Vanadium	9	22.2%	58.350	59.000	N/A	46.830	7150.0	mg/kg
Zinc	9	33.3%	131.333	169.000	N/A	104.400	307000.0	mg/kg
Subsurface Sediment								
Aluminum	3	33.3%	23000.000	23000.000	N/A	15713.070	228000.0	mg/kg
Arsenic	3	33.3%	7.300	7.300	N/A	7.240	22.2	mg/kg
Barium	3	66.7%	195.000	200.000	N/A	188.170	26400.0	mg/kg
Chromium	3	33.3%	25.000	25.000	N/A	23.230	268.0	mg/kg
Iron	3	33.3%	55000.000	55000.000	N/A	21379.010	307000.0	mg/kg
Nickel	3	33.3%	18.000	18.000	N/A	17.890	20400.0	mg/kg
Vanadium	3	33.3%	53.000	53.000	N/A	46.830	7150.0	mg/kg

Table 11
Pond A-5 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Surface Sediment								
Acetone	4	25.0%	210.000	210.000	100.000		102000000.0	ug/kg
Aluminum	7	28.6%	19000.000	21000.000	N/A	15713.070	228000.0	mg/kg
Barium	7	14.3%	220.000	220.000	N/A	188.170	26400.0	mg/kg
Cobalt	7	14.3%	13.300	13.300	N/A	12.300	1550.0	mg/kg
Iron	7	14.3%	22000.000	22000.000	N/A	21379.010	307000.0	mg/kg
Nickel	7	28.6%	18.550	19.000	N/A	17.890	20400.0	mg/kg
Toluene	4	75.0%	16.333	18.000	5.000	N/A	31300000.0	ug/kg
Zinc	7	14.3%	130.000	130.000	N/A	104.400	307000.0	mg/kg
Subsurface Sediment								
Aluminum	3	33.3%	17000.000	17000.000	N/A	15713.070	228000.0	mg/kg
Toluene	2	50.0%	16.000	16.000	5.000	N/A	31300000.0	ug/kg
Surface Soil								
Americium-241	2	50.0%	0.122	0.122	N/A	0.023	76.0	pCi/g
Cadmium	8	25.0%	1.665	1.700	N/A	1.612	962.0	mg/kg
Iron	8	12.5%	20800.000	20800.000	N/A	18037.000	307000.0	mg/kg
Lithium	8	50.0%	12.100	13.100	N/A	11.550	20400.0	mg/kg
Nickel	8	37.5%	17.000	18.200	N/A	14.910	20400.0	mg/kg
Plutonium-239/240	2	100.0%	0.262	0.285	N/A	0.066	50.0	pCi/g
Strontium	8	25.0%	54.350	56.000	N/A	48.940	613000.0	mg/kg

Table 12
Pond B-4 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Surface Sediment								
Acenaphthene	5	0.20	110.000	110.000	38.000	N/A	40800000.0	ug/kg
Aluminum	5	0.60	22000.000	29000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	5	0.60	0.598	0.760	N/A	0.270	76.0	pCi/g
Anthracene	5	0.40	106.500	140.000	35.000	N/A	204000000.0	ug/kg
Aroclor-1254	10	0.10	160.000	160.000	12.000	N/A	12400.0	ug/kg
Arsenic	5	0.60	8.067	8.700	N/A	7.240	22.2	mg/kg
Barium	5	0.60	210.000	220.000	N/A	188.170	26400.0	mg/kg
Benzo(a)anthracene	5	0.60	206.667	300.000	41.667	N/A	34900.0	ug/kg
Benzo(a)pyrene	5	0.40	305.000	320.000	41.500	N/A	3490.0	ug/kg
Benzo(b)fluoranthene	5	0.40	250.000	270.000	110.000	N/A	34900.0	ug/kg
Benzo(k)fluoranthene	5	0.40	290.000	310.000	82.500	N/A	349000.0	ug/kg
bis(2-Ethylhexyl)phthalate	5	0.80	460.000	710.000	76.000	N/A	1970000.0	ug/kg
Chromium	5	0.40	28.000	29.000	N/A	23.230	268.0	mg/kg
Chrysene	5	0.60	251.333	350.000	56.333	N/A	3490000.0	ug/kg
Copper	5	0.40	31.500	32.000	N/A	27.270	40900.0	mg/kg

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Dibenz(a,h)anthracene	5	0.40	78.500	92.000	39.500	N/A	3490.0	ug/kg
Fluoranthene	5	0.60	500.000	750.000	75.000	N/A	27200000.0	ug/kg
Fluorene	5	0.20	94.000	94.000	41.000	N/A	40800000.0	ug/kg
Indeno(1,2,3-cd)pyrene	5	0.40	175.000	200.000	45.500	N/A	34900.0	ug/kg
Iron	5	0.40	23500.000	24000.000	N/A	21379.010	307000.0	mg/kg
Nickel	5	0.60	20.000	23.000	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	5	0.20	2.060	2.060	N/A	1.350	50.0	pCi/g
Pyrene	5	0.40	640.000	700.000	270.000	N/A	22100000.0	ug/kg
Selenium	5	0.20	1.800	1.800	N/A	1.550	5110.0	mg/kg
Silver	5	0.40	2.900	3.100	N/A	2.280	5110.0	mg/kg
Vanadium	5	0.40	57.000	63.000	N/A	46.830	7150.0	mg/kg
Zinc	5	1.00	288.000	510.000	N/A	104.400	307000.0	mg/kg
Subsurface Sediment								
Aluminum	17	0.35	20833.333	29000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	17	0.76	8.265	56.500	N/A	0.270	76.0	pCi/g
Anthracene	17	0.18	185.000	420.000	41.000	N/A	204000000.0	ug/kg
Antimony	13	0.15	25.150	25.600	N/A	13.010	409.0	mg/kg
Aroclor-1254	17	0.41	921.429	3100.000	169.714	N/A	12400.0	ug/kg
Arsenic	17	0.41	8.086	9.100	N/A	7.240	22.2	mg/kg
Barium	17	0.29	199.200	230.000	N/A	188.170	26400.0	mg/kg
Benzo(a)anthracene	17	0.41	234.000	360.000	42.429	N/A	34900.0	ug/kg
Benzo(a)pyrene	17	0.41	312.857	490.000	42.429	N/A	3490.0	ug/kg
Benzo(b)fluoranthene	17	0.82	689.286	1500.000	386.357	N/A	34900.0	ug/kg
Benzo(k)fluoranthene	17	0.29	360.000	540.000	223.600	N/A	349000.0	ug/kg
bis(2-Ethylhexyl)phthalate	17	0.76	4434.615	25000.000	403.308	N/A	1970000.0	ug/kg
Cadmium	17	0.24	12.950	44.000	N/A	1.880	962.0	mg/kg
Chromium	17	0.24	54.025	140.000	N/A	23.230	268.0	mg/kg
Chrysene	17	0.41	382.857	610.000	56.429	N/A	3490000.0	ug/kg
Copper	17	0.41	45.386	120.000	N/A	27.270	40900.0	mg/kg
Dibenz(a,h)anthracene	17	0.06	110.000	110.000	31.000	N/A	3490.0	ug/kg
Fluoranthene	17	0.88	950.000	1400.000	387.333	N/A	27200000.0	ug/kg
gamma-BHC	7	0.14	25.000	25.000	8.000	N/A	25500.0	ug/kg
Indeno(1,2,3-cd)pyrene	17	0.35	189.667	280.000	38.667	N/A	34900.0	ug/kg
Iron	17	0.06	22000.000	22000.000	N/A	21379.010	307000.0	mg/kg
Lead	17	0.06	110.000	110.000	N/A	95.600	1000.0	mg/kg
Mercury	17	0.06	1.700	1.700	N/A	0.340	25200.0	mg/kg
Nickel	17	0.47	20.788	31.000	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	16	0.56	40.100	217.000	N/A	1.350	50.0	pCi/g
Pyrene	17	0.76	832.308	1200.000	486.923	N/A	22100000.0	ug/kg
Selenium	17	0.06	3.600	3.600	N/A	1.550	5110.0	mg/kg
Silver	17	0.41	464.586	3100.000	N/A	2.280	5110.0	mg/kg
Toluene	5	0.60	131.667	360.000	5.000	N/A	31300000.0	ug/kg
Uranium-234	17	0.12	5.690	6.040	N/A	3.980	300.0	pCi/g
Uranium-238	17	0.12	7.135	8.510	N/A	3.460	351.0	pCi/g
Vanadium	17	0.12	55.000	55.000	N/A	46.830	7150.0	mg/kg
Zinc	17	0.76	212.615	410.000	N/A	104.400	307000.0	mg/kg

Table 13
Pond B-5 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Background	WRW AL	Unit
Surface Sediment								
Aluminum	12	58.3%	19100.000	24000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	10	20.0%	0.321	0.337	N/A	0.270	76.0	pCi/g
Arsenic	12	25.0%	8.067	8.600	N/A	7.240	22.2	mg/kg
Barium	12	16.7%	217.000	240.000	N/A	188.170	26400.0	mg/kg
Carbon Tetrachloride	7	28.6%	415.000	440.000	5.000	N/A	81500.0	ug/kg
Chromium	12	16.7%	26.500	27.000	N/A	23.230	268.0	mg/kg
Copper	12	16.7%	28.950	29.900	N/A	27.270	40900.0	mg/kg
Iron	12	8.3%	22000.000	22000.000	N/A	21379.010	307000.0	mg/kg
Methylene chloride	7	28.6%	415.000	420.000	5.000	N/A	2530000.0	ug/kg
Nickel	12	50.0%	19.883	23.800	N/A	17.890	20400.0	mg/kg
Selenium	12	8.3%	1.600	1.600	N/A	1.550	5110.0	mg/kg
Tin	12	8.3%	39.500	39.500	N/A	29.270	613000.0	mg/kg
Toluene	6	83.3%	24.400	47.000	5.000	N/A	31300000.0	ug/kg
Vanadium	12	25.0%	49.600	51.000	N/A	46.830	7150.0	mg/kg
Zinc	12	41.7%	161.200	240.000	N/A	104.400	307000.0	mg/kg
Subsurface Sediment								
Uranium-235	2	50.0%	0.243	0.243	N/A	0.150	8.0	pCi/g

Table 14
Pond C-1 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Surface Sediment								
2,4-Dinitrophenol	5	20.0%	890.000	890.000	270.000	N/A	2040000.0	ug/kg
4,6-Dinitro-2-methylphenol	5	20.0%	750.000	750.000	350.000	N/A	1020000.0	ug/kg
Acenaphthene	5	40.0%	197.000	320.000	33.500	N/A	40800000.0	ug/kg
Aluminum	6	66.7%	26250.000	31000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	11	9.1%	0.442	0.442	N/A	0.270	76.0	pCi/g
Anthracene	5	80.0%	332.500	450.000	36.250	N/A	204000000.0	ug/kg
Aroclor-1254	6	16.7%	94.000	94.000	14.000	N/A	12400.0	ug/kg
Arsenic	10	20.0%	9.500	10.100	N/A	7.240	22.2	mg/kg
Barium	10	100.0%	489.700	857.000	N/A	188.170	26400.0	mg/kg
Benzo(a)anthracene	5	60.0%	133.000	190.000	40.333	N/A	34900.0	ug/kg
Benzo(a)pyrene	5	40.0%	118.000	170.000	39.500	N/A	3490.0	ug/kg
Benzo(b)fluoranthene	5	40.0%	175.000	180.000	115.000	N/A	34900.0	ug/kg
Benzo(k)fluoranthene	5	20.0%	150.000	150.000	87.000	N/A	349000.0	ug/kg
Chromium	10	70.0%	36.429	45.300	N/A	23.230	268.0	mg/kg
Chrysene	5	60.0%	128.333	190.000	55.000	N/A	3490000.0	ug/kg
Cobalt	10	20.0%	13.000	13.000	N/A	12.300	1550.0	mg/kg

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Copper	10	70.0%	49.186	83.500	N/A	27.270	40900.0	mg/kg
Dibenz(a,h)anthracene	4	25.0%	530.000	530.000	41.000	N/A	3490.0	ug/kg
Fluoranthene	5	60.0%	190.000	330.000	73.333	N/A	27200000.0	ug/kg
Indeno(1,2,3-cd)pyrene	5	40.0%	420.000	500.000	44.000	N/A	34900.0	ug/kg
Iron	10	90.0%	32400.000	43400.000	N/A	21379.010	307000.0	mg/kg
Manganese	10	30.0%	821.333	970.000	N/A	659.220	3480.0	mg/kg
Mercury	6	33.3%	1.450	1.600	N/A	0.340	25200.0	mg/kg
Nickel	10	90.0%	29.822	49.400	N/A	17.890	20400.0	mg/kg
Pentachlorophenol	5	20.0%	950.000	950.000	240.000	N/A	162000.0	ug/kg
Plutonium-239/240	11	9.1%	2.200	2.200	N/A	1.350	50.0	pCi/g
Pyrene	5	20.0%	310.000	310.000	270.000	N/A	22100000.0	ug/kg
Selenium	9	66.7%	3.067	3.930	N/A	1.550	5110.0	mg/kg
Strontium	10	40.0%	302.750	378.000	N/A	201.440	613000.0	mg/kg
Toluene	2	100.0%	450.000	520.000	5.000	N/A	31300000.0	ug/kg
Uranium-234	11	36.4%	6.750	8.900	N/A	3.980	300.0	pCi/g
Uranium-235	11	45.5%	0.448	0.590	N/A	0.150	8.0	pCi/g
Uranium-238	11	36.4%	6.750	8.900	N/A	3.460	351.0	pCi/g
Vanadium	10	60.0%	112.000	198.000	N/A	46.830	7150.0	mg/kg
Zinc	10	70.0%	133.714	176.000	N/A	104.400	307000.0	mg/kg
Subsurface Sediment								
Acenaphthene	2	50.0%	360.000	360.000	35.000	N/A	40800000.0	ug/kg
Aluminum	2	50.0%	32000.000	32000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	7	14.3%	0.275	0.275	N/A	0.270	76.0	pCi/g
Anthracene	2	50.0%	410.000	410.000	35.000	N/A	204000000.0	ug/kg
Aroclor-1254	2	50.0%	120.000	120.000	8.200	N/A	12400.0	ug/kg
Arsenic	6	66.7%	11.330	14.500	N/A	7.240	22.2	mg/kg
Barium	6	83.3%	679.600	880.000	N/A	188.170	26400.0	mg/kg
Benzo(a)anthracene	2	100.0%	71.000	83.000	33.000	N/A	34900.0	ug/kg
Benzo(a)pyrene	2	50.0%	79.000	79.000	41.000	N/A	3490.0	ug/kg
bis(2-Ethylhexyl)phthalate	2	50.0%	130.000	130.000	39.000	N/A	1970000.0	ug/kg
Chromium	6	83.3%	35.560	40.800	N/A	23.230	268.0	mg/kg
Chrysene	2	100.0%	70.500	81.000	45.000	N/A	3490000.0	ug/kg
Copper	6	66.7%	52.050	59.300	N/A	27.270	40900.0	mg/kg
Fluoranthene	2	100.0%	125.000	130.000	60.000	N/A	27200000.0	ug/kg
Indeno(1,2,3-cd)pyrene	2	50.0%	400.000	400.000	46.000	N/A	34900.0	ug/kg
Iron	6	83.3%	34260.000	37100.000	N/A	21379.010	307000.0	mg/kg
Nickel	6	83.3%	38.400	46.000	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	7	14.3%	1.400	1.400	N/A	1.350	50.0	pCi/g
Selenium	6	33.3%	2.030	2.240	N/A	1.550	5110.0	mg/kg
Strontium	6	66.7%	207.750	217.000	N/A	201.440	613000.0	mg/kg
Uranium-234	7	57.1%	9.600	13.000	N/A	3.980	300.0	pCi/g
Uranium-235	7	71.4%	0.446	0.500	N/A	0.150	8.0	pCi/g
Uranium-238	7	57.1%	9.600	13.000	N/A	3.460	351.0	pCi/g
Vanadium	6	83.3%	130.000	155.000	N/A	46.830	7150.0	mg/kg

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Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Zinc	6	83.3%	139.600	157.000	N/A	104.400	307000.0	mg/kg

Table 15
Pond C-2 Summary Statistics

Analyte	No. of Samples	Detection Frequency	Average Result	Maximum Result	RL	Back-ground	WRW AL	Unit
Surface Sediment								
Aluminum	8	25.0%	22000.000	22000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	8	75.0%	0.394	0.727	N/A	0.270	76.0	pCi/g
Arsenic	8	25.0%	8.750	9.800	N/A	7.240	22.2	mg/kg
Barium	8	25.0%	223.000	226.000	N/A	188.170	26400.0	mg/kg
Chromium	8	12.5%	25.000	25.000	N/A	23.230	268.0	mg/kg
Copper	8	12.5%	35.900	35.900	N/A	27.270	40900.0	mg/kg
Iron	8	25.0%	25500.000	29000.000	N/A	21379.010	307000.0	mg/kg
Mercury	8	37.5%	0.660	0.680	N/A	0.340	25200.0	mg/kg
Nickel	8	62.5%	18.820	21.000	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	8	75.0%	2.088	2.960	N/A	1.350	50.0	pCi/g
Toluene	3	100.0%	373.333	410.000	5.000	N/A	31300000.0	ug/kg
Uranium-235	5	20.0%	0.219	0.219	N/A	0.150	8.0	pCi/g
Vanadium	8	12.5%	50.000	50.000	N/A	46.830	7150.0	mg/kg
Zinc	8	37.5%	163.667	201.000	N/A	104.400	307000.0	mg/kg
Subsurface Sediment								
Aluminum	3	33.3%	21000.000	21000.000	N/A	15713.070	228000.0	mg/kg
Americium-241	3	33.3%	0.305	0.305	N/A	0.270	76.0	pCi/g
Nickel	3	33.3%	20.000	20.000	N/A	17.890	20400.0	mg/kg
Plutonium-239/240	3	33.3%	1.640	1.640	N/A	1.350	50.0	pCi/g

3.0 RCRA UNIT CLOSURE

The ponds are not RCRA Units; therefore, RCRA Unit information is not applicable.

4.0 SUBSURFACE SOIL RISK SCREEN

Although the Subsurface Soil Risk Screen (SSRS) generally applies to soil, the RFCA parties have agreed that this analysis should also apply to sediment. The SSRS follows the steps identified on Figure 3 in Attachment 5 of RFCA (DOE et al. 2003). Screens 2 and 3 are omitted when all Contaminant of Concern (COC) concentrations are below WRW ALs.

Screen 1 – Are the COC concentrations below RFCA Table 3 WRW Soil ALs?

No. As shown in Table 3, all COC concentrations or activities are less than the WRW ALs with the exception of one subsurface sediment sample in Pond B-4, which had

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plutonium-239/240 activity of 217 pCi/g in a sample collected at a depth of 2.5 to 3.9 ft bgs.

Screen 2 – Is there a potential for subsurface soil to become surface soil?

Given that all of the ponds, including B-4, are currently configured as low-energy ponds favoring ongoing sedimentation (not erosion), it is not likely that subsurface sediment at currently at depths exceeding 2.5 feet bgs will become surface sediment.

Screen 3 – Does subsurface soil radiological contamination exceed the criteria in Section 5.3 of Attachment 14?

No. The contamination consists only of one detection of plutonium-239/240 at an activity of 217 pCi/g. Furthermore, Attachment 14 is applicable to subsurface soil associated with OPWL, and there are no OPWLs associated with Pond B-4, where this detection occurred.

Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause an exceedance of the surface water standards?

An environmental pathway to surface water is inherent to the ponds; however, the quantity of COCs at IHSS Group NE-1 is very low. The only COCs with concentrations exceeding 10 percent of the WRW ALs in Ponds A-1, A-2, A-3, A-4, A-5, B-4, B-5, C-1, and C-2 are aluminum, arsenic, chromium, iron, and manganese. These COCs with levels that exceeded 10 percent of the WRW ALs in subsurface soil or sediment are listed in Table 16.

Table 16
COCs with Concentrations Greater Than 10 Percent of the WRW AL

Analyte	Number of Locations	Maximum Detection	Depth (ft)	Background	WRW AL	Unit
Aluminum	5	49000	2.5-4.5	15713.07	228000	mg/kg
Arsenic	9	12	0.5-2.5	7.24	22.2	mg/kg
Chromium	3	44	2.5-4.5	23.23	268	mg/kg
Iron	1	39000	2.5-4.5	21379.01	307000	mg/kg
Manganese	1	900	2.5-4.5	659.22	3480	mg/kg

As shown in Table 16, the contaminant concentrations in these ponds are low compared to WRW ALs and generally only slightly greater than background or RLs. Additionally, all radionuclide activities at depths greater than 3 ft were less than 10 percent of their respective WRW ALs.

Contaminant migration via erosion from a significant storm event or flooding is a possible pathway whereby surface water could be affected by IHSS Group NE-1 pond sediment and soil. However, the ponds are configured to protect off-site water sources. Water retained in the terminal ponds is routinely sampled and is released only after it is determined that the results meet applicable surface water standards. Erosion of the pond sediments by a large influx of water (from a storm) is not likely because the ponds are

currently, and are expected to remain, as low-energy ponds. The quantity of water available for these ponds is expected to decrease after Site closure. Additionally, predictions of contaminant migration based on integration of the Water Erosion Prediction Project (WEPP) (USDA 1995) and Hydraulic Engineering Center (HEC)-6T (Thomas 1999) models are conservative. Site empirical data indicate contaminant migration is less than model predictions. Additional details can be found in the Report on Soil Erosion and Surface Water Sediment Transport Modeling for Actinide Migration Evaluations (DOE 2000).

Although it is possible that contaminants from IHSS Group NE-1 could enter groundwater via dissolution in infiltrating precipitation, the impact would be minimal because the amount of contamination present is minimal. Groundwater beneath IHSS Group NE-1 is contaminated with VOCs. These analytes were not detected in IHSS Group NE-1 sediment and have sources in other areas of the IA. Groundwater is evaluated in the Groundwater Interim Measure/Interim Remedial Action (IM/IRA) (DOE 2005d). Additionally, potential groundwater impacts to surface water from RFETS activities would occur before surface water left the Site.

5.0 ECOLOGICAL EVALUATION

In accordance with the CRA Methodology (DOE 2004d), an ecological screen was conducted to determine whether additional actions are warranted to protect ecological receptors. A number of differences exists between the accelerated action approach and the ecological screening approach as follows:

- Background comparisons are addressed differently in the ecological screen than for the accelerated actions. Background values used in the accelerated actions are listed in the IABZSAP, Appendix F (DOE 2004b) and include the lowest nondetected value for analytes with all nondetected results. Background comparisons were conducted using statistical tests, comparing data distributions for the ecological screen.
- Nondetected analytes are eliminated from the accelerated action data comparison. For the ecological screen, however, one-half the value is used for nondetected results when calculating summary statistics.
- The data set used for the ecological screen and the accelerated action comparison is dated August 11, 2005. The accelerated action comparison includes surface soil data for Pond A-5 because these data are included in the IHSS disposition.

5.1 Ecological Chemical of Potential Concern Data Comparisons

- The ecological contaminant of potential concern (ECOPC) data comparisons were conducted in accordance with the CRA Methodology (DOE 2004d) in a step-by-step analysis on an individual pond basis. Comparisons include the following:
- The maximum detected concentration (MDC) of each analyte of interest was compared to the ecological screening level (ESL), and if greater than the ESL, the analyte was retained for further evaluation.

- Analytes that could not be evaluated because of a lack of available ESLs were not assessed further in the ecological screen.
- If the analyte was detected in more than 5 percent of the samples, the analyte was retained for further evaluation.
- Inorganic analyte distributions were compared to background distributions. If the inorganic analyte distribution was significantly greater than the background distribution, it was retained for further evaluation.
- The exposure point concentration (EPC) (95th percent upper tolerance limit [UTL] {95th percent upper confidence limit [UCL] of the 90th percentile}) was compared to the ESL. If the EPC exceeded the ESL, the analyte was retained for further evaluation.

5.2 Risk Characterization

The ecological screen risk characterization was conducted in accordance with the CRA Methodology (DOE 2004d) for analytes that were retained for further evaluation. The first step of the risk characterization process consisted of hazard quotient (HQ) evaluation (using ESLs) for surface sediment.

The risk characterization process for remaining ECOPCs included multiple lines of evidence, each of which evaluated the potential for risk to aquatic receptors from individual ECOPCs and which together provided an overall risk conclusion for each ECOPC. Chemical lines of evidence included an HQ assessment using the surface sediment EPCs for each ECOPC as compared to ESLs and literature-derived alternative toxicity (AT) values as allowed under Step 7 defined within the Data Quality Objectives (DQO) section of the CRA Methodology. The HQ evaluation included assessment of the MDC from surface sediments (0 – 12"), the MDC from all sediments, the 95 UCL from all sediments, and the pond-series mean as compared to ESL and AT values. The frequency of detection was evaluated and the spatial extent of contamination was evaluated to determine the extent of ECOPC occurrence within the ponds. The final chemical line of evidence was the comparison of the ECOPC MDC to the range of background concentrations in order to determine whether the chemical risk is within the range of background . Those ECOPCs found to have surface sediment MDC HQs (using ESLs) of 1 or less, or that were not detected in surface sediment, were eliminated from further consideration. This was conducted because surface sediment concentrations more accurately reflect exposure conditions within a pond.

Previous studies, relevant to the ponds at RFETS, were reviewed and their information was used as additional lines of evidence. These studies included tissue analyses, aquatic population studies, toxicity bioassays, and waterfowl and wading bird exposure studies (Appendix A, Attachment 4). Results from the chemical risk characterization and pond and drainage-specific lines of evidence determine the risk from each pond.

The A-Series Ponds are part of the North Walnut Creek AEU (NW AEU), the B-Series Ponds are part of the South Walnut Creek AEU (SW AEU), and the C-Series Ponds are part of the Woman Creek AEU (WC AEU). The results of the ecological screen for each

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AEU are briefly described in the following sections and details are included in Appendix A.

5.2.1 Pond A-1

Sediment ECOPCs requiring further evaluation included two metals (aluminum and selenium) and three organic chemicals (benzo[g,h,i]perylene, indeno[1,2,3-cd]pyrene, and Aroclor-1254 as identified from the evaluation of total PCBs. Surface sediment ESL HQs for these chemicals were less than 10. Additionally, selenium occurred within the range of background. Aquatic life within Pond A-1 is typical of pond systems within the region and there has not been a measurable impact on Pond A-1 aquatic ecology attributable to a chemical. These analytes have a low risk to aquatic populations in Pond A-1.

5.2.2 Pond A-2

Sediment ECOPCs requiring further evaluation included two metals (aluminum and manganese) and five organic chemicals (acenaphthene, anthracene, indeno[1,2,3-cd]pyrene, Aroclor-1254, and total PCBs). Surface sediment ESL HQs for aluminum, manganese, anthracene, and total PCBs were less than 10. Acenaphthene had an HQ of 27, however, it was detected in only 1 of 10 samples. Similarly, indeno(1,2,3-cd)pyrene had an HQ of 12, but it also was only detected in 1 of 10 samples. Concentrations of manganese occurred within the range of background. The aquatic life within Pond A-2 is typical of pond systems within the region and there has not been a measurable impact on Pond A-2 aquatic ecology attributable to a chemical stressor. These analytes have a low risk to aquatic populations in Pond A-2.

5.2.3 Pond A-3

Sediment ECOPCs requiring further evaluation included four metals (aluminum, antimony, selenium and zinc) and two organic chemicals (pyrene and total PCBs). Surface sediment ESL HQs for these chemicals were all less than 10. Aroclor-1254 was the only PCB congener detected with a frequency of one of eight samples collected. Concentrations of zinc occurred within the range of background. Aquatic life within Pond A-3 is typical of pond systems within the region and there has not been a measurable impact on Pond A-3 aquatic ecology attributable to a chemical stressor. These analytes have a low risk to aquatic populations in Pond A-3.

5.2.4 Pond A-4

Sediment ECOPCs requiring further evaluation included four metals (aluminum, antimony, cadmium, and selenium). Surface sediment ESL HQs for aluminum, cadmium, and selenium were less than 10. Antimony had an HQ of 21; however, it was detected in only 4 of 12 samples and occurred within the range of background. Aquatic life within Pond A-4 is typical of pond systems within the region There has never been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond A-4. These analytes have a low risk to aquatic populations in Pond A-4.

5.2.5 Pond A-5

All ECOPCs identified at Pond A-5 have surface sediment MDC values less than the ESL. These chemicals have a low risk to aquatic populations in Pond A-5.

5.2.6 Pond B-4

Sediment ECOPCs requiring further evaluation included 5 metals (aluminum, cadmium, selenium, silver and zinc) and 13 organic chemicals (anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[g,h,i]perylene, chrysene, dibenz[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, phenanthrene, pyrene, Aroclor-1254, total PAHs and total PCBs). Surface sediment ESL HQs for these chemicals, with the exceptions of benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene, were less than 10. Benzo(g,h,i)perylene had an HQ of 21; however, it was detected in only ten of 22 samples. Similarly, indeno(1,2,3-cd)pyrene had an HQ of 12, but it was detected in only 10 of 22 samples. Zinc occurred within the range of risk attributable to background. These analytes have a low risk to aquatic populations in Pond B-4.

5.2.7 Pond B-5

Sediment ECOPCs requiring further evaluation included three metals (aluminum, selenium and zinc). Surface sediment ESL HQs for these metals were less than 10. Aquatic life within Pond B-5 is typical of pond systems within the region and there has not been a measurable impact on Pond B-5 aquatic ecology attributable to a chemical stressor. There has never been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond B-5. These analytes have a low risk to aquatic populations in Pond A-4.

5.2.8 Pond C-1

Sediment ECOPCs requiring further evaluation included 6 metals (aluminum, barium, iron, manganese, mercury and selenium) and 11 organic chemicals (acenaphthene, anthracene, benzo[a]anthracene, benzo[g,h,i]perylene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene, pentachlorophenol, phenanthrene, pyrene, Aroclor-1254, and total PCBs). Surface sediment ESL HQs for these chemicals, with the exceptions of acenaphthene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, were less than 10 . Acenaphthene had an HQ of 48 but was detected in three of six samples, while benzo(g,h,i)perylene had an HQ of 12 and was detected in only one of six samples. Similarly, dibenz(a,h)anthracene had an HQ of 16 and was detected in one of five samples, while indeno(1,2,3-cd)pyrene had an HQ of 22 but it was detected in only three of six samples. Concentrations of iron, manganese, and selenium occurred within the range of background. Aquatic life within Pond C-1 is very limited, yet typical of pond systems within the region and there has not been a measurable impact on Pond C-1 aquatic ecology attributable to a chemical stressor. These analytes have a low risk to aquatic populations in Pond C-1.

5.2.9 Pond C-2

Sediment ECOPCs requiring further evaluation included two metals (mercury and zinc) and one organic chemical (total PAHs). The surface sediment ESL HQs for these chemicals were less than 10 indicating low risk. Concentrations of zinc occurs within the range of background. Aquatic life within Pond C-2 is typical of pond systems within the region and there has not been a measurable impact on Pond C-2 aquatic ecology attributable to a chemical stressor. These analytes have a low risk to aquatic populations in Pond C-2.

Results, by pond, indicate there are no continuing, significant risks to aquatic life from ECOPCs due to RFETS-related operations. Potential risk to aquatic receptors is expected to be within the range of background risks. No additional risks above what would be expected to be encountered in the natural environment in the vicinity of the ponds within the AEUs are predicted for the aquatic life receptors. Overall, the aquatic communities in RFETS AEUs are limited by natural environmental conditions (that is, low flows and poor habitat) characteristic of the Colorado Front Range.

6.0 NFAA SUMMARY

Based on analytical results, the SSRS, and the ecological screen, accelerated action is not required and an NFAA determination is justified for IHSS Group NE-1 given the following:

- Activities and concentrations of COCs were uniformly below RFCA WRW soil ALs with the exception of one detection of plutonium-239/240 in a subsurface sediment sample collected at Pond B-4 at a depth of 2.5 to 3.9 feet. This is an isolated detection.
- Migration of soil or sediment contaminants to surface water is unlikely to impact water quality because little contamination is present. Routine surface water monitoring results indicate surface water standards are met and that pond sediments are not impacting surface water. The ponds are also configured to protect off-site water sources. Stormwater runoff is retained in the Terminal Ponds, sampled, and if the surface water results meet applicable standards, the water is released. Erosion of the pond sediments because of a large influx of water (from a storm) is not likely because the ponds are currently and expected to remain as low-energy ponds and less water will be available after Site closure. Additionally, predictions of contaminant migration based on the integration of the WEPP (USDA 1995) and HEC-6T (Thomas 1999) models are conservative. Site empirical data indicate contaminant migration is less than model predictions.
- Contaminants originating in IHSS Group NE-1 soil and sediment are not likely to impact surface water via transport in groundwater because soil contamination levels in IHSS Group NE-1 are very low. Groundwater contamination present beneath IHSS Group NE-1 was evaluated as part of the Groundwater IM/IRA (DOE 2005d).

- Based on the ecological screen for the NW AEU, SW AEU, and WC AEU, removal of sediment to protect ecological receptors is not necessary.

Approval of this Data Summary Report constitutes regulatory agency determination that IHSSs NE-142.1, NE-142.2, NE-142.3, NE-142.4, NE-142.8, NE-142.9, NE-142.12, SE-142.10, and SE-142.11 are NFAA Sites. This information and the NFAA determination will be documented in the FY05 HRR. Ecological factors will be further evaluated in the CRA on an EU-wide basis.

7.0 DATA QUALITY ASSESSMENT

This Data Quality Assessment (DQA) was conducted in accordance with the IABZSAP (DOE 2004b) to describe the quality of data and its adherence to the IABZSAP DQOs. DQOs for recent project data are described in the IABZSAP (DOE 2004b). DQOs for OU-specific data collection are described in the Final Phase I RFI/RI Work Plan for the Walnut Creek Priority Drainage, OU 6 (DOE 1999). Only QC records associated with data included in this report are included in the DQA. The DQA for the ecological screen is presented in Volume 2 of the CRA (DOE 2005e).

The DQOs for this project are described in the IASAP (DOE 2001a). All DQOs for this project were achieved based on the following:

- Regulatory agency-approved sampling program design in accordance with the IASAP (DOE 2001a) and IABZSAP(DOE 2004d);
- Collection of samples in accordance with the sampling design;
- Implementation of remediation activities in accordance with ER RSOP Notification #05-01 (DOE 2004c); and
- Results of the DQA, as described in the following sections.

7.1 Data Quality Assessment Process

The DQA process ensures that the type, quantity, and quality of environmental data used in decision making are defensible, and is based on the following guidance and requirements:

- EPA, 1994a, Guidance for the Data Quality Objective Process, QA/G-4;
- EPA, 1998, Guidance for the Data Quality Assessment Process, Practical Methods for Data Analysis, QA/G-9; and
- DOE, 1999, Quality Assurance, Order 414.1A.

Verification and validation (V&V) of data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions; uncertainty within the decisions; and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and

sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines:

- EPA, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012;
- EPA, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013;
- Kaiser-Hill Company, L.L.C. (K-H), 2002a, General Guidelines for Data Verification and Validation, DA-GR01-v2, October;
- K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, October;
- K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v3, October;
- K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v3, October;
- K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v3, October; and
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

This report will be submitted to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) AR for permanent storage 30 days after being provided to CDPHE and/or EPA.

7.2 Verification and Validation of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSDs);
- Laboratory control samples (LCSs);
- Field duplicate measurements;
- Chemical yield (radiochemistry);

- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively); and
- Sample analysis and preparation methods.

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (that is, within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation "flags" or qualifiers to individual records.

Raw hard-copy data (for example, individual analytical data packages) are currently filed by report identification number (RIN) and maintained by K-H Analytical Services Division (ASD). Older hard copies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS SWD. Standardized real and QC data are included on the enclosed CD.

7.2.1 Accuracy

The following measures of accuracy were evaluated:

- LCSs;
- Surrogates;
- Field blanks; and
- Sample MSs.

Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA COCs where the results could impact project decisions. Particular attention is paid to those values near ALs when QC results could indicate unacceptable levels of uncertainty for decision-making purposes.

Laboratory Control Sample Evaluation

As indicated in Table 11, LCS analyses were run, but not for all methods. When the In-Situ Counting System (ISOCS) technique is used for gamma spectroscopy, an internal standard approach is used instead of LCSs. The onsite laboratory that performs gamma spectroscopy is therefore not required to provide LCS data. Numerous samples were collected and analyzed prior to the current DQO, and were therefore not required to meet the modern DQO requirements. Several batches were without LCSs; however, this did not impact project decisions.

Table 17
LCS Summary

Test Method	Laboratory Batch	LCS Run?
ALPHA SPEC	107131	No
ALPHA SPEC	130421	Yes

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Test Method	Laboratory Batch	LCS Run?
ALPHA SPEC	130422	Yes
ALPHA SPEC	130423	Yes
ALPHA SPEC	1575	No
ALPHA SPEC	1650	Yes
ALPHA SPEC	1701	Yes
ALPHA SPEC	1862	Yes
ALPHA SPEC	1997	Yes
ALPHA SPEC	2036	Yes
ALPHA SPEC	2150	Yes
ALPHA SPEC	2279	Yes
ALPHA SPEC	2358	Yes
ALPHA SPEC	2378	Yes
ALPHA SPEC	4363290	Yes
ALPHA SPEC	4363293	Yes
ALPHA SPEC	4363295	Yes
ALPHA SPEC	4364318	Yes
ALPHA SPEC	4364321	Yes
ALPHA SPEC	4364322	Yes
ALPHA SPEC	5193438	Yes
ALPHA SPEC	5193445	Yes
ALPHA SPEC	5193446	Yes
ALPHA SPEC	5199477	Yes
ALPHA SPEC	5199482	Yes
ALPHA SPEC	5199483	Yes
ALPHA SPEC	5201227	Yes
ALPHA SPEC	5201229	Yes
ALPHA SPEC	5201231	Yes
ALPHA SPEC	5202490	Yes
ALPHA SPEC	5202496	Yes
ALPHA SPEC	5203300	Yes
ALPHA SPEC	5203302	Yes
ALPHA SPEC	5203304	Yes
ALPHA SPEC	5207516	Yes
ALPHA SPEC	5207520	Yes
ALPHA SPEC	5207521	Yes
ALPHA SPEC	5207535	Yes
ALPHA SPEC	5210490	Yes
ALPHA SPEC	5210492	Yes
ALPHA SPEC	5210496	Yes
ALPHA SPEC	5214455	Yes
ALPHA SPEC	5214456	Yes
ALPHA SPEC	5214457	Yes
ALPHA SPEC	5215430	Yes

Test Method	Laboratory Batch	LCS Run?
ALPHA SPEC	5215433	Yes
ALPHA SPEC	5215434	Yes
BN/ACLP	P304	No
BN/ACLP	S215	No
BN/ACLP	S239	No
BN/ACLP	S245	No
BN/ACLP	S260	No
BN/ACLP	S431	No
CLP-SOW-TOTAL	97GI802	Yes
CLP-SOW-TOTAL	97HG094	Yes
CLP-SOWMEDIUM LEVEL SOIL METHO	V10104	No
EPA 624	00LVH396	Yes
EPA 624	00LVK001	Yes
EPA 624	00LVK300	Yes
EPA 624	01LVK165	Yes
EPA 624	01LVN126	Yes
EPA 624	242042801	Yes
METADD	P304	No
METADD	S209	No
METADD	S218	No
METADD	S229	No
METADD	S235	No
METADD	S236	No
METADD	S237	No
METADD	S244	No
METADD	S248	No
METADD	S266	No
METADD	S444	No
METCLP	S218	No
PCB8080C	9406G456	No
PCB8080C	9406G580	No
PCB8080C	9406G631	No
PCB8080C	9406G723	No
PCB8080C	9406G747	No
PCB8080C	9406G871	No
PCB8080C	9407G123	No
PESTCLP	P304	No
PESTCLP	S127	No
PESTCLP	S215	No
PESTCLP	S239	No
PESTCLP	S245	No
PESTCLP	S260	No

Test Method	Laboratory Batch	LCS Run?
PESTCLP	S431	No
SMETCLP	P304	No
SMETCLP	S209	No
SMETCLP	S218	No
SMETCLP	S229	No
SMETCLP	S235	No
SMETCLP	S236	No
SMETCLP	S237	No
SMETCLP	S244	No
SMETCLP	S248	No
SMETCLP	S266	No
SMETCLP	S444	No
SW-846 6010	4363216	Yes
SW-846 6010	4363604	Yes
SW-846 6010	4365400	Yes
SW-846 6010	5189459	Yes
SW-846 6010	5192216	Yes
SW-846 6010	5195222	Yes
SW-846 6010	5195567	Yes
SW-846 6010	5196202	Yes
SW-846 6010	5196440	Yes
SW-846 6010	5199186	Yes
SW-846 6010	5200236	Yes
SW-846 6010	5201020	Yes
SW-846 6010	5201040	Yes
SW-846 6010	5201582	Yes
SW-846 6010	5202290	Yes
SW-846 6010	5202612	Yes
SW-846 6010	5203462	Yes
SW-846 6010	5206211	Yes
SW-846 6010	5206460	Yes
SW-846 6010	5210499	Yes
SW-846 6010	5211142	Yes
SW-846 6010	5211153	Yes
SW-846 6010	5213593	Yes
SW-846 6010	5214583	Yes
SW-846 6010/6010B	130033	Yes
SW-846 6010/6010B	130037	Yes
SW-846 6010/6010B	130264	Yes
SW-846 6010/6010B	131022	Yes
SW-846 6010/6010B	131030	Yes
SW-846 6010/6010B	131089	Yes
SW-846 6010/6010B	131122	Yes

Test Method	Laboratory Batch	LCS Run?
SW-846 6010/6010B	132307	Yes
SW-846 8082	4362441	Yes
SW-846 8082	4363589	Yes
SW-846 8082	5189366	Yes
SW-846 8082	5196457	Yes
SW-846 8082	5199549	Yes
SW-846 8082	5200530	Yes
SW-846 8082	5201424	Yes
SW-846 8082	5201631	Yes
SW-846 8082	5202432	Yes
SW-846 8082	5204014	Yes
SW-846 8260	131871	Yes
SW-846 8260	5004135	Yes
SW-846 8260 LOW LEVEL	00LVK108	No
SW-846 8270	4364401	Yes
SW-846 8270	5189367	Yes
SW-846 8270	5196456	Yes
SW-846 8270	5199551	Yes
SW-846 8270	5201425	Yes
SW-846 8270	5202461	Yes
SW-846 8270	5203386	Yes
SW-846 8270	5209618	Yes
SW-846 8270B	00LE0229	Yes
TRADS	RF-W-SDG1	No
TRADS	RF249	No
TRADS	RF250	No
TRADS	S2-11-056	No
TRADS	S2-12-018	No
TRADS	S3-05-061	No
TRADS	SDG1643	No
TRADS	SDG1644	No
TRADS	SDG1833	No
TRADS	SDG1849	No
TRADS	SDG2944	No
TRADS	SDG2945	No
VOACLP	P304	No
VOACLP	S213	No
VOACLP	S238	No
VOACLP	S257	No
VOACLP	S262	No
VOACLP	S440	No
WQPL	S211	No
WQPL	S217	No

Test Method	Laboratory Batch	LCS Run?
WQPL	S221	No
WQPL	S223	No
WQPL	S224	No
WQPL	S225	No
WQPL	S246	No
WQPL	S254	No
WQPL	S269	No

The minimum and maximum LCS results are tabulated, by chemical, for the entire project in Table 12. LCS results outside of tolerances were reviewed to determine whether a potential bias might be indicated. LCS recoveries are not indicative of matrix effects because they are not prepared using site samples. LCS results do indicate whether the laboratory may be introducing a bias in the results. Recoveries reported above the upper limit may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed.

The analytes with unacceptably low recoveries were evaluated. If the highest sample result divided by the lowest LCS recovery for that analyte is less than the AL, no further action is taken because any indicated bias is not great enough to affect project decisions. Based on this analysis, the LCS recoveries for this project did not affect project decisions.

Table 18
LCS Evaluation Summary

Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery
SW-846 8260	71-55-6	1,1,1-Trichloroethane	93	93
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	104	104
SW-846 8260	79-00-5	1,1,2-Trichloroethane	96	96
SW-846 8260	75-34-3	1,1-Dichloroethane	88	88
SW-846 8260	75-35-4	1,1-Dichloroethene	93	105
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	97	97
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	56	81
SW-846 8260	95-50-1	1,2-Dichlorobenzene	93	93
SW-846 8260	107-06-2	1,2-Dichloroethane	87	87
SW-846 8260	78-87-5	1,2-Dichloropropane	88	88
SW-846 8260	106-46-7	1,4-Dichlorobenzene	96	96
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	69	86
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	64	89
SW-846 8270	120-83-2	2,4-Dichlorophenol	64	80
SW-846 8270	105-67-9	2,4-Dimethylphenol	66	80
SW-846 8270	51-28-5	2,4-Dinitrophenol	22	77

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Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery
SW-846 8270	121-14-2	2,4-Dinitrotoluene	73	94
SW-846 8270	606-20-2	2,6-Dinitrotoluene	64	89
SW-846 8260	78-93-3	2-Butanone	93	93
SW-846 8270	91-58-7	2-Chloronaphthalene	65	80
SW-846 8270	95-57-8	2-Chlorophenol	64	81
SW-846 8270	91-57-6	2-Methylnaphthalene	63	80
SW-846 8270	95-48-7	2-Methylphenol	66	91
SW-846 8270	88-74-4	2-Nitroaniline	63	91
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	60	82
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	35	82
SW-846 8270	106-47-8	4-Chloroaniline	52	64
SW-846 8260	108-10-1	4-Methyl-2-pentanone	95	95
SW-846 8270	106-44-5	4-Methylphenol	69	94
SW-846 8270	100-02-7	4-Nitrophenol	66	113
SW-846 8270	83-32-9	Acenaphthene	63	79
SW-846 8260	67-64-1	Acetone	93	93
SW-846 6010/6010B	7429-90-5	Aluminum	109.1	114.4
CLP-SOW-TOTAL	7429-90-5	Aluminum	92.6	92.6
SW-846 6010	7429-90-5	Aluminum	95	109
ALPHA SPEC	14596-10-2	Americium-241	110	110
SW-846 8270	120-12-7	Anthracene	68	87
SW-846 6010/6010B	7440-36-0	Antimony	66.7	75.6
SW-846 6010	7440-36-0	Antimony	89	99
CLP-SOW-TOTAL	7440-36-0	Antimony	91	91
SW-846 8082	12674-11-2	Aroclor-1016	81	112
SW-846 8082	11096-82-5	Aroclor-1260	73	106
SW-846 6010/6010B	7440-38-2	Arsenic	100.8	100.8
CLP-SOW-TOTAL	7440-38-2	Arsenic	91.3	91.3
SW-846 6010	7440-38-2	Arsenic	90	101
SW-846 6010	7440-39-3	Barium	98	104
CLP-SOW-TOTAL	7440-39-3	Barium	88.7	88.7
SW-846 6010/6010B	7440-39-3	Barium	98.6	104.6
SW-846 8260	71-43-2	Benzene	85	93
SW-846 8270	56-55-3	Benzo(a)anthracene	64	97
SW-846 8270	50-32-8	Benzo(a)pyrene	64	94
SW-846 8270	205-99-2	Benzo(b)fluoranthene	64	100
SW-846 8270	207-08-9	Benzo(k)fluoranthene	65	89
SW-846 8270	65-85-0	Benzoic Acid	21	74
SW-846 8270	100-51-6	Benzyl Alcohol	63	81

Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery
SW-846 6010/6010B	7440-41-7	Beryllium	83.1	89.3
CLP-SOW-TOTAL	7440-41-7	Beryllium	90.1	90.1
SW-846 6010	7440-41-7	Beryllium	97	103
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	61	80
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	73	85
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	65	103
SW-846 8260	75-27-4	Bromodichloromethane	90	90
SW-846 8260	75-25-2	Bromoform	101	101
SW-846 8260	74-83-9	Bromomethane	97	97
SW-846 8270	85-68-7	Butylbenzylphthalate	68	100
SW-846 6010	7440-43-9	Cadmium	92	102
CLP-SOW-TOTAL	7440-43-9	Cadmium	92	92
SW-846 6010/6010B	7440-43-9	Cadmium	91.2	98.4
SW-846 8260	75-15-0	Carbon Disulfide	75	75
SW-846 8260	56-23-5	Carbon Tetrachloride	93	93
SW-846 8260	108-90-7	Chlorobenzene	94	97
SW-846 8260	75-00-3	Chloroethane	95	95
SW-846 8260	67-66-3	Chloroform	91	91
SW-846 8260	74-87-3	Chloromethane	94	94
SW-846 6010/6010B	7440-47-3	Chromium	102.8	104.9
CLP-SOW-TOTAL	7440-47-3	Chromium	92.9	92.9
SW-846 6010	7440-47-3	Chromium	94	104
SW-846 8270	218-01-9	Chrysene	63	94
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	93	93
SW-846 6010/6010B	7440-48-4	Cobalt	104.5	107.3
SW-846 6010	7440-48-4	Cobalt	91	101
CLP-SOW-TOTAL	7440-48-4	Cobalt	91.3	91.3
CLP-SOW-TOTAL	7440-50-8	Copper	89.3	89.3
SW-846 6010	7440-50-8	Copper	93	100
SW-846 6010/6010B	7440-50-8	Copper	99.3	109.2
SW-846 8270	84-74-2	Di-n-butylphthalate	70	101
SW-846 8270	117-84-0	Di-n-octylphthalate	65	96
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	61	89
SW-846 8270	132-64-9	Dibenzofuran	64	87
SW-846 8260	124-48-1	Dibromochloromethane	95	95
SW-846 8270	84-66-2	Diethylphthalate	70	92
SW-846 8270	131-11-3	Dimethylphthalate	69	90
SW-846 8260	100-41-4	Ethylbenzene	100	100
SW-846 8270	206-44-0	Fluoranthene	71	100

Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery
SW-846 8270	86-73-7	Fluorene	65	86
SW-846 8270	118-74-1	Hexachlorobenzene	64	89
SW-846 8260	87-68-3	Hexachlorobutadiene	96	96
SW-846 8270	87-68-3	Hexachlorobutadiene	51	78
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	51	78
SW-846 8270	67-72-1	Hexachloroethane	54	76
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	62	87
SW-846 6010/6010B	7439-89-6	Iron	97.2	103.5
SW-846 6010	7439-89-6	Iron	98	120
CLP-SOW-TOTAL	7439-89-6	Iron	88.8	88.8
SW-846 8270	78-59-1	Isophorone	61	77
CLP-SOW-TOTAL	7439-92-1	Lead	92.8	92.8
SW-846 6010	7439-92-1	Lead	92	100
SW-846 6010/6010B	7439-92-1	Lead	95.3	95.8
SW-846 6010/6010B	7439-93-2	Lithium	96.9	97.1
SW-846 6010	7439-93-2	Lithium	97	104
CLP-SOW-TOTAL	7439-93-2	Lithium	105	105
CLP-SOW-TOTAL	7439-96-5	Manganese	89.8	89.8
SW-846 6010	7439-96-5	Manganese	96	102
SW-846 6010/6010B	7439-96-5	Manganese	103.4	104.9
SW-846 6010/6010B	7439-97-6	Mercury	87.1	91.1
SW-846 6010	7439-97-6	Mercury	93	106
CLP-SOW-TOTAL	7439-97-6	Mercury	107	107
SW-846 8260	75-09-2	Methylene chloride	93	93
CLP-SOW-TOTAL	7439-98-7	Molybdenum	90.8	90.8
SW-846 6010	7439-98-7	Molybdenum	92	101
SW-846 6010/6010B	7439-98-7	Molybdenum	100.9	104.4
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	73	158
SW-846 8270	621-64-7	n-Nitrosodipropylamine	68	81
SW-846 8260	91-20-3	Naphthalene	95	95
SW-846 8270	91-20-3	Naphthalene	59	78
SW-846 6010/6010B	7440-02-0	Nickel	103.8	108.3
SW-846 6010	7440-02-0	Nickel	93	101
CLP-SOW-TOTAL	7440-02-0	Nickel	92.3	92.3
SW-846 8270	98-95-3	Nitrobenzene	66	81
SW-846 8270	87-86-5	Pentachlorophenol	60	97
SW-846 8270	108-95-2	Phenol	69	85

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Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery
ALPHA SPEC	10-12-8	Plutonium-239/240	105	105
SW-846 8270	129-00-0	Pyrene	62	105
SW-846 6010/6010B	7782-49-2	Selenium	106.7	106.9
SW-846 6010	7782-49-2	Selenium	90	99
CLP-SOW-TOTAL	7782-49-2	Selenium	92.2	92.2
SW-846 6010/6010B	7440-22-4	Silver	110.4	116
CLP-SOW-TOTAL	7440-22-4	Silver	92.1	92.1
SW-846 6010	7440-22-4	Silver	95	106
SW-846 6010	7440-24-6	Strontium	96	102
CLP-SOW-TOTAL	7440-24-6	Strontium	90.3	90.3
SW-846 6010/6010B	7440-24-6	Strontium	102.5	110.9
SW-846 8260	100-42-5	Styrene	102	102
SW-846 8260	127-18-4	Tetrachloroethene	98	98
SW-846 6010/6010B	7440-31-5	Tin	98.3	99.3
CLP-SOW-TOTAL	7440-31-5	Tin	91.8	91.8
SW-846 6010	7440-31-5	Tin	91	100
SW-846 8260	108-88-3	Toluene	88	97
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	97	97
SW-846 8260	79-01-6	Trichloroethene	86	92
SW-846 6010	11-09-6	Uranium, Total	99	108
SW-846 6010/6010B	11-09-6	Uranium, Total	81.3	90.4
ALPHA SPEC	7440-61-1	Uranium-238	84	84
SW-846 6010/6010B	7440-62-2	Vanadium	98.7	108
SW-846 6010	7440-62-2	Vanadium	94	103
CLP-SOW-TOTAL	7440-62-2	Vanadium	100	100
SW-846 8260	75-01-4	Vinyl chloride	94	94
SW-846 8260	1330-20-7	Xylene	101	101
CLP-SOW-TOTAL	7440-66-6	Zinc	91.2	91.2
SW-846 6010	7440-66-6	Zinc	91	98
SW-846 6010/6010B	7440-66-6	Zinc	100.5	105.3

Surrogate Evaluation

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 13. Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project. Surrogates are added to every sample, and, therefore, surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential

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matrix effects. The highest and lowest surrogate recoveries for this project were reviewed, and results did not affect project decisions.

Table 19
Surrogate Recovery Summary

VOC Surrogate Recoveries				
Number of Samples	**Analyte**	**Minimum Recovery**	**Maximum Recovery**	**Unit**
27	4-Bromofluorobenzene	78	126	%REC
11	Deuterated 1,2-dichloroethane	76	95	%REC
27	Deuterated toluene	92	118	%REC
SVOC Surrogate Recoveries				
Number of Samples	**Analyte**	**Minimum Recovery**	**Maximum Recovery**	**Unit**
34	2-Fluorobiphenyl	50	75	%REC
34	2-Fluorophenol	49	73	%REC
34	Deuterated nitrobenzene	44	70	%REC
34	p-Terphenyl-d14	53	83	%REC

% REC – percent recovery

Field Blank Evaluation

Results of the field blank analyses are listed in Table 14. Detectable amounts of contaminants within the blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminant is detected in the associated real samples. When the real result is less than 10 times the blank result for laboratory contaminants and 5 times the result for non-laboratory contaminants, the real result is eliminated. None of the chemicals were detected in the blanks at concentrations greater than one-tenth the AL. Therefore, blank contamination did not adversely impact project decisions.

Table 20
Field Blank Summary

Laboratory	CAS No.	Analyte	Sample QC Code	Detected Result	Unit
ESTLDEN	7429-90-5	Aluminum	FB	0.04	mg/L
ITLSL	7429-90-5	Aluminum	RNS	48.80	ug/L
ITLR	14596-10-2	Americium-241	RNS	0.02	pCi/L
SCTK	14596-10-2	Americium-241	RNS	0.00	pCi/L
TMAN	14596-10-2	Americium-241	RNS	0.01	pCi/L
ITLSL	7440-36-0	Antimony	RNS	67.10	ug/L
RFWG	11097-69-1	Aroclor-1254	RNS	95.00	%
ITLSL	7440-39-3	Barium	RNS	6.20	ug/L
TMAS	7440-39-3	Barium	RNS	5.30	ug/L

Laboratory	CAS No.	Analyte	Sample QC Code	Detected Result	Unit
ESTLDEN	7440-39-3	Barium	FB	0.00	mg/L
ESTLDEN	71-43-2	Benzene	FB	0.25	ug/L
ITLSL	117-81-7	bis(2-Ethylhexyl)phthalate	RNS	3.00	ug/L
ITLSL	7440-47-3	Chromium	RNS	11.60	ug/L
ESTLDEN	7440-50-8	Copper	FB	0.00	mg/L
ESTLDEN	100-41-4	Ethylbenzene	FB	0.27	ug/L
TMAS	7439-89-6	Iron	RNS	85.00	ug/L
TMAS	7439-92-1	Lead	RNS	1.10	ug/L
ITLSL	7439-92-1	Lead	RNS	3.90	ug/L
ITLSL	7439-96-5	Manganese	RNS	20.50	ug/L
ESTLDEN	7439-96-5	Manganese	FB	0.00	mg/L
TMAS	7439-96-5	Manganese	RNS	9.40	ug/L
SCTK	10-12-8	Plutonium-239/240	RNS	0.00	pCi/L
ITLR	10-12-8	Plutonium-239/240	RNS	0.04	pCi/L
ITLSL	7782-49-2	Selenium	RNS	2.00	ug/L
ITLSL	7440-22-4	Silver	RNS	11.90	ug/L
ESTLDEN	7440-24-6	Strontium	FB	0.00	mg/L
TMAS	7440-24-6	Strontium	RNS	2.30	ug/L
ITLSL	7440-31-5	Tin	RNS	234.00	ug/L
ESTLDEN	108-88-3	Toluene	FB	1.50	ug/L
ITLR	11-08-5	Uranium-234	RNS	0.27	pCi/L
SCTK	11-08-5	Uranium-234	RNS	-0.49	pCi/L
SCTK	15117-96-1	Uranium-235	RNS	0.04	pCi/L
URS	15117-96-1	Uranium-235	FB	0.17	pCi/g
ITLR	15117-96-1	Uranium-235	RNS	0.13	pCi/L
ITLR	7440-61-1	Uranium-238	RNS	0.15	pCi/L
URS	7440-61-1	Uranium-238	FB	2.27	pCi/g
SCTK	7440-61-1	Uranium-238	RNS	0.09	pCi/L
ESTLDEN	1330-20-7	Xylene	FB	1.10	ug/L
ESTLDEN	7440-66-6	Zinc	FB	0.01	mg/L
ITLSL	7440-66-6	Zinc	RNS	98.10	ug/L

Field blank (EB = equipment, FB = field, RNS = rinse, TB = trip)
results greater than detection limits (not "U" qualified).

Sample Matrix Spike Evaluation

The minimum and maximum MS results are summarized by chemical for the entire project in Table 15. Organic analytes with unacceptably low recoveries resulted in a review of the LCS recoveries. According to the EPA data validation guidelines (EPA 1994b), if organic MS recoveries are low, the data reviewer may use the MS and MSD results in conjunction with other QC criteria. For this project, the LCS recoveries were checked, and these checks indicate no decisions were impacted for organic analytes. For inorganics, the associated maximum sample results were divided by the lowest percent recovery for each analyte. If the resulting number was less than the AL, decisions were

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not impacted, and no action was taken. For this project, all results were acceptable. Low recoveries of 2,4-Dinotrophenol, 4,6-Dinitro-2-methylphenol, and benzoic acid did not affect project decisions.

Table 21
Sample MS Evaluation Summary

Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery	No. of Samples	No. of Lab Batches
SW-846 8260	71-55-6	1,1,1-Trichloroethane	81	81	1	1
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	96	96	1	1
SW-846 8260	79-00-5	1,1,2-Trichloroethane	87	87	1	1
SW-846 8260	75-34-3	1,1-Dichloroethane	79	79	1	1
CLP-SOWMEDIUM LEVEL SOIL METHO	75-35-4	1,1-Dichloroethene	93	93	1	1
SW-846 8260	75-35-4	1,1-Dichloroethene	78	90	2	2
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	66	66	1	1
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	57	70	4	4
SW-846 8260	95-50-1	1,2-Dichlorobenzene	80	80	1	1
SW-846 8260	107-06-2	1,2-Dichloroethane	81	81	1	1
SW-846 8260	78-87-5	1,2-Dichloropropane	81	81	1	1
SW-846 8260	106-46-7	1,4-Dichlorobenzene	80	80	1	1
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	61	80	4	4
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	57	82	4	4
SW-846 8270	120-83-2	2,4-Dichlorophenol	58	74	4	4
SW-846 8270	105-67-9	2,4-Dimethylphenol	57	75	4	4
SW-846 8270	51-28-5	2,4-Dinitrophenol	23	46	4	4
SW-846 8270	121-14-2	2,4-Dinitrotoluene	64	88	4	4
SW-846 8270	606-20-2	2,6-Dinitrotoluene	58	84	4	4
SW-846 8260	78-93-3	2-Butanone	77	77	1	1
SW-846 8270	91-58-7	2-Chloronaphthalene	56	77	4	4
SW-846 8270	95-57-8	2-Chlorophenol	59	75	4	4
SW-846 8270	91-57-6	2-Methylnaphthalene	60	73	4	4
SW-846 8270	95-48-7	2-Methylphenol	59	75	4	4
SW-846 8270	88-74-4	2-Nitroaniline	56	77	4	4
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	19	57	4	4
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	17	54	4	4
SW-846 8270	106-47-8	4-Chloroaniline	23	54	4	4
SW-846 8260	108-10-1	4-Methyl-2-pentanone	83	83	1	1
SW-846 8270	106-44-5	4-Methylphenol	61	77	4	4
SW-846 8270	100-02-7	4-Nitrophenol	59	97	4	4
SW-846 8270	83-32-9	Acenaphthene	57	74	4	4
SW-846 8260	67-64-1	Acetone	72	72	1	1
SW-846 6010	7429-90-5	Aluminum	4320	8460	9	9

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Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery	No. of Samples	No. of Lab Batches
SW-846 6010/6010B	7429-90-5	Aluminum	1906.6	2464.4	2	2
SW-846 8270	120-12-7	Anthracene	58	79	4	4
CLP-SOW-TOTAL	7440-36-0	Antimony	13.9	13.9	1	1
SW-846 6010	7440-36-0	Antimony	33	48	9	9
SW-846 6010/6010B	7440-36-0	Antimony	26.1	32.5	2	2
SW-846 8082	12674-11-2	Aroclor-1016	76	176	7	7
SW-846 8082	11096-82-5	Aroclor-1260	86	191	7	7
CLP-SOW-TOTAL	7440-38-2	Arsenic	78.6	78.6	1	1
SW-846 6010	7440-38-2	Arsenic	89	100	9	9
SW-846 6010/6010B	7440-38-2	Arsenic	85.2	88.9	2	2
CLP-SOW-TOTAL	7440-39-3	Barium	75.4	75.4	1	1
SW-846 6010	7440-39-3	Barium	99	119	9	9
SW-846 6010/6010B	7440-39-3	Barium	81.7	147.8	2	2
CLP-SOWMEDIUM LEVEL SOIL METHO	71-43-2	Benzene	90	90	1	1
SW-846 8260	71-43-2	Benzene	76	83	2	2
SW-846 8270	56-55-3	Benzo(a)anthracene	56	77	4	4
SW-846 8270	50-32-8	Benzo(a)pyrene	56	78	4	4
SW-846 8270	205-99-2	Benzo(b)fluoranthene	60	78	4	4
SW-846 8270	207-08-9	Benzo(k)fluoranthene	54	83	4	4
SW-846 8270	65-85-0	Benzoic Acid	0	53	4	4
SW-846 8270	100-51-6	Benzyl Alcohol	54	75	4	4
CLP-SOW-TOTAL	7440-41-7	Beryllium	78.7	78.7	1	1
SW-846 6010	7440-41-7	Beryllium	96	104	9	9
SW-846 6010/6010B	7440-41-7	Beryllium	95.3	96	2	2
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	54	74	4	4
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	55	76	4	4
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	58	86	4	4
SW-846 8260	75-27-4	Bromodichloromethane	83	83	1	1
SW-846 8260	75-25-2	Bromoform	86	86	1	1
SW-846 8260	74-83-9	Bromomethane	91	91	1	1
SW-846 8270	85-68-7	Butylbenzylphthalate	59	82	4	4
CLP-SOW-TOTAL	7440-43-9	Cadmium	80.7	80.7	1	1
SW-846 6010	7440-43-9	Cadmium	92	101	9	9
SW-846 6010/6010B	7440-43-9	Cadmium	94.5	97.3	2	2
SW-846 8260	75-15-0	Carbon Disulfide	67	67	1	1
SW-846 8260	56-23-5	Carbon Tetrachloride	79	79	1	1
CLP-SOWMEDIUM LEVEL SOIL METHO	108-90-7	Chlorobenzene	92	92	1	1
SW-846 8260	108-90-7	Chlorobenzene	78	87	2	2
SW-846 8260	75-00-3	Chloroethane	92	92	1	1
SW-846 8260	67-66-3	Chloroform	84	84	1	1

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Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery	No. of Samples	No. of Lab Batches
SW-846 8260	74-87-3	Chloromethane	91	91	1	1
CLP-SOW-TOTAL	7440-47-3	Chromium	83.9	83.9	1	1
SW-846 6010	7440-47-3	Chromium	122	156	9	9
SW-846 6010/6010B	7440-47-3	Chromium	107.4	118.2	2	2
SW-846 8270	218-01-9	Chrysene	54	75	4	4
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	82	82	1	1
CLP-SOW-TOTAL	7440-48-4	Cobalt	80	80	1	1
SW-846 6010	7440-48-4	Cobalt	92	102	9	9
SW-846 6010/6010B	7440-48-4	Cobalt	89.4	94.3	2	2
CLP-SOW-TOTAL	7440-50-8	Copper	80	80	1	1
SW-846 6010	7440-50-8	Copper	90	108	9	9
SW-846 6010/6010B	7440-50-8	Copper	89.9	90.8	2	2
SW-846 8270	84-74-2	Di-n-butylphthalate	62	83	4	4
SW-846 8270	117-84-0	Di-n-octylphthalate	59	79	4	4
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	54	75	4	4
SW-846 8270	132-64-9	Dibenzofuran	61	80	4	4
SW-846 8260	124-48-1	Dibromochloromethane	86	86	1	1
SW-846 8270	84-66-2	Diethylphthalate	64	81	4	4
SW-846 8270	131-11-3	Dimethylphthalate	62	78	4	4
SW-846 8260	100-41-4	Ethylbenzene	90	90	1	1
SW-846 8270	206-44-0	Fluoranthene	61	80	4	4
SW-846 8270	86-73-7	Fluorene	58	78	4	4
SW-846 8270	118-74-1	Hexachlorobenzene	57	81	4	4
SW-846 8260	87-68-3	Hexachlorobutadiene	64	64	1	1
SW-846 8270	87-68-3	Hexachlorobutadiene	56	71	4	4
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	0	51	4	4
SW-846 8270	67-72-1	Hexachloroethane	13	56	4	4
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	54	73	4	4
SW-846 6010	7439-89-6	Iron	0	5590	9	9
SW-846 6010/6010B	7439-89-6	Iron	-2779.7	155.6	2	2
SW-846 8270	78-59-1	Isophorone	58	72	4	4
CLP-SOW-TOTAL	7439-92-1	Lead	79	79	1	1
SW-846 6010	7439-92-1	Lead	76	100	9	9
SW-846 6010/6010B	7439-92-1	Lead	80.5	94.6	2	2
CLP-SOW-TOTAL	7439-93-2	Lithium	103	103	1	1
SW-846 6010	7439-93-2	Lithium	99	108	9	9
SW-846 6010/6010B	7439-93-2	Lithium	82.9	104.1	2	2
CLP-SOW-TOTAL	7439-96-5	Manganese	84.7	84.7	1	1
SW-846 6010	7439-96-5	Manganese	0	191	9	9
SW-846 6010/6010B	7439-96-5	Manganese	-105.1	58.4	2	2
SW-846 6010	7439-97-6	Mercury	89	105	12	12
SW-846 6010/6010B	7439-97-6	Mercury	92.2	94.9	2	2

Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery	No. of Samples	No. of Lab Batches
SW-846 8260	75-09-2	Methylene chloride	81	81	1	1
CLP-SOW-TOTAL	7439-98-7	Molybdenum	70.8	70.8	1	1
SW-846 6010	7439-98-7	Molybdenum	88	97	9	9
SW-846 6010/6010B	7439-98-7	Molybdenum	83.3	84.1	2	2
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	65	114	4	4
SW-846 8270	621-64-7	n-Nitrosodipropylamine	57	76	4	4
SW-846 8260	91-20-3	Naphthalene	64	64	1	1
SW-846 8270	91-20-3	Naphthalene	55	71	4	4
CLP-SOW-TOTAL	7440-02-0	Nickel	80.7	80.7	1	1
SW-846 6010	7440-02-0	Nickel	90	105	9	9
SW-846 6010/6010B	7440-02-0	Nickel	84.4	90.7	2	2
SW-846 8270	98-95-3	Nitrobenzene	56	74	4	4
SW-846 8270	87-86-5	Pentachlorophenol	57	73	4	4
SW-846 8270	108-95-2	Phenol	61	77	4	4
SW-846 8270	129-00-0	Pyrene	54	82	4	4
CLP-SOW-TOTAL	7782-49-2	Selenium	73.7	73.7	1	1
SW-846 6010	7782-49-2	Selenium	87	98	9	9
SW-846 6010/6010B	7782-49-2	Selenium	83.5	89.5	2	2
CLP-SOW-TOTAL	7440-22-4	Silver	82.2	82.2	1	1
SW-846 6010	7440-22-4	Silver	0	112	10	10
SW-846 6010/6010B	7440-22-4	Silver	91.8	100.3	2	2
CLP-SOW-TOTAL	7440-24-6	Strontium	79.5	79.5	1	1
SW-846 6010	7440-24-6	Strontium	80	108	9	9
SW-846 6010/6010B	7440-24-6	Strontium	92.6	120	2	2
SW-846 8260	100-42-5	Styrene	90	90	1	1
SW-846 8260	127-18-4	Tetrachloroethene	83	83	1	1
CLP-SOW-TOTAL	7440-31-5	Tin	65.1	65.1	1	1
SW-846 6010	7440-31-5	Tin	87	95	9	9
SW-846 6010/6010B	7440-31-5	Tin	88.5	90.5	2	2
CLP-SOWMEDIUM LEVEL SOIL METHO	108-88-3	Toluene	95	95	1	1
SW-846 8260	108-88-3	Toluene	74	90	2	2
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	90	90	1	1
CLP-SOWMEDIUM LEVEL SOIL METHO	79-01-6	Trichloroethene	99	99	1	1
SW-846 8260	79-01-6	Trichloroethene	74	77	2	2
SW-846 6010	11-09-6	Uranium, Total	92	104	9	9
SW-846 6010/6010B	11-09-6	Uranium, Total	90.5	102.3	2	2
CLP-SOW-TOTAL	7440-62-2	Vanadium	93.4	93.4	1	1
SW-846 6010	7440-62-2	Vanadium	111	153	9	9
SW-846 6010/6010B	7440-62-2	Vanadium	124.1	133.2	2	2
SW-846 8260	75-01-4	Vinyl chloride	88	88	1	1
SW-846 8260	1330-20-7	Xylene	90	90	1	1

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Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery	No. of Samples	No. of Lab Batches
CLP-SOW-TOTAL	7440-66-6	Zinc	71	71	1	1
SW-846 6010	7440-66-6	Zinc	47	137	9	9
SW-846 6010/6010B	7440-66-6	Zinc	48.8	82.9	2	2

7.2.2 Precision

Precision is measured by evaluated both MSDs and field duplicates, as described in the following sections.

Sample Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSDs, as summarized in Table 16. Analytes with the highest relative percent differences (RPDs) were reviewed by comparing the highest sample result to the RFCA WRW soil AL. For analytes with RPDs greater than 35 percent, if the highest sample concentrations were sufficiently below the ALs, no further action is needed. Review of analytes listed on Table 16 with a RPD of greater than 35 percent indicated decisions were not impacted.

Table 22
Sample MSD Evaluation Summary

Test Method	CAS No.	Analyte	Max RPD (%)
SW-846 8260	71-55-6	1,1,1-Trichloroethane	3.64
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	5.08
SW-846 8260	79-00-5	1,1,2-Trichloroethane	2.27
SW-846 8260	75-34-3	1,1-Dichloroethane	3.73
SW-846 8260	75-35-4	1,1-Dichloroethene	6.45
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	20.47
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	11.20
SW-846 8260	95-50-1	1,2-Dichlorobenzene	2.53
SW-846 8260	107-06-2	1,2-Dichloroethane	2.44
SW-846 8260	78-87-5	1,2-Dichloropropane	3.64
SW-846 8260	106-46-7	1,4-Dichlorobenzene	3.68
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	13.74
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	11.61
SW-846 8270	120-83-2	2,4-Dichlorophenol	14.40
SW-846 8270	105-67-9	2,4-Dimethylphenol	17.60
SW-846 8270	51-28-5	2,4-Dinitrophenol	32.73
SW-846 8270	121-14-2	2,4-Dinitrotoluene	13.14
SW-846 8270	606-20-2	2,6-Dinitrotoluene	14.40
SW-846 8260	78-93-3	2-Butanone	9.88
SW-846 8270	91-58-7	2-Chloronaphthalene	17.89
SW-846 8270	95-57-8	2-Chlorophenol	17.05
SW-846 8270	91-57-6	2-Methylnaphthalene	18.18
SW-846 8270	95-48-7	2-Methylphenol	15.63

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Test Method	CAS No.	Analyte	Max RPD (%)
SW-846 8270	88-74-4	2-Nitroaniline	16.39
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	10.00
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	53.85
SW-846 8270	106-47-8	4-Chloroaniline	13.86
SW-846 8260	108-10-1	4-Methyl-2-pentanone	6.98
SW-846 8270	106-44-5	4-Methylphenol	16.54
SW-846 8270	100-02-7	4-Nitrophenol	15.63
SW-846 8270	83-32-9	Acenaphthene	16.13
SW-846 8260	67-64-1	Acetone	6.71
SW-846 6010	7429-90-5	Aluminum	30.57
SW-846 8270	120-12-7	Anthracene	17.32
SW-846 6010	7440-36-0	Antimony	16.22
SW-846 8082	12674-11-2	Aroclor-1016	38.64
SW-846 8082	11096-82-5	Aroclor-1260	18.78
SW-846 6010	7440-38-2	Arsenic	2.17
SW-846 6010	7440-39-3	Barium	26.09
SW-846 8260	71-43-2	Benzene	8.81
SW-846 8270	56-55-3	Benzo(a)anthracene	13.33
SW-846 8270	50-32-8	Benzo(a)pyrene	14.88
SW-846 8270	205-99-2	Benzo(b)fluoranthene	12.50
SW-846 8270	207-08-9	Benzo(k)fluoranthene	18.49
SW-846 8270	65-85-0	Benzoic Acid	200.00
SW-846 8270	100-51-6	Benzyl Alcohol	15.38
SW-846 6010	7440-41-7	Beryllium	5.88
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	19.35
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	19.55
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	14.40
SW-846 8260	75-27-4	Bromodichloromethane	2.38
SW-846 8260	75-25-2	Bromoform	2.30
SW-846 8260	74-83-9	Bromomethane	2.17
SW-846 8270	85-68-7	Butylbenzylphthalate	15.63
SW-846 6010	7440-43-9	Cadmium	4.17
SW-846 8260	75-15-0	Carbon Disulfide	1.50
SW-846 8260	56-23-5	Carbon Tetrachloride	4.94
SW-846 8260	108-90-7	Chlorobenzene	9.76
SW-846 8260	75-00-3	Chloroethane	1.08
SW-846 8260	67-66-3	Chloroform	2.35
SW-846 8260	74-87-3	Chloromethane	1.09
SW-846 6010	7440-47-3	Chromium	9.19
SW-846 8270	218-01-9	Chrysene	13.79
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	1.21
SW-846 6010	7440-48-4	Cobalt	4.12
SW-846 6010	7440-50-8	Copper	10.10
SW-846 8270	84-74-2	Di-n-butylphthalate	14.93
SW-846 8270	117-84-0	Di-n-octylphthalate	15.63
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	13.79
SW-846 8270	132-64-9	Dibenzofuran	13.74
SW-846 8260	124-48-1	Dibromochloromethane	1.16

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Test Method	CAS No.	Analyte	Max RPD (%)
SW-846 8270	84-66-2	Diethylphthalate	13.14
SW-846 8270	131-11-3	Dimethylphthalate	14.93
SW-846 8260	100-41-4	Ethylbenzene	1.10
SW-846 8270	206-44-0	Fluoranthene	16.54
SW-846 8270	86-73-7	Fluorene	15.87
SW-846 8270	118-74-1	Hexachlorobenzene	14.63
SW-846 8270	87-68-3	Hexachlorobutadiene	19.35
SW-846 8260	87-68-3	Hexachlorobutadiene	24.56
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	22.61
SW-846 8270	67-72-1	Hexachloroethane	19.35
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	13.79
SW-846 6010	7439-89-6	Iron	77.25
SW-846 8270	78-59-1	Isophorone	20.16
SW-846 6010	7439-92-1	Lead	16.27
SW-846 6010	7439-93-2	Lithium	7.27
SW-846 6010	7439-96-5	Manganese	200.00
SW-846 6010	7439-97-6	Mercury	3.14
SW-846 8260	75-09-2	Methylene chloride	1.23
SW-846 6010	7439-98-7	Molybdenum	3.28
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	14.29
SW-846 8270	621-64-7	n-Nitrosodipropylamine	19.26
SW-846 8270	91-20-3	Naphthalene	18.18
SW-846 8260	91-20-3	Naphthalene	1.57
SW-846 6010	7440-02-0	Nickel	4.35
SW-846 8270	98-95-3	Nitrobenzene	17.60
SW-846 8270	87-86-5	Pentachlorophenol	14.63
SW-846 8270	108-95-2	Phenol	13.74
SW-846 8270	129-00-0	Pyrene	15.38
SW-846 6010	7782-49-2	Selenium	2.33
SW-846 6010	7440-22-4	Silver	200.00
SW-846 6010	7440-24-6	Strontium	7.84
SW-846 8260	100-42-5	Styrene	3.39
SW-846 8260	127-18-4	Tetrachloroethene	1.20
SW-846 6010	7440-31-5	Tin	3.21
SW-846 8260	108-88-3	Toluene	7.79
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	1.10
SW-846 8260	79-01-6	Trichloroethene	10.26
SW-846 6010	11-09-6	Uranium, Total	3.21
SW-846 6010	7440-62-2	Vanadium	10.45
SW-846 8260	75-01-4	Vinyl chloride	1.13
SW-846 8260	1330-20-7	Xylene	1.12
SW-846 6010	7440-66-6	Zinc	89.23

Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Table 17 indicates field duplicate frequencies were

inadequate for radionuclides (GAMMA SPEC), metals (SW846 6010/6010B), and SVOCs (SW-846 8270B). However, project decisions were not impacted.

Table 23
Field Duplicate Sample Frequency Summary

Test Method	No. of Real Samples	No. of Duplicate Samples	% Duplicate Samples
ALPHA SPEC	102	6	5.9%
BN/ACLP	80	4	5.0%
CLHERB615	12	0	0.0%
CLP-SOW-TOTAL	2	0	0.0%
CLP-SOWMEDIUM LEVEL SOIL METHO	2	0	0.0%
DHSLMET	11	0	0.0%
DIOX613	21	0	0.0%
DMETAA	1	0	0.0%
DMETADD	25	0	0.0%
DMETCLP	12	0	0.0%
DRADS	50	0	0.0%
DSMETCLP	53	0	0.0%
DWQPL	12	0	0.0%
GAMMA SPECTROSCOPY	52	3	5.8%
GAS PROPORTION/AL COUNTER	4	0	0.0%
HERB8150	26	0	0.0%
HSLMET	17	0	0.0%
METAA	2	0	0.0%
METADD	60	4	6.7%
METCLP	16	0	0.0%
PCB8080C	25	0	0.0%
PESTCLP	77	4	5.2%
PHPEST610	19	0	0.0%
SMETCLP	172	4	2.3%
SW-846 6010	70	6	8.6%
SW-846 6010/6010B	16	0	0.0%
SW-846 6200	8	0	0.0%
SW-846 8082	39	1	2.6%
SW-846 8260	25	0	0.0%
SW-846 8270	39	1	2.6%
SW-846 8290	9	0	0.0%
TRADS	1464	5	0.3%
TRIPES619	57	0	0.0%
VOA502.2	28	0	0.0%
VOA524.2	12	0	0.0%
VOACLP	96	3	3.1%
WQPL	298	4	1.3%

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The field duplicate RPD values indicate how much variation exists in the field duplicate analyses. EPA data validation guidelines state "there are no required review criteria for field duplicate analyses comparability" (EPA 1994b). For the DQA, the highest RPD values were reviewed (Table 18). For this project, project decisions were not impacted.

Table 24
RPD Evaluation Summary

Lab Code	Test Method	Analyte	Max RPD (%)
ESTLDEN	SW-846 6010	Aluminum	151.85
ITLSL	SMETCLP	Aluminum	22.72
ITLO	TRADS	Americium-241	48.72
ITLR	TRADS	Americium-241	190.45
ESTLDEN	ALPHA SPEC	Americium-241	15.61
ESTLDEN	SW-846 6010	Arsenic	72.11
ESTLDEN	SW-846 6010	Barium	106.71
ESTLDEN	SW-846 6010	Cadmium	92.54
ESTLDEN	SW-846 6010	Chromium	125.93
ITLSL	SMETCLP	Chromium	30.71
ESTLDEN	SW-846 6010	Cobalt	68.46
ESTLDEN	SW-846 6010	Copper	143.95
ESTLDEN	SW-846 6010	Iron	114.96
ITLSL	SMETCLP	Iron	7.32
ITLSL	SMETCLP	Lead	28.07
ESTLDEN	SW-846 6010	Lead	110.68
ESTLDEN	SW-846 6010	Lithium	145.95
ESTLDEN	SW-846 6010	Manganese	144.50
ITLSL	SMETCLP	Manganese	9.61
ESTLDEN	SW-846 6010	Mercury	25.32
ESTLDEN	SW-846 6010	Nickel	85.71
ESTLDEN	ALPHA SPEC	Plutonium-239/240	119.84
ITLR	TRADS	Plutonium-239/240	197.96
ITLO	TRADS	Plutonium-239/240	21.05
ESTLDEN	SW-846 6010	Strontium	137.86
ITLSL	VOACLP	Toluene	66.67
ITLO	TRADS	Uranium-234	7.27
ITLR	TRADS	Uranium-234	180.11
ESTLDEN	ALPHA SPEC	Uranium-234	7.06
ESTLDEN	ALPHA SPEC	Uranium-238	30.12
ITLR	TRADS	Uranium-238	49.91
ITLO	TRADS	Uranium-238	5.77
ESTLDEN	SW-846 6010	Vanadium	118.52
ESTLDEN	SW-846 6010	Zinc	168.79
ITLSL	SMETCLP	Zinc	15.38

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7.2.3 Completeness

Based on original project DQOs, a minimum of 25 percent of Environmental Restoration (ER) Program analytical (and radiological) results must be formally verified and validated. Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. The number and percentage of validated records (codes without "1"), the number and percentage of verified records (codes with "1"), and the percentage of rejected records for each analyte group for this project are listed in Table 25.

Four hundred and thirty one records out of 23,669 (1.82 percent) total records were rejected. None of the rejected records affected project decisions. For this project, 38.17 percent of the analyses were validated. This exceeds the overall ER Program V&V goal of 25 percent.

7.2.4 Sensitivity

Reporting limits, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides, were compared with RFCA WRW soil ALs. Adequate sensitivities of analytical methods were attained for all COCs that affect remediation decisions. "Adequate" sensitivity is defined as an RL less than an analyte's associated AL, typically less than one-half the AL.

Table 25
Validation and Verification Summary

Validation Qualifier Code	Total No. of Records	No. of Dissolved Metals	No. of Dissolved Radionulcides	No. of Pesticides	No. of Phosphorus Pesticides	No. of Semivolatile Organic Compounds	No. of Total Metals	No. of Total Radionuclides	No. of Volatile Organic Compounds	No. of Water Quality Parameters
No V&V	1917	377	0	53	0	378	458	146	419	86
1	12	0	0	0	0	0	12	0	0	0
A	421	0	38	13	0	127	0	221	22	0
J	1016	170	0	1	0	66	559	1	205	14
J1	420	0	0	0	0	1	403	12	4	0
JB	26	0	0	0	0	0	0	0	26	0
JB1	9	0	0	0	0	0	0	0	9	0
R	423	20	6	70	0	125	29	44	107	22
R1	8	0	0	0	0	0	8	0	0	0
UJ	51	0	0	0	0	0	3	0	48	0
UJ1	136	0	0	0	0	1	81	0	54	0
V	7093	470	63	1252	0	2273	922	240	1812	61
V1	4502	0	0	238	0	2026	1409	514	315	0
Y	5	0	0	0	0	0	0	0	0	5
Z	7630	539	95	700	247	1352	432	1749	2312	204
Total	23669	1576	202	2327	247	6349	4316	2927	5333	392
Validated	9035	660	107	1336	0	2591	1513	506	2220	102
% Validated	38.17%	41.88%	52.97%	57.41%	0.00%	40.81%	35.06%	17.29%	41.63%	26.02%
Verified	5087	0	0	238	0	2028	1913	526	382	0
% Verified	21.49%	0.00%	0.00%	10.23%	0.00%	31.94%	44.32%	17.97%	7.16%	0.00%
Rejected	431	20	6	70	0	125	37	44	107	22
% Rejected	1.82%	1.27%	2.97%	3.01%	0.00%	1.97%	0.86%	1.50%	2.01%	5.61%

Validated codes: J, V, JB, UJ

Verified codes: 1, J1, V1, JB1, UJ1

7.3 Summary of Data Quality

RPDs greater than 35 percent indicate the sampling precision limits of some analytes have been exceeded; however, data collected and used for this group are adequate for decision making.

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ENCLOSURE

Compact Disc Containing Standardized Real and QC Data

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APPENDIX A

ECOLOGICAL SCREENING SUMMARY

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LIST OF ATTACHMENTS

Attachment 1 Background Statistical Analyses
Attachment 2 Alternative Toxicity Values and Site-Specific ESLs
Attachment 3 Chemical Risk Characterization Lines of Evidence in Support of the Risk Characterization
Attachment 4 Other/Drainage Lines of Evidence in Support of the Risk Characterization

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ACRONYMS AND ABBREVIATIONS

µg	micrograms
µg/kg	micrograms per kilogram (sometimes found as ug/kg)
µg/L	micrograms per liter
ac-ft	acre-feet
AET	apparent effects threshold
AEU	Aquatic Exposure Unit
AT	alternative toxicity
CCME	Canadian Council of Ministers of the Environment
CDH	Colorado Department of Health
CRA	Comprehensive Risk Assessment
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
ECOC	ecological contaminant of concern
ECOI	ecological contaminant of interest
ECOPC	ecological contaminant of potential concern
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
EqP	equilibrium partitioning
ERA	Ecological Risk Assessment
ERL	effects range low
ERM	effects range median
ESL	ecological screening level
FCV	Freshwater chronic value
HI	hazard index
HQ	hazard quotient
IA	Industrial Area
IHSS	Individual Hazardous Substance Site
ISQG	interim sediment quality guideline
K-H	Kaiser-Hill Company, L.L.C.
LEL	lowest effect level
LOAEL	lowest observed adverse effect level
LOE	line of evidence
M	meter
MDC	maximum detected concentration
MENVIQ/EC	Ministere de l'Environement du Quebec et Environement Canada
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
N/A	not applicable

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NAWQC	National Ambient Water Quality Criteria
NEC	no effects concentration
ng/kg	nanograms per kilogram
NN AEU	No Name Gulch Aquatic Exposure Unit
NOAEL	no observed adverse effects level
NPDES	National Pollutant Discharge Elimination System
NW AEU	North Walnut Creek Aquatic Exposure Unit
NYSDEC	New York State Department of Environmental Conservation
OMOE	Ontario Ministry of the Environment
OU	Operable Unit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
pCi/kg	picocuries per kilogram
PEC	probable effect concentration
PEL	probable effect level
RFETS or Site	Rocky Flats Environmental Technology Site
SID	South Interceptor Ditch
SLCA	
SQG	sediment quality guideline
TCDD	tetrachlorodibenzo-para-dioxin
TEC	threshold effect concentration
TEF	toxicity equivalency factor
TEL	toxic effects level
TEL	threshold effects level
TEQ	toxicity equivalency quotient
TNRCC	Texas Natural Resource Conservation Commission
UCL	upper confidence limit
UTL	upper tolerance limit
WC AEU	Woman Creek Aquatic Exposure Unit
WHO	World Health Organization
WQCC	Water Quality Control Commission

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EXECUTIVE SUMMARY

This appendix presents the ecological screening summary for the sediment data collected from the A-Series, B-Series, and C-Series ponds that are included in the Data Summary Report for Individual Hazardous Substance Site (IHSS) Group NE-1 (that is., Ponds A-1, A-2, A-3, A-4, A-5, B-4, B-5, C-1, and C-2). The purpose of the ecological screening summary is to provide information for risk managers at the Rocky Flats Environmental Technology Site (RFETS or Site) to determine whether accelerated actions are warranted for the ponds based on protection of ecological receptors.

The ecological screening summary follows the Comprehensive Risk Assessment (CRA) Work Plan and Methodology (CRA Methodology). The steps of the Ecological Risk Assessment (ERA) process outlined in the CRA Methodology are included in this appendix: identification of ecological contaminants of potential concern (ECOPCs) and risk characterization. The Data Quality Assessment (DQA), data adequacy assessment, and detailed discussion of uncertainties associated with the risk results for these ponds are not included in this appendix but will be provided in the CRA. In addition, the ponds will be included in the Aquatic Exposure Unit (AEU) ERAs that are part of the CRA.

The ECOPC identification process was completed using all sediment sample results (regardless of depth fraction) available within the pond areas. Results are summarized in Table A.1 for the A-Series Ponds, Table A.2 for the B-Series Ponds, and Table A.3 for the C-Series Ponds. The following ECOIs were identified as ECOPCs and carried forward for further evaluation in the risk characterization:

- Pond A-1: aluminum, antimony, barium, cadmium, copper, iron, lead, mercury, nickel, selenium, silver, zinc, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, Aroclor-1254, Aroclor-1260, total polynuclear aromatic hydrocarbons (PAHs) and total polychlorinated biphyenyls (PCBs);
- Pond A-2: aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, nickel, silver, zinc, acenaphthene, anthracene, bis(2-ethylhexyl)phthalate, indeno(1,2,3-cd)pyrene, Aroclor-1254, total-PAHs, and total-PCBs;
- Pond A-3: aluminum, antimony, barium, iron, nickel, selenium, zinc, benzo(a)pyrene, chrysene, fluoranthene, phenanthrene, pyrene, total-PAHs and total-PCBs;
- Pond A-4: aluminum, antimony, arsenic, barium, cadmium, copper, iron, nickel, selenium, zinc, and atrazine;
- Pond A-5: aluminum, barium, iron, silver, and zinc;
- Pond B-4: aluminum, antimony, barium, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, silver, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, gamma-BHC, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, Aroclor-1254, total-PAHs, and total-PCBs;

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- Pond B-5: aluminum, barium, iron, lead, nickel, selenium, silver, zinc, and total-PAHs;
- Pond C-1: aluminum, barium, iron, lead, manganese, mercury, nickel, selenium, zinc, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, pentachlorophenol, phenanthrene, pyrene, Aroclor-1254, total-PAHs, and total-PCBs; and
- Pond C-2: aluminum, arsenic, barium, copper, iron, mercury, selenium, zinc, and total-PAHs.

The first step in the risk characterization process was to calculate surface sediment hazard quotients (HQs) using the maximum detected concentrations (MDCs) and ecological screening levels (ESLs). Those ECOPCs found to have surface sediment MDC HQs (using ESLs) of 1 or less, or were not detected in surface sediment were eliminated from further consideration. Upon completion of this decision process, the list of ECOPCs requiring further risk characterization included:

- Pond A-1: aluminum, selenium, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, and Aroclor-1254, and total-PCBs;
- Pond A-2: aluminum, manganese, acenaphthene, anthracene, indeno(1,2,3-cd)pyrene, Aroclor-1254, and total-PCBs;
- Pond A-3: aluminum, antimony, selenium, zinc, pyrene, and total-PCBs;
- Pond A-4: aluminum, antimony, cadmium, and selenium;
- Pond A-5: no ECOPCs were identified for further evaluation;
- Pond B-4: aluminum, cadmium, selenium, silver, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, total-PAHs, Aroclor-1254, and total-PCBs;
- Pond B-5: selenium and zinc;
- Pond C-1: aluminum, barium, iron, manganese, mercury, selenium, acenaphthene, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, pentachlorophenol, phenanthrene, pyrene, total-PAHs, Aroclor-1254, and total-PCBs; and
- Pond C-2: mercury and zinc.

The risk characterization process for these remaining chemicals involved multiple LOE, each of which evaluated the potential for risk to aquatic receptors from individual ECOPCs, which together provided an overall risk conclusion for each ECOPC. Chemical LOE (LOE) included an HQ assessment using the exposure point concentrations (EPCs) for each ECOPC as compared to ESLs and literature-derived alternative toxicity (AT) values. The HQ evaluation included assessments of the MDC from surface sediments, the MDC from all sediments, the 95 percent upper confidence limit (95 UCL) from all sediments, and the pond-series mean as compared to ESL and AT values. In addition, the frequency of detection was evaluated and the spatial extent of contamination was depicted to determine the extent of ECOPC occurrence within the ponds. The final LOE

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was the comparison of the ECOPC MDC to the range of background concentrations to determine whether the chemical risk is within the range of background risk.

The risk characterization continued by reviewing pond-specific conclusions from previous studies at RFETS. These additional LOE included studies of tissue analyses, aquatic population studies, toxicity bioassays, and waterfowl and wading bird exposure studies. The combination of findings from the chemical risk characterization and drainage-specific LOE constitute the weight-of-evidence approach to this ecological screening summary.

Findings for specific ponds were as follows:

- Pond A-1 – Sediment ECOPCs requiring further evaluation included two metals (aluminum and selenium) and three organic chemicals (benzo[g,h,i]perylene, indeno[1,2,3-cd]pyrene, Aroclor-1254, and total-PCBs). Aroclor-1254 was eliminated since the surface sediment MDC was less than the Aroclor-1254 ESL. Results of further chemical risk evaluation determined that the surface sediment ESL HQs for these chemicals were low (less than 10) for each ECOPC. Other chemical LOE found selenium to occur within the range of risk attributable to background. The spatial extent of these chemicals within surface sediment was often limited to a few locations with concentrations greater than the ESL, while the remainder were either less than the ESL or concentrations below detection. Based on a culmination of chemical risk LOE, these ECOPCs were found to be of low risk to aquatic populations. Results from several studies conducted by others have demonstrated that the aquatic life within Pond A-1 is typical of pond systems within the region. There has not been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond A-1 as measured by bioassay analysis and population studies. The results of the chemical risk characterization in combination with other LOE indicate there are low risk concerns to aquatic populations within Pond A-1.
- Pond A-2 – Sediment ECOPCs requiring further evaluation included two metals (aluminum and manganese) and five organic chemicals (acenaphthene, anthracene, indeno[1,2,3-cd]pyrene, Aroclor-1254, and total-PCBs). Further chemical risk evaluation determined that the surface sediment ESL HQs for aluminum, manganese, anthracene, Aroclor-1254 and total-PCBs were less than 10. Acenaphthene had an HQ of 27; however, it was detected in only 1 of 10 samples indicating a limited spatial extent. Similarly, indeno(1,2,3-cd)pyrene had an HQ of 12, but it also was only detected in 1 of 10 samples. Other chemical LOE found manganese occurred within the range of risk attributable to background. The spatial extent of these chemicals within surface sediment was often limited to a few locations as having measured concentrations greater than the ESL, while the remainder were either less than the ESL or concentrations below detection. Based on a culmination of chemical risk LOE, these ECOPCs were found to be of low risk to aquatic populations. Results from studies conducted by others have demonstrated that the aquatic life within Pond A-2 is typical of pond systems within the region. There has not been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond A-1 as measured by bioassay analysis and population studies. There has not been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond A-2. The results of the chemical risk characterization in

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combination with other LOE indicate there are low risk concerns to aquatic populations within Pond A-2.

- Pond A-3 – Sediment ECOPCs requiring further evaluation included four metals (aluminum, antimony, selenium and zinc) and two organic chemicals (pyrene and total-PCBs). Further chemical risk evaluation determined that the surface sediment ESL HQs for these chemicals were all less than 10. The only PCB congener detected was Aroclor-1254, which was detected in only one of eight samples collected. Other chemical LOE found zinc occurred within the range of risk attributable to background. Based on a culmination of chemical risk LOE, these ECOPCs were found to be of low risk to aquatic populations. Results from studies conducted by others have demonstrated that the aquatic life within Pond A-3 is typical of pond systems within the region. There has not been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond A-1 as measured by bioassay analysis and population studies. There has never been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond A-3. The results of the chemical risk characterization in combination with other LOE indicate there are low risk concerns to aquatic populations within Pond A-3.
- Pond A-4 – Sediment ECOPCs requiring further evaluation included four metals (aluminum, antimony, cadmium, and selenium). Further chemical risk evaluation determined that the surface sediment ESL HQs for aluminum, cadmium, and selenium were less than 10. Antimony had an HQ of 21; however, it was detected in only 4 of 12 samples indicating a minimal spatial extent. Other chemical LOE found selenium occurred within the range of risk attributable to background. Based on a culmination of chemical risk LOE, these ECOPCs were found to be of low risk to aquatic populations. Results from studies conducted by others have demonstrated that the aquatic life within Pond A-4 is typical of pond systems within the region. There has never been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond A-4. The results of the chemical risk characterization in combination with other LOE indicate there are low risk concerns to aquatic populations within Pond A-4.
- Pond A-5 – There were no sediment ECOPCs evaluated within the risk characterization. Those ECOPCs identified from the entire sediment data set were found to have surface sediment MDC values less than the ESLs. Therefore, these chemicals do not pose a risk to aquatic populations within Pond A-5.
- Pond B-4 – Sediment ECOPCs requiring further evaluation included five metals (aluminum, cadmium, selenium, silver and zinc) and 13 organic chemicals (anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[g,h,i]perylene, chrysene, dibenz[a,h]anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, phenanthrene, pyrene, Aroclor-1254, total-PAHs, and total-PCBs). Further chemical risk evaluation determined that the surface sediment ESL HQs for these chemicals with the exceptions of benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene were less than 10. Benzo(g,h,i)perylene had an HQ of 21; however, it was detected in 10 of 22 samples. Similarly, indeno(1,2,3-cd)pyrene had an HQ of 12 but it was detected in only 10 of 22 samples. While these two PAH constituents yielded large HQ values (benzo(g,h,i)peryelene: HQ = 21, and indeno(1,2,3-cd)pyrene with an HQ = 12) the

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MDCs for these chemicals fell below the AT and were limited in their spatial extent of exceedence as compared to the ESLs (both had three measured values greater than the ESL, while the remaining three sample locations within the Pond B-4 were at concentrations below detection). The overall risk attributable to these chemicals is expected to be low. Other chemical LOE found zinc occurred within the range of risk attributable to background. Based on a culmination of chemical risk LOE, these ECOPCs were found to be of low risk to aquatic populations. There has not been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond B-4 as measured by bioassay analysis and population studies. The results of the chemical risk characterization in combination with other LOE indicate there are low risk concerns to aquatic populations within Pond B-4.

- Pond B-5 – Sediment ECOPCs requiring further evaluation included three metals (aluminum, selenium and zinc) and one organic chemical (total-PAHs). Surface sediment ESL HQs for these chemicals were less than 10. Further evaluation indicated that the risk attributable to these metals was within the range of background conditions. Based on a culmination of chemical risk LOE, these ECOPCs were found to be of low risk to aquatic populations. The results of the chemical risk characterization in combination with other LOE indicate there are low risk concerns to aquatic populations within Pond B-5.
- Pond C-1 – Sediment ECOPCs requiring further evaluation included 6 metals (aluminum, barium, iron, manganese, mercury and selenium) and 12 organic chemicals (acenaphthene, anthracene, benzo[a]anthracene, benzo[g,h,i]perylene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene, pentachlorophenol, phenanthrene, pyrene, Aroclor-1254, total-PCBs and total-PAHs). Further chemical risk evaluation determined that the surface sediment ESL HQs for these chemicals with the exceptions of acenaphthene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene were less than 10. While five organic chemicals yielded large HQ values (acenaphthene with an HQ = 48, anthracene with an HQ of 8, benzo(g,h,i)peryelene with an HQ = 12, dibenz(a,h)anthracene with an HQ of 16, indeno(1,2,3-cd)pyrene with an HQ = 29 and pentachlorophenol with an HQ of 4) the MDCs for anthracene, benzo(g,h,i)perylene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene were comparable to the AT. In addition, dibenz(a,h)anthracene, benzo(g,h,i)perylene and pentachlorophenol were infrequently detected above their respective ESLs. The remaining chemicals with uncertain toxicity potential were acenaphthene and indeno(1,2,3-cd)pyrene since they were frequently detected (50% of total samples) yet had minimal spatial exceedences as compared to their ESLs. Results of sediment bioassay analysis indicate that Pond C-1 sediment is comparable to controls. There were no chemical stressors measured as a result of the bioassay analysis. In addition, previous studies did not identify PAHs as creating a risk to aquatic life or other receptors (wildlife and waterfowl) associated with the Pond. Other chemical LOE found iron, manganese, and selenium occurred within the range of risk attributable to background. Based on a culmination of chemical risk LOE, these ECOPCs were found to be of low risk to aquatic populations. Results from studies conducted by others have demonstrated that the aquatic life within Pond C-1 is very limited yet typical of pond systems within the region. There has not been a measurable impact attributable to a chemical stressor in relation to the aquatic

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ecology within Pond C-1. Results of the chemical risk characterization in combination with other LOE indicate there are low risk concerns to aquatic populations within Pond C-1.

- Pond C-2 – Sediment ECOPCs requiring further evaluation included two metals (mercury and zinc) and one organic chemical (total-PAHs). Further chemical risk evaluation determined that the surface sediment ESL HQs for these chemicals were less than 10. Other chemical LOE found zinc to occur within the range of risk attributable to background. Based on a culmination of chemical risk LOE, these ECOPCs were found to be of low risk to aquatic populations. Results from studies conducted by others have demonstrated that the aquatic life within Pond C-2 is typical of pond systems within the region. There has not been a measurable impact attributable to a chemical stressor in relation to the aquatic ecology within Pond C-2. Results of the chemical risk characterization in combination with other LOE indicate there are low risk concerns to aquatic populations within Pond C-2.

Results of this ecological screening indicate there are no continuing, significant risks to aquatic life in the ponds addressed in this report from residual ECOPCs because of RFETS-related operations. Any potential risk to these receptors is expected to be within the range of background risks. No additional risks above what is expected to be encountered in the natural environment in the vicinity of the ponds within the AEUs are predicted for the aquatic life receptors evaluated in this ecological screen. Overall, the aquatic communities in RFETS AEUs are limited by natural environmental conditions (that is, low flows and poor habitat), which is characteristic of this area along the Colorado Front Range. Therefore, aquatic receptor exposure pathways are often incomplete when discharge is low in these ephemeral streams.

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1.0 INTRODUCTION AND SITE SETTING

An evaluation of the potential risk to aquatic populations within individual ponds at the Rocky Flats Environmental Technology Site (RFETS or Site) was completed as part of the Data Summary Report for Individual Hazardous Substance Site (IHSS) Group NE-1. This process involved the following two components: (1) the identification of ecological contaminants of potential concern (ECOPCs) based on all sediment sample results gathered (regardless of depth fraction), and (2) risk characterization. The ECOPC selection process followed the Comprehensive Risk Assessment (CRA) Work Plan and Methodology (CRA Methodology) (DOE 2004a) and was completed for each pond. The risk characterization process addressed those ECOPCs carried forward. There are three components to the risk characterization: (1) a chemical risk characterization; (2) other LOE gathered from previous studies focused upon tissue analysis, aquatic population measures, bioassay analysis, and waterfowl and wading bird studies (Attachments 1 and 2); and (3) a weight of evidence conclusion where the chemical risk and other lines of evidence (LOE) are combined to form a risk conclusion.

The LOE used within the chemical risk characterization included a hazard quotient (HQ) evaluation of the ECOPCs using surface sediment results, a frequency of detection and spatial extent evaluation, a comparison to the range of background conditions, and additional chemical LOE as appropriate. Other LOE gathered from previous studies (focusing upon tissues analysis, aquatic population measures, and so forth) were also compiled to more fully understand the potential risk conditions associated with the ponds (Attachments 1 and 2). Several previous studies focused specifically on the ponds and these studies are also summarized in Attachments 1 and 2. The combination of chemical risk assessment and other LOE formulates the weight of evidence summary risk conclusions. Each pond was evaluated independently. In addition, each pond's contribution to the pond-series is described.

Aquatic habitats at RFETS have been highly modified by diversion and impoundment of water, which occurred historically for agricultural use and, more recently, for control of potential off-site transport of contaminants in water and sediments. Prior to agricultural development, Walnut Creek and Woman Creek were seasonally intermittent streams fed primarily by snowmelt and runoff. Aquatic communities were limited by both the periodic lack of flows and the generally low flows. Reliable surface flows occurred only near seeps and springs (DOE 1996).

Construction of detention ponds in both watersheds severely altered the natural hydrologic conditions. Creation of the ponds resulted in permanent lentic (standing water) habitats in areas where water previously was present only seasonally. In Walnut Creek, batch-release of water from the terminal ponds (Pond A-4 and Pond B-5) has caused stream segments immediately downstream to be dry most of the time. Establishment of aquatic life in these stream segments is limited because batch-releases are of short duration and occur at irregular intervals. Much of the water in Woman Creek has historically been diverted to Mower Ditch, leaving the segment below Pond C-2 dry much of the year. Flow in portions of Woman Creek upstream of Pond C-2 is relatively natural, although some groundwater sources may have been interrupted by installation of

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the South Interceptor Ditch (SID) and French drain in Operable Unit (OU) 1 and OU 5 (DOE 1996).

Stream communities at RFETS are composed of species that are typical of limited-flow or seasonal flow environments. Under these conditions, assessment of impacts because of contaminant input is difficult because of natural variability (DOE 1996). Physical conditions in the ponds also hinder assessment of toxic impacts. Water levels in historic Ponds A-3, A- 4, B-2, B-3, and B-5 were manipulated for Site water management. Ponds A-1, A-2, B-1, and B-2 were relatively shallow (less than 1 meter [m]), had no regular input besides local runoff, and had no regular output besides evaporation. As a result, the ponds historically have had abundant aquatic plant life. However, faunal communities are limited, probably because of high daytime temperatures (in summer) and low dissolved oxygen at night.

The most common aquatic macroinvertebrates (aquatic insects) are the larvae of the blackfly (Order *Diptera, Simulidae* sp.), midge (Order *Diptera, Chironomidae* sp), and mayfly (Order *Ephemeroptera*). Other species include caddisflies (Order *Trichoptera*), craneflies (*Tipulidae* ssp.), and damselfly larvae (Order *Odonata*), as well as snails (Class *Gastropoda*) and amphipods (Order *Amphipoda*). Large macroinvertebrates such as crayfish (Order *Decapoda*, Family *Astacidae*) and snails are potentially important prey for other fish, waterfowl, and mammal species.

Each of the primary drainages at the Site contains a variety of pond and stream habitats, varying amounts of habitat modification, and seasonal water flows. The Walnut Creek drainage has been highly modified as part of the development of RFETS. The upper section of the drainage was filled and the lower section modified into a series of small reservoirs that can retain water released from the Industrial Area (IA). A variety of non-native fish species such as rainbow trout (*Salmo gairdneri)*, carp (*Cyprinus carpio)*, and bass (Order *Centrarchidae, Micropterus* sp.*)* were introduced into the Walnut Creek reservoirs. Although all introductions did not establish reproducing fish populations, carp, goldfish *(Carassius auratus)* and fathead minnows *(Pimephales promelas)* are present in these reservoirs. Woman Creek retains a significant amount of stream habitat and holds the majority of RFETS fish species. Native fish species that reproduce within Woman Creek include white suckers *(Catostomus commersoni)* fathead minnows, green sunfish *(Lepomis cyanellus*), stonerollers *(Campostoma anomalum*), and creek chubs *(Semotilus atromaculatus*). Two non-native fish species, golden shiners *(Notemigonus crysoleucas)* and largemouth bass *(Micropterus salmoides)* also are found in the drainage.

The A- and B-Series Ponds are downgradient of the IHSSs in the Walnut Creek watershed and may contain contaminants transported from primary source areas. Contaminants that have accumulated in water and sediments could affect the aquatic populations within these ponds.

Most of the IHSSs in the Woman Creek watershed are located on the south-facing slopes of this drainage. These IHSSs were used primarily for storage and disposal of hazardous materials. In some of the IHSSs, most notably the 903 Pad, hazardous wastes leaked from drums into surrounding soil. The drums and contaminated soil underneath have since been removed. Exposure to aquatic receptors is most likely through contact with contaminated sediment and surface water.

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Ponds C-1 and C-2 are downgradient of IHSSs and therefore may contain contaminants originating from these sites. Pond C-1 is probably the most "natural" pond in terms of associated vegetation and persistent water levels. Pond C-2 supports a population of fathead minnows.

Details of the history and uses of the ponds are provided in the main body of this Data Summary Report.

2.0 IDENTIFICATION OF ECOLOGICAL CONTAMINANTS OF POTENTIAL CONCERN

This section provides a summary of the methods and findings of the pond ECOPC process. A summary of the ECOPCs identified for each pond are provided in Table A.1 for the A-Series, A.2 for the B-Series, and A.3 for the C-Series.

2.1 Data Used in the Evaluation

The ECOPC screen was conducted using the complete sediment data set available for each individual pond (all samples regardless of depth fraction collected after June 23, 1991, including the recently collected July, 2005 samples). Therefore, all sediment samples comprised of all depth fractions within a given pond were compiled for the process. Summary statistics for detected chemicals within all sediment samples collected for each pond are provided in Tables A.4 through A.12.

Polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) tend to act in an additive manner because of similar modes of toxic action. To account for this interactive toxicity, a total concentration was calculated for PCBs and PAHs within each sample. The total-PCB and total-PAH concentrations were determined by:

1. PAH compounds detected in greater than 5 percent of the samples were included in the total calculations.
2. A sum of PAHs was determined for each sample using one-half the detection limit for nondetected chemicals.
3. The total maximum detected value was compared to the "total-PAH" ecological screening level (ESL) for the ECOPC screen.
4. The total detected maximum sum for each sample location was calculated for surface sediment and compared to the ESL for the risk characterization screen.

The total maximum PCB concentration was determined by:

1. Aroclors detected in greater than 5 percent of the samples were included in the total calculations.
2. A total maximum sum of PCBs was determined for each sample using one-half the detection limit for nondetected congeners.
3. The total maximum detected value was compared to the "total-PCB" ecological screening level (ESL) for the ECOPC screen.
4. The total maximum detected value in surface sediment was compared to the ESL for the risk characterization screen.

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Similarly, additional sampling for dioxins/furan congeners was completed after the CRA Methodology was put in place. The toxicity evaluation of these chemicals requires the use of toxicity equivalency factors (TEFs) as related to 2,3,7,8-TCDD. The methods are more thoroughly described in Attachment 2. For dioxins/furans, the following steps were taken:

1. Detected congener concentrations were summed, using one-half the detection limit was used for nondetected concentrations, to develop a conservative total dioxin concentration.
2. This total dioxin concentration was then compared to a total dioxin ESL for ECOPC screening.
3. If the total dioxin concentration exceeded the ESL and was retained for risk characterization, then a toxicity equivalency quotient (TEQ) was calculated using congener-specific TEFs (WHO 1998).

The results of these analyses were compared to available toxicity benchmarks protective of aquatic life. Values of 0.85 nanogram per kilogram (ng/kg) no observed effects level (NOAEL) and 21.5 ng/kg lowest observed effects level (LOAEL) were used for the comparison (WHO 1998).

2.2 Identification of Sediment ECOPCs

The pond ECOPC identification process examined ecological contamimants of interest (ECOIs) (that is, analytes detected at least once in sediment samples) that were present in sediment through the sequential, multi-step process described in the CRA Methodology. In the interest of being conservative, the professional judgment step was eliminated from the process used to select ECOPCs for the ponds. A summary of the process and the specific application to the pond ECOPC selection process is described below.

As the first step in this process, the maximum detected concentrations (MDCs) of ECOIs were screened against ESLs. ECOIs without ESLs were considered to be chemicals of uncertain potential for risk, and are discussed further in the uncertainty section of the CRA (Volume 2).

The ECOPC selection process continued with the exclusion of chemicals with a detection frequency of less than 5 percent and, subsequently, with concentrations not significantly different from background. Infrequently detected ECOIs and those with concentrations not greater than background are assumed not to pose a potential for risk to aquatic receptors. Because each pond has a small and concentrated data set, it was found that the less than 5 percent detection frequency and background screening steps did not eliminate any ECOIs from further consideration.

The next step of the ECOPC selection process compared the exposure point concentration (EPC), represented by the 95th upper tolerance limit (UTL) (95th upper confidence limit [UCL] of the 90th percentile), to the ESL. Because of the size of the data sets, it was often found that the UTL was greater than the MDC. Therefore, there were no ECOIs eliminated from further consideration within the ECOPC process as a result of this step.

The final ECOPC selection step outlined in the CRA Methodology involves a professional judgment evaluation of each remaining ECOI to determine whether the

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ECOI was related to site activities and if there was a realistic potential for risk to aquatic communities that required a thorough risk characterization. As noted above, this step was not applied for the ecological screening summary.

2.3 Summary of ECOPCs by Pond

All ECOIs with MDCs greater than the ESL were ultimately retained as an ECOPC. The decision steps involving a frequency of detection screen, a statistical comparison to background and the comparison of the UTL to the ESL did not eliminate any ECOIs from further consideration.

Statistical background results and summary statistics from which the ECOI UTLs were developed are provided in Attachment 1.

Results of each ECOPC step are shown in Tables A.13 through A.21 by pond. A summary of the total-PCB evaluations for all sediment sample results and surface sediment sample results are provided in Tables A.22 and A.23, respectively, total-PAH values for all sediment by sample are provided within Table A.24, and total-PAHs for surface sediment by location within Table A.25, while dioxin TEQ calculations for all sediment sample results and surface sediment results are provided in Tables A.26 and A.27, respectively. The values provided in these Tables A.22 and A.23 represent measured values and ½ of the reported value for the non-detect sample results. Similarly, the values presented in Tables A.28 and A.29 represent measured values and ½ of the reported value for the non-detect sample results. For instance, values presented for locations and samples within Ponds A-4 and A-5 were all non-detect, thus ½ the reporting limit values are presented for each chemical.

The total-PCB MDC was used for the ECOPC evaluation step. In general, Aroclor-1254 was the only congener detected in the ponds (with the exception of Pond A-1), therefore the MDC for Aroclor-1254 was the equivalent of the total maximum PCB concentration. Total-PCBs were identified as an ECOPC for Ponds A-1, A-2, A-3, B-4 and C-1. Further analysis of the total-PCB results identified Aroclor-1254 as an ECOPC for Ponds A-1, A-2, A-3, B-4 and C-1 while Aroclor-1260 was an ECOPC for Pond A-1.

Total-PAHs were calculated for each pond using detected values and ½ the reported value for non-detected chemicals. The results were compared to the total-PAH ESL Total-PAHs were identified as an ECOPC for all of the ponds except A-4 and A-5 where data analysis indicated that all sample results from the comprehensive sediment data set were below detection limits.

Dioxin was evaluated by summing the products of detected congener concentrations and TEFs. The resulting total dioxin equivalent (TEQ) concentration was compared to available toxicity benchmarks protective of aquatic life. A NOAEL of 0.85 ng/kg and a LOAEL of 21.5 ng/kg were used for the comparison (WHO 1998). The summed values provided in Table A.24 are below the LOAEL level.

The ECOPCs identified for each pond are as follows:

- Pond A-1 (Table A.13): aluminum, antimony, barium, cadmium, copper, iron, lead, mercury, nickel, selenium, silver, zinc, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, fluoranthene,

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indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, Aroclor-1254, Aroclor-1260, total-PAHs, and total-PCBs;

- Pond A-2 (Table A.14): aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, nickel, silver, zinc, acenaphthene, anthracene, bis(2-ethylhexyl)phthalate, indeno(1,2,3-cd)pyrene, Aroclor-1254, total-PAHs, and total-PCBs;
- Pond A-3 (Table A.15): aluminum, antimony, barium, iron, nickel, selenium, zinc, benzo(a)pyrene, chrysene, fluoranthene, phenanthrene, pyrene, total-PAHs and total-PCBs;
- Pond A-4 (Table A.16): aluminum, antimony, arsenic, barium, cadmium, copper, iron, nickel, selenium, zinc, and atrazine;
- Pond A-5 (Table A.17): aluminum, barium, iron, silver, and zinc;
- Pond B-4 (Table A.18): aluminum, antimony, barium, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, silver, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluorantheene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, gamma-BHC, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, Aroclor-1254, total-PAHs, and total-PCBs;
- Pond B-5 (Table A.19): aluminum, barium, iron, lead, nickel, selenium, silver, zinc, and total-PAHs;
- Pond C-1 (Table A.20): aluminum, barium, iron, lead, manganese, mercury, nickel, selenium, zinc, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, pentachlorophenol, phenanthrene, pyrene, Aroclor-1254, total-PAHs and total-PCBs; and
- Pond C-2 (Table A.21): aluminum, arsenic, barium, copper, iron, mercury, selenium, zinc, and total-PAHs.

3.0 ECOLOGICAL EXPOSURE ASSESSMENT

An exposure pathway describes a specific environmental route by which an individual receptor could be exposed to contaminants present at or originating from a site. A complete exposure pathway includes five elements: source, mechanism of release, transport medium, exposure point, and intake route. If any of these elements is missing, the pathway is considered incomplete. It is assumed that aquatic life may be exposed to sediment-related ECOPCs via several routes (direct contact, inhalation, and ingestion) for the purposes of the pond evaluations. This evaluation conservatively assumes that an aquatic receptor obtains 100 percent of its exposure from each respective pond.

4.0 ECOLOGICAL TOXICITY ASSESSMENT

ESLs that were identified in the CRA Methodology are typically screening-level concentrations at which adverse effects are rarely observed and provide a conservative lower bound indicating concentrations above which the potential for adverse effects are

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possible as discussed in the CRA Methodology. Alternative toxicity (AT) values were identified for consideration in the risk characterization of ECOPCs to provide an upper-bound concentration at which the potential for adverse effects is possible (Attachment 2).

AT values represent literature-derived toxicity values for contaminants that reflect upper-bound concentrations above which adverse effects are possible. Concentrations between the ESL and AT values are within the range of uncertain toxicity where adverse effects may be observed. The use of both the lower- and upper-bound toxicity values for each ECOPC brackets the potential for risk from each ECOPC and allows an evaluation of the likelihood of potential risk.

Aquatic ATs vary in their endpoint and receptor of interest. The available literature was reviewed to identify suitable AT values for each ECOPC that correlate to a lowest observed adverse effect level (LOAEL) or similar measure. The selection process for AT values, their endpoints, and sources are described in Attachment 2. In general, the AT values were identified from the literature using the same steps applied for the development of ESLs as defined in the CRA Methodology.

5.0 POND ECOLOGICAL RISK EVALUATION

The pond risk evaluation involved two components: (1) a chemical risk LOE (LOE) evaluation, and (2) other LOE gathered from previous studies focused upon the evaluation of the pond's ecology. Both components were evaluated and form the final weight of evidence risk conclusions for each pond. The chemical risk LOE relied upon specific data sets generated from surface sediment and pond-series results. These data and a summary of their application to this evaluation are provided in Attachment 3. The other LOE gathered from previous studies focused upon site ecology, as summarized in detail in Attachment 4. First, the ecological setting is described in context of the series, then the chemical risk and other LOE for each pond are provided.

Chemical risk characterization LOE generally followed several steps. The initial step involved an HQ assessment, comparing the ECOPC MDC from surface sediment to the ESLs (CRA Methodology ESLs) and ATs. Surface sediment represents the realistic exposure medium by which aquatic receptors can become affected. Those ECOPCs that were either not detected or had ESL HQs of 1 or less in surface sediment were eliminated from further risk characterization.

The total-PCBs MDC was equal to the total maximum concentration in surface sediment as determined by steps previously described in subsection 2.1. The total-PAHs MDC was equal to the total detected maximum concentration determined by location for each pond as shown in Figures A.30 for the A-Series, Figure A.58 for the B-Series and A.82 for the C-Series.

The HQ evaluation also encompassed use of the UCL, which provided a measure of the central tendency of chemical concentrations. In addition, summary statistics for the pond series were developed (provided in Attachment 3) from which an arithmetic mean was calculated and also evaluated using the HQ method. The results were used to provide a perspective in regards to HQs from the entire sediment and surface sediment data sets. They were not used for decision purposes.

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As described in Section 2.0, the ECOPC identification process used ESLs from the CRA Methodology. For risk characterization, ATs were developed where appropriate. The ESLs and ATs were compared to surface sediment MDCs, sediment (all depth fractions) MDCs, and EPC values (pond-specific UCL 95 and pond-series arithmetic mean) for the HQ process. The HQs were developed using the following standard equation:

HQ = EPC/ESL or AT

Where:

EPC = media-specific EPC (micrograms per kilogram [µg/kg], picocuries per kilogram [pCi/kg], or milligrams per kilogram [mg/kg] for sediment)
ESL = media-specific ESL (comparable units to the EPC)
AT = media-specific ecological AT (comparable units to the EPC)

The second step of chemical risk characterization was to evaluate the frequency of detection and spatial extent of each ECOPC. A low detection frequency indicates uncertainty in the potential for risk evaluation.

As a final step, the spatial distribution of concentrations of ECOPCs was evaluated. This step involved mapping the location of each sample and indicating the concentration relative to the ESL. The spatial extent was evaluated to identify any potential areas that could present a localized risk to aquatic organisms. If all measured results were consistently greater than the ESL within a habitat area, then the potential for risk could not be excluded. If, however, ESL exceedances were scattered and not consistently present throughout the habitat area, then there may be a low potential of risk. The ECOPCs were mapped for both the comprehensive sediment data set and surface sediment data set. Figures for the comprehensive sediment data set are provided in Attachment 3, while Figures for the surface sediment data set are provided within this text.

ECOPCs were mapped by pond series. The maps indicate where results are either nondetect, greater than ESLs, or less than ESLs. Therefore, each ECOPC identified for any pond within a series is shown for all ponds within the series regardless of ECOPC status. For instance, arsenic was identified as an ECOPC for Pond A-2 and not for Pond A-1. In order to understand the spatial extent of occurrence within the entire habitat region, arsenic was mapped for surface sediment throughout the series. This same approach was applied for the B- and C-Series ECOPCs as well. Figures A.1 through A.30 depict the A-Series ECOPCs and show results by pond. Figures A.31 through A.58 show the B-Series ECOPCs, while Figures A.59 through A.82 provide the C-Series. Specific data queries were completed for PCB and PAH constituents in surface sediment by pond series. These maps are provided on Figures A.30 for the A-Series, A.58 for the B-Series and A.82 for the C-Series.

In addition to the chemical LOEs, a second component of risk characterization was the review of conclusions from other reports and studies. The ecological setting of RFETS is a key to understanding the controlling factors other than chemical concentrations that affect the ecology of each drainage. These LOEs consist of previously collected data from the OU 5/OU 6 Watershed Ecological Risk Assessment (ERA), ecological monitoring data, and others. These studies defined ecological conditions of the Site over time and provided insight to the changes, adverse effects, or controlling factors that may

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have been affecting the site ecology. Each study provided a LOE describing the ecological risk setting.

Attachment 4 provides a summary of other LOEs gathered from previous studies that were conducted within RFETS and which focused on the ponds specifically. LOEs that can provide information regarding risk conditions to aquatic life can be derived using a number of strategies (measurement endpoints). Previous studies completed within RFETS that encompass aquatic life measurement endpoints include the following four categories:

- Tissue analyses – Included sampling and analysis to determine bioaccumulation and bioconcentration trends;
- Aquatic population studies – Evaluated populations of benthic macroinvertebrates and fish within RFETS;
- Bioassay analyses – Measured direct toxicity effects to laboratory test organisms from potentially contaminated surface water or sediment; and
- Waterfowl/wading bird studies – Determined the potential impacts to these higher trophic level receptors by assessing their potential exposure to aquatic species as food sources (recording feeding behaviors and ranges).

Attachment 4 provides a summary of previous studies by type of LOE (that is, tissue analyses, aquatic population studies, bioassay analyses, waterfowl/wading bird studies, chemical loading analyses, and so forth) presented in a chronological order. The methods, conclusions, and application to this ecological screening summary are also provided. A summary of findings is then presented within the risk characterization in order to draw weight-of-evidence risk conclusions.

5.1 A-Series Pond Risk Characterization

The A-Series Ponds occur within the North Walnut Creek Aquatic Exposure Unit (NW AEU), which encompasses the watershed components associated with the North Walnut drainage. Runoff from the northern portion of the IA flows into North Walnut Creek. North Walnut Creek upstream of Pond A-4 is classified as stream Segment 5 in the Big Dry Creek basin by the Colorado Water Quality Control Commission (WQCC). North Walnut Creek has continuous flow at approximately 150 acre-feet (ac-ft) per year. These flows are likely to diminish with the removal of buildings and pavement from the IA, which will significantly reduce the volumes and peak discharge rates of runoff. Pond A-1 is isolated from North Walnut Creek by design and does not receive runoff from the IA. Historically, it was held in reserve to catch runoff in the event of a hazardous waste spill in the northern portion of the IA.

Fathead minnows (*Pimephales promelas*), a native species, are present in the A-Ponds and are the dominant fish species found in this AEU. A variety of non-native fish species (rainbow trout [*Salmo Gairdneri*], carp [*Cyprinus carpio*], and bass [*Micropterus sp.*]) were inadvertently introduced into the Walnut Creek ponds, although these introductions have not resulted in established reproducing fish populations. Golden shiners (*Notemigonus crysoleucas*), a non-native fish, is also present in the A-Ponds.

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Within the Walnut Creek area, the most common aquatic macroinvertebrates are the larvae of the blackfly (*Diptera, Simulidae* sp.) midge (*Diptera, Chironomidae sp*), mayfly (*Ephemeroptera*) (DOE, 1997) and scuds (*Hyalella azteca*). Other species include caddisflies (*Trichoptera*), craneflies (*Tipulidae sp.*), and damselfly larvae (*Odonata*), as well as snails (*Class Gastropoda*) and other amphipods (*Amphipoda*). Large macroinvertebrates such as crayfish (*Decapoda, Astacidae*) and snails are potentially important prey for other fish, waterfowl, and mammal species.

Characterization of the aquatic habitat provided by North Walnut Creek is of primary consideration with regards to aquatic risk. Currently sustained flows exist, albeit minimal in nature, that support some aquatic species. The location and amount of viable aquatic habitat that will be present after accelerated actions are complete is unclear because overland flow may be altered by the IA accelerated actions.

5.1.1 Pond A-1

The following describes the outcome of the surface sediment HQ analysis completed for each identified ECOPC. Those chemicals identified for further risk characterization are more thoroughly described in the Chemical Risk Characterization – Further Analysis section.

Chemical Risk Characterization – Surface Sediment Screen Results

Table A.28 provides the results of the HQ assessment for the Pond A-1 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESLs. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen are summarized below:

Aluminum was retained for further consideration with a surface sediment HQ of 2. The spatial extent of aluminum in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.1.

Antimony was not detected in Pond A-1 surface sediment and was therefore removed from further risk characterization. The spatial extent of antimony sampling in surface sediment within the A-Series is provided in Figure A.2. As shown on this figure, four locations were sampled with results at nondetect levels.

Barium had a surface sediment HQ of 1 or less and was removed from further consideration within the risk characterization. Further analysis indicated that the MDC for barium is less than the MDC in background. Based on this comparison, the risk attributable to barium is no greater than the risk attributable to background. The spatial extent of this chemical in surface sediment is shown on Figure A.4. For barium, there were three of four locations with measured concentrations greater than the ESL. However, the magnitude of exceedence was low yielding an HQ just greater than 1. The risk attributable to barium in Pond A-1 is expected to be within the range of background and does not require further evaluation.

Cadmium had a surface sediment HQ of 1 or less and was removed from further consideration within the risk characterization. The spatial extent of this chemical in surface sediment is shown on Figure A.5. Cadmium was detected at one location with a concentration greater than the ESL with the remaining concentrations at nondetect levels.

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Given the extent of detection of cadmium in surface sediment, the risk attributable to cadmium in Pond A-1 is expected to be low and does not require further evaluation.

Copper had a surface sediment HQ of 1 or less and was removed from further consideration within the risk characterization. The spatial extent of this chemical in surface sediment is shown on Figure A.7. The measured concentrations for copper within Pond A-1 were all below the ESL. Given the magnitude of concentrations in surface sediment, the risk attributable to copper in Pond A-1 is expected to be low and does not require further evaluation.

Iron and lead had surface sediment HQs of 1 or less and were removed from further consideration. Further analysis indicated that the MDC for both iron and lead is less than the MDCs in background. Based on the comparison, the risk attributable to these metals is no greater than the risk attributable to background. The spatial extent of these chemicals in surface sediment is shown on Figures A.8 and A.9, respectively. As shown on these figures, the measured concentrations for lead within Pond A-1 were all below the ESL. Three of four measured concentrations for iron were just slightly greater than the ESL. The risk attributable to these metals in Pond A-1 is within the range of background and does not require further evaluation.

Mercury had surface sediment HQs of 1 or less and was removed from further consideration. Further analysis indicated that the MDC for mercury is less than the MDC in background. Based on this comparison, the risk attributable to mercury would be no greater than the risk attributable to background. Mercury was detected at one location in surface sediment with a concentration just slightly greater than the ESL (Figure A.11). The risk attributable to mercury is within the range of background and does not require further evaluation.

Nickel had a surface sediment HQ of 1 or less and was removed from further consideration within the risk characterization. The spatial extent of this chemical in surface sediment is shown on Figure A.12. The measured concentrations for nickel within Pond A-1 were all below the ESL. Given the magnitude of concentrations in surface sediment, the risk attributable to nickel in Pond A-1 is expected to be low and does not require further evaluation.

Selenium was retained for further consideration with a surface sediment HQ of 2. Further analysis indicated that the MDC for selenium is less than the MDCs in background. Based on this comparison, the risk attributable to this metal is no greater than the risk attributable to background. The spatial extent of selenium in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.13. Because the surface sediment HQ for selenium was greater than 1, it was retained for further risk characterization.

Silver had a surface sediment HQ of 1 or less and was removed from further consideration. The spatial extent of this chemical in surface sediment is shown on Figure A.14. The measured concentrations for silver within Pond A-1 were either nondetect or below the ESL. Given the magnitude of concentrations in surface sediment, the risk attributable to silver in Pond A-1 is expected to be low and does not require further evaluation.

Zinc had a surface sediment HQ of 1 or less and was removed from further consideration within the risk characterization. Further analysis indicated that the MDC for zinc is less than the MDC in background. Based on this comparison, the risk attributable to zinc would be no greater than the risk attributable to background. The spatial extent of this chemical in surface sediment is shown on Figure A.15. For zinc, there were two of four locations with measured concentrations greater than the ESL. However the magnitude of exceedence was slight, yielding an HQ just greater than 1. The risk attributable to zinc in Pond A-1 would be within the range of background and does not require further evaluation.

Acenaphthene and anthracene were not detected in Pond A-1 surface sediment and were therefore removed from further risk characterization. The spatial extent of the surface sediment sampling for these chemicals in the A-Series Ponds surface sediment is provided on Figures A.16 and A.17, respectively. As shown on these figures, four locations were sampled with results at concentrations below detection.

Benzo(a)anthracene and benzo(a)pyrene had surface sediment HQs of 1 or less and were removed from further consideration. The spatial extent of these chemicals in surface sediment is shown on Figures A.19 and A.20, respectively. Benzo(a)anthracene was detected at a concentration slightly greater than the ESL at one location, while the remaining locations were less than the ESL. Similarly, benzo(a)pyrene exceeded the ESL at one location, while the remaining results were either less than the ESL or nondetect. Given the magnitude of concentrations in surface sediment, the risk attributable to these chemicals in Pond A-1 would be low and does not require further evaluation.

Benzo(g,h,i)perylene was retained for further consideration with a surface sediment HQ of 8. The spatial extent of benzo(g,h,i)perylene in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.21.

Chrysene and fluoranthene had surface sediment HQs of 1 or less and were removed from further consideration. The spatial extent of these chemicals in surface sediment is shown on Figures A.23 and A.24, respectively. Both chemicals had measured concentrations less than their respective ESLs at all four sampling locations. Given the magnitude of concentrations in surface sediment, the risk attributable to these chemicals in Pond A-1 is expected to be low and does not require further evaluation.

Indeno(1,2,3-cd)pyrene was retained for further consideration with a surface sediment HQ of 5. The spatial extent of indeno(1,2,3-cd)pyene in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.25.

Phenanthrene had a surface sediment HQ of 1 or less and was removed from further consideration. The spatial extent of this chemical in surface sediment is shown on Figure A.26. The measured concentrations for phenanthrene within Pond A-1 were all below the ESL. Given the magnitude of concentrations in surface sediment, the risk attributable to phenanthrene in Pond A-1 is expected to be low and does not require further evaluation.

Pyrene was not detected in Pond A-1 surface sediment and was therefore removed from further risk characterization. The spatial extent of sampling for this chemical in the A-Series Ponds surface sediment is provided on Figure A.27. As shown on this figure, four locations for pyrene were sampled with concentrations below detection.

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Total-PAHs were evaluated for Pond A-1. Results of the total-PAH calculation for each sample within the comprehensive data set was provided in Table A.24, while the results by location for the surface sediment data set were provided in Table A.25. These results reflect the measured values as well as one-half the reported value for the nondetected chemicals. The majority of the values were nondetect. The maximum concentrations for the comprehensive data set (6230 ug/kg) and the surface sediment data set (4428) were greater than the ESL, yet represent maximum non-detect values. As shown on Figure A.30, the maximum detected total-PAHs for Pond A-1 was 1050 ug/kg, which falls below the ESL (1610), indicating there is low risk associated with these combined chemicals. No further evaluation of total-PAHs is required.

Aroclor-1254 had an HQ just slightly greater than 1 and was therefore retained for further analysis as a conservative measure. The spatial extent in surface sediment is shown within Figure A.28.

Aroclor-1260 was not detected in surface sediment therefore it was removed from further consideration (Figure A.29). Aroclor-1260 had a low frequency of detection in the comprehensive sediment dataset (detected in 1 of 15 samples) and therefore does not demonstrate a spatial distribution of concern to aquatic life. No further evaluation is required.

Total-PCBs had a surface sediment HQ of 2. The MDC was calculated using the results of both Aroclor-1254 and Aroclor-1260. Individually, Aroclor-1254 was the only congener detected in surface sediment. Therefore, total-PCBs in surface sediment are truly a measure of Aroclor-1254. Aroclor-1254 was retained for further consideration as a conservative measure even though the surface sediment HQ for this individual congener was 1. The HQ for Aroclor-1254 differs from the HQ of total-PCBs due to the different ESL applied. The spatial extent of Aroclor-1254 exceedences as compared to the ESL within the A-Series Ponds is shown on Figure A.28. Aroclor-1254 will be the only chemical retained for further risk characterization analysis. Aroclor-1260 was not detected in surface sediment therefore it was removed from further consideration (Figure A.29).

Chemical Risk Characterization – Further Analysis

Aluminum, selenium, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, and Aroclor-1254 and were retained for further risk characterization. The results are provided below by chemical.

Aluminum had a frequency of detection of 100 percent (detected in 11 of 11 samples collected). The surface sediment HQ for the ESL is 2, which is within the HQ range where adverse effects are uncertain. The surface sediment HQ for the AT is less than 1. The aluminum ESL in sediment (15,900 milligrams per kilogram [mg/kg]) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the Sediment Quality Guideline (SQG) by the Texas Natural Resource Conservation Commission (TNRCC). The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating aluminum concentrations in media that receptors are potentially exposed to. Toxicity-based alternative screening

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benchmarks ranged from 14,000 mg/kg effects range low (ERL)[1] to 58,000 mg/kg effects range medium (ERM), with a high no effects concentration (NEC) of 73,000 mg/kg (Ingersoll et al. 1996). Comparison to these toxicity-based values provides a better indication of the potential for risk to sediment organisms. (Refer to Attachment 2 for details of alternative screening benchmarks and criteria for selection of ATs used for HQs.) Review of the surface sediment data on a point by point basis indicated that each measured aluminum result was less than the AT value. Within Pond A-1, three of the four locations had measured values greater than the ESL, the remaining location was less than the ESL. Because the measured concentrations all fall below the AT values, the likelihood for risk attributable to aluminum is expected to be low.

Selenium had a frequency of detection of 27 percent (detected in 3 of 11 samples) indicating minimal spatial extent. The surface sediment HQ for the ESL is 2, while the HQ for the AT was 1. The selenium ESL for sediment (0.95 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating selenium concentrations in media that receptors are potentially exposed to. Alternative screening benchmarks ranged from 1.73 mg/kg for the 85th percentile concentration in reservoirs (TNRCC 1996) up to 5.0 mg/kg for the British Columbia SQG (Nagpal et al. 1995). Therefore, despite sediment concentrations exceeding the ESL, the potential for adverse effects is uncertain and unlikely for selenium concentrations less than the alternative toxicity SQG. Review of the surface sediment data on a point by point basis indicates that selenium was detected above the ESL in pond A-1 surface sediment at two locations. The remaining locations were at nondetect levels. The spatial extent of selenium is limited. In addition, the MDC for selenium was within the range of background conditions. The combined LOE indicate that the risk attributable to selenium is expected to be low and within the range of background, therefore no further analysis is required.

Benzo(g,h,i)perylene had a frequency of detection of 64 percent (detected in 7 of 11 samples). The surface sediment HQ for the ESL is 8, while the HQ for the AT is less than 1. The ESL was based on the ERL for *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996). Alternative screening benchmarks ranged from the 16 µg/kg TEL to the 280 µg/kg ERM, with a high NEC of 1,200 µg/kg (Ingersoll et al. 1996). Review of the surface sediment data on a point by point basis revealed all of the measured values of benzo(g,h,i)perylene fell below the AT value. Three of the measured values were greater than the ESL, while the remaining location was below detection. Therefore, despite the MDC exceeding the ESL, it is unlikely that the concentrations of benzo(g,h,i)perylene in sediment pose a potential for adverse effects to benthic organisms in Pond A-1.

Indeno(1,2,3-cd)pyrene had a frequency of detection of 73 percent (detected in 8 of 11 samples). The surface sediment HQ for the ESL is 5, while the HQ for the AT is less than

[1] Not used as an ESL because this value was noted as unreliable (Ingersoll et al. 1996) where fewer than five samples designated as toxic for the chemical, or the number of toxic samples with concentrations below the sediment effect concentration (SEC) was greater than the number of toxic samples with concentrations above the SEC.

1. The ESL is based on the TEL for the *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996). Alternative screening benchmarks ranged from the 30 µg/kg ERL to the 250 µg/kg ERM, with a high NEC of 770 µg/kg (Ingersoll et al. 1996). All of the measured values of indeno(1,2,3-cd)pyrene were less than the AT value. Review of the surface sediment data on a point by point basis identified three of the measured values were greater than the ESL, while the remaining was at a concentration below detection. Therefore, despite the MDC exceeding the ESL, it is unlikely that the concentrations of indeno(1,2,3-cd)pyrene in sediment pose a potential for adverse effects to benthic organisms in Pond A-1.

Aroclor-1254 was retained for further analysis as a conservative step regardless of the low ESL HQ value (equal to 1). Aroclor-1254 had a frequency of detection of 67 percent (detected in 10 of 15 samples). The surface sediment HQ for the ESL is 1, while the HQ for the AT is less than 1. The ESL was based on a consensus-based threshold effect concentration (TEC) (MacDonald et al. 2000), at which the potential for adverse effects is first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be nontoxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based probable effect concentration (PEC) (300 µg/kg). Review of the surface sediment data on a point by point basis identified four locations out of seven with concentrations just slightly above the ESL (Figure A8.30). The remaining three locations were at nondetect levels. Given the low HQ values (1 to <1) it is unlikely that Aroclor-1254, exceeding the ESL by a low magnitude, poses an unacceptable risk to benthic populations that inhabit Pond A-1.

Total-PCBs were evaluated for Pond A-1. Two Aroclor congeners were detected (1254 and 1360); however, arochlor-1260 was detected in one subsurface sediment sample of 15 collected. Since it was not detected in the surface sediment, it was removed from further consideration. The total maximum surface sediment concentration for total-PCBs was compared to the total-PCBs ESL and yielded an HQ of 1 while the HQ for the AT is less than 1. The ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC (676 µg/kg). Given the low HQ values (1 to <1) it is unlikely that total-PCBs, which exceeds the ESL by a low magnitude, poses an unacceptable risk to benthic populations within Pond A-1.

Other Lines of Evidence

Chemical hazard indices (HIs) in the A-Series Ponds are reported in the 1996 U.S. Department of Energy (DOE) evaluation. At Pond A-1 the HI equals 160. Anthracene had an HQ of 89, chrysene had an HQ of 34, and benzo(b)fluoranthene had an HQ of 18. Other ecological contaminants of concern (ECOCs) in Pond A-1 had HQs between 1 and 10 including antimony, magnesium, toluene, cobalt, vanadium, Aroclor-1254, and benzo(k)fluoranthene.

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Risks to aquatic life, as indicated by the HI values, were primarily because of PAHs in sediments. However, no toxicity was detected in sediment toxicity tests and ecological population measures did not correlate with increasing HI values from the ponds. For example, Pond A-1 had the highest HI but also the highest species richness of any pond sampled. It also had one of the highest densities of organisms (number/m^2) within the A-Series Ponds, surpassed only by Pond A-3. Furthermore, Pond A-1 had the least pollution-tolerant macroinvertebrate community of all the ponds sampled at RFETS. Although the ecological measures cited here only represent 1 year of observation of pond aquatic life, the measures tend to indicate ecological health as opposed to risk from contaminants in sediments. It is more likely that limited flows and pond management limits aquatic life much more than contaminants in sediment.

Weight-of-Evidence Conclusions

The results of the chemical risk characterization indicated that the sediment ECOPCs within surface sediment would pose a low risk to aquatic life within Pond A-1. Those chemicals requiring further analysis (aluminum, selenium, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, Aroclor-1254 and total-PCBs) were found have measured concentrations greater than their respective ESLs but less than AT values. The ESL HQs for these chemicals were low (less than 10 in all cases) indicating a low risk potential. In addition, selenium was found to be within the range of risk attributable to background, while the remaining chemicals evaluated had a minimal spatial extent of ESL exceedences (aluminum, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, and Aroclor-1254). The overall risk attributable to these chemicals would be low.

These results coincide with the other LOE conclusions drawn from other studies of this pond. Previous research indicates that the aquatic populations represent typical assemblages unaffected by chemical stressors. These studies occurred within a time-frame that overlaps with the data collected and evaluated for this effort and provides supporting evidence that there are no chemical stressors controlling the ecology. The weight of evidence indicates that the risk associated with Pond A-1 to aquatic populations is expected to be low.

5.1.2 Pond A-2

The following text describes the outcome of the surface sediment HQ analysis completed for each identified ECOPC in Pond A-2. Those chemicals identified for further risk characterization are more thoroughly described in the Chemical Risk Characterization – Further Analysis section.

Chemical Risk Characterization – Surface Sediment Screen Results

Table A.29 provides the results of the HQ assessment for the Pond A-2 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESLs. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen as summarized below.

Aluminum was retained for further consideration with a surface sediment HQ of 2. The spatial extent of aluminum in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.1.

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Arsenic, barium, cadmium, chromium, and copper had surface sediment HQs of 1 or less and were removed from further consideration within the risk characterization. The spatial extent of these chemicals in surface sediment is shown on Figures A.3 through A.7. For arsenic and barium, there were two of four locations with measured concentrations greater than the ESLs. However, the magnitude of exceedence was low yielding HQs just greater than 1. Cadmium, chromium, and copper had concentrations less than the ESLs at all four sampled locations. The risk attributable to these metals in Pond A-2 is low and does not require further evaluation.

Iron and lead had surface sediment HQs of 1 or less and were removed from further consideration. Further analysis indicated the MDC for both iron and lead is less than the MDCs in background. Based on this comparison, the risk attributable to these metals is no greater than the risk attributable to background. The spatial extent of these chemicals in surface sediment is shown on Figures A.8 and A.9, respectively. As shown on these figures, the measured concentrations for lead within Pond A-2 were all below the ESL. Two of four measured concentrations for iron were just slightly greater than the ESL. The risk attributable to these metals in Pond A-2 is within the range of background and does not require further evaluation.

Manganese was retained for further consideration with a surface sediment HQ of 2. Further analysis indicated that the MDC for manganese is less than the MDCs in background. Based on this comparison, the risk attributable to this metal is no greater than the risk attributable to background. The spatial extent of manganese in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.10. Because the surface sediment HQ for manganese was greater than 1, it was retained for further risk characterization.

Nickel and silver had surface sediment HQs of 1 or less and were removed from further consideration within the risk characterization. The spatial extent of these chemicals in surface sediment is shown on Figures A.12 and A.14, respectively. The measured concentrations for both nickel and silver within Pond A-2 were all below the ESL or at concentrations below detection. The risk attributable to nickel and silver in Pond A-2 is low and does not require further evaluation.

Zinc had a surface sediment HQ of 1 or less and was removed from further consideration within the risk characterization. Further analysis indicated that the MDC for zinc is less than the MDC in background. Based on this comparison, the risk attributable to zinc would be no greater than the risk attributable to background. The spatial extent of this chemical in surface sediment is shown on Figure A.15. For zinc, all measured results were less than the ESL. The risk attributable to zinc in Pond A-2 would be within the range of background and does not require further evaluation.

Acenaphthene, anthracene, and indeno(1,2,3-cd)pyrene were retained for further consideration with surface sediment HQs of greater than 1. The spatial extent of these chemicals in surface sediment is shown on Figures A.16, A.17, and A.25 respectively.

Bis(2-ethylhexyl)phthalate had a surface sediment HQ of 1 or less and was removed from further consideration. The spatial extent of this chemical in surface sediment is shown on Figure A.22. The measured concentrations for bis(2-ethylhexyl)phthalate within Pond A-2 were all below the ESL or at concentrations below detection nondetect levels. The risk

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attributable to bis(2-ethylhexyl)phthalate in Pond A-2 is low and does not require further evaluation.

Total-PAHs were evaluated for Pond A-2. Results of the total-PAH calculation for each sample within the comprehensive data set was provided in Table A.24, while the results by location for the surface sediment data set were provided in Table A.25. These results reflect the measured values as well as ½ the reported value for the non detected chemicals. The majority of the values were nondetect. The maximum concentrations for the comprehensive data set (22,800 ug/kg) and the surface sediment data set (22800) were greater than the ESL, yet represent maximum non-detect values. Figure A.30 depicts the spatial extent of each detected PAH constituent within the Pond A-2 surface sediment sampling locations. As shown on Figure A.30, there was one detected concentration of a PAH constituent within surface sediment (fluoranthene at 652 ug/kg), which falls below the ESL (1,610 ug/kg), indicating there is low risk associated with PAH chemicals. No further evaluation of total-PAHs is required.

Aroclor-1254 had a surface sediment HQ of 2 and was therefore retained for further analysis. The spatial extent of this chemical in surface sediment is shown within Figure A.28. The spatial extent of aroclor-1254 measured concentrations at each surface sediment locations within the A-Series Ponds is shown on Figure A.30.

Total-PCBs had a surface sediment HQ of 3 and was therefore retained for further analysis. Aroclor-1254 was the only detected congener, therefore the spatial distribution of total-PCBs is equivalent to that of aroclor-1254 and provided within Figure A.28.

Chemical Risk Characterization- Further Analysis

Aluminum, manganese, acenaphthene, anthracene, indeno(1,2,3-cd)pyrene, aroclor-1254, and total-PCBs were retained for further risk characterization. The results are provided by chemical below.

Aluminum had a frequency of detection of 100 percent (detected in 10 of 10 samples collected). The surface sediment HQ for the ESL is 2, which is within the HQ range where adverse effects are uncertain. The surface sediment HQ for the AT was less than 1. The aluminum ESL in sediment (15,900 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating aluminum concentrations in media that receptors are potentially exposed to. Toxicity-based alternative screening benchmarks ranged from 14,000 mg/kg ERL[2] to 58,000 mg/kg ERM, with a high NEC of 73,000 mg/kg (Ingersoll et al. 1996). Comparison to these toxicity-based values provides a better indication of the potential for risk to sediment organisms. Review of the surface sediment data on a point by point basis indicated that each measured aluminum result was less than the AT value. Within Pond A-2, two of six locations had measured values greater than the ESL, the

[2] Not used as an ESL because this value was noted as unreliable (Ingersoll et al. 1996) where fewer than five samples designated as toxic for the chemical, or the number of toxic samples with concentrations below the sediment effect concentration (SEC) was greater than the number of toxic samples with concentrations above the SEC.

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remaining were less than the ESL. Because the measured concentrations fall below the AT value, and the low ESL HQ level, the likelihood for risk attributable to aluminum is low.

Manganese had a frequency of detection of 100 percent (detected in 10 of 10 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is 1. The manganese ESL in sediment (630 mg/kg) was based on the TEL for *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996; cited in MacDonald et al. 1999). Alternative screening benchmarks ranged from the 460 mg/kg lowest effect level (LEL) (NYSDEC 1994) to the 1,200 mg/kg probable effect level (PEL) and the 1,700 milligrams per liter (mg/L) ERM (Ingersoll et al. 1996). Despite concentrations exceeding the ESL, it is uncertain whether concentrations of manganese in sediment pose a real risk potential if they do not exceed the AT value (Ingersoll et al. 1996) ERM. Review of the surface sediment data on a point by point basis indicated that there were two locations with measured concentrations just above the ESL, while the remaining four locations were less than the ESL. In addition, the MDC for manganese was within the range of background conditions. The combined LOE indicate that the risk attributable to manganese is low and within the range of background.

Acenaphthene had a frequency of detection of 10 percent (detected in 1 of 10 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 27, while the HQ for the AT is 2. The HQ was based on the result of the one measured value as compared to the ESL. The ESL was based on a PEL (CCME 2002) at which the potential for adverse effects are first observed. The potential for adverse effects is uncertain at concentrations greater than the ESL, and below the benchmark identified by Jones et al. (1997) of 270 μg/kg. Review of the surface sediment data on a point by point basis indicates that the one measured value occurs outside the pond area, and within the channel above the pond. The sampled locations within the pond were at nondetect levels. Therefore, it is unlikely that acenaphthene, which exceeded the ESL by a small amount with a low frequency of detection, poses an unacceptable risk to benthic populations that inhabit Pond A-2. The combined LOE indicate the risk attributable to acenaphthene is low.

Anthracene had a frequency of detection of 10 percent (detected in 1 of 10 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 4, while the HQ for the AT is less than 1. The HQ was based on the result of the one measured value as compared to the ESL. The ESL was based on a consensus-based TEC (MacDonald et al. 2000) at which the potential for adverse effects is first observed. Validation of this benchmark found that 83 percent of samples (n=139) below this concentration were accurately predicted to be nontoxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than the ESL, and below the consensus-based PEC (845 μg/kg). The single measured value of anthracene fell below the AT value. Review of the surface sediment data on a point by point basis indicates that the one measured value occurs outside the pond area, and within the channel above the pond. The sampled locations within the pond were at non-detect levels. Therefore, it is unlikely that anthracene, which exceeded the ESL by a small amount (and with a low frequency of detection), poses an unacceptable risk to benthic populations that inhabit Pond A-2. The combined LOE indicate the risk attributable to anthracene is low.

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Indeno(1,2,3-cd)pyrene had a frequency of detection of 10 percent (detected in 1 of 10 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 12, while the HQ for the AT is 1. The HQ was based on the result of the one measured value as compared to the ESL. The ESL is based on the TEL for the *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996). Alternative screening benchmarks ranged from the 30 µg/kg ERL to the 250 µg/kg ERM, with a high NEC of 770 µg/kg (Ingersoll et al. 1996). The single measured value of indeno(1,2,3-cd)pyrene fell at or below the AT value. Review of the surface sediment data on a point by point basis indicates that the one measured value occurs outside the pond area, and within the channel above the pond. The sampled locations within the pond were at non-detect levels. Therefore, it is unlikely that the concentration of indeno(1,2,3-cd)pyrene in sediment poses a potential for adverse effects to benthic organisms in Pond A-2.

Aroclor-1254 had a frequency of detection of 33 percent (detected in 4 of 12 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 2, while the HQ for the AT is less than 1. The ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects is first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be nontoxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC (300 µg/kg). Review of the data on a point by point basis for surface sediment indicated that there were two locations with measured concentrations greater than the ESL. The remaining four sampled locations had concentrations at non-detect levels. Given the low HQ ESL value, and minimal surface sediment spatial extent, it is unlikely that Aroclor-1254, poses an unacceptable risk to benthic populations that inhabit Pond A-2.

Total-PCBs were evaluated for Pond A-2 and found to have a total detected maximum concentration of 130 ug/kg attributable to Aroclor-1254. This value exceedes the total-PCB ESL of 40 but is less than the total-PCB AT of 676 ug/kg. The surface sediment HQ for the ESL is 3, while the HQ for the AT is less than 1. The ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC (676 µg/kg). Therefore, it is unlikely that total-PCBs, which exceeded the ESL by a small amount, poses an unacceptable risk to benthic populations that inhabit Pond A-2.

Other Lines of Evidence

Chemical risk HIs in the A-Series Ponds are reported in by DOE (1996). For Pond A-2 the HI equals 17. (No ECOCs have HQs greater than 10.) Analytes with HQs between 1 and 10 were chrysene, magnesium, aldrin, zinc, benzoic acid, cobalt, acetone, and vanadium. Risks to aquatic life, as indicated by the HI values, were primarily because of PAHs in sediments. However, no toxicity was detected in sediment toxicity tests and ecological measures did not correlate with increasing HI values from the ponds. It is

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more likely that limited flows and pond management limits aquatic life much more than contaminants in sediment.

Weight-of-Evidence Conclusions

Results of the chemical risk characterization indicated the sediment ECOPCs within surface sediment would pose a low risk to aquatic life within Pond A-2. Those chemicals requiring further analysis (aluminum, manganese, acenaphthene, anthracene, indeno(1,2,3-cd)pyrene, aroclor-1254 and total-PCBs) were found to have measured concentrations greater than their respective ESLs but less than AT values in most cases. The ESL HQs were low (less than 5) for all chemicals evaluated except for acenaphthene and indeno(1,2,3-cd)pyrene. Acenaphthene and indeno(1,2,3-cd)pyrene had low frequencies of detection within the comprehensive sediment data set being detected in one of 10 samples, and also within the surface sediment being detected in one of 6 samples. This indicates that these chemicals have a minimal spatial extent of occurrence. In addition, manganese was found to be within the range of risk attributable to background, while the remaining chemicals evaluated had a minimal spatial extent of ESL exceedences (aluminum, acenaphthene, anthracene, indeno(1,2,3-cd)pyrene, and Aroclor-1254). The overall risk attributable to these chemicals would be low.

The results agree with the other LOE conclusions drawn from other studies of this pond. Previous research indicates that the aquatic populations represent typical assemblages unaffected by chemical stressors. These studies occurred within a time-frame that overlaps with the data collected and evaluated for this effort and provides supporting evidence that there are no chemical stressors controlling the ecology. The weight of evidence indicates the risk associated with Pond A-2 to aquatic populations is expected to be low.

5.1.3 Pond A-3

The following text describes the outcome of the surface sediment HQ analysis completed for each identified ECOPC in Pond A-3. Those chemicals identified for further risk characterization are more thoroughly described within the Chemical Risk Characterization – Further Analysis section.

Chemical Risk Characterization – Surface Sediment Screen Results

Table A.30 provides the results of the HQ assessment for the Pond A-3 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESLs. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen are summarized below.

Aluminum was retained for further consideration with a surface sediment HQ of 2. The spatial extent of aluminum in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.1.

Antimony was retained for further consideration with a surface sediment HQ of 13. The spatial extent of antimony in surface sediment as compared to the ESL within the A-Series is shown on Figure A.2.

Barium, iron, and nickel had surface sediment HQs of 1 or less and were removed from further consideration within the risk characterization. Further analysis indicated that the

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MDC for these metals is less than the MDCs in background. The risk attributable to these metals is no greater than the risk attributable to background. The spatial extent of these chemicals in surface sediment is shown on Figures A.4, A.8, and A.12, respectively. For barium there was one location with a measured concentration greater than the ESL, while iron had four locations greater than the ESL. However, the magnitude of exceedence was small, yielding HQs just greater than 1. Nickel was detected at concentrations less than the ESL at all five sampled locations. The risk attributable to these metals in Pond A-3 would be within the range of background and does not require further evaluation.

Selenium was retained for further consideration with a surface sediment HQ of 2. Further analysis indicated that the MDC for selenium is less than the MDCs in background. The risk attributable to this metal is no greater than the risk attributable to background. The spatial extent of selenium in surface sediment as compared to the ESL within the A-Series is shown on Figure A.13.

Zinc was retained for further consideration with a surface sediment HQ of 4. Further analysis indicated that the MDC for zinc is less than the MDCs in background. The risk attributable to this metal is no greater than the risk attributable to background. The spatial extent of zinc in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.15. Because the surface sediment HQ for zinc is greater than 1, it was retained for further risk characterization.

Benzo(a)pyrene, chrysene, fluoranthene, and phenanthrene had surface sediment HQs of one or less and were removed from further consideration within the risk characterization. The spatial extent of these chemicals in surface sediment is shown on Figures A.20, A.23, A.24, and A.26, respectively.

Pyrene was retained for further consideration with a surface sediment HQ of 2. The spatial extent of pyrene in surface sediment as compared to the ESL within the A-Series is shown on Figure A.27.

Total-PAHs were evaluated for Pond A-3. Results of the total-PAH calculation for each sample within the comprehensive data set was provided in Table A.24, while the results by location for the surface sediment data set were provided in Table A.25. These results reflect the measured values as well as one-half the reported value for the non detected chemicals. The majority of the values were nondetect. The maximum concentrations for the comprehensive data set (4,480 ug/kg) and the surface sediment data set (3,710 ug/kg) was greater than the ESL, yet represents a maximum non-detect value. The MDC for total-PAHs using detected concentrations (Figure A.30) from the surface sediment data set was 1270 ug/kg which is less than the ESL; therefore, no further evaluation is required.

Aroclor-1254 had an HQ of less than 1 and was therefore removed from further consideration. The spatial extent of Aroclor-1254 in surface sediment is shown on Figure A.28.

Total-PCBs were retained for further consideration as a conservative measure even though the surface sediment HQ was 1. The only detected congener was Aroclor-1254 with a maximum detected value of 45, which is greater than the total-PCB ESL of 40. The results of Aroclor-1254 were greater than the total-PCB ESL, yet less than the

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Aroclor-1254 ESL. The spatial extent of Aroclor-1254 as compared to the ESL within the A-Series Ponds is shown on Figure A.28. The measured results by sample location are shown in A8.30.

Chemical Risk Characterization – Further Analysis

Aluminum, antimony, selenium, zinc, pyrene, and total-PCBs were retained for further risk characterization. The results are provided below by chemical.

Aluminum had a frequency of detection of 100 percent (detected in 8 of 8 samples collected). The surface sediment HQ for the ESL is 2, which is within the HQ range of uncertainty where adverse effects are unknown. The surface sediment HQ for the AT is less than 1. The aluminum ESL in sediment (15,900 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating aluminum concentrations in media that receptors are potentially exposed to. Toxicity-based alternative screening benchmarks ranged from the 14,000 mg/kg ERL[3] to the 58,000 mg/kg ERM, with a high NEC of 73,000 mg/kg (Ingersoll et al. 1996). Comparison to these toxicity-based values provides a better indication of the potential for risk to sediment organisms. Review of the surface sediment data on a point by point basis indicated that each measured aluminum result was less than the AT value. Within Pond A-3, four of the five surface sediment locations had measured values greater than the ESL, the remaining location was less than the ESL. However, ecause the measured concentrations fall below the AT values, and were just slightly greater than the ESL (as indicated with the low ESL HQ), the likelihood for risk attributable to aluminum would be low.

Antimony had a frequency of detection of 26 percent (detected in 1 of 7 samples collected) indicating a limited spatial extent. The surface sediment HQ for the ESL is 13. The surface sediment HQ for the AT is 8. The antimony ESL in sediment (2 mg/kg) was based on the 85th percentile concentration in streams (in MacDonald et al. 1999), which defined the SLCA by NYSDEC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from historical data. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating antimony concentrations in media that receptors at the site are potentially exposed. Toxicity-based alternative screening benchmarks ranged from 2-500 mg/kg. Comparison to these toxicity-based values provides a better indication of the potential for risk to sediment organisms. Review of the surface sediment data on a point by point basis identified one location with a measured concentration greater than the ESL, while the remaining four locations were at nondetect levels. Because antimony has a very limited spatial extent, the risk attributable to this metal is likely to be low.

Selenium had a frequency of detection of 13 percent (detected in 1 of 8 samples) indicating a minimal spatial extent of occurrence. The surface sediment HQ for the ESL

[3] Not used as an ESL because this value was noted as unreliable (Ingersoll et al. 1996) where fewer than five samples designated as toxic for the chemical, or the number of toxic samples with concentrations below the sediment effect concentration (SEC) was greater than the number of toxic samples with concentrations above the SEC.

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is 2, while the HQ for the AT is 1. The selenium ESL for sediment (0.95 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating selenium concentrations in media that receptors are potentially exposed to. Alternative screening benchmarks ranged from 1.73 for the 85th percentile concentration in reservoirs (TNRCC 1996) up to 5.0 mg/kg for the British Columbia SQG (Nagpal et al. 1998). Therefore, despite sediment concentrations exceeding the screening level ESL, the potential for adverse effects is uncertain and unlikely for selenium concentrations not greater than the alternative toxicity SQG. In addition, selenium had a low frequency of detection indicating a minimal exposure potential exists for aquatic receptors. Review of the surface sediment data on a point by point basis indicated that selenium was measured at a concentration greater than the ESL at one location.The four remaining sample locations were at non-detect levels. The combined LOE indicate the risk attributable to selenium is low.

Zinc had a frequency of detection of 100 Percent (detected in 8 of 8 samples). The surface sediment HQ for the ESL is 4, while the HQ for the AT is 1. The ESL for zinc in sediment (121 mg/kg) was based on a consensus-based TEC (MacDonald et al. 2000), where the potential for adverse effects is first observed. Validation of this benchmark found that 81.6 percent of samples (n=347) below this concentration were accurately predicted to be nontoxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC of 459 mg/kg. All of the measured zinc concentrations occurred at or below the AT value indicating low risk. Review of the surface sediment data on a point-by-point basis indicated there are measured concentrations of zinc greater than the ESL at four of five sample locations. However, these exceedances are slight given the low HQ ESL value. In addition, the MDC for zinc was within the range of background conditions. The combined LOE indicate the risk attributable to zinc is low and within the range of background.

Pyrene had a frequency of detection of 100 percent (detected in 4 of 4 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is less than 1. The pyrene ESL for sediment (195 ug/kg) ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects is first observed. Validation of this benchmark found that 80 percent of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC of 1,520 ug/kg. The measured concentrations yielded low HQ values and were all less than the AT. Review of the surface sediment data on a point-by-point basis identified one sample location with a measured value greater than the ESL. The combined LOE indicate the risk attributable to pyrene is low.

Total-PCBs were evaluated for Pond A-3 and found to have a total detected maximum concentration of 45 ug/kg, attributable to Aroclor-1254. The results of Aroclor-1254 were greater than the total-PCB ESL, yet less than the Aroclor-1254 ESL of 60 ug/kg. In addition, this value is less than the total-PCB AT of 676 ug/kg. The surface sediment HQ

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for the ESL is 1, while the HQ for the AT is less than 1. Aroclor-1254 had a frequency of detection of 12.5 percent (detected in 1 of 8 samples from the comprehensive sediment data set, and detected in 1 of 4 samples from the surface sediment data set) indicating a limited spatial extent. Review of the surface sediment data on a point-by-point basis indicated Aroclor-1254 was detected in one of four samples with a concentration greater than the ESL. The remaining was at nondetect levels. The ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be nontoxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC (676 μg/kg). Therefore, it is unlikely that total-PCBs pose an unacceptable risk to benthic populations that inhabit Pond A-3.

Other Lines of Evidence

Individual pond HIs in the A-Series Ponds are reported in the 1996 DOE evaluation. For Pond A-3 the HI equals 59. (Chrysene and benzo[b]fluoranthene had HQ values of 29.1 and 18.3, respectively). Other ECOCs with HQs between 1 and 10 included antimony, magnesium, vanadium, cobalt, and zinc. Risks to aquatic life, as indicated by the HI values, were primarily because of PAHs in sediments. However, no toxicity was detected in sediment toxicity tests and ecological measures did not correlate with increasing HI values from the ponds. It is more likely that limited flows and pond management limits aquatic life much more than contaminants in sediment.

Weight-of-Evidence Conclusions

The results of the chemical risk characterization indicated the sediment ECOPCs within surface sediment would pose a low risk to aquatic life within Pond A-3. Those chemicals requiring further analysis (aluminum, antimony, selenium, zinc, pyrene, and total-PCBs) were found to have measured concentrations greater than their respective ESLs but less than AT values in most cases. The ESL HQs for these chemicals were low (less than 5; with the exception of antimony), indicating a low risk potential. Antimony had a low frequency of detection in the comprehensive data set (detected in 1 of 7 samples) and within the surface sediment data set (detected in 1 of 5 samples) indicating a minimal spatial extent. In addition, selenium and zinc was found to be within the range of risk attributable to background, while the remaining chemicals evaluated had a minimal spatial extent of ESL exceedances (aluminum, antimony, pyrene, and total-PCBs). The overall risk attributable to these chemicals would be low.

These results coincide with the other LOE conclusions drawn from other studies of this pond. Previous research indicates the aquatic populations represent typical assemblages unaffected by chemical stressors. These studies occurred within a time-frame that overlaps with the data collected and evaluated for this effort, and provides supporting evidence that there are no chemical stressors controlling the ecology. The weight of evidence indicates the risk associated with Pond A-3 to aquatic populations is low.

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5.1.4 Pond A-4

The following text describes the outcome of the surface sediment HQ analysis completed for each identified ECOPC. Those chemicals identified for further risk characterization are more thoroughly described within the Chemical Risk Characterization – Further Analysis section.

Chemical Risk Characterization – Surface Sediment Screen Results

Table A.31 provides the results of the HQ assessment for the Pond A-4 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESLs. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen are summarized below.

Aluminum was retained for further consideration with a surface sediment HQ of 2. The spatial extent of aluminum in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.1.

Antimony was retained for further consideration with a surface sediment HQ of 21. The spatial extent of aluminum in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.2.

Arsenic had a surface sediment HQ of 1 or less and was removed from further consideration within the risk characterization. The spatial extent of this chemical in surface sediment is shown on Figure A.3. For arsenic there was one of nine locations with a measured concentration greater than the ESL. However, the magnitude of exceedence was small, yielding HQs just greater than 1. The risk attributable to this metal in Pond A-4 is low and does not require further evaluation.

Barium, copper, iron, nickel, and zinc had surface sediment HQs of 1 or less and were removed from further consideration. Further analysis indicated that the MDCs for these metals are less than the MDCs in background. The risk attributable to these metals would be no greater than the risk attributable to background. The spatial extent of these chemicals in surface sediment is shown on Figures A.4, A.7, A.8, A.12, and A.15, respectively. As shown on these figures, barium had three samples greater than the ESL and iron and nickel had two samples greater than the ESL, while copper and zinc each had 1 sample greater than the ESLs. These values were just slightly greater than the ESLs. The risk attributable to these metals in Pond A-4 would be within the range of background and do not require further evaluation.

Cadmium was retained for further consideration with a surface sediment HQ of 3. The spatial extent of cadmium in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.5.

Selenium was retained for further consideration with a surface sediment HQ of 2. The spatial extent of selenium in surface sediment as compared to the ESL within the A-Series Ponds is shown on Figure A.13.

Atrazine was not evaluated for in Pond A-4 surface sediment because observed detections were all subsurface from historic sampling. An HQ of 7 was calculated based on the subsurface result, which indicates the MDC is within the range of uncertain toxicity.

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Since this chemical was not detected in the surface sediment, it was not retained for further analysis.

Total-PAHs were evaluated for Pond A-4. Results of the total-PAH calculation for each sample within the comprehensive data set was provided in Table A.24, while the results by location for the surface sediment data set were provided in Table A.25. These results reflect the measured values as well as one-half the reported value for the nondetected chemicals. All of the values were nondetect. The maximum concentrations for the comprehensive data set (6,930 ug/kg) and the surface sediment data set (6930 ug/kg) were greater than the ESL, yet represent maximum non-detect values. Figure A.58 depicts the spatial extent of each detected PAH constituent within the Pond A-4 surface sediment sampling locations. As shown on Figure A.58, there were no detected concentrations of PAHs within surface sediment, indicating there is low risk associated with PAH chemicals. No further evaluation of total-PAHs is required.

Chemical Risk Characterization – Further Analysis

Aluminum, antimony, cadmium, and selenium were retained for further risk characterization. The results are provided below by chemical.

Aluminum had a frequency of detection of 100 percent (detected in 12 of 12 samples collected). The surface sediment HQ for the ESL is 2, which is within the HQ range of uncertainty where adverse effects are unknown. The surface sediment HQ for the AT is less than 1. The aluminum ESL in sediment (15,900 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating aluminum concentrations in media that receptors are potentially exposed to. Toxicity-based alternative screening benchmarks ranged from the 14,000 mg/kg ERL[4] to the 58,000 mg/kg ERM, with a high NEC of 73,000 mg/kg (Ingersoll et al. 1996). Comparison to these toxicity-based values provides a better indication of the potential for risk to sediment organisms. Review of the surface sediment data on a point by point basis indicated that each measured aluminum result was less than the AT value. Within Pond A-4, six of the nine locations had measured values greater than the ESL, the remaining were less than the ESL. Because the measured concentrations fall below these AT values, the likelihood for risk attributable to aluminum low.

Antimony had a frequency of detection of 25 percent (detected in 4 of 12 samples collected) indicating a limited spatial extent. The surface sediment HQ for the ESL is 21. The surface sediment HQ for the AT is 13. The antimony ESL in sediment (2 mg/kg) was based on the 85th percentile concentration in streams (in MacDonald et al. 1999), which defined the SLCA by New York State Department of Environmental Conservation (NYSDEC). The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from historical data. As a regulatory

[4] Not used as an ESL because this value was noted as unreliable (Ingersoll et al. 1996) where fewer than five samples designated as toxic for the chemical, or the number of toxic samples with concentrations below the sediment effect concentration (SEC) was greater than the number of toxic samples with concentrations above the SEC.

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screening level it is not enforceable, but rather provides a basis for evaluating antimony concentrations in media that receptors at the site are potentially exposed. Toxicity-based alternative screening benchmarks ranged from 2 to 500 mg/kg. Comparison to these toxicity-based values provides a better indication of the potential for risk to sediment organisms. Review of the surface sediment data on a point by point basis indicated that there were three locations with results that were greater than the ESL, while the remaining six locations had either a measured concentration less than the ESL or were at non-detect levels. Because the measured concentrations fall below AT values, and the spatial extent of antimony is limited, the likelihood for risk attributable to antimony is low.

Cadmium had a frequency of detection of 75 percent (detected in 9 of 12 samples collected). The surface sediment HQ for the ESL is 3. The surface sediment HQ for the AT is 1. The cadmium ESL for sediment (0.99 mg/kg) was based on a consensus-based TEC (MacDonald et al. 2000), where the potential for adverse effects is first observed. Validation of this benchmark found that 80.4 percent of samples (n=347) below this concentration were accurately predicted to be nontoxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus-based PEC of 4.98 mg/kg. . Review of the surface sediment data on a point by point basis indicated there was a single measured cadmium result that was greater than the ESL, while the remaining eight locations had either measured concentrations less than the ESL or were at nondetect levels. Given the limited spatial extent and low HQ values, the risk attributable to cadmium is low.

Selenium had a frequency of detection of 20 percent (detected in 3 of 12 samples) indicating a minimal spatial extent. The surface sediment HQ for the ESL is 2, while the HQ for the AT is 1. The selenium ESL for sediment (0.95 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating selenium concentrations in media that receptors are potentially exposed to. Alternative screening benchmarks ranged from 1.73 mg/kg for the 85th percentile concentration in reservoirs (TNRCC 1996) up to 5.0 mg/kg for the British Columbia SQG (Nagpal et al. 1995). Therefore, despite sediment concentrations exceeding the ESL, the potential for adverse effects is uncertain and unlikely for selenium concentrations less than the AT SQG. Review of the surface sediment data results indicate that there were three locations with measured values slightly greater than the ESL, while the remaining six locations had measured values at nondetect levels. In addition, the MDC for selenium was within the range of background values. The combined LOE indicate the risk attributable to selenium is low and within the range of background.

Other Lines of Evidence

Individual pond HIs in the A-Series Ponds are reported in the 1996 DOE evaluation. Pond A-4 had an HI of 13. (No ECOCs had HQs greater than 10.) Analytes with HQs between 1 and 10 included antimony, magnesium, vanadium, and cobalt. Risks to aquatic life, as indicated by the HI values, were primarily because of PAHs in sediments.

However, no toxicity was detected in sediment toxicity tests and ecological measures did not correlate with increasing HI values from the ponds. It is more likely that limited flows and pond management limits aquatic life much more than contaminants in sediment.

Weight-of-Evidence Conclusions

The results of the chemical risk characterization indicated that the sediment ECOPCs within surface sediment would pose a low risk to aquatic life within Pond A-4. Those chemicals requiring further analysis (aluminum, antimony, cadmium and selenium) were found to have measured concentrations greater than their respective ESLs but less than AT values. The ESL HQs for these chemicals were low (less than 5; with the exception of antimony) indicating a low risk potential. Antimony had a frequency of detection of 4 detected results from 12 samples collected within the comprehensive data set, and four detected results from 9 samples from the surface sediment data set. Further analysis indicates that only one surface sediment location had a measured value greater than the ESL while the remaining were nondetect or below the ESL indicating a minimal spatial extent of concern. In addition, selenium was found to be within the range of risk attributable to background, while the remaining chemicals evaluated had a minimal spatial extent of ESL exceedances (aluminum, antimony, and cadmium). The overall risk attributable to these chemicals is expected to be low.

These results coincide with the other LOE conclusions drawn from other studies of this pond. Previous research indicates the aquatic populations represent typical assemblages unaffected by chemical stressors. These studies occurred within a time-frame that overlaps with the data collected and evaluated for this effort, and provides supporting evidence that there are no chemical stressors controlling the ecology. The weight of evidence indicates the risk associated with Pond A-4 to aquatic populations is expected to be low.

5.1.5 Pond A-5

The following text describes the outcome of the surface sediment HQ analysis completed for each identified ECOPC in Pond A-5.

Chemical Risk Characterization – Surface Sediment Screen Results

Table A.32 provides the results of the HQ assessment for the Pond A-5 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESLs. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen are summarized below.

Aluminum, barium, iron, silver, and zinc had surface sediment HQs of 1 or less and were removed from further consideration within the risk characterization. Further analysis indicated the MDCs for these metals are less than the MDCs in background. The risk attributable to these metals would be no greater than the risk attributable to background. The spatial extent of these chemicals in surface sediment is shown on Figures A.1, A.4, A.8, A.14, and A.15, respectively. For aluminum, there were two locations with a measured concentration greater than the ESL. For barium, iron, silver, and zinc there was one sample result greater than the ESLs. However, the magnitude of exceedance for these

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results was small yielding HQs just greater than 1. The risk attributable to these metals in Pond A-5 would be within the range of background.

Total-PAHs were evaluated for Pond A-5. Results of the total-PAH calculation for each sample within the comprehensive data set was provided in Table A.24, while the results by location for the surface sediment data set were provided in Table A.25. These results reflect the measured values as well as on-half the reported value for the nondetected chemicals. All of the values were nondetect. The maximum concentrations for the comprehensive data set (4,200 ug/kg) and the surface sediment data set (4,200 ug/kg) were greater than the ESLs, yet represent maximum nondetect values. Figure A.58 depicts the spatial extent of each detected PAH constituent within the Pond A-5 surface sediment sampling locations. As shown on Figure A.58, there were no detected concentrations of PAHs within surface sediment, indicating there is low risk associated with PAH chemicals.

Other Lines of Evidence

Individual pond HIs in the A-Series Ponds are reported in the 1996 DOE evaluation. For Pond A-5 (Indiana Pond) an HI of 16 was calculated. (No ECOCs had HQs greater than 10.) Analytes with HQs between 1 and 10 were benzoic acid, acetone, magnesium, vanadium, and cobalt. Risks to aquatic life, as indicated by the HI values, were primarily because of PAHs in sediments. However, no toxicity was detected in sediment toxicity tests and ecological measures did not correlate with increasing HI values from the ponds. It is more likely that limited flows and pond management limits aquatic life much more than contaminants in sediment.

Weight-of-Evidence Conclusions

The results of the chemical risk characterization indicated that the sediment ECOPCs within surface sediment conditions would pose a low risk to aquatic life within Pond A-5. The results agree with the other LOE conclusions drawn from other studies of this pond. The weight of evidence indicates that the risk associated with Pond A-5 to aquatic populations is low.

5.2 B-Series Pond Risk Characterization

South Walnut Creek is a portion of the watershed that provides the major drainage for the north-central portion of RFETS including the majority of the IA. South Walnut Creek has five retention ponds (Ponds B-1, B-2, B-3, B-4, and B-5). The section of the stream upgradient from Pond B-5 is classified as stream Segment 5 in the Big Dry Creek basin by the WQCC. Downstream from Pond B-5, South Walnut Creek is classified as stream Segment 4b. The flow in South Walnut Creek was highly dependent on effluent from the former Sewage Treatment Plant, stormwater runoff from the IA, and management of the ponds. This AEU has continuous flows immediately downstream of the IA until the last retention pond, Pond B-5. Below Pond B-5, the aquatic environment is totally dependent upon periodic releases from the ponds. Between batch releases from the terminal ponds (Ponds B-5 and A-4), the lower section of Walnut Creek is often dry. The hydrology of South Walnut Creek is expected to change in response to accelerated actions that include removal of buildings within the IA and the elimination of water historically imported for RFETS operations. This includes the elimination of the Sewage Treatment Plant

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discharge and removal of pavement from within the IA. All of these efforts combined are expected to create a decrease in flows within South Walnut Creek.

Native fish species are found in the Walnut Creek ponds and specific sections of the stream. Fathead minnows (*Pimephales promelas*) are present in the B-Ponds, the stream between Ponds B-4 and B-5, and in Lower Walnut Creek. A variety of non-native fish species including rainbow trout (*Salmo gairdneri*), carp (*Cyprinus carpio*), and bass (*Micropterus* sp.) were introduced into the ponds at various times; however, no introductions have led to established, reproducing fish populations in the B-Ponds.

Within the Walnut Creek area, the most common aquatic macroinvertebrates are the larvae of the blackfly (Order *Diptera, Simulidae* sp.), midge (Order *Diptera, Chironomidae* sp), mayfly (Order *Ephemeroptera*) (DOE 1997), and scuds (*Hyalella azteca*). Other species include caddisflies (Order *Trichoptera*), craneflies (*Tipulidae* ssp.), and damselfly larvae (Order *Odonata*), as well as snails (Class *Gastropoda*) and other amphipods (Order *Amphipoda*). Large macroinvertebrate species such as those present within the Walnut Creek area, such as crayfish (Order *Decapoda,* Family *Astacidae*) and snails, are potentially important prey for other fish, waterfowl, and mammal species.

Characterization of the aquatic habitat provided by North Walnut Creek is of primary consideration with regards to aquatic risk. Currently, sustained flows exist, albeit minimal in nature, that supports some aquatic species. The location and amount of viable aquatic habitat that will be present after accelerated actions are complete is unclear because overland flow may be altered by the IA accelerated actions.

5.2.1 Pond B-4

The following text describes the outcome of the surface sediment HQ analysis completed for each identified ECOPC in Pond B-4. Those chemicals identified for further risk characterization are more thoroughly described within the Chemical Risk Characterization – Further Analysis section.

Chemical Risk Characterization – Surface Sediment Screen Results

Table A.33 provides the results of the HQ assessment for the Pond B-4 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESLs. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen are summarized below.

Aluminum was retained for further consideration with a surface sediment HQ of 2. The spatial extent of aluminum in surface sediment as compared to the ESL within the B-Series Ponds is shown on Figure A.31.

Antimony, chromium, copper, lead, mercury, and nickel had surface sediment HQs of 1 or less and were removed from further consideration within the risk characterization. The spatial extent of these chemicals within surface sediment is shown on Figures A.32, A.35, A.36, A.38, A.39, and A.40, respectively. Antimony, copper, lead, and nickel were detected at one location with concentrations greater than the ESLs and the remaining concentrations at nondetect levels or less than the ESLs. Chromium and mercury were

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only detected at concentrations less than the ESL. The risk attributable to these metals in Pond B-4 is low.

Barium and iron had surface sediment HQs of 1 or less and were removed from further consideration within the risk characterization. Further analysis indicated that the MDC for these two metals was less than the MDC in background. The risk attributable to barium and iron would be no greater than the risk attributable to background. The spatial extent of these chemicals in surface sediment is shown on Figures A.33 and A.37, respectively. For both barium and iron, there were three of six locations with measured concentrations greater than the ESL. However, the magnitude of exceedance was small, yielding an HQ just greater than 1. The risk attributable to barium and iron in Pond B-4 would be within the range of background.

Cadmium was retained for further consideration with a surface sediment HQ of 2. The spatial extent of cadmium in surface sediment as compared to the ESL within the B-Series Ponds is shown on Figure A.34.

Selenium was retained for further consideration with a surface sediment HQ of 2. The spatial extent of selenium in surface sediment as compared to the ESL within the B-Series Ponds is shown on Figure A.41.

Silver was retained for further consideration with a surface sediment HQ of 3. The spatial extent of silver in surface sediment as compared in surface sediment to the ESL within the B-Series Ponds is shown on Figure A.42.

Zinc was retained for further consideration with a surface sediment HQ of 4. Further analysis indicated that the MDC for zinc is less than the MDCs in background. The risk attributable to this metal is no greater than the risk attributable to background. The spatial extent of zinc in surface sediment as compared to the ESL within the B-Series Ponds is shown on Figure A.43. Because the surface sediment HQ for zinc was greater than 1, it was retained for further risk characterization.

Anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were retained for further consideration because surface sediment HQs were greater than 1. The spatial extent of these chemicals in surface sediment as compared to their respective ESLs within the B-Series Ponds are shown on Figures A.44, A.45, A.46, A.47, A.50, A.51, A.52, A.54, A.55, and A.56, respectively.

Benzo(k)fluoranthene and bis(2-ethylhexyl)phthalate had surface sediment HQs of 1 or less and were removed from further consideration. The spatial extent of these chemicals in surface sediment is shown on Figures A.48 and A.49, respectively.
Benzo(k)fluoranthene was detected at a concentration slightly greater than the ESL at two locations, while the remaining locations were nondetect. Bis(2-ethylhexyl)phthalate occurred at concentrations less than the ESL or at nondetect levels. Given the magnitude of surface sediment conditions, the risk attributable to these chemicals in Pond B-4 is low and does not require further evaluation.

Gamma-BHC was not detected in Pond B-4 surface sediment and was therefore removed from further risk characterization.

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Total-PAHs were evaluated for Pond B-4. As shown on Figure A.58, the maximum detected total-PAH values by location for the surface sediment samples was 360-3620, which exceeds the ESL. Both individual (as identified above) and total-PAHs were retained for further evaluation.

Aroclor-1254 was retained for further consideration with a surface sediment HQ of 4. The spatial extent of Aroclor-1254 as compared to the ESL within the B-Series Ponds is shown on Figure A.57. Aroclor-1254 results were used for the total-PCB results because it was the only congener detected. Therefore, this congener will be the only chemical retained for further risk characterization analysis.

Total-PCBs were evaluated for Pond B-4, and retained for further evaluation since the ESL HQ was 6. Aroclor-1254 was the only congener detected; therefore, the extent of total-PAHs within the B-Series Ponds is shown on Figure A.57.

Chemical Risk Characterization- Further Analysis

Aluminum, cadmium, selenium silver, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and Aroclor-1254 were retained for further risk characterization. The results are provided by chemical as follows:

Aluminum had a frequency of detection of 100% (detected in 22 of 22 samples collected). The surface sediment HQ for the ESL is 2, which is within the HQ range of uncertainty where adverse effects are unknown. The surface sediment HQ for the AT is 1. The aluminum ESL in sediment (15,900 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating aluminum concentrations in media that receptors are potentially exposed to. Toxicity based alternative screening benchmarks ranged from 14,000 mg/kg ERL[5], to 58,000 mg/kg ERM, and a high NEC of 73,000 mg/kg (Ingersoll et al. 1996). Comparison to these toxicity-based values provides a better indication of the risk potential to sediment organisms. Review of the surface sediment data on a point by point basis indicated that each measured aluminum result was less than the AT value. Within Pond B-4, four of six locations had measured values greater than the ESL (but less than the AT), the remaining were less than the ESL. Because the measured concentrations fall below these AT values, and the low ESL HQ value, the likelihood for risk attributable to aluminum is low.

Cadmium had a frequency of detection of 86% (detected in 19 of 22 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The cadmium ESL for sediment (0.99 mg/kg) was based on a consensus based TEC (MacDonald et al. 2000), where the potential for adverse effects are first observed. Validation of this benchmark found that 80.4% of samples (n=347) below this concentration were

[5] Not used as an ESL because this value was noted as unreliable (Ingersoll et al. 1996) where fewer than five samples designated as toxic for the chemical, or the number of toxic samples with concentrations below the sediment effect concentration (SEC) was greater than the number of toxic samples with concentrations above the SEC.

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accurately predicted to be nontoxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 4.98 mg/kg. In this situation the potential for risks can not be excluded but is not considered likely if fewer than 20 percent of samples exceed the ESL. Review of the surface sediment data on a point by point basis indicated that each measured cadmium result was less than the AT value. Within Pond B-4, three of six locations had measured values greater than the ESL (but less than the AT), the remaining were less than the ESL. Because the measured concentrations fall below these AT values, and the low ESL HQ value, the likelihood for risk attributable to cadmium is low.

Selenium had a frequency of detection of 14% (detected in 3 of 22 samples) indicating a minimal spatial extent of occurrence. The surface sediment HQ for the ESL is 2, while the HQ for the AT is 1. The selenium ESL for sediment (0.95 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating selenium concentrations in media that receptors are potentially exposed to. Alternative screening benchmarks ranged from 1.73 for the 85th percentile concentration in reservoirs (TNRCC 1996) up to 5.0 mg/kg for the British Columbia SQG (Nagpal et al. 1998). Therefore, despite sediment concentrations exceeding the screening level ESL, the potential for adverse effects is uncertain and unlikely for selenium concentrations not greater than the alternative toxicity SQG. Review of the surface sediment data on a point by point basis indicated that the measured selenium results were at or below the AT value. Within Pond B-4, two of six locations had measured values greater than the ESL (but less than the AT), the remaining were at nondetect levels. The combined LOE indicate that the risk attributable to selenium is low.

Silver had a frequency of detection of 50% (detected in 11 of 22 samples) indicating a minimal spatial extent of occurrence. The surface sediment HQ for the ESL is 3, while the HQ for the AT is 2. The silver ESL in sediment (1.00 mg/kg) was based on a study completed by Long et al. 1995, which represents the ERL for the protection of benthic macroinvertebrates (in MacDonald et al. 1999). The potential for adverse effects associated with this ESL is considered low because it reflects a benchmark below, which adverse effects are not expected. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating silver concentrations in media that receptors are potentially exposed to. Toxicity based alternative screening benchmarks ranged from 0.5 to 4.5 mg/kg. Comparison to these toxicity-based values provides a better indication of the potential for risk to sediment organisms. Review of the surface sediment data on a point by point basis indicated that the measured silver results were at or below the AT value. Within Pond B-4, three of six locations had measured values greater than the ESL (but less than the AT), the remaining were below detection levels. Because the measured concentrations fall below these AT values, and the low ESL HQ, the likelihood for risk attributable to silver is low.

Zinc had a frequency of detection of 100% (detected in 22 of 22 samples). The surface sediment HQ for the ESL is 4, while the HQ for the AT is <1. The ESL for zinc in

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sediment (121 mg/kg) was based on a consensus based TEC (MacDonald et al. 2000), where the potential for adverse effects are first observed. Validation of this benchmark found that 81.6% of samples (n=347) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 459 mg/kg. In this situation the potential for risks can not be excluded but is not considered likely if fewer than 20 percent of samples exceed the ESL. Review of the surface sediment data on a point by point basis indicates that all measured concentrations within Pond B-4 exceeded the ESL slightly (thus, providing a low HQ). In addition, the MDC for zinc was within the range of background conditions. The combined LOE indicate that the risk attributable to zinc is low and within the range of background.

Anthracene had a frequency of detection of 45% (detected in 10 of 22 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The anthracene ESL for sediment (57.2 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 83% of samples (n=129) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 845 ug/kg. Review of the surface sediment data on a point by point basis indicated that the measured anthracene results were below the AT value. Within Pond B-4, two of five locations had measured values greater than the ESL (but less than the AT), the remaining had concentrations below detection levels. The combined LOE indicate that the risk attributable to anthracene is low.

Benzo(a)anthracene had a frequency of detection of 73% (detected in 16 of 22 samples). The surface sediment HQ for the ESL is 3, while the HQ for the AT is <1. The benzo(a)anthracene ESL for sediment (108 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 83% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1050 ug/kg. Review of the surface sediment data on a point by point basis indicated that the measured benzo(a)anthracene results were at or below the AT value. Within Pond B-4, two of six locations had measured values greater than the ESL (but less than the AT), the remaining were below the ESL or below detection levels. The combined LOE indicate that the risk attributable to benzo(a)anthracene is low.

Benzo(a)pyrene had a frequency of detection of 77% (detected in 17 of 22 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The benzo(a)pyrene ESL for sediment (150 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1450 ug/kg. Review of the surface sediment data on a point by point basis indicated that the measured benzo(a)pyrene results were at or below

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the AT value. Within Pond B-4, two of six locations had measured values greater than the ESL (but less than the AT), the remaining were below the ESL or had concentrations below detection levels. The combined LOE indicate that the risk attributable to benzo(a)pyrene is low.

Benzo(g,h,i)perylene had a frequency of detection of 45% (detected in 10 of 22 samples). The surface sediment HQ for the ESL is 21, while the HQ for the AT is 1. The ESL was based on the ERL for *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996). Alternative screening benchmarks ranged from the 16 µg/kg TEL to 280 µg/kg ERM, and a high NEC of 1,200 µg/kg (Ingersoll et al. 1996). Review of the surface sediment data on a point by point basis indicated that the measured benzo(g,h,i)perylene results were at or below the AT value. Within Pond B-4, three of six locations had measured values greater than the ESL (but less than the AT), the remaining were at concentrations below detection levels. The combined LOE indicate that the risk attributable to benzo(a)pyrene is low.

Chrysene had a frequency of detection of 82% (detected in 18 of 22 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The chrysene ESL for sediment (166 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 80% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1290 ug/kg. Review of the surface sediment data on a point by point basis indicated that the measured chrysene results were at or below the AT value. Within Pond B-4, two of six locations had measured values greater than the ESL (but less than the AT), the remaining were below the ESL or were below detection levels. The combined LOE indicate that the risk attributable to chrysene is low.

Dibenz(a,h)anthracene had a frequency of detection of 14% (detected in 3 of 22 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 3, while the HQ for the AT is <1. The dibenz(a,h)anthracene ESL for sediment (33 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 80% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 240 ug/kg. Review of the surface sediment data on a point by point basis indicated that the measured dibenz(a,h)anthracene results were at or below the AT value. Within Pond B-4, two of six locations had measured values greater than the ESL (but less than the AT), the remaining had concentrations below detection levels. The combined LOE indicate that the risk attributable to dibenz(a,h)anthracene is low.

Indeno(1,2,3-cd)pyrene had a frequency of detection of 45% (detected in 10 of 22 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 12, while the HQ for the AT is 1. The ESL is based on the TEL for the *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996). Alternative screening benchmarks ranged from the 30 µg/kg ERL, to 250 µg/kg ERM, and a high NEC of 770 µg/kg (Ingersoll et al. 1996). Review of the surface sediment data on a point by point basis indicated that the

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measured indeno(1,2,3-cd)pyrene results were at or below the AT value. Within Pond B-4, three of six locations had measured values greater than the ESL (but less than the AT), the remaining were at below detection levels. Therefore, despite the MDC exceeding the ESL, it is unlikely that the concentrations of indeno(1,2,3-cd)pyrene in sediment pose a potential for adverse effects to benthic organisms in Pond B-4.

Phenanthrene had a frequency of detection of 82% (detected in 18 of 22 samples). The surface sediment HQ for the ESL is 3, while the HQ for the AT is 1. The phenanthrene ESL for sediment (204 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1170 ug/kg. Review of the surface sediment data on a point by point basis indicated that the measured phenanthrene results were at or below the AT value. Within Pond B-4, two of six locations had measured values greater than the ESL (but less than the AT), the remaining were below the ESL or below detection levels. The combined LOE indicate that the risk attributable to phenanthrene is low.

Pyrene had a frequency of detection of 73% (detected in 16 of 22 samples). The surface sediment HQ for the ESL is 4, while the HQ for the AT is <1. The pyrene ESL for sediment (195 ug/kg) ESL was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 80% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1,520 ug/kg. Review of the surface sediment data on a point by point basis indicated that the measured pyrene results were at or below the AT value. Within Pond B-4, two of six locations had measured values greater than the ESL (but less than the AT), the remaining were at nondetect levels. The combined LOE indicate that the risk attributable to pyrene is low.

Total-PAHs were determined for the surface sediment samples collected within Pond B-4. As shown within Figure A.58, four locations had detected PAH concentrations. From these locations the total-PAH sum ranged from 360 to 3,620 ug/kg. Using the maximum detected total-PAH concentration, an HQ of 2 was developed. Using the total-PAH AT (22,800 ug/kg) an AT HQ of <1 was derived. The total-PAH ESL for sediment (1,610 ug/kg) ESL was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 80% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based probable effects concentration (PEC; 22,800ug/kg). The combined LOE indicate that the risk attributable to total-PAHs would be low.

Aroclor-1254 had a frequency of detection of 56% (detected in 15 of 27 samples in the comprehensive sediment data set, and 6 of 11 in the surface sediment data set). The detected concentrations within surface sediment are shown within Figure A.58. These values are greater than the ESL but less than the AT at five locations, while the remaining

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were nondetect. The surface sediment HQ for the ESL is 4, while the HQ for the AT is 1. The ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC (300 μg/kg). All of the measured values occur within this range indicating uncertain toxicity associated with this chemical. Given the magnitude of measured concentrations as compared to the ESL, it is unlikely that Aroclor-1254 poses an unacceptable risk to benthic populations that inhabit Pond B-4.

Total-PCBs were evaluated for Pond B-4 and found to have a total detected maximum concentration of 220 ug/kg attributable to Aroclor-1254. This value exceeds the total-PCB ESL of 40 but is less than the total-PCB AT of 676 ug/kg. The surface sediment HQ for the ESL is 6, while the HQ for the AT is <1. The ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC (676 μg/kg). Therefore, it is unlikely that total-PCBs pose an unacceptable risk to benthic populations that inhabit Pond B-4.

Other Lines of Evidence

Chemical risk HIs in the B-Series Ponds were identified in the 1996 DOE evaluation. Pond B-4 has an HI of 250 (anthracene, chrysene, benzo(b)fluoranthene, and silver had HQs ranging from 15 to 105). Other ECOCs with HQs between 1 and 10 included antimony, gamma-BHC, magnesium, benzo(k)fluoranthene, vanadium, Aroclor-1254, zinc, and cobalt. Risks to aquatic life, as indicated by the HI values, were primarily because of PAHs in sediments. However, no toxicity was detected in sediment toxicity tests and ecological measures did not correlate with increasing HI values from the ponds. The importance of sediment contamination is unclear but does not appear to be the primary factor controlling benthic community structure in the B-Series Ponds. In addition, aquatic monitoring in streams between the ponds found a naturally self sustaining population of fathead minnows in South Walnut Creek between Ponds B-4 and B-5. Fish in the ponds are more likely limited by flow and water management practices than by the chemicals of potential concern.

Weight of Evidence Conclusions

Results of the chemical risk characterization indicated that the sediment ECOPCs within surface sediment would pose a low risk to aquatic life within Pond B-4. Those chemicals requiring further analysis (aluminum, cadmium, selenium, silver, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, aroclor-1254 and total-PCBs) were found to have measured concentrations greater than their respective ESLs but less than AT values in most cases. In addition, zinc was found to be within the range of risk attributable to background. The ESL HQs for these

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chemicals were low (less than 5; with the exceptions of benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene and total-PCBs) indicating a low risk potential. For the two PAH constituents with large HQ values (benzo(g,h,i)peryelene: HQ = 21, and indeno(1,2,3-cd)pyrene with an HQ = 12) the MDCs for these chemicals fell below the AT and were limited in their spatial extent (both had three measured values greater than the ESL, while the remaining three sample locations within the Pond B-4 were below detection levels). Similarly, total-PCBs were found to be entirely attributable to Aroclor-1254 which when compared to the Aroclor-1254 ESL yielded low HQ values indicating a low risk potential. The overall risk attributable to these chemicals would therefore be low.

The results agree with the other LOE conclusions drawn from other studies of this pond. Previous research indicates that the aquatic populations represent typical assemblages unaffected by chemical stressors. Bioassay analysis indicated that results of Pond B-4 sediment toxicity were comparable to control tests indicating no chemical stressor affects. These studies occurred within a time-frame that overlaps with the data collected and evaluated for this effort and provides supporting evidence that there are no chemical stressors controlling the ecology. The weight of evidence indicates that the risk associated with Pond B-4 to aquatic populations is low.

5.2.2 Pond B-5

The following describes the outcome of the surface sediment HQ analysis completed for each identified ECOPC.

Chemical Risk Characterization – Surface Sediment Screen Results

Table A.34 provides the results of the HQ assessment for the Pond B-5 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESL. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen indicate the following:

Aluminum, barium, iron, lead, nickel, and silver had surface sediment HQs of one or less and were removed from further consideration within the risk characterization. Further analysis indicated that the MDC for these metals is less than the maximum detected concentrations in background. The risk attributable to these metals is no greater than the risk attributable to background. The risk attributable to the B-5 would be within the range of background and does not require further evaluation. The spatial extent of these chemicals in surface sediment is shown on Figures A.31, A.33, A.37, A.38, A.40, and A.42.

Selenium and zinc were retained for further consideration with surface sediment HQs of 2. The spatial extent of selenium and zinc in surface sediment as compared to the ESL within the B-Series Ponds is shown on Figure A.41 and A.43. Further analysis indicated that the MDC for these metals is less than the maximum detected concentrations in background. The risk attributable to these metals is no greater than the risk attributable to background.

Total-PAHs were evaluated for Pond B-5. Results of the total-PAH calculation for each sample within the comprehensive data set was provided in Table A.24, while the results by location for the surface sediment data set were provided in Table A.25. These results reflect the measured values as well as ½ the reported value for the non detected

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chemicals. The majority of the values were non-detect. The maximum concentrations for the comprehensive data set (5030 ug/kg) and the surface sediment data set (5030 ug/kg) were greater than the ESL, yet represent maximum non-detect values. Figure A.58 depicts the spatial extent of each detected PAH constituent within B-Series surface sediment sampling locations. As shown on Figure A.58, the maximum total-PAH value of 350 ug/kg is less than the ESL of 1610 ug/kg, indicating there is low risk associated with PAH chemicals. No further evaluation of total-PAHs is required.

Chemical Risk Characterization- Further Analysis

Selenium and zinc were retained for further risk characterization. The results are provided by chemical as follows:

Selenium had a frequency of detection of 23% (detected in 3 of 13 samples) indicating a minimal spatial extent. The surface sediment HQ for the ESL is 2, while the HQ for the AT is 1. The selenium ESL for sediment (0.95 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating aluminum concentrations in media that receptors are potentially exposed to. Alternative screening benchmarks ranged from 1.73 for the 85th percentile concentration in reservoirs (TNRCC 1996) up to 5.0 mg/kg for the British Columbia SQG (Nagpal et al. 1998). Therefore, despite sediment concentrations exceeding the ESL, the potential for adverse effects is uncertain and unlikely for selenium concentrations less than the alternative toxicity SQG. Results of a point by point evaluation of the surface sediment data set indicated that there is one location within Pond B-5 with a measured concentration greater than the ESL. The remaining locations had results less than the ESL or below detection levels. In addition, the MDC for selenium was within the range of background values. The combined LOE indicate that the risk attributable to selenium is low and within the range of background.

Zinc had a frequency of detection of 100% (detected in 14 of 14 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The ESL for zinc in sediment (121 mg/kg) was based on a consensus based TEC (MacDonald et al. 2000), where the potential for adverse effects are first observed. Validation of this benchmark found that 81.6% of samples (n=347) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 459 mg/kg. All of the measured zinc concentrations occurred at or below the AT value indicating low risk. Results of a point by point evaluation of the surface sediment data set indicated that there are three locations within Pond B-5 with a measured concentration greater than the ESL. The remaining nine locations had results less than the ESL indicating a minimal spatial extent. In addition, the MDC for zinc was within the range of background conditions. The combined LOE indicate that the risk attributable to zinc is low and within the range of background.

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Other Lines of Evidence

Chemical risk HIs in the B-Series Ponds were identified in the 1996 DOE evaluation. Pond B-5 has an HI of 8.1 (ECOCs in Pond B-5 that had HQs between 1 and 10 were magnesium, vanadium, and cobalt) (DOE 1996). Risks to aquatic life, as indicated by the HI values, were primarily because of PAHs in sediments. However, no toxicity was detected in sediment toxicity tests and ecological measures did not correlate with increasing HI values from the ponds. The importance of sediment contamination is unclear but does not appear to be the primary factor controlling benthic community structure in the B-Series Ponds. In addition, aquatic monitoring in streams between the ponds found a naturally self sustaining population of fathead minnows in South Walnut Creek between Ponds B-4 and B-5. Fish in the ponds are more likely limited by flow and water management practices than by the chemicals of potential concern.

Weight of Evidence Conclusions

Results of the chemical risk characterization indicated that the sediment ECOPCs within surface sediment conditions would pose a low risk within background ranges to aquatic life within Pond B-5. These results agree with the other LOE conclusions drawn from other studies of this pond. The weight of evidence indicates that the risk associated with Pond B-5 to aquatic populations would be low.

5.3 C-Series Pond Risk Characterization

The C-Series Ponds occur within the Woman Creek AEU (WC AEU). Aquatic habitats within the WC AEU are restricted to the head waters of Woman Creek and its tributaries (i.e., the area above Pond C-2). Intermittent stream flows alternate with areas of persistent flow within the headwaters. Intermittent segments contain isolated pools that provide important habitat for many aquatic species during the late summer and early fall when flow ceases. Persistent flows originate from seeps and springs and provide year-round aquatic habitats. Pond C-1 is the only pond associated with Woman Creek directly because Pond C-2 is hydrologically isolated from the Creek and receives flows from the SID. The SID provides only marginal ephemeral habitats. These ephemeral habitats comprise a few small pools where water collects during storm events and they dry out quickly. Below Pond C-2 only one or two small pools remain most of the year in Lower Woman Creek. The rest of this reach is dry the majority of the year.

Woman Creek retains a significant amount of stream habitat and holds the majority of RFETS fish species. Native fish species that reproduce within Woman Creek include white suckers (*Catostomus commersoni*), fathead minnows, green sunfish (*Lepomis cyanellus*), stonerollers (*Capostoma anomalus*), and creek chubs (*Semotilus atromaculatus*). Two non-native fish species, golden shiners (*Notemigonus crysoleucas* and largemouth bass (*Micropterus salmoides*), also are found in the drainage.

Within Woman Creek, the most common aquatic macroinvertebrates are Oligochaetes (tubificid worms), the larvae of the blackfly (Order *Diptera, Simulidae* sp.) midge (Order *Diptera, Chironomidae* sp) and mayfly (Order *Ephemeroptera*). Other species include caddisflies (Order *Trichoptera*), craneflies (*Tipulidae* ssp.), and damselfly larvae (Order *Odonata*), stonefly larva (Order *Plecoptera*) as well as snails (Class *Gastropoda*) and amphipods (Order *Amphipoda*). Large macroinvertebrates such as crayfish (Order

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Decapoda, Family *Astacidae*) and snails are potentially important prey for other fish, waterfowl, and mammal species.

The hydrology in the Woman Creek tributaries is expected to remain unchanged between the historic and future configuration of RFETS with the exception of the SID, in which reduced flows are anticipated. Woman Creek flows through Pond C-1, which was reconfigured as a low-profile, flow-through structure in 2005. Woman Creek is isolated from IA surface runoff by the SID, which intercepts surface flow and diverts it to Pond C- 2. Woman Creek is diverted around Pond C-2 via a concrete diversion wall and channel, rejoining the original Woman Creek channel downstream of Pond C-2.

Characterization of the aquatic habitat provided by Woman Creek is of primary consideration with regards to aquatic risk. Currently sustained flows exist in portions of the creek that support aquatic species. The location and amount of viable aquatic habitat that will be present after accelerated actions are complete is unclear because overland flow may be altered by accelerated actions.

5.3.1 Pond C-1

The following describes the outcome of the surface sediment HQ analysis completed for each identified ECOPC. Those chemicals identified for further risk characterization are more thoroughly described within the Chemical Risk Characterization – Further Analysis subsection.

Chemical Risk Characterization- Surface Sediment Screen Results

Table A.35 provides the results of the HQ assessment for the Pond C-1 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESL. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen indicate the following;

Aluminum, barium, iron, manganese, mercury, and selenium were retained for further consideration with surface sediment HQs greater than 1. The spatial extent of these metals within the C-Series Ponds in surface sediment is shown on Figures A.59, A.61, A.63, A.65, A.66 and A.68. Iron, manganese, and selenium had MDCs that were less than the maximum background level. Therefore the risk attributable to these metals is within the range of background. Because the HQs for these metals were greater than 1 however, they were retained for further evaluation.

Lead, nickel, and zinc had surface sediment HQs of one or less and were removed from further consideration within the risk characterization. Further analysis indicated that the MDC for these metals was less than the maximum detected concentration in background. The risk attributable to lead, nickel, and zinc is no greater than the risk attributable to background. The spatial extent of these chemicals is shown on Figures A.64, A.67 and A.69. Lead, nickel, and zinc were detected at one location with a concentration greater than the ESL with the remaining concentrations less than the ESL. The risk attributable to these metals within Pond C-1 would be within the range of background and does not require further evaluation.

Acenaphthene, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, pentachlorophenol, phenanthrene, and

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pyrene were retained for further consideration because surface sediment HQs were greater than 1. The spatial extent of these chemicals in surface sediment as compared to their respective ESLs within the C-Series Ponds are shown on Figures A.70, A.71, A.72, A.74, A.76, A.77, A.78, A.79, and A.80.

Benzo(a)pyrene and chrysene had surface sediment HQs of one or less and were removed from further consideration. The spatial extent of these chemicals in surface sediment is shown on Figures A.73 and A.75. Both chemicals were detected at one concentration slightly greater than the ESL while the remaining locations were less than the ESL or below detection levelst levels. The risk attributable to these chemicals in Pond C-1 is low and does not require further evaluation.

Aroclor-1254 was retained for further consideration with a surface sediment HQ of 2. The spatial extent of aroclor-1254 in surface sediment as compared to the ESL within the C-Series Ponds is shown on Figure A.81. The results of aroclor-1254 were used for the total-PCB results because it was the only congener detected. Therefore this congener will be the only chemical retained for further risk characterization analysis.

Total-PCBs were retained for further consideration with a surface sediment HQ of 2. Aroclor-1254 was the only detected congener therefore the spatial distribution of total-PCBs is depicted in Figure A.81 which demonstrates the results for Aroclor-1254 within the C-Series ponds.

Total-PAHs were evaluated for Pond C-1. As shown on Figure A.82, the range of detected total-PAHs for the surface sediment samples was 1104 – 2510 µg/kg, which exceeds the ESL. Both individual (identified above) and total-PAHs were retained for further evaluation.

Chemical Risk Characterization- Further Analysis

Aluminum, barium, iron, manganese, mercury, selenium, acenaphthene, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, pentachlorophenol, phenanthrene, pyrene, aroclor-1254, total-PCBs and total-PAHs were retained for further risk characterization. The results are provided by chemical as follows:

Aluminum had a frequency of detection of 100% (detected in 7 of 7 samples collected). The surface sediment HQ for the ESL is 2, which is within the HQ range of uncertainty where adverse effects are unknown. The surface sediment HQ for the AT is 1. The aluminum ESL in sediment (15,900 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating aluminum concentrations in media that receptors are potentially exposed to. Toxicity based alternative screening benchmarks ranged from 14,000 mg/kg ERL[6], to 58,000 mg/kg ERM, and a high NEC of 73,000 mg/kg (Ingersoll

[6] Not used as an ESL because this value was noted as unreliable (Ingersoll et al. 1996) where fewer than five samples designated as toxic for the chemical, or the number of toxic samples with concentrations below the sediment effect concentration (SEC) was greater than the number of toxic samples with concentrations above the SEC.

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et al. 1996). Comparison to these toxicity-based values provides a better indication of the potential for risk to sediment organisms. Review of the surface sediment data on a point by point basis indicates that aluminum was detected at concentrations greater than the ESL at four of six locations within Pond C-2. These concentrations however, were just slightly greater than the ESL. The remaining two locations had concentrations less than the ESL. Because the measured concentrations fall below the AT values, the likelihood for risk attributable to aluminum is low.

Barium had a frequency of detection of 100% (detected in 7 of 7 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is 1. The barium ESL for sediment (189 m/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999). The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating aluminum concentrations in media that receptors are potentially exposed to. Toxicity from barium in sediment is not well documented and there are no other applicable screening criteria available for this metal. Buchman (1999) proposed a PEL for barium of 48 mg/kg, but this was based on an apparent effects threshold (AET) concentration from marine sediment amphipod bioassays. Comparison to these toxicity-based values provide an indication of when the potential for risk to sediment organisms is likely to be absent, but do not adequately evaluate when risks exist. Therefore, because of the lack of an appropriate ESL for barium, it is considered an uncertainty; although, barium is not considered a priority pollutant by the EPA and for this reason is unlikely to pose a significant risk to benthic receptors. Review of the surface sediment data on a point by point basis indicates that barium had measured concentrations at each of the sampled locations. However these values were only slightly greater than the ESL. The combined LOE indicate that the risk attributable to barium is low.

Iron had a frequency of detection of 100% (detected in 7 of 7 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The iron ESL for sediment (20,000 mg/kg) was based on a LEL (NYSDEC 1994; cited in MacDonald et al. 1999). The potential for adverse effects associated with this ESL is low, because this is a concentration at which effects were first observed in test sediment. TELs for RFETS will depend on the relative sensitivity of site receptors and sediment chemical properties. Alternative screening benchmarks ranged from 8000 mg/kg indicating light pollution (Pavlou & Weston 1983), to the 190,000 mg/kg TEL for the *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996), and a 290,000 mg/kg NEC for *Hyalella azteca* (Ingersoll et al. 1996). Low frequencies of AT exceedances suggest that the potential for adverse effects to benthic macroinvertebrate receptors from iron in sediments at Pond C-1 is unlikely. Review of the surface sediment data on a point by point basis indicates that iron was measured at concentrations greater than the ESL at five of the six sample locations. These measured values however, were only slightly greater than the ESL. In addition, the MDC for iron was within the range of background conditions. The combined LOE indicate that the risk attributable to iron would be low and within the range of background.

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Manganese had a frequency of detection of 100% (detected in 7 of 7 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is 1. The manganese ESL in sediment (630 mg/kg) was based on the TEL for *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996; cited in MacDonald et al. 1999). Alternative screening benchmarks ranged from the 460 mg/kg LEL (NYSDEC 1994), to the 1200 mg/kg PEL, and the 1700 mg/L ERM (Ingersoll et al. 1996). Despite concentrations exceeding the ESL, it is uncertain whether concentrations of manganese in sediment pose a real potential for risk if they do not exceed the AT value represented by the ERM (Ingersoll et al. 1996). Review of the surface sediment data on a point by point basis indicates that manganese was measured at only one location with a concentration greater than the ESL. The remaining five sample locations all had concentrations less than the ESL. In addition, the MDC for manganese was within the range of background conditions. The combined LOE indicate that the risk attributable to manganese is low and within the range of background.

Mercury had a frequency of detection of 100% (detected in 7 of 7 samples). The surface sediment HQ for the ESL is 9, while the HQ for the AT is <1. The ESL for mercury in sediment (0.18 mg/kg) was based on a consensus based TEC (MacDonald et al. 2000a), at which the potential for adverse effects are first observed. Validation of this benchmark found that 34.3% of samples (n=79) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. Thus, there is low confidence that this ESL predicts the potential for adverse effects from mercury in sediment. The potential for adverse effects is also uncertain at concentrations greater than this ESL, and below the consensus based probable effects concentration (PEC; 1.06 mg/kg). Given the uncertainty associated with mercury ESLs the potential for risks can not be excluded; however, it is not considered likely if fewer than 20 percent of samples exceed the ESL. Review of the data on a point by point basis indicated that each measured mercury result was equal or less than the AT value. Review of the surface sediment data on a point by point basis indicates that mercury was measured at only two locations with concentrations greater than the ESL. The remaining four sample locations all had concentrations less than the ESL. The combined LOE indicate that the risk attributable to mercury is low.

Selenium had a frequency of detection of 50% (detected in 3 of 6 samples). The surface sediment HQ for the ESL is 3, while the HQ for the AT is 1. The selenium ESL for sediment (0.95 mg/kg) was based on the 85th percentile concentration in streams (TNRCC 1996; cited in MacDonald et al. 1999), which defined the SQG by TNRCC. The potential for adverse effects associated with this ESL is uncertain because it is based on a percentile concentration from statewide historical data and is not toxicity based. As a regulatory screening level it is not enforceable, but rather provides a basis for evaluating selenium concentrations in media that receptors are potentially exposed to. Alternative screening benchmarks ranged from 1.73 for the 85th percentile concentration in reservoirs (TNRCC 1996) up to 5.0 mg/kg for the British Columbia SQG (Nagpal et al. 1998). Therefore, despite sediment concentrations exceeding the ESL, the potential for adverse effects is uncertain and unlikely for selenium concentrations not greater than the alternative toxicity SQG. Review of the data on a point by point basis indicated that each measured selenium result was less than the AT value. There were three locations with measured concentrations greater than the ESL, while the remaining twolocations were at

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below detection levels. The combined LOE indicate that the risk attributable to selenium is low.

Acenaphthene had a frequency of detection of 50% (detected in 3 of 6 samples). The surface sediment HQ for the ESL is 48, while the HQ for the AT is 4. The acenaphthene ESL for sediment (6.71 ug/kg) was based on the Canadian interim sediment quality guideline (ISQG) (CCME 2002). Alternative screening benchmarks ranged from the 89 ug/kg British Columbia PEL (Nagpal et al. 1998), and the 7320 ug/kg interim EPA freshwater chronic value (FCV) determined by the EqP method (EPA 1997), to the apparent effects threshold approach (AETA[7]) of 100,000 ug/kg (Cubbage et al. 1997). Despite concentrations exceeding the ESL, it is unlikely that the concentrations of acenaphthene in sediment pose a real potential for risk if they do not exceed the AT value represented by the British Columbia PEL (89 ug/kg). The recently measured concentrations of acenaphthene in surface sediment ranged from 74 to 320 ug/kg. These values fall within the range of AT values within the literature indicating that there is uncertainty associated with the toxicity attributable to acenaphthene. Review of the surface sediment data on a point by point basis indicated that within Pond C-1, two of the five locations had measured values greater than the ESL, the remaining were below detection levels. The combined LOE indicate that the risk attributable to acenaphthene is low.

Anthracene had a frequency of detection of 83% (detected in 5 of 6 samples). The surface sediment HQ for the ESL is 8, while the HQ for the AT is 1. The anthracene ESL for sediment (57.2 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 83% of samples (n=129) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 845 Review of the data on a point by point basis indicated that within Pond C-1, four of the five locations had measured values greater than the ESL, the remaining location was below detection levels. The combined LOE indicate that the risk attributable to anthracene is low.

Benzo(a)anthracene had a frequency of detection of 67% (detected in 4 of 6 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The benzo(a)anthracene ESL for sediment (108 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 83% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1050 ug/kg. Review of the data on a point by point basis indicated that within Pond C-1, two of the five locations had measured values greater than the ESL, the remaining were below detection levels or less than the ESL. The combined LOE describing the limited spatial extent of exceedence indicate that the risk attributable to benzo(a)anthracene is low.

[7] The AETA is an calculated value based on measured sediment concentrations and observed effects. This approach defines the sediment concentration above, which significant ($p<0.05$) biological effects are always observed.

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Benzo(g,h,i)perylene had a frequency of detection of 17% (detected in 1 of 6 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 12, while the HQ for the AT is 1. The ESL was based on the ERL for *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996). Alternative screening benchmarks ranged from the 16 µg/kg TEL to 280 µg/kg ERM, and a high NEC of 1,200 µg/kg (Ingersoll et al. 1996). Review of the data on a point by point basis indicated that within Pond C-1, only one of the five locations had measured values greater than the ESL, the remaining four locations were below detection levels. Therefore, given the limited spatial extent of exceedence, it is unlikely that the concentrations of benzo(g,h,i)perylene in sediment pose a potential for adverse effects to benthic organisms in Pond C-1.

Dibenz(a,h)anthracene had a frequency of detection of 20% (detected in 1 of 5 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 16, while the HQ for the AT is 2. The dibenz(a,h)anthracene ESL for sediment (33 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 80% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 240 ug/kg. Review of the data on a point by point basis indicated that within Pond C-1, only one of the four locations had measured values greater than the ESL, the remaining locations were below detection levels. The combined LOE describing the limited spatial extent of exceedences indicate that the risk attributable to dibenz(a,h)anthracene is low.

Indeno(1,2,3-cd)pyrene had a frequency of detection of 50% (detected in 3 of 6 samples). The surface sediment HQ for the ESL is 29, while the HQ for the AT is 2. The ESL is based on the TEL for the *Hyalella azteca* 28-day sediment bioassay (Ingersoll et al. 1996). Alternative screening benchmarks ranged from the 30 µg/kg ERL, to 250 µg/kg ERM, and a high NEC of 770 µg/kg (Ingersoll et al. 1996). Review of the data on a point by point basis indicated that within Pond C-1, two of the five locations had measured values greater than the ESL, the remaining locations were below detection levels. The combined LOE describing the limited spatial extent of exceedences indicate that the risk attributable to indeno(1,2,3-cd)pyrene is low.

Pentachlorophenol had a frequency of detection of 17% (detected in 1 of 6 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 4, while the HQ for the AT is 3. The pentachlorophenol ESL for sediment (255 ug/kg) was based on an equilibrium partitioning (EqP) based equation using the chronic ESL for surface water, and an estimate of 1% organic carbon (EPA 1997). There is uncertainty added to the potential for risk evaluation when extrapolating screening benchmarks using this method. However, it is the best option when alternative screening benchmarks are unavailable. Including the site specific organic carbon content in this calculation would improve the appropriateness of the refined ESL; however, the current estimate of 1% organic carbon is conservative and likely results in an overprotective ESL. An AT value of 360 was available from Cubbage et al. (1997). This Washington State sediment quality standard was derived as a protective concentration in marine waters. Review of the data on a point by point basis indicated that within Pond C-1, only one of the five locations had measured values greater than the ESL, the remaining locations were below

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detection levels. The combined LOE describing the limited spatial extent of exceedence indicate that the risk attributable to pentachlorophenol is low.

Phenanthrene had a frequency of detection of 83% (detected in 5 of 6 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The phenanthrene ESL for sediment (204 ug/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1170 ug/kg. Review of the data on a point by point basis indicated that within Pond C-1, four of the five sample locations had measured concentrations greater than the ESL. The remaining location was below detection levels. The magnitude of exceedences were slight lending to the low ESL HQ. The combined LOE describing the limited spatial extent of exceedence indicate that the risk attributable to phenanthrene is low.

Pyrene had a frequency of detection of 17% (detected in 1 of 6 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The pyrene ESL for sediment (195 ug/kg) ESL was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 80% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1,520 ug/kg. Review of the data on a point by point basis indicated that within Pond C-1, only one of the five locations had measured values greater than the ESL, the remaining locations were below detection levels. The combined LOE describing the limited spatial extent of exceedence indicate that the risk attributable to pyrene is low.

Total-PAHs were determined for the surface sediment samples collected within Pond C-1. As shown within Figure A.82, four locations had detected PAH concentrations. From these locations the total-PAH sum ranged from 790 to 2,510 ug/kg. Using the maximum detected total-PAH concentration, an HQ of 2 was developed. Using the total-PAH AT (22,800 ug/kg) an AT HQ of <1 was derived. The total-PAH ESL for sediment (1,610 ug/kg) ESL was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 80% of samples (n=139) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based probable effects concentration (PEC; 22,800ug/kg). The combined LOE indicate that the risk attributable to total-PAHs would be low.

Aroclor-1254 had a frequency of detection of 14% (detected in 1 of 7 samples) indicating a limited spatial extent. The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC

(300 µg/kg). Review of the data on a point by point basis indicated that within Pond C-1, only one of the six locations had measured values greater than the ESL, the remaining locations were below detection levels. Therefore, it is unlikely that Aroclor-1254, exceeding the ESL by a small amount, poses an unacceptable risk to benthic populations that inhabit Pond C-1.

Total-PCBs were evaluated for Pond C-1 and found to have a total detected maximum concentration of 94 ug/kg attributable to Aroclor-1254. This value exceedes the total-PCB ESL of 40 but is less than the total-PCB AT of 676 ug/kg. The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The ESL was based on a consensus-based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 82 percent of samples (n=139) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL and below the consensus-based PEC (676 µg/kg). Therefore, it is unlikely that total-PCBs pose an unacceptable risk to benthic populations that inhabit Pond C-1.

Other Lines of Evidence

Chemical risk HIs in the Woman Creek Ponds identified Pond C-1 as having an HI of 2.6 (Benzoic acid was the only ECOC with and HQ greater than 1 [HQ = 2.6]) (DOE 1996). Additional results from biomonitoring indicated that Pond C-1 appears to have thriving aquatic life with high diversity of macroinvertebrates and fish. Upstream of the ponds, Woman Creek supports good quality aquatic habitat and several fish species. Risk estimates indicate low risk and ecological monitoring support the fact that the ecosystem is healthy.

Weight of Evidence Conclusions

Results of the chemical risk characterization indicated that the sediment ECOPCs within surface sediment would pose a low risk to aquatic life within Pond C-1. Those chemicals requiring further analysis (aluminum, barium, iron, manganese, mercury, selenium, acenaphthene, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, pentachlorophenol, phenanthrene, pyrene, aroclor-1254, total-PCBs and total-PAHs) were found to have measured concentrations greater than their respective ESLs but less than AT values in most cases. In addition, iron and manganese were found to be within the range of risk attributable to background, while the remaining chemicals evaluated had a minimal spatial extent of ESL.. While five organic chemicals yielded large HQ values (acenaphthene with an HQ = 48, anthracene with an HQ of 8, benzo(g,h,i)peryelene with an HQ = 12, dibenz(a,h)anthracene with an HQ of 16, indeno(1,2,3-cd)pyrene with an HQ = 29 and pentachlorophenol with an HQ of 4) the MDCs for anthracene, benzo(g,h,i)perylene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene were comparable to the AT. In addition, dibenz(a,h)anthracene, benzo(g,h,i)perylene and pentachlorophenol were infrequently detected above their respective ESLs. The remaining chemicals with uncertain toxicity potential were acenaphthene and indeno(1,2,3-cd)pyrene since they were frequently detected (50% of total samples) and had moderate spatial exceedences as compared to their ESLs . Therefore, other LOE in which the review of point by point data

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results were reviewed. Results indicated a limited spatial extent of exceedence for these chemicals as well.

Evaluation of other LOE provided from previous studies indicates that the results of sediment bioassay analysis indicate that Pond C-1 sediment is comparable to controls. There were no chemical stressors measured as a result of the bioassay analysis. In addition, previous studies did not identify PAHs as creating a risk to aquatic life or other receptors (wildlife and waterfowl) associated with the Pond.

In summary, the chemical risk findings are likely conservative of risk conditions within Pond C-1. The majority of the chemical risk findings coincide with the other LOE conclusions drawn from other studies of this pond. Previous research indicates that the aquatic populations represent typical assemblages unaffected by chemical stressors. Bioassay analysis indicated that results of Pond C-1 sediment toxicity were comparable to control tests indicating no chemical stressor affects. These studies occurred within a time-frame that overlaps with the data collected and evaluated for this effort and provides supporting evidence that there are no chemical stressors controlling the ecology. Although there are two chemicals of uncertain toxicity (acenaphthene and indeno(1,2,3-cd)pyrene, the weight of evidence indicates that the risk associated with Pond C-1 to aquatic populations is low.

5.3.2 Pond C-2

Chemical Risk Characterization- Surface Sediment Screen Results

Table A.36 provides the results of the HQ assessment for the Pond C-2 ECOPCs. As shown in this table, several chemicals had surface sediment MDCs that were less than the ESL. Those chemicals with surface sediment MDC ESL HQs of 1 or less were eliminated from further consideration. Results of the HQ screen indicate the following:

Aluminum, arsenic, barium, copper, iron, and selenium had surface sediment HQs of one or less and were removed from further consideration within the risk characterization. Further analysis indicated that the MDC for aluminum, barium, copper, iron, and selenium were less than the maximum detected concentration in background. The risk attributable to these metals is no greater than the risk attributable to background. The spatial extent of these chemicals in surface sediment is shown on Figures A.59, A.60, A.61, A.62, A.63, and A.68. Iron was detected at four locations with a concentration greater than the ESL, aluminum and barium were detected at two locations, while arsenic, copper, and selenium were detected at one location. The remaining concentrations were less than the ESL (or at nondetect levels for selenium). The risk attributable to these metals within Pond C-2 would be within the range of background and does not require further evaluation.

Mercury and zinc were retained for further consideration with surface sediment HQs greater than 1. The spatial extent of these metals within the surface sediment of the C-Series Ponds is shown on Figures A.66 and A.69. Zinc had an MDC less than the maximum background level. Therefore the risk attributable to this metal would be within the range of background. Because the HQs for these metals were greater than 1 however, they were retained for further evaluation.

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Total-PAHs were evaluated for Pond C-2. Results of the total-PAH calculation for each sample within the comprehensive data set was provided in Table A.24, while the results by location for the surface sediment data set were provided in Table A.25. These results reflect the measured values as well as ½ the reported value for the non detected chemicals. The majority of the values were non-detect. The maximum concentrations for the comprehensive data set (14700 ug/kg) and the surface sediment data set (14700) were greater than the ESL, yet represent maximum non-detect values. Figure A.82 depicts the spatial extent of each detected PAH constituent within the Pond C-1 surface sediment sampling locations. As shown on Figure A.82, there was a maximum detected total-PAH concentration of 140 ug/kg which is less than the ESL within surface sediment, indicating there is low risk associated with PAH chemicals. No further evaluation of total-PAHs is required.

Chemical Risk Characterization- Further Analysis

Mercury and zinc were retained for further risk characterization. The results are provided by chemical as follows:

Mercury had a frequency of detection of 91% (detected in 10 of 11 samples). The surface sediment HQ for the ESL is 4, while the HQ for the AT is 1. The ESL for mercury in sediment (0.18 mg/kg) was based on a consensus based TEC (MacDonald et al. 2000), at which the potential for adverse effects are first observed. Validation of this benchmark found that 34.3% of samples (n=79) below this concentration were accurately predicted to not be toxic to benthic macroinvertebrates. Thus, there is low confidence that this ESL predicts the potential for adverse effects from mercury in sediment. The potential for adverse effects is also uncertain at concentrations greater than this ESL, and below the consensus based PEC of 1.06 mg/kg. Given the uncertainty associated with mercury ESLs the potential for risks can not be excluded; however, it is not considered likely if fewer than 20 percent of samples exceed the ESL. Review of the data on a point by point basis indicated that each measured mercury result was less than the AT value. Within Pond C-2, three of the eight locations had measured values greater than the ESL, the remaining were less than the ESL.The combined LOE describing the limited spatial extent of exceedence indicate that the risk attributable to mercury is low and within the range of background.

Zinc had a frequency of detection of 100% (detected in 11 of 11 samples). The surface sediment HQ for the ESL is 2, while the HQ for the AT is <1. The ESL for zinc in sediment (121 mg/kg) was based on a consensus based TEC (MacDonald et al. 2000), where the potential for adverse effects are first observed. Validation of this benchmark found that 81.6% of samples (n=347) below this concentration were accurately predicted to be non-toxic to benthic macroinvertebrates. The potential for adverse effects is uncertain at concentrations greater than this ESL, and below the consensus based PEC of 459 mg/kg. In this situation the potential for risks can not be excluded but is not considered likely if fewer than 20 percent of samples exceed the ESL. Review of the data on a point by point basis indicated that each measured zinc result was less than the AT value. Within Pond C-2, three of the eight locations had measured values greater than the ESL, the remaining were less than the ESL. In addition, the MDC for zinc was within the

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range of background conditions. The combined LOE indicate that the risk attributable to zinc is low and within the range of background.

Other Lines of Evidence

Individual pond HIs in the Woman Creek Ponds identified Pond C-2 as having an HI of 3.0 (Benzoic acid and zinc were the only ECOCs with and HQ greater than 1 [1.7 and 1.3, respectively]) (DOE 1996). Additional results from biomonitoring described Pond C-2 is an off-channel reservoir and does not have as high a diversity of aquatic life, however, pond management including limited inflow and rapid fluctuations of water levels makes a harsh physical environment for aquatic organisms. Upstream of the ponds, Woman Creek supports good quality aquatic habitat and several fish species. Risk estimates indicate low risk and ecological monitoring support the fact that the ecosystem is healthy.

Weight of Evidence Conclusions

The results of the chemical risk characterization indicated that the sediment ECOPCs within surface sediment would pose a low risk to aquatic life within Pond C-2. Those chemicals requiring further analysis (mercury and zinc) were found to have measured concentrations greater than their respective ESLs but less than AT values in most cases. In addition, zinc was found to be within the range of risk attributable to background, while mercury had a minimal spatial extent of ESL exceedences. The overall risk attributable to these chemicals would be low.

These results coincide with the other LOE conclusions drawn from other studies of this pond. Previous research indicates that the aquatic populations represent typical assemblages unaffected by chemical stressors. These studies occurred within a time-frame that overlaps with the data collected and evaluated for this effort and provides supporting evidence that there are no chemical stressors controlling the ecology. The weight of evidence indicates that the risk associated with Pond C-2 to aquatic populations is low.

6.0 UNCERTAINTIES ASSOCIATED WITH THE ECOLOGICAL RISK ASSESSMENT

Quantitative evaluation of ecological risks is limited by uncertainties regarding the assumptions used to predict risk and the data available for quantifying risk. These limitations are usually addressed by making estimates based on the data available or by making assumptions based on professional judgment when data are limited. Because of these assumptions and estimates, the results of the risk calculations themselves are uncertain, and it is important for risk managers and the public to view the results of the risk assessment with this in mind. The detailed assessment of uncertainties associated with ecological evaluations for AEUs is provided in Volume 15B2 of the CRA.

An additional uncertainty introduced by this evaluation is the assumption that each pond provides sufficient habitat for an aquatic population. This is likely an overestimate of habitat quality and conditions because flow controls available habitat and aquatic species often utilize larger habitat areas than those provided within a single pond. Therefore these

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pond-specific estimates likely overestimate the risk potential to an aquatic population within a given AEU.

7.0 CONCLUSIONS

Multiple LOEs were gathered to evaluate the aquatic risk conditions within Ponds A-1, A-2, A-3, A-4, A-5, B-4, B-5, C-1 and C-2. An evaluation of the chemical risk potential was conducted using a standard HQ approach as well as other chemical risk LOE. Additional LOEs gathered from other studies were also compiled with the chemical risk evaluation in order to formulate a risk conclusion.

The sediment ECOPCs carried through the chemical risk characterization process were determined to have no-to-low risk potential. The spatial distribution evaluation indicated few locations where observed concentrations exceeded ESL values. Detailed analysis of certain chemicals indicates the frequency of detection and magnitude of the ECOPCs is not substantial compared to the ESLs and ATs.

The methods applied within the chemical risk characterization likely overestimate risk conditions because data were evaluated on a point-by-point basis and conservative ESLs were applied throughout the process. The aquatic conditions within the ponds indicate that these habitats are limited and largely controlled by flow conditions. Flows are seasonal and related to precipitation events. In turn, the aquatic life within the ponds are comprised of an opportunistic assemblage of aquatic invertebrates. There are minimal records of these ponds containing fish species. There have been no studies to indicate water quality is a controlling factor to the ecology. Instead, it is well documented that flow conditions are the controlling factor that limit the amount of available habitat year-round.

In summary, the multiple LOEs support the weight-of-evidence conclusion that there is low-to-no potential risk to aquatic life within the ponds evaluated as related to the ECOPCs. The overlying risk driver to these organisms is the habitat condition itself.

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Table A.1

Sediment ECOPCs by Pond within the A-Series

ECOPC	A-1	A-2	A-3	A-4	A-5
Inorganics					
Aluminum	x	x	x	x	x
Antimony	x		x	x	
Arsenic		x		x	
Barium	x	x	x	x	x
Cadmium	x	x		x	
Chromium		x			
Copper	x	x		x	
Iron	x	x	x	x	x
Lead	x	x			
Manganese		x			
Mercury	x				
Nickel	x	x	x	x	
Selenium	x		x	x	
Silver	x	x			x
Zinc	x	x	x	x	x
Organics					
Acenaphthene	x	x			
Anthracene	x	x			
Atrazine				x	
Benzo(a)anthracene	x				
Benzo(a)pyrene	x		x		
Benzo(g,h,i)perylene	x				
Bis(2-ethyl-hexyl)phthalate		x			
Chrysene	x		x		
Fluoranthene	x		x		
Indeno(1,2,3-cd)pyrene	x	x			
Pentachlorophenol					
Phenanthrene	x		x		
Pyrene	x		x		
PCB-1254	x	x			
PCB-1260	x				
Total PAHs	23	9	x	x	
Total PCBs	x	x	x		
Total ECOPCs	**29**	**9**	**14**	**12**	**5**

x - Indicates analyte is an ECOPC.

Table A.2

Sediment ECOPCs by Pond within the B-Series

ECOPC	B-4	B-5
Inorganics		
Aluminum	x	x
Antimony	x	
Arsenic		
Barium	x	x
Cadmium	x	
Chromium	x	
Copper	x	
Iron	x	x
Lead	x	x
Manganese		
Mercury	x	
Nickel	x	x
Selenium	x	x
Silver	x	x
Zinc	x	x
Organics		
Anthracene	x	
Benzo(a)anthracene	x	
Benzo(a)pyrene	x	
Benzo(g,h,i)perylene	x	
Benzo(k)fluoranthene	x	
Bis(2-ethyl-hexyl)phthalate	x	
Chrysene	x	
Dibenz(a,h)anthracene	x	
Fluoranthene	x	
Fluorene		
gamma-BHC	x	
Indeno(1,2,3-cd)pyrene	x	
Pentachlorophenol		
Phenanthrene	x	
Pyrene	x	
PCB-1254	x	
Total PAHs	23	9
Total PCBs	x	
Total ECOPCs	29	9

x - Indicates analyte is an ECOPC.

Table A.3

Sediment ECOPCs by Pond within the C-Series

ECOPC	C-1	C-2
Inorganics		
Aluminum	x	x
Antimony		
Arsenic		x
Barium	x	x
Cadmium		
Chromium		
Copper		x
Fluoride		
Iron	x	x
Lead	x	
Manganese	x	
Mercury	x	x
Nickel	x	
Selenium	x	x
Silver		
Zinc	x	x
Organics		
Acenaphthene	x	
Anthracene	x	
Benzo(a)anthracene	x	
Benzo(a)pyrene	x	
Benzo(g,h,i)perylene	x	
Chrysene	x	
Dibenz(a,h)anthracene	x	
Indeno(1,2,3-cd)pyrene	x	
Pentachlorophenol	x	
Phenanthrene	x	
Pyrene	x	
PCB-1254	x	
Total PAHs	x	x
Total PCBs	X	
Total ECOPCs	**23**	**9**

x - Indicates analyte is an ECOPC.

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Table A.4
Summary of Sediment ECOI Data for Pond A-1

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	11	11	100	5.9 - 40	8,500	29,000	17,345	7,448
Antimony	2	11	18.2	0.47 - 12	29.6	30.4	7.61	11.8
Arsenic	11	11	100	0.78 - 2	4.60	9.30	6.84	1.58
Barium	11	11	100	0.15 - 40	53.0	230	171	60.1
Beryllium	9	11	81.8	0.034 - 1	0.480	1.50	0.956	0.473
Boron	7	7	100	1.2 - 2	3.50	12.0	8.79	2.92
Cadmium	8	11	72.7	0.031 - 1	0.140	8.30	1.80	2.33
Calcium	11	11	100	7.6 - 1000	6,400	27,000	15,164	5,811
Cesium	4	4	100	200 - 200	1.80	5.80	3.15	1.84
Chromium	11	11	100	0.081 - 2	10.0	30.0	19.3	7.11
Cobalt	11	11	100	0.12 - 10	3.60	13.0	8.76	2.62
Copper	11	11	100	0.1 - 5	15.0	43.0	26.3	7.39
Iron	11	11	100	1.7 - 20	5,400	24,000	18,045	6,029
Lead	11	11	100	0.33 - 1	20.0	39.0	28.9	6.76
Lithium	7	11	63.6	0.37 - 20	8.30	22.0	12.6	7.07
Magnesium	11	11	100	4.5 - 1000	1,800	5,300	4,175	1,077
Manganese	11	11	100	0.096 - 3	72.0	500	319	112
Mercury	11	11	100	0.0058 - 0.1	0.071	0.470	0.231	0.155
Molybdenum	7	11	63.6	0.27 - 40	0.580	2.30	2.10	1.41
Nickel	9	11	81.8	0.27 - 8	7.80	26.4	16.8	7.29
Potassium	11	11	100	48 - 1000	800	3,700	2,593	962
Selenium	3	11	27.3	0.97 - 1.4	1.20	1.80	0.760	0.520
Silica	7	7	100	2 - 6.9	1,000	1,500	1,243	190
Silver	3	11	27.3	0.099 - 2	0.710	2.00	0.864	0.546
Sodium	11	11	100	72 - 1000	360	1,200	633	230
Strontium	11	11	100	0.079 - 40	65.0	140	94.5	27.6
Tin	6	11	54.5	0.77 - 40	1.20	1.80	7.52	8.35
Titanium	7	7	100	0.17 - 0.3	36.0	170	114	48.1
Vanadium	11	11	100	0.47 - 10	26.0	57.0	40.3	10.6
Zinc	11	11	100	0.43 - 4	55.0	140	107	28.2
Organics (ug/kg)								
1234678-HpCDF	1	1	100	0.00184 - 0.00184	0.030	0.030	0.030	
1234789-HpCDF	1	1	100	0.00184 - 0.00184	0.002	0.002	0.002	
123478-HxCDD	1	1	100	0.00184 - 0.00184	0.001	0.001	0.001	
123478-HxCDF	1	1	100	0.00184 - 0.00184	0.004	0.004	0.004	

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Table A.4
Summary of Sediment ECOI Data for Pond A-1

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
123678-HxCDD	1	1	100	0.00184 - 0.00184	0.005	0.005	0.005	
123678-HxCDF	1	1	100	0.00184 - 0.00184	0.003	0.003	0.003	
123789-HxCDD	1	1	100	0.00184 - 0.00184	0.003	0.003	0.003	
12378-PeCDF	1	1	100	0.00184 - 0.00184	0.002	0.002	0.002	
234678-HxCDF	1	1	100	0.00184 - 0.00184	0.002	0.002	0.002	
23478-PeCDF	1	1	100	0.00184 - 0.00184	0.004	0.004	0.004	
2378-TCDD	1	1	100	.000735 - 0.00073	0.003	0.003	0.003	
2378-TCDF	1	1	100	.000735 - 0.00073	0.006	0.006	0.006	
2-Butanone	4	5	80.0	7.3 - 10	6.00	19.0	12.7	4.99
4-Methyl-2-pentanone	1	5	20.0	6.1 - 10	6.00	6.00	10.2	3.40
Acenaphthene	1	11	9.09	21 - 330	89.0	89.0	243	61.7
Acetone	1	5	20.0	7.2 - 10	11.0	11.0	40.0	19.4
Anthracene	3	11	27.3	21 - 330	52.0	88.0	203	91.7
Benzo(a)anthracene	9	11	81.8	25 - 330	73.0	270	212	141
Benzo(a)pyrene	8	11	72.7	25 - 330	83.0	310	263	148
Benzo(b)fluoranthene	8	11	72.7	44 - 330	83.0	420	270	138
Benzo(g,h,i)perylene	7	11	63.6	20 - 330	60.0	210	239	164
Benzo(k)fluoranthene	8	11	72.7	48 - 330	63.0	200	214	171
bis(2-ethylhexyl)phthalate	4	11	36.4	39 - 330	230	360	386	103
Chrysene	9	11	81.8	34 - 330	82.0	350	239	138
Di-n-octylphthalate	2	11	18.2	30 - 330	66.0	130	374	154
Fluoranthene	9	11	81.8	34 - 330	170	790	435	199
Heptachlorodibenzo-p-dioxin	1	1	100	0.00184 - 0.00184	0.095	0.095	0.095	
Indeno(1,2,3-cd)pyrene	8	11	72.7	28 - 330	50.0	210	206	145
Methylene Chloride	1	5	20.0	1.3 - 5	3.70	3.70	13.3	17.8
OCDD	1	1	100	0.00368 - 0.00368	0.539	0.539	0.539	
OCDF	1	1	100	0.00368 - 0.00368	0.041	0.041	0.041	
PCB-1254	10	15	66.7	8.3 - 530	55.0	5,200	496	1,314
PCB-1260	1	15	6.67	1.8 - 530	150	150	121	92.6
Phenanthrene	9	11	81.8	21 - 330	87.0	520	302	173
Phenol	1	11	9.09	23 - 330	54.0	54.0	371	134
Pyrene	4	11	36.4	160 - 330	420	710	492	83.9
Toluene	4	5	80.0	1.2 - 5	97.0	280	140	105
Radionuclides (pCi/g)								
Americium-241	15	15	100	0 - 0.115	0.116	13.2	4.60	4.66
Cesium-134	4	4	100	0.03 - 0.04	0.040	0.050	0.045	0.006

Table A.4
Summary of Sediment ECOI Data for Pond A-1

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Cesium-137	8	8	100	0.05 - 0.09	0.210	0.685	0.384	0.181
Gross Alpha	8	8	100	2.26 - 4.36	19.8	70.7	40.4	20.1
Gross Beta	8	8	100	2.3 - 4.03	27.3	31.5	29.0	1.50
Plutonium-239/240	15	15	100	0 - 0.129	0.256	36.2	12.5	12.4
Radium-226	4	4	100	0.25 - 0.29	1.84	2.10	1.95	0.120
Radium-228	4	4	100	0.149 - 0.247	1.59	1.83	1.72	0.098
Strontium-89/90	5	5	100	0.0503 - 0.3504	0.270	0.827	0.601	0.215
Uranium-233/234	15	15	100	0.035 - 0.381	1.33	3.87	2.07	0.643
Uranium-235	15	15	100	0 - 0.47	0.041	0.352	0.113	0.081
Uranium-238	15	15	100	0.024 - 0.347	1.05	5.35	2.54	1.20

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Table A.5
Summary of Sediment ECOI Data for Pond A-2

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	10	10	100	4.3 - 40	5,790	49,000	19,357	13,448
Arsenic	10	10	100	0.56 - 3.5	2.40	12.0	7.55	3.43
Barium	10	10	100	0.13 - 40	73.0	390	210	98.0
Beryllium	7	10	70.0	0.025 - 1	0.440	2.50	1.13	0.712
Boron	7	7	100	1.1 - 6	5.90	26.0	14.0	6.47
Cadmium	7	10	70.0	0.027 - 1	0.340	3.20	1.11	0.813
Calcium	10	10	100	6.6 - 1000	8,350	43,000	20,755	11,633
Chromium	10	10	100	0.058 - 2	4.70	44.0	20.5	13.7
Cobalt	10	10	100	0.11 - 10	3.00	15.0	9.35	3.19
Copper	10	10	100	0.072 - 5	9.10	56.0	27.1	15.6
Iron	10	10	100	1.2 - 20	7,700	39,000	21,410	9,093
Lead	10	10	100	0.29 - 1.4	8.00	45.0	27.5	11.6
Lithium	10	10	100	0.28 - 20	4.90	37.0	16.9	10.6
Magnesium	10	10	100	4 - 1000	2,100	11,000	5,059	2,619
Manganese	10	10	100	0.084 - 3	310	1,100	548	285
Mercury	7	10	70.0	0.005 - 0.1	0.024	0.150	0.072	0.042
Molybdenum	6	10	60.0	0.19 - 40	0.650	5.40	2.82	1.93
Nickel	9	10	90.0	0.19 - 8	6.10	34.0	19.6	8.75
Potassium	10	10	100	35 - 1000	1,200	6,500	3,191	1,568
Silica	7	7	100	1.5 - 23	720	4,900	2,297	1,453
Silver	4	10	40.0	0.071 - 2.6	0.098	3.90	1.14	1.09
Sodium	10	10	100	63 - 1000	378	2,100	925	522
Strontium	10	10	100	0.069 - 40	48.5	220	118	64.5
Tin	1	10	10.0	0.55 - 40	2.70	2.70	7.17	9.18
Titanium	7	7	100	0.15 - 0.88	66.0	310	159	79.5
Uranium	3	7	42.9	1 - 39	4.30	20.0	11.8	6.77
Vanadium	10	10	100	0.34 - 10	16.0	96.0	44.7	24.2
Zinc	10	10	100	0.38 - 4	33.0	170	97.7	46.8
Organics (ug/kg)								
1234678-HpCDF	2	3	66.7	0.00286 - 0.00474	0.003	0.003	0.002	3.69E-04
1234789-HpCDF	2	3	66.7	0.00286 - 0.00474	7.40E-04	7.70E-04	9.80E-04	3.90E-04
123478-HxCDF	2	3	66.7	0.00286 - 0.00474	5.50E-04	5.66E-04	0.001	8.87E-04
123678-HxCDD	1	3	33.3	0.00286 - 0.00474	0.001	0.001	0.002	6.01E-04
123789-HxCDD	1	3	33.3	0.00286 - 0.00474	0.001	0.001	0.002	6.91E-04

Table A.5
Summary of Sediment ECOI Data for Pond A-2

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
123789-HxCDF	1	3	33.3	0.00286 - 0.00474	5.53E-04	5.53E-04	0.001	9.09E-04
2-Butanone	3	6	50.0	10 - 22	26.0	71.0	291	617
Acenaphthene	1	10	10.0	18 - 330	180	180	479	234
Acetone	4	6	66.7	10 - 21	77.0	400	439	608
Anthracene	1	10	10.0	18 - 330	210	210	482	229
Benzo(a)anthracene	1	10	10.0	21 - 330	52.0	52.0	835	589
Benzo(a)pyrene	2	10	20.0	21 - 330	51.0	80.0	763	636
Benzo(b)fluoranthene	1	10	10.0	56 - 330	64.0	64.0	836	587
Benzoic Acid	3	10	30.0	300 - 1600	290	2,700	3,532	2,884
bis(2-ethylhexyl)phthalate	9	10	90.0	33 - 330	110	47,000	6,211	14,543
Chrysene	2	10	20.0	28 - 330	60.0	81.0	764	635
Fluoranthene	2	10	20.0	38 - 330	89.0	140	772	624
Heptachlorodibenzo-p-diox	2	3	66.7	0.00286 - 0.00474	0.020	0.020	0.014	0.010
Indeno(1,2,3-cd)pyrene	1	10	10.0	23 - 330	210	210	851	567
Methylene Chloride	3	6	50.0	2.4 - 5	5.60	9.30	698	1,691
OCDD	3	3	100	0.00571 - 0.00948	0.018	0.161	0.098	0.073
OCDF	2	3	66.7	0.00571 - 0.00948	0.006	0.009	0.006	0.002
PCB-1254	4	12	33.3	7.1 - 690	34.0	130	83.6	53.5
Phenanthrene	2	10	20.0	18 - 330	99.0	190	778	618
Pyrene	2	10	20.0	140 - 690	71.0	83.0	809	616
Toluene	3	6	50.0	2.3 - 5	4.00	860	257	391
Radionuclides (pCi/g)								
Americium-241	12	12	100	0.00377 - 0.225	0.154	3.47	1.46	0.773
Cesium-134	3	3	100	0.05 - 0.05	0.050	0.100	0.077	0.025
Cesium-137	6	6	100	0.07 - 0.11	0.130	0.610	0.424	0.182
Gross Alpha	6	6	100	1.6 - 3.77	21.7	45.6	31.7	7.90
Gross Beta	6	6	100	3.6 - 5.5	27.8	32.7	30.0	1.94
Plutonium-239/240	13	13	100	0 - 0.155	0.587	10.5	4.32	2.50
Radium-226	3	3	100	0.37 - 0.42	2.75	3.08	2.92	0.165
Radium-228	3	3	100	0.17 - 0.18	1.70	1.89	1.81	0.101
Strontium-89/90	3	3	100	0.0536 - 0.0581	0.357	0.779	0.542	0.215
Uranium-233/234	13	13	100	0 - 0.418	1.11	3.70	2.36	0.888
Uranium-235	13	13	100	0 - 0.392	0.016	0.338	0.165	0.089
Uranium-238	13	13	100	0 - 0.313	1.21	6.10	3.70	1.70

Table A.6
Summary of Sediment ECOI Data for Pond A-3

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	8	8	100	6.7 - 40	13,100	27,400	21,650	4,617
Antimony	1	7	14.3	0.52 - 12	26.0	26.0	6.79	9.65
Arsenic	8	8	100	0.9 - 2	5.60	7.80	7.11	0.698
Barium	8	8	100	0.16 - 40	160	200	179	13.4
Beryllium	4	8	50.0	0.2 - 1	1.10	1.30	0.906	0.296
Boron	4	4	100	1.3 - 2.1	5.50	9.90	7.30	2.06
Cadmium	4	8	50.0	0.034 - 1	0.350	0.490	0.588	0.181
Calcium	8	8	100	8.4 - 1000	7,200	51,000	17,213	14,533
Cesium	4	4	100	200 - 200	3.30	4.90	4.30	0.693
Chromium	8	8	100	0.37 - 2	12.9	29.9	21.9	5.24
Cobalt	8	8	100	0.14 - 10	8.50	15.5	11.1	2.57
Copper	8	8	100	0.76 - 5	19.0	24.1	22.2	1.96
Iron	8	8	100	2 - 20	18,000	25,000	21,775	2,279
Lead	8	8	100	0.37 - 1	20.0	29.3	25.4	3.20
Lithium	8	8	100	0.41 - 20	7.70	18.0	14.1	3.24
Magnesium	8	8	100	5 - 1000	3,930	5,400	4,645	605
Manganese	8	8	100	0.11 - 3	321	520	396	65.5
Mercury	4	8	50.0	0.0064 - 0.1	0.040	0.068	0.047	0.009
Molybdenum	4	8	50.0	0.35 - 40	0.680	1.10	2.14	1.41
Nickel	7	8	87.5	0.33 - 8	15.4	25.6	18.2	5.36
Potassium	8	8	100	56 - 1000	1,690	3,440	2,583	613
Selenium	1	8	12.5	1 - 1.9	1.80	1.80	0.673	0.500
Silica	4	4	100	6 - 9.6	1,300	2,000	1,725	310
Sodium	8	8	100	80 - 1000	240	850	377	195
Strontium	8	8	100	0.087 - 40	53.0	140	80.7	27.2
Tin	4	8	50.0	1.2 - 40	2.00	3.90	9.54	7.40
Titanium	4	4	100	0.19 - 0.31	140	170	150	14.1
Vanadium	8	8	100	0.84 - 10	39.6	62.7	50.0	8.17
Zinc	8	8	100	0.48 - 4	120	540	192	142
Organics (ug/kg)								
2-Butanone	4	4	100	10 - 10	2.00	4.00	2.75	0.957
Benzo(a)pyrene	3	4	75.0	330 - 330	150	240	214	66.5
Benzo(b)fluoranthene	4	4	100	330 - 330	240	370	278	62.4
bis(2-ethylhexyl)phthalate	1	4	25.0	330 - 330	570	570	413	142

Table A.6
Summary of Sediment ECOI Data for Pond A-3

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Chrysene	4	4	100	330 - 330	170	250	193	38.6
Fluoranthene	4	4	100	330 - 330	360	540	423	80.2
PCB-1254	1	8	12.5	160 - 450	45.0	45.0	151	57.6
Phenanthrene	4	4	100	330 - 330	170	260	208	37.7
Pyrene	4	4	100	330 - 330	290	460	355	73.3
Toluene	4	4	100	5 - 5	6.00	62.0	32.5	25.6
Radionuclides (pCi/g)								
Americium-241	8	8	100	0 - 0.201	0.155	0.666	0.367	0.158
Cesium-137	4	4	100	0.05 - 0.07	0.083	0.288	0.202	0.086
Gross Alpha	4	4	100	2.44 - 3	15.3	22.4	18.1	3.17
Gross Beta	4	4	100	2.23 - 2.46	27.1	30.2	28.7	1.44
Plutonium-239/240	8	8	100	0 - 0.415	0.323	2.05	0.936	0.536
Strontium-89/90	4	4	100	0.04 - 0.06	0.124	0.162	0.142	0.020
Uranium-233/234	8	8	100	0.032 - 0.779	0.527	1.59	1.24	0.349
Uranium-235	8	8	100	0 - 0.993	-0.052	0.149	0.042	0.055
Uranium-238	8	8	100	0.022 - 0.709	1.04	1.63	1.26	0.184

Table A.7
Summary of Sediment ECOI Data for Pond A-4

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	12	12	100	5.5 - 40	6,200	26,000	16,597	5,801
Antimony	4	12	33.3	0.43 - 12	0.740	41.4	9.77	14.8
Arsenic	12	12	100	0.75 - 2	3.80	10.2	6.33	1.80
Barium	12	12	100	0.14 - 40	120	206	166	31.2
Beryllium	10	12	83.3	0.17 - 1	0.870	1.20	0.927	0.192
Boron	8	8	100	1.1 - 1.6	6.50	10.0	7.69	1.27
Cadmium	9	12	75.0	0.028 - 1	0.350	3.10	0.800	0.804
Calcium	12	12	100	7 - 1000	4,300	38,000	13,051	10,399
Cesium	4	4	100	200 - 200	2.10	5.50	3.85	1.61
Chromium	10	12	83.3	0.31 - 2	4.70	27.0	16.6	7.47
Cobalt	12	12	100	0.11 - 10	7.40	13.9	9.53	2.24
Copper	12	12	100	0.63 - 5	9.70	33.4	18.2	5.86
Iron	12	12	100	1.7 - 20	16,000	55,000	21,392	10,809
Lead	12	12	100	0.31 - 1	12.0	35.9	20.6	6.08
Lithium	9	12	75.0	0.34 - 20	5.70	19.0	11.5	5.17
Magnesium	12	12	100	4.2 - 1000	1,900	5,220	3,780	1,006
Manganese	12	12	100	0.088 - 3	220	630	349	115
Mercury	8	12	66.7	0.0053 - 0.1	0.016	0.035	0.034	0.020
Molybdenum	6	12	50.0	0.29 - 40	0.390	0.930	1.63	1.97
Nickel	11	12	91.7	0.27 - 8	15.0	25.5	18.2	3.59
Nitrate / Nitrite	2	2	100	0.2 - 0.2	2.43	2.50	2.47	0.049
Potassium	9	12	75.0	46 - 1000	940	4,300	2,194	1,175
Selenium	3	12	25.0	0.97 - 1.4	1.60	1.90	0.790	0.581
Silica	8	8	100	5 - 7	590	980	790	143
Sodium	8	12	66.7	67 - 1000	79.0	486	192	140
Strontium	12	12	100	0.072 - 40	31.0	140	73.2	29.9
Thallium	2	12	16.7	0.73 - 2	0.350	0.580	0.405	0.105
Titanium	8	8	100	0.16 - 0.22	62.0	160	107	37.6
Vanadium	12	12	100	0.7 - 10	25.7	59.0	42.8	10.4
Zinc	12	12	100	0.4 - 4	46.0	169	84.1	33.6
Organics (ug/kg)								
Atrazine	1	1	100	50 - 50	120	120	120	
Benzene	1	4	25.0	5 - 5	3.00	3.00	4.63	2.59
bis(2-ethylhexyl)phthalate	2	4	50.0	330 - 330	170	950	399	369

Table A.7
Summary of Sediment ECOI Data for Pond A-4

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Toluene	2	4	50.0	5 - 5	5.00	8.00	5.00	2.12
Radionuclides (pCi/g)								
Americium-241	12	12	100	0 - 0.128	-0.015	0.173	0.070	0.059
Cesium-137	4	4	100	0.05 - 0.07	0.297	0.598	0.430	0.127
Gross Alpha	4	4	100	2.07 - 2.91	11.3	17.0	13.3	2.59
Gross Beta	4	4	100	2.27 - 2.45	25.4	29.0	27.6	1.66
Plutonium-239/240	12	12	100	0 - 0.126	-0.009	0.498	0.153	0.160
Strontium-89/90	4	4	100	0.04 - 0.06	0.468	1.80	1.24	0.585
Uranium-233/234	12	12	100	0.025 - 0.263	0.500	1.68	1.19	0.320
Uranium-235	12	12	100	0 - 0.296	0.023	0.243	0.109	0.071
Uranium-238	12	12	100	0 - 0.272	0.802	1.67	1.28	0.261

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Table A.8
Summary of Sediment ECOI Data for Pond A-5

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration
Inorganics (mg/kg)							
Aluminum	9	9	100	7.4 - 40	7,710	21,000	12,434
Arsenic	9	9	100	1 - 2	3.40	4.60	3.92
Barium	9	9	100	0.18 - 40	120	220	159
Beryllium	4	9	44.4	0.23 - 1	0.630	1.20	0.686
Boron	4	4	100	1.5 - 2.4	5.20	11.0	7.68
Calcium	9	9	100	9.4 - 1000	7,740	17,000	10,861
Chromium	9	9	100	0.41 - 2	8.30	21.0	13.3
Cobalt	9	9	100	0.15 - 10	6.20	13.3	9.60
Copper	9	9	100	0.85 - 5	11.0	22.0	17.2
Iron	9	9	100	2.3 - 20	13,000	22,000	15,911
Lead	9	9	100	0.41 - 1	13.0	21.0	17.2
Lithium	9	9	100	0.45 - 20	6.50	17.0	10.0
Magnesium	9	9	100	5.6 - 1000	2,000	4,200	3,068
Manganese	9	9	100	0.12 - 3	130	330	230
Molybdenum	3	9	33.3	0.39 - 40	0.400	0.990	2.18
Nickel	8	9	88.9	0.36 - 8	12.0	19.0	15.4
Potassium	9	9	100	62 - 1000	1,360	3,400	2,063
Silica	4	4	100	6.7 - 11	1,300	2,000	1,600
Silver	3	9	33.3	0.73 - 2	0.880	1.20	0.974
Sodium	8	9	88.9	89 - 1000	138	790	285
Strontium	9	9	100	0.097 - 40	51.5	95.0	63.8
Thallium	3	9	33.3	0.99 - 2	0.610	0.690	0.516
Titanium	4	4	100	0.21 - 0.35	79.0	130	105
Vanadium	9	9	100	0.94 - 10	26.0	46.0	33.9
Zinc	9	9	100	0.53 - 4	55.0	130	75.7
Organics (ug/kg)							
2-Butanone	4	5	80.0	10 - 10	8.00	51.0	26.2
Acetone	2	5	40.0	10 - 10	130	210	114
Benzoic Acid	4	5	80.0	1600 - 1600	240	500	578
bis(2-ethylhexyl)phthalate	4	5	80.0	330 - 330	68.0	130	128
Methylene Chloride	1	5	20.0	5 - 5	18.0	18.0	8.50
Phenol	1	5	20.0	330 - 330	110	110	237
Toluene	5	5	100	5 - 5	3.00	18.0	13.6
Radionuclides (pCi/g)							
Americium-241	11	11	100	0 - 0.119	0.024	0.121	0.061

Table A.8
Summary of Sediment ECOI Data for Pond A-5

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration
Cesium-137	5	5	100	0.086 - 0.103	0.003	0.100	0.038
Gross Alpha	5	5	100	1.6 - 2.6	21.0	28.3	24.3
Gross Beta	5	5	100	5.3 - 5.6	22.2	30.7	26.5
Plutonium-239/240	12	12	100	0 - 0.13	0.045	0.332	0.138
Uranium-233/234	12	12	100	0.019 - 0.306	0.780	1.33	1.03
Uranium-235	12	12	100	0 - 0.328	0.019	0.183	0.073
Uranium-238	12	12	100	0 - 0.279	0	1.44	0.975

Standard Deviation
4,678
0.387
29.9
0.300
2.52
2,969
4.45
2.14
2.92
2,751
2.59
3.85
615
61.2
1.52
3.36
740
316
0.257
212
13.1
0.214
21.2
6.46
22.3
18.6
60.1
389
74.6
5.85
73.4
6.27
0.028

Standard Deviation
0.048
3.11
3.07
0.074
0.166
0.052
0.336

Table A.9
Summary of Sediment ECOI Data for Pond B-4

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration
Inorganics (mg/kg)							
Aluminum	22	22	100	6 - 40	5,890	29,000	15,376
Antimony	5	18	27.8	0.46 - 12	0.730	25.6	4.24
Arsenic	22	22	100	0.8 - 2	4.40	9.10	6.58
Barium	22	22	100	0.15 - 40	110	230	171
Beryllium	15	22	68.2	0.18 - 1	0.550	2.20	0.955
Boron	14	14	100	1.2 - 2.6	4.10	30.0	9.14
Cadmium	19	22	86.4	0.03 - 1	0.130	44.0	3.24
Calcium	22	22	100	7.6 - 1000	3,900	51,000	17,036
Cesium	7	8	87.5	200 - 200	1.40	3.50	2.26
Chromium	22	22	100	0.33 - 2	4.50	140	23.1
Cobalt	22	22	100	0.12 - 10	3.50	12.0	8.46
Copper	22	22	100	0.68 - 5	13.0	120	29.2
Iron	22	22	100	1.8 - 20	11,600	24,000	17,132
Lead	22	22	100	0.33 - 1	14.0	110	38.1
Lithium	19	22	86.4	0.37 - 20	3.40	27.0	11.2
Magnesium	22	22	100	4.5 - 1000	1,600	5,800	3,637
Manganese	22	22	100	0.095 - 3	110	350	244
Mercury	16	22	72.7	0.0057 - 0.1	0.013	1.70	0.145
Molybdenum	14	22	63.6	0.32 - 40	0.430	4.10	1.96
Nickel	21	22	95.5	0.29 - 8	8.70	31.0	16.9
Potassium	22	22	100	50 - 1000	930	3,900	2,289
Selenium	3	22	13.6	1 - 2.3	1.50	3.60	0.780
Silica	14	14	100	5.4 - 12	860	1,700	1,164
Silver	11	22	50.0	0.58 - 130	0.780	3,100	149
Sodium	21	22	95.5	72 - 1000	190	990	322
Strontium	22	22	100	0.078 - 40	40.0	150	76.5
Thallium	4	22	18.2	0.79 - 2	0.380	1.20	0.487
Tin	5	22	22.7	1 - 40	1.20	24.0	7.52
Titanium	14	14	100	0.17 - 0.37	53.0	190	124
Vanadium	22	22	100	0.76 - 10	20.9	63.0	38.7
Zinc	22	22	100	0.43 - 4	63.0	510	205
Organics (ug/kg)							
2-Butanone	3	5	60.0	10 - 10	3.00	11.0	7.00
Acenaphthene	1	22	4.55	21 - 330	110	110	333

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Table A.9
Summary of Sediment ECOI Data for Pond B-4

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration
Acetone	1	5	20.0	10 - 10	61.0	61.0	29.3
Anthracene	10	22	45.5	21 - 330	60.0	420	254
Benzo(a)anthracene	16	22	72.7	24 - 330	80.0	430	399
Benzo(a)pyrene	17	22	77.3	24 - 330	100	570	485
Benzo(b)fluoranthene	17	22	77.3	65 - 330	180	1,500	686
Benzo(g,h,i)perylene	10	22	45.5	19 - 330	90.0	320	449
Benzo(k)fluoranthene	12	22	54.5	49 - 330	200	540	546
bis(2-ethylhexyl)phthalate	18	22	81.8	38 - 330	300	25,000	2,916
Butylbenzylphthalate	2	22	9.09	52 - 330	66.0	110	576
Chrysene	18	22	81.8	33 - 330	74.0	650	510
Dibenz(a,h)anthracene	3	22	13.6	23 - 330	65.0	110	516
Di-n-octylphthalate	3	22	13.6	29 - 330	74.0	250	571
Fluoranthene	18	22	81.8	44 - 330	170	1,400	889
Fluorene	1	22	4.55	22 - 330	94.0	94.0	560
gamma-BHC (Lindane)	1	7	14.3	8 - 8	25.0	25.0	9.00
Indeno(1,2,3-cd)pyrene	10	22	45.5	27 - 330	74.0	300	435
PCB-1254	15	27	55.6	8 - 370	120	3,100	322
Phenanthrene	18	22	81.8	21 - 330	110	760	537
Pyrene	16	22	72.7	160 - 710	310	1,200	806
Toluene	4	5	80.0	5 - 5	2.00	360	80.2
Radionuclides (pCi/g)							
Americium-241	22	22	100	0 - 0.802	0.027	56.5	5.00
Cesium-137	8	8	100	0.04 - 0.07	0.090	0.832	0.270
Gross Alpha	8	8	100	2.08 - 2.8	16.9	49.0	26.6
Gross Beta	8	8	100	2.27 - 2.64	25.0	30.8	26.8
Plutonium-239/240	21	21	100	0 - 0.666	-0.008	217	17.6
Radium-226	4	4	100	0.5 - 0.5	0.749	1.02	0.888
Radium-228	4	4	100	0.5 - 0.5	1.45	1.78	1.65
Strontium-89/90	4	4	100	0.05 - 0.07	0.155	0.217	0.174
Uranium-233/234	22	22	100	0.028 - 1.54	0.857	6.04	1.71
Uranium-235	22	22	100	0 - 1.96	-0.015	0.293	0.109
Uranium-238	22	22	100	0 - 1.76	0.939	8.51	1.97

Standard Deviation
6,300
8.11
1.57
32.0
0.522
6.64
9.13
10,782
0.945
26.9
2.07
21.5
3,520
21.9
6.47
1,003
67.3
0.350
1.28
5.25
838
0.734
233
660
189
29.3
0.245
8.10
40.6
10.8
120
2.92
181

Standard Deviation
19.9
204
381
364
405
441
421
5,360
424
363
443
427
403
421
7.11
448
611
367
340
157
12.3
0.240
12.0
1.81
47.3
0.111
0.147
0.029
1.35
0.085
1.81

Table A.10
Summary of Sediment ECOI Data for Pond B-5

Analyte	Num Detects	Num Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	14	14	100	3.2 - 40	2,600	24,000	14,671	5,804
Antimony	2	13	15.4	0.17 - 12	0.580	0.580	3.56	5.12
Arsenic	14	14	100	0.27 - 2	2.40	8.60	5.38	1.76
Barium	14	14	100	0.05 - 40	73.0	240	139	44.3
Beryllium	9	14	64.3	0.04 - 1	0.220	1.30	0.775	0.283
Boron	7	7	100	1.2 - 1.9	1.30	8.50	4.96	2.40
Cadmium	9	14	64.3	0.03 - 1	0.036	0.620	0.513	0.279
Calcium	14	14	100	0.98 - 1000	4,000	16,900	8,871	3,319
Cesium	5	5	100	200 - 200	2.40	3.50	3.04	0.451
Chromium	14	14	100	0.08 - 2	5.00	27.0	16.3	6.04
Cobalt	14	14	100	0.1 - 10	4.70	11.0	7.81	2.02
Copper	14	14	100	0.17 - 5	4.40	29.9	17.9	7.12
Iron	14	14	100	1.5 - 20	5,400	22,000	15,550	4,499
Lead	14	14	100	0.17 - 1	6.90	36.8	19.9	8.61
Lithium	14	14	100	0.32 - 20	2.50	19.0	10.9	4.29
Magnesium	14	14	100	1.2 - 1000	640	5,000	3,190	1,187
Manganese	14	14	100	0.05 - 3	58.0	350	226	77.5
Mercury	7	14	50.0	0.0057 - 0.1	0.017	0.086	0.041	0.022
Molybdenum	8	14	57.1	0.08 - 40	0.440	1.40	1.78	1.47
Nickel	14	14	100	0.08 - 8	8.00	23.8	15.8	4.33
Potassium	14	14	100	3.1 - 1000	410	3,600	2,026	851
Selenium	3	13	23.1	0.26 - 1.6	0.720	1.60	0.643	0.350
Silica	7	7	100	5.3 - 8.3	490	1,300	867	273
Silver	4	14	28.6	0.09 - 2	0.340	1.40	0.738	0.451
Sodium	13	14	92.9	24.5 - 1000	84.0	510	300	136
Strontium	14	14	100	0.05 - 40	16.0	87.0	53.6	18.5
Thallium	3	14	21.4	0.25 - 2	0.450	0.720	0.410	0.196
Tin	2	14	14.3	0.31 - 40	1.90	39.5	8.39	12.0
Titanium	7	7	100	0.17 - 0.26	43.0	160	108	46.5
Vanadium	14	14	100	0.25 - 10	11.0	51.0	36.3	11.4
Zinc	14	14	100	0.12 - 4	22.0	240	103	56.6
Organics (ug/kg)								
2-Butanone	3	7	42.9	10 - 1300	2.00	21.0	192	313
Acetone	1	7	14.3	10 - 1300	87.0	87.0	205	305

Table A.10
Summary of Sediment ECOI Data for Pond B-5

Analyte	Num Detects	Num Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
bis(2-ethylhexyl)phthalate	2	5	40.0	330 - 330	180	270	306	142
Carbon Tetrachloride	2	7	28.6	5 - 1300	390	440	122	201
Di-n-octylphthalate	1	5	20.0	330 - 330	240	240	253	20.2
Fluoranthene	2	5	40.0	330 - 330	84.0	190	203	71.4
Methylene Chloride	2	7	28.6	5 - 1300	410	420	122	200
Pyrene	1	5	20.0	330 - 330	160	160	237	47.0
Toluene	5	6	83.3	5 - 1300	12.0	47.0	129	256
Radionuclides (pCi/g)								
Americium-241	12	12	100	0 - 0.119	0.024	0.337	0.129	0.106
Cesium-137	5	5	100	0.05 - 0.06	0.032	0.187	0.093	0.057
Gross Alpha	5	5	100	2.15 - 3.56	13.0	34.0	18.7	8.63
Gross Beta	5	5	100	2.27 - 2.46	20.7	28.6	24.8	3.08
Plutonium-239/240	12	12	100	0 - 0.127	-0.002	0.895	0.315	0.253
Radium-226	5	5	100	0.5 - 0.5	0.773	0.961	0.889	0.071
Radium-228	5	5	100	0.5 - 0.5	1.47	1.84	1.62	0.139
Strontium-89/90	5	5	100	0.01 - 0.06	0.111	0.579	0.369	0.199
Uranium-233/234	12	12	100	0 - 0.272	0.889	1.83	1.21	0.274
Uranium-235	12	12	100	0 - 0.31	-0.006	0.243	0.098	0.074
Uranium-238	12	12	100	0 - 0.339	0.759	1.53	1.15	0.238

Table A.11
Summary of Sediment ECOI Data for Pond C-1

Analyte	Num Detects	Num Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration
Inorganics (mg/kg)							
Aluminum	7	7	100	8.9 - 40	13,000	32,000	23,643
Antimony	1	6	16.7	0.69 - 12	0.820	0.820	1.13
Arsenic	7	7	100	1.2 - 2	4.90	8.90	6.44
Barium	7	7	100	0.22 - 40	208	330	274
Beryllium	7	7	100	0.27 - 1	0.860	6.70	2.05
Boron	5	5	100	1.8 - 2.3	7.90	11.0	9.16
Cadmium	5	6	83.3	0.045 - 1	0.560	0.850	0.707
Calcium	7	7	100	11 - 1000	7,000	19,000	11,300
Chromium	7	7	100	0.49 - 2	17.4	30.0	24.3
Cobalt	7	7	100	0.18 - 10	10.9	13.0	11.9
Copper	7	7	100	1 - 5	23.0	30.0	26.8
Iron	7	7	100	2.7 - 20	19,100	31,000	26,086
Lead	7	7	100	0.49 - 0.65	26.0	38.0	30.5
Lithium	7	7	100	0.55 - 20	12.4	28.0	20.4
Magnesium	7	7	100	6.7 - 1000	3,540	5,800	4,607
Manganese	7	7	100	0.14 - 3	200	970	397
Mercury	7	7	100	0.0085 - 0.1	0.075	1.60	0.483
Molybdenum	3	6	50.0	0.47 - 40	0.830	2.00	1.06
Nickel	7	7	100	0.44 - 8	16.4	24.0	20.5
Nitrate / Nitrite	2	2	100	0.2 - 0.2	1.00	1.30	1.15
Potassium	7	7	100	75 - 1000	2,320	4,200	3,167
Selenium	3	6	50.0	1 - 2.1	1.50	2.80	1.61
Silica	5	5	100	8 - 11	1,100	1,600	1,420
Sodium	4	7	57.1	110 - 1000	23.3	290	124
Strontium	7	7	100	0.12 - 40	54.5	89.0	68.5
Thallium	2	6	33.3	1.2 - 2	7.70	10.0	3.66
Tin	2	7	28.6	1.6 - 40	11.0	11.0	5.86
Titanium	5	5	100	0.25 - 0.33	190	300	246
Vanadium	7	7	100	1.1 - 10	32.4	56.0	44.4
Zinc	7	7	100	0.64 - 4	95.2	140	109
Organics (ug/kg)							
1234678-HpCDF	2	2	100	0.00226 - 0.00271	8.07E-04	0.002	0.001
123478-HxCDF	1	2	50.0	0.00226 - 0.00271	0.001	0.001	0.001
123678-HxCDF	1	2	50.0	0.00226 - 0.00271	5.62E-04	5.62E-04	9.59E-04
2,4-Dinitrophenol	1	6	16.7	220 - 1600	890	890	2,873

Table A.11
Summary of Sediment ECOI Data for Pond C-1

Analyte	Num Detects	Num Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration
234678-HxCDF	1	2	50.0	0.00226 - 0.00271	7.81E-04	7.81E-04	0.001
23478-PeCDF	1	2	50.0	0.00226 - 0.00271	0.001	0.001	0.001
4,6-Dinitro-2-methylphenol	1	6	16.7	290 - 1600	750	750	2,850
Acenaphthene	3	6	50.0	31 - 330	74.0	360	335
Anthracene	5	6	83.3	31 - 330	90.0	450	373
Benzo(a)anthracene	4	6	66.7	36 - 330	69.0	190	297
Benzo(a)pyrene	3	6	50.0	36 - 330	66.0	170	386
Benzo(b)fluoranthene	2	6	33.3	97 - 330	170	180	492
Benzo(g,h,i)perylene	1	6	16.7	29 - 330	150	150	575
Benzo(k)fluoranthene	1	6	16.7	73 - 330	150	150	575
Benzoic Acid	2	7	28.6	510 - 1600	190	410	2,579
Chrysene	4	6	66.7	49 - 330	65.0	190	294
Dibenz(a,h)anthracene	1	5	20.0	35 - 45	530	530	666
Di-n-butylphthalate	1	6	16.7	53 - 330	110	110	602
Fluoranthene	4	6	66.7	66 - 330	120	330	333
Heptachlorodibenzo-p-dioxin	2	2	100	0.00226 - 0.00271	0.003	0.005	0.004
Indeno(1,2,3-cd)pyrene	3	6	50.0	40 - 330	340	500	540
OCDD	2	2	100	0.00452 - 0.00542	0.013	0.031	0.022
OCDF	2	2	100	0.00452 - 0.00542	0.001	0.002	0.002
PCB-1254	1	7	14.3	12 - 160	94.0	94.0	142
Pentachlorodibenzo-p-dioxin	1	2	50.0	0.00226 - 0.00271	3.72E-04	3.72E-04	8.64E-04
Pentachlorophenol	1	6	16.7	200 - 1600	950	950	2,883
Phenanthrene	5	6	83.3	31 - 330	310	360	367
Pyrene	1	6	16.7	240 - 330	310	310	602
Toluene	2	2	100	5 - 5	380	520	450
Radionuclides (pCi/g)							
Americium-241	9	9	100	0.005 - 0.11	0.059	0.442	0.169
Gross Alpha	4	4	100	2.2 - 3.5	37.0	59.0	45.5
Gross Beta	4	4	100	4.4 - 5.6	28.0	46.0	34.5
Plutonium-239/240	9	9	100	0.003 - 0.135	0.320	2.20	0.971
Uranium-233/234	9	9	100	0.012 - 0.203	1.70	3.50	2.35
Uranium-235	9	9	100	0.012 - 0.242	0.071	0.405	0.196
Uranium-238	9	9	100	0.012 - 0.23	1.30	3.36	2.15

Standard Deviation
7,341
1.59
1.30
41.6
2.07
1.30
0.157
4,629
4.64
0.932
2.15
3,954
3.67
5.38
691
260
0.667
0.831
2.38
0.212
662
0.918
192
108
11.9
4.10
3.60
42.8
7.78
14.9
5.47E-04
6.01E-05
5.61E-04
1,088

Standard Deviation
4.06E-04
5.30E-05
1,139
142
147
293
324
265
232
232
1,583
295
104
249
275
0.002
177
0.012
3.39E-04
179
6.95E-04
1,066
67.4
176
99.0
0.125
9.75
7.94
0.580
0.687
0.113
0.666

Table A.12
Summary of Sediment ECOI Data for Pond C-2

Analyte	Num Detects	Num Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	11	11	100	5.3 - 40	4,460	22,000	13,069	6,157
Arsenic	11	11	100	0.71 - 2	2.50	9.80	5.75	1.94
Barium	11	11	100	0.13 - 40	70.0	226	152	52.9
Beryllium	9	10	90.0	0.16 - 1	0.470	1.20	0.803	0.325
Boron	8	8	100	1.1 - 1.5	3.60	10.0	6.21	2.05
Cadmium	1	10	10.0	0.027 - 1	0.130	0.130	0.178	0.327
Calcium	11	11	100	6.7 - 1000	1,400	47,700	13,965	16,130
Chromium	11	11	100	0.29 - 2	7.00	25.0	15.1	5.78
Cobalt	11	11	100	0.11 - 10	4.00	12.0	8.53	2.52
Copper	11	11	100	0.6 - 5	6.40	35.9	18.2	8.62
Iron	11	11	100	1.6 - 20	8,090	29,000	18,563	5,590
Lead	11	11	100	0.29 - 0.6	9.70	34.6	19.7	7.73
Lithium	11	11	100	0.32 - 20	3.60	19.0	10.9	4.87
Magnesium	11	11	100	4 - 1000	1,100	5,400	3,222	1,465
Manganese	11	11	100	0.084 - 3	250	602	431	122
Mercury	10	11	90.9	0.005 - 0.1	0.014	0.680	0.200	0.296
Molybdenum	7	10	70.0	0.28 - 40	0.400	1.10	0.880	0.581
Nickel	11	11	100	0.26 - 8	5.30	21.0	15.3	5.12
Nitrate / Nitrite	3	3	100	0.2 - 0.2	0.700	1.90	1.40	0.624
Potassium	11	11	100	44 - 1000	1,100	3,900	2,270	967
Selenium	1	10	10.0	0.92 - 1.3	1.10	1.10	0.584	0.196
Silica	8	8	100	4.7 - 6.7	610	1,400	858	286
Sodium	9	11	81.8	63 - 1000	76.3	460	175	124
Strontium	11	11	100	0.069 - 40	16.0	167	72.2	53.1
Titanium	8	8	100	0.15 - 0.21	53.0	160	104	35.0
Vanadium	11	11	100	0.67 - 10	14.3	50.0	34.5	10.7
Zinc	11	11	100	0.38 - 4	27.0	201	84.3	55.3
Organics (ug/kg)								
Benzoic Acid	1	2	50.0	1600 - 1600	240	240	2,620	3,366
Fluoranthene	1	2	50.0	330 - 330	140	140	595	643
Phenol	1	2	50.0	330 - 330	150	150	600	636
Toluene	3	3	100	5 - 5	340	410	373	35.1
Radionuclides (pCi/g)								
Americium-241	11	11	100	0.002 - 0.13	0.024	0.727	0.292	0.187

Table A.12
Summary of Sediment ECOI Data for Pond C-2

Analyte	Num Detects	Num Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Gross Alpha	3	3	100	2.4 - 3.1	33.0	59.0	44.0	13.5
Gross Beta	3	3	100	4.9 - 5.2	32.0	44.0	39.0	6.24
Plutonium-239/240	11	11	100	0.002 - 0.106	0.027	2.96	1.58	0.795
Uranium-233/234	8	8	100	0.195 - 0.278	0.801	1.40	1.09	0.205
Uranium-235	8	8	100	0.198 - 0.355	0.037	0.247	0.130	0.075
Uranium-238	8	8	100	0.18 - 0.289	0.805	1.79	1.10	0.340

Table A.13
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-1

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	29,000	11.0	11.0	34,291	100	Yes	Yes	Yes	Yes	Yes
Antimony	2.00	30.4	11.0	2.00	30.4	18.2	Yes	Yes	N/A	Yes	Yes
Arsenic	9.79	9.30	11.0	11.0	10.4	100	No	--	--	--	No
Barium	189	230	11.0	11.0	230	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	1.50	11.0	9.00	2.03	81.8	N/A	--	--	--	N/A
Boron	N/A	12.0	7.00	7.00	16.8	100	N/A	--	--	--	N/A
Cadmium	0.990	8.30	11.0	8.00	11.4	72.7	Yes	Yes	N/A	Yes	Yes
Calcium	N/A	27,000	11.0	11.0	28,386	100	N/A	--	--	--	N/A
Cesium	N/A	5.80	4.00	4.00	10.8	100	N/A	--	--	--	N/A
Chromium	43.4	30.0	11.0	11.0	35.4	100	No	--	--	--	No
Cobalt	N/A	13.0	11.0	11.0	14.7	100	N/A	--	--	--	N/A
Copper	31.6	43.0	11.0	11.0	43.1	100	Yes	Yes	Yes	Yes	Yes
Iron	20,000	24,000	11.0	11.0	24,000	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	39.0	11.0	11.0	44.3	100	Yes	Yes	Yes	Yes	Yes
Lithium	N/A	22.0	11.0	7.00	45.1	63.6	N/A	--	--	--	N/A
Magnesium	N/A	5,300	11.0	11.0	6,626	100	N/A	--	--	--	N/A
Manganese	630	500	11.0	11.0	574	100	No	--	--	--	No
Mercury	0.180	0.470	11.0	11.0	0.583	100	Yes	Yes	N/A	Yes	Yes
Molybdenum	N/A	2.30	11.0	7.00	3.95	63.6	N/A	--	--	--	No
Nickel	22.7	26.4	11.0	9.00	26.4	81.8	Yes	Yes	Yes	Yes	Yes
Potassium	N/A	3,700	11.0	11.0	4,782	100	N/A	--	--	--	N/A
Selenium	0.950	1.80	11.0	3.00	1.80	27.3	Yes	Yes	Yes	Yes	Yes
Silica	N/A	1,500	7.00	7.00	1,767	100	N/A	--	--	--	N/A
Silver	1.00	2.00	11.0	3.00	2.11	27.3	Yes	--	--	--	Yes
Sodium	N/A	1,200	11.0	11.0	1,157	100	N/A	--	--	--	N/A
Strontium	N/A	140	11.0	11.0	157	100	N/A	--	--	--	N/A
Tin	N/A	1.80	11.0	6.00	18.8	54.5	N/A	--	--	--	No
Titanium	N/A	170	7.00	7.00	246	100	N/A	--	--	--	N/A
Vanadium	N/A	57.0	11.0	11.0	64.4	100	N/A	--	--	--	N/A
Zinc	121	140	11.0	11.0	171	100	Yes	Yes	Yes	Yes	Yes
Organics (ug/kg)											
1234678-HpCDF	TEQ	0.030	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
1234789-HpCDF	TEQ	0.002	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
123478-HxCDD	TEQ	0.001	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
123478-HxCDF	TEQ	0.004	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
123678-HxCDD	TEQ	0.005	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
123678-HxCDF	TEQ	0.003	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
123789-HxCDD	TEQ	0.003	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
12378-PeCDF	TEQ	0.002	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
234678-HxCDF	TEQ	0.002	1.00	1.00	N/A	100	N/A	--	--	--	TEQ

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Table A.13
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-1

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency ≥5%	> Bkg	95th UTL>ESL?	ECOPC
23478-PeCDF	TEQ	0.004	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
2378-TCDD	0.009	0.003	1.00	1.00	N/A	100	No	--	--	--	No
2378-TCDF	TEQ	0.006	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
2-Butanone	84.2	19.0	5.00	4.00	N/A	80.0	No	--	--	--	No
4-Methyl-2-pentanone	N/A	6.00	5.00	1.00	N/A	20.0	N/A	--	--	--	N/A
Acenaphthene	6.71	89.0	11.0	1.00	383	9.09	Yes	Yes	N/A	Yes	Yes
Acetone	N/A	11.0	5.00	1.00	N/A	20.0	N/A	--	--	--	N/A
Anthracene	57.2	88.0	11.0	3.00	412	27.3	Yes	Yes	N/A	Yes	Yes
Benzo(a)anthracene	108	270	11.0	9.00	532	81.8	Yes	Yes	N/A	Yes	Yes
Benzo(a)pyrene	150	310	11.0	8.00	599	72.7	Yes	Yes	N/A	Yes	Yes
Benzo(b)fluoranthene	N/A	420	11.0	8.00	N/A	72.7	N/A	--	--	--	N/A
Benzo(g,h,i)perylene	13.0	210	11.0	7.00	613	63.6	Yes	Yes	N/A	Yes	Yes
Benzo(k)fluoranthene	240	200	11.0	8.00	N/A	72.7	No	--	--	--	No
bis(2-ethylhexyl)phthalate	24,900	360	11.0	4.00	N/A	36.4	No	--	--	--	No
Chrysene	166	350	11.0	9.00	554	81.8	Yes	Yes	N/A	Yes	Yes
Di-n-octylphthalate	N/A	130	11.0	2.00	N/A	18.2	N/A	--	--	--	N/A
Fluoranthene	423	790	11.0	9.00	889	81.8	Yes	Yes	N/A	Yes	Yes
Heptachlorodibenzo-p-dioxin	N/A	0.095	1.00	1.00	N/A	100	N/A	--	--	--	N/A
Indeno(1,2,3-cd)pyrene	17.0	210	11.0	8.00	535	72.7	Yes	Yes	N/A	Yes	Yes
Methylene Chloride	N/A	3.70	5.00	1.00	N/A	20.0	N/A	--	--	--	N/A
OCDD	TEQ	0.539	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
OCDF	TEQ	0.041	1.00	1.00	N/A	100	N/A	--	--	--	TEQ
Aroclor-1254	60.0	5,200	15.0	10.0	2,868	66.7	Yes	Yes	N/A	Yes	Yes
Aroclor-1260	05.0	150	15.0	1.00	265	6.67	Yes	Yes	N/A	Yes	Yes
Phenanthrene	204	520	11.0	9.00	695	81.8	Yes	Yes	N/A	Yes	Yes
Phenol	773	54.0	11.0	1.00	N/A	9.09	No	--	--	--	No
Pyrene	195	710	11.0	4.00	710	36.4	Yes	Yes	N/A	Yes	Yes
Toluene	1,660	280	5.00	4.00	N/A	80.0	No	--	--	--	No
Total PCBs	40.0	5,200	N/A	N/A	5,221	N/A	Yes	N/A	N/A	Yes	Yes
Total PAHs	1,610	6,230	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Radionuclides (pCi/g)											
Americium-241	5,150	13.2	15.0	15.0	13.2	100	No	--	--	--	No
Cesium-134	N/A	0.050	4.00	4.00	0.050	100	N/A	--	--	--	No
Cesium-137	3,120	0.685	8.00	8.00	0.851	100	No	--	--	--	No
Gross Alpha	N/A	70.7	8.00	8.00	92.2	100	N/A	--	--	--	N/A
Gross Beta	N/A	31.5	8.00	8.00	32.9	100	N/A	--	--	--	N/A
Plutonium-239/240	5,860	36.2	15.0	15.0	36.2	100	No	--	--	--	No
Radium-226	101	2.10	4.00	4.00	2.45	100	No	--	--	--	No
Radium-228	87.8	1.83	4.00	4.00	2.13	100	No	--	--	--	No
Strontium-89/90	582	0.827	5.00	5.00	1.33	100	No	--	--	--	No
Uranium-233/234	5,280	3.87	15.0	15.0	3.87	100	No	--	--	--	No

Table A.13
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-1

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL?	ECOPC
Uranium-235	3,730	0.352	15.0	9.00	0.352	60.0	No	--	--	--	No
Uranium-238	2,490	5.35	15.0	15.0	5.02	100	No	--	--	--	No

TEQ = Dioxin and furan cogeners were evaluated using a total equivalent quotient. Summary values are provided in tables.

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Table A.14
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-2

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	49,000	10.0	10.0	51,022	100	Yes	Yes	Yes	Yes	Yes
Arsenic	9.79	12.0	10.0	10.0	15.6	100	Yes	Yes	Yes	Yes	Yes
Barium	189	390	10.0	10.0	441	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	2.50	10.0	7.00	2.81	70.0	N/A	--	--	--	N/A
Boron	N/A	26.0	7.00	7.00	31.9	100	N/A	--	--	--	N/A
Cadmium	0.990	3.20	10.0	7.00	3.20	70.0	Yes	Yes	N/A	Yes	Yes
Calcium	N/A	43,000	10.0	10.0	48,146	100	N/A	--	--	--	N/A
Chromium	43.4	44.0	10.0	10.0	52.9	100	Yes	Yes	Yes	Yes	Yes
Cobalt	N/A	15.0	10.0	10.0	16.9	100	N/A	--	--	--	N/A
Copper	31.6	56.0	10.0	10.0	63.8	100	Yes	Yes	Yes	Yes	Yes
Iron	20,000	39,000	10.0	10.0	42,822	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	45.0	10.0	10.0	54.8	100	Yes	Yes	Yes	Yes	Yes
Lithium	N/A	37.0	10.0	10.0	41.9	100	N/A	--	--	--	N/A
Magnesium	N/A	11,000	10.0	10.0	11,225	100	N/A	--	--	--	N/A
Manganese	630	1,100	10.0	10.0	1,519	100	Yes	Yes	Yes	Yes	Yes
Mercury	0.180	0.150	10.0	7.00	0.171	70.0	No	--	--	--	No
Molybdenum	N/A	5.40	10.0	6.00	7.37	60.0	N/A	--	--	--	No
Nickel	22.7	34.0	10.0	9.00	40.2	90.0	Yes	Yes	Yes	Yes	Yes
Potassium	N/A	6,500	10.0	10.0	6,882	100	N/A	--	--	--	N/A
Silica	N/A	4,900	7.00	7.00	6,300	100	N/A	--	--	--	N/A
Silver	1.00	3.90	10.0	4.00	3.90	40.0	Yes	Yes	N/A	Yes	Yes
Sodium	N/A	2,100	10.0	10.0	2,154	100	N/A	--	--	--	N/A
Strontium	N/A	220	10.0	10.0	269	100	N/A	--	--	--	N/A
Tin	N/A	2.70	10.0	1.00	81.6	10.0	N/A	--	--	--	N/A
Titanium	N/A	310	7.00	7.00	378	100	N/A	--	--	--	N/A
Uranium	N/A	20.0	7.00	3.00	30.4	42.9	N/A	--	--	--	N/A
Vanadium	N/A	96.0	10.0	10.0	102	100	N/A	--	--	--	N/A
Zinc	121	170	10.0	10.0	208	100	Yes	Yes	Yes	Yes	Yes
Oranics (ug/kg)											
1234678-HpCDF	TEQ	0.003	3.00	2.00	N/A	66.7	N/A	--	--	--	N/A
1234789-HpCDF	TEQ	7.70E-04	3.00	2.00	N/A	66.7	N/A	--	--	--	N/A
123478-HxCDF	TEQ	5.66E-04	3.00	2.00	N/A	66.7	N/A	--	--	--	N/A
123678-HxCDD	TEQ	0.001	3.00	1.00	N/A	33.3	N/A	--	--	--	N/A
123789-HxCDD	TEQ	0.001	3.00	1.00	N/A	33.3	N/A	--	--	--	N/A
123789-HxCDF	TEQ	5.53E-04	3.00	1.00	N/A	33.3	N/A	--	--	--	N/A
2-Butanone	84.2	71.0	6.00	3.00	N/A	50.0	No	--	--	--	No
Acenaphthene	6.71	180	10.0	1.00	1,028	10.0	Yes	Yes	N/A	Yes	Yes
Acetone	N/A	400	6.00	4.00	N/A	66.7	N/A	--	--	--	N/A
Anthracene	57.2	210	10.0	1.00	1,022	10.0	Yes	Yes	N/A	Yes	Yes
Benzo(a)anthracene	108	52.0	10.0	1.00	N/A	10.0	No	--	--	--	No
Benzo(a)pyrene	150	80.0	10.0	2.00	N/A	20.0	No	--	--	--	No

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Table A.14
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-2

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL?	ECOPC
Benzo(b)fluoranthene	N/A	64.0	10.0	1.00	N/A	10.0	N/A	--	--	--	N/A
Benzoic Acid	N/A	2,700	10.0	3.00	N/A	30.0	N/A	--	--	--	N/A
bis(2-ethylhexyl)phthalate	24,900	47,000	10.0	9.00	80,294	90.0	Yes	Yes	N/A	Yes	Yes
Chrysene	166	81.0	10.0	2.00	N/A	20.0	No	--	--	--	No
Fluoranthene	423	140	10.0	2.00	N/A	20.0	No	--	--	--	No
Heptachlorodibenzo-p-dioxin	TEQ	0.020	3.00	2.00	N/A	66.7	N/A	--	--	--	TEQ
Indeno(1,2,3-cd)pyrene	17.0	210	10.0	1.00	2,186	10.0	Yes	Yes	N/A	Yes	Yes
Methylene Chloride	N/A	9.30	6.00	3.00	N/A	50.0	N/A	--	--	--	N/A
OCDD	TEQ	0.161	3.00	3.00	N/A	100	N/A	Yes	N/A	N/A	TEQ
OCDF	TEQ	0.009	3.00	2.00	N/A	66.7	N/A	Yes	N/A	N/A	TEQ
Aroclor-1254	60.0	130	12.0	4.00	202	33.3	Yes	Yes	N/A	Yes	Yes
Phenanthrene	204	190	10.0	2.00	N/A	20.0	No	--	--	--	No
Pyrene	195	83.0	10.0	2.00	N/A	20.0	No	--	--	--	No
Toluene	1,660	860	6.00	3.00	N/A	50.0	No	--	--	--	No
Total PCBs	40.0	185	N/A	N/A	185.00	N/A	Yes	N/A	N/A	Yes	Yes
Total PAHs	1,610	22,800	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Radionuclides (pCi/g)											
Americium-241	5,150	3.47	12.0	12.0	3.47	100	No	--	--	--	No
Cesium-134	N/A	0.100	3.00	3.00	0.100	100	N/A	--	--	--	No
Cesium-137	3,120	0.610	6.00	6.00	0.971	100	No	--	--	--	No
Gross Alpha	N/A	45.6	6.00	6.00	55.5	100	N/A	--	--	--	N/A
Gross Beta	N/A	32.7	6.00	6.00	35.9	100	N/A	--	--	--	N/A
Plutonium-239/240	5,860	10.5	13.0	13.0	9.72	100	No	--	--	--	No
Radium-226	101	3.08	3.00	3.00	3.08	100	No	--	--	--	No
Radium-228	87.8	1.89	3.00	3.00	1.89	100	No	--	--	--	No
Strontium-89/90	582	0.779	3.00	3.00	0.779	100	No	--	--	--	No
Uranium-233/234	5,280	3.70	13.0	13.0	4.28	100	No	--	--	--	No
Uranium-235	3,730	0.285	13.0	7.00	0.357	53.8	No	--	--	--	No
Uranium-238	2,490	6.10	13.0	13.0	7.36	100	No	--	--	--	No

TEQ = Dioxin and furan cogeners were evaluated using a total equivalent quotient. Summary values are provided in Tables A.26 and A.27.

Table A.15

Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-3

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency ≥5%	> Bkg	95th UTL>ESL ?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	27,400	8.00	8.00	33,572	100	Yes	Yes	Yes	Yes	Yes
Antimony	2.00	26.0	7.00	1.00	26.0	14.3	Yes	Yes	N/A	Yes	Yes
Arsenic	9.79	7.80	8.00	8.00	8.91	100	No	--	--	--	No
Barium	189	200	8.00	8.00	213	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	1.30	8.00	4.00	1.67	50.0	N/A	--	--	--	N/A
Boron	N/A	9.90	4.00	4.00	15.9	100	N/A	--	--	--	N/A
Cadmium	0.990	0.490	8.00	4.00	1.05	50.0	No	--	--	--	No
Calcium	N/A	51,000	8.00	8.00	69,727	100	N/A	--	--	--	N/A
Cesium	N/A	4.90	4.00	4.00	7.18	100	N/A	--	--	--	N/A
Chromium	43.4	29.9	8.00	8.00	35.4	100	No	--	--	--	No
Cobalt	N/A	15.5	8.00	8.00	17.8	100	N/A	--	--	--	N/A
Copper	31.6	24.1	8.00	8.00	27.2	100	No	--	--	--	No
Iron	20,000	25,000	8.00	8.00	27,659	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	29.3	8.00	8.00	33.7	100	No	--	--	--	No
Lithium	N/A	18.0	8.00	8.00	22.5	100	N/A	--	--	--	N/A
Magnesium	N/A	5,400	8.00	8.00	6,207	100	N/A	--	--	--	N/A
Manganese	630	520	8.00	8.00	566	100	No	--	--	--	No
Mercury	0.180	0.068	8.00	4.00	0.068	50.0	No	--	--	--	No
Molybdenum	N/A	1.10	8.00	4.00	3.65	50.0	N/A	--	--	--	No
Nickel	22.7	25.6	8.00	7.00	32.1	87.5	Yes	--	--	--	Yes
Potassium	N/A	3,440	8.00	8.00	4,164	100	N/A	--	--	--	N/A
Selenium	0.950	1.80	8.00	1.00	1.80	12.5	Yes	--	--	--	Yes
Silica	N/A	2,000	4.00	4.00	3,013	100	N/A	--	--	--	N/A
Sodium	N/A	850	8.00	8.00	850	100	N/A	--	--	--	N/A
Strontium	N/A	140	8.00	8.00	140	100	N/A	--	--	--	N/A
Tin	N/A	3.90	8.00	4.00	17.4	50.0	N/A	--	--	--	No
Titanium	N/A	170	4.00	4.00	209	100	N/A	--	--	--	N/A
Vanadium	N/A	62.7	8.00	8.00	71.1	100	N/A	--	--	--	N/A
Zinc	121	540	8.00	8.00	540	100	Yes	Yes	Yes	Yes	Yes
Organics (ug/kg)											
2-Butanone	84.2	4.00	4.00	4.00		100	No	--	--	--	No
Benzo(a)pyrene	150	240	4.00	3.00	491	75.0	Yes	Yes	N/A	Yes	Yes
Benzo(b)fluoranthene	N/A	370	4.00	4.00		100	N/A	--	--	--	N/A
bis(2-ethylhexyl)phthalate	24,900	570	4.00	1.00		25.0	No	--	--	--	No
Chrysene	166	250	4.00	4.00	250	100	Yes	Yes	N/A	Yes	Yes
Fluoranthene	423	540	4.00	4.00	756	100	Yes	Yes	N/A	Yes	Yes
Aroclor-1254	60.0	45.0	8.00	1.00	300	12.5	No	Yes	N/A	Yes	No
Phenanthrene	204	260	4.00	4.00	365	100	Yes	Yes	N/A	Yes	Yes
Pyrene	195	460	4.00	4.00	660	100	Yes	Yes	N/A	Yes	Yes
Toluene	1,660	62.0	4.00	4.00		100	No	--	--	--	No
Total PCBs	40.0	225	N/A	N/A	225	N/A	Yes	N/A	N/A	Yes	Yes
Total PAHs	1,610	4,480	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes

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Table A.15
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-3

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL ?	ECOPC
Radionuclides (pCi/g)											
Americium-241	5,150	0.666	8.00	8.00	0.775	100	No	--	--	--	No
Cesium-137	3,120	0.288	4.00	4.00	0.560	100	No	--	--	--	No
Gross Alpha	N/A	22.4	4.00	4.00	31.3	100	N/A	Yes	No	--	No
Gross Beta	N/A	30.2	4.00	4.00	34.6	100	N/A	Yes	No	--	No
Plutonium-239/240	5,860	2.05	8.00	8.00	2.32	100	No	--	--	--	No
Strontium-89/90	582	0.162	4.00	4.00	0.227	100	No	--	--	--	No
Uranium-233/234	5,280	1.59	8.00	7.00	2.15	87.5	No	--	--	--	No
Uranium-235	3,730	0.060	8.00	4.00	0.184	50.0	No	--	--	--	No
Uranium-238	2,490	1.63	8.00	8.00	1.74	100	No	--	--	--	No

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Table A.16
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-4

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	26,000	12.0	12.0	29,418	100	Yes	Yes	Yes	Yes	Yes
Antimony	2.00	41.4	12.0	4.00	41.4	33.3	Yes	Yes	N/A	Yes	Yes
Arsenic	9.79	10.2	12.0	12.0	10.3	100	Yes	Yes	Yes	Yes	Yes
Barium	189	206	12.0	12.0	235	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	1.20	12.0	10.0	1.20	83.3	N/A	--	--	--	N/A
Boron	N/A	10.0	8.00	8.00	11.0	100	N/A	--	--	--	N/A
Cadmium	0.990	3.10	12.0	9.00	3.10	75.0	Yes	Yes	N/A	Yes	Yes
Calcium	N/A	38,000	12.0	12.0	38,000	100	N/A	--	--	--	N/A
Cesium	N/A	5.50	4.00	4.00	10.6	100	N/A	--	--	--	N/A
Chromium	43.4	27.0	12.0	10.0	33.1	83.3	No	--	--	--	No
Cobalt	N/A	13.9	12.0	12.0	13.9	100	N/A	--	--	--	N/A
Copper	31.6	33.4	12.0	12.0	33.4	100	Yes	Yes	Yes	Yes	Yes
Iron	20,000	55,000	12.0	12.0	55,000	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	35.9	12.0	12.0	34.1	100	Yes	Yes	Yes	No	No
Lithium	N/A	19.0	12.0	9.00	23.0	75.0	N/A	--	--	--	N/A
Magnesium	N/A	5,220	12.0	12.0	6,004	100	N/A	--	--	--	N/A
Manganese	630	630	12.0	12.0	603	100	No	--	--	--	No
Mercury	0.180	0.035	12.0	8.00	0.085	66.7	No	--	--	--	No
Molybdenum	N/A	0.930	12.0	6.00	6.50	50.0	N/A	--	--	--	No
Nickel	22.7	25.5	12.0	11.0	26.1	91.7	Yes	Yes	Yes	Yes	Yes
Nitrate / Nitrite	N/A	2.50	2.00	2.00	N/A	100	N/A	--	--	--	N/A
Potassium	N/A	4,300	12.0	9.00	4,792	75.0	N/A	--	--	--	N/A
Selenium	0.950	1.90	12.0	3.00	1.90	25.0	Yes	Yes	Yes	Yes	Yes
Silica	N/A	980	8.00	8.00	1,159	100	N/A	--	--	--	N/A
Sodium	N/A	486	12.0	8.00	501	66.7	N/A	--	--	--	No
Strontium	N/A	140	12.0	12.0	139	100	N/A	--	--	--	N/A
Thallium	N/A	0.580	12.0	2.00	0.637	16.7	N/A	--	--	--	N/A
Titanium	N/A	160	8.00	8.00	204	100	N/A	--	--	--	N/A
Vanadium	N/A	59.0	12.0	12.0	65.9	100	N/A	--	--	--	N/A
Zinc	121	169	12.0	12.0	169	100	Yes	Yes	Yes	Yes	Yes
Organics (ug/kg)											
Atrazine	16.8	120	1.00	1.00	N/A	100	Yes	Yes	N/A	N/A	Yes
Benzene	260	3.00	4.00	1.00	N/A	25.0	No	--	--	--	No
bis(2-ethylhexyl)phthalate	24,900	950	4.00	2.00	N/A	50.0	No	--	--	--	No
Toluene	1,660	8.00	4.00	2.00	N/A	50.0	No	--	--	--	No
Total PAHs	1,610	6930.00	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Radionuclides (pCi/g)											
Americium-241	5,150	0.173	12.0	7.00	0.201	58.3	No	--	--	--	No
Cesium-137	3,120	0.598	4.00	4.00	0.959	100	No	--	--	--	No
Gross Alpha	N/A	17.0	4.00	4.00	24.1	100	N/A	--	--	--	No
Gross Beta	N/A	29.0	4.00	4.00	34.6	100	N/A	--	--	--	No

Table A.16
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-4

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL?	ECOPC
Plutonium-239/240	5,860	0.498	12.0	8.00	0.507	66.7	No	--	--	--	No
Strontium-89/90	582	1.80	4.00	4.00	3.67	100	No	--	--	--	No
Uranium-233/234	5,280	1.68	12.0	12.0	1.90	100	No	--	--	--	No
Uranium-235	3,730	0.084	12.0	4.00	0.267	33.3	No	--	--	--	No
Uranium-238	2,490	1.67	12.0	12.0	1.85	100	No	--	--	--	No

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Table A.17
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-5

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency ≥5%	> Bkg	95th UTL>ESL?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	21,000	9.00	9.00	23,912	100	Yes	Yes	Yes	Yes	Yes
Arsenic	9.79	4.60	9.00	9.00	4.87	100	No	--	--	--	No
Barium	189	220	9.00	9.00	233	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	1.20	9.00	4.00	1.42	44.4	N/A	--	--	--	N/A
Boron	N/A	11.0	4.00	4.00	18.1	100	N/A	--	--	--	N/A
Calcium	N/A	17,000	9.00	9.00	18,147	100	N/A	--	--	--	N/A
Chromium	43.4	21.0	9.00	9.00	24.2	100	No	--	--	--	No
Cobalt	N/A	13.3	9.00	9.00	14.9	100	N/A	--	--	--	N/A
Copper	31.6	22.0	9.00	9.00	24.4	100	No	--	--	--	No
Iron	20,000	22,000	9.00	9.00	22,661	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	21.0	9.00	9.00	23.6	100	No	--	--	--	No
Lithium	N/A	17.0	9.00	9.00	22.5	100	N/A	--	--	--	N/A
Magnesium	N/A	4,200	9.00	9.00	4,578	100	N/A	--	--	--	N/A
Manganese	630	330	9.00	9.00	380	100	No	--	--	--	No
Molybdenum	N/A	0.990	9.00	3.00	5.91	33.3	N/A	--	--	--	No
Nickel	22.7	19.0	9.00	8.00	23.6	88.9	No	--	--	--	No
Potassium	N/A	3,400	9.00	9.00	3,878	100	N/A	--	--	--	N/A
Silica	N/A	2,000	4.00	4.00	2,916	100	N/A	--	--	--	N/A
Silver	1.00	1.20	9.00	3.00	1.60	33.3	Yes	Yes	N/A	Yes	Yes
Sodium	N/A	790	9.00	8.00	790	88.9	N/A	--	--	--	N/A
Strontium	N/A	95.0	9.00	9.00	95.0	100	N/A	--	--	--	N/A
Thallium	N/A	0.690	9.00	3.00	1.04	33.3	N/A	--	--	--	N/A
Titanium	N/A	130	4.00	4.00	193	100	N/A	--	--	--	N/A
Vanadium	N/A	46.0	9.00	9.00	49.8	100	N/A	--	--	--	N/A
Zinc	121	130	9.00	9.00	135	100	Yes	Yes	Yes	Yes	Yes
Organics (ug/kg)											
2-Butanone	84.2	51.0	5.00	4.00	N/A	80.0	No	--	--	--	No
Acetone	N/A	210	5.00	2.00	N/A	40.0	N/A	--	--	--	N/A
Benzoic Acid	N/A	500	5.00	4.00	N/A	80.0	N/A	--	--	--	N/A
bis(2-ethylhexyl)phthalate	24,900	130	5.00	4.00	N/A	80.0	No	--	--	--	No
Methylene Chloride	N/A	18.0	5.00	1.00	N/A	20.0	N/A	--	--	--	N/A
Phenol	773	110	5.00	1.00	N/A	20.0	No	--	--	--	No
Toluene	1,660	18.0	5.00	5.00	N/A	100	No	--	--	--	No
Total PAHs	1,610	4200.0	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Radionuclides (pCi/g)											
Americium-241	5,150	0.121	11.0	8.00	0.124	72.7	No	--	--	--	No
Cesium-137	3,120	0.100	5.00	2.00	0.100	40.0	No	--	--	--	No
Gross Alpha	N/A	28.3	5.00	5.00	34.9	100	N/A	--	--	--	N/A
Gross Beta	N/A	30.7	5.00	5.00	36.9	100	N/A	--	--	--	N/A
Plutonium-239/240	5,860	0.332	12.0	12.0	0.332	100	No	--	--	--	No
Uranium-233/234	5,280	1.33	12.0	12.0	1.40	100	No	--	--	--	No

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Table A.17
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond A-5

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL?	ECOPC
Uranium-235	3,730	0.072	12.0	8.00	0.183	66.7	No	--	--	--	No
Uranium-238	2,490	1.44	12.0	12.0	1.44	100	No	--	--	--	No

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Table A.18
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond B-4

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL ?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	29,000	22.0	22.0	27,260	100	Yes	Yes	Yes	Yes	Yes
Antimony	2.00	25.6	18.0	5.00	25.6	27.8	Yes	Yes	N/A	Yes	Yes
Arsenic	9.79	9.10	22.0	22.0	9.55	100	No	--	--	--	No
Barium	189	230	22.0	22.0	230	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	2.20	22.0	15.0	1.94	68.2	N/A	--	--	--	N/A
Boron	N/A	30.0	14.0	14.0	23.1	100	N/A	--	--	--	N/A
Cadmium	0.990	44.0	22.0	19.0	9.64	86.4	Yes	Yes	N/A	Yes	Yes
Calcium	N/A	51,000	22.0	22.0	37,376	100	N/A	--	--	--	N/A
Cesium	N/A	3.50	8.00	7.00	4.70	87.5	N/A	--	--	--	N/A
Chromium	43.4	140	22.0	22.0	73.8	100	Yes	Yes	Yes	Yes	Yes
Cobalt	N/A	12.0	22.0	22.0	12.4	100	N/A	--	--	--	N/A
Copper	31.6	120	22.0	22.0	69.7	100	Yes	Yes	Yes	Yes	Yes
Iron	20,000	24,000	22.0	22.0	24,000	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	110	22.0	22.0	79.4	100	Yes	Yes	Yes	Yes	Yes
Lithium	N/A	27.0	22.0	19.0	35.8	86.4	N/A	--	--	--	N/A
Magnesium	N/A	5,800	22.0	22.0	5,530	100	N/A	--	--	--	N/A
Manganese	630	350	22.0	22.0	371	100	No	--	--	--	No
Mercury	0.180	1.70	22.0	16.0	0.806	72.7	Yes	Yes	N/A	Yes	Yes
Molybdenum	N/A	4.10	22.0	14.0	4.10	63.6	N/A	--	--	--	No
Nickel	22.7	31.0	22.0	21.0	31.0	95.5	Yes	Yes	Yes	Yes	Yes
Potassium	N/A	3,900	22.0	22.0	3,869	100	N/A	--	--	--	N/A
Selenium	0.950	3.60	22.0	3.00	3.60	13.6	Yes	Yes	N/A	Yes	Yes
Silica	N/A	1,700	14.0	14.0	1,655	100	N/A	--	--	--	N/A
Silver	1.00	3,100	22.0	11.0	1,393	50.0	Yes	Yes	N/A	Yes	Yes
Sodium	N/A	990	22.0	21.0	678	95.5	N/A	--	--	--	N/A
Strontium	N/A	150	22.0	22.0	132	100	N/A	--	--	--	N/A
Thallium	N/A	1.20	22.0	4.00	1.20	18.2	N/A	--	--	--	N/A
Tin	N/A	24.0	22.0	5.00	24.0	22.7	N/A	--	--	--	No
Titanium	N/A	190	14.0	14.0	210	100	N/A	--	--	--	N/A
Vanadium	N/A	63.0	22.0	22.0	59.2	100	N/A	--	--	--	N/A
Zinc	121	510	22.0	22.0	432	100	Yes	Yes	Yes	Yes	Yes
Organics (ug/kg)											
2-Butanone	84.2	11.0	5.00	3.00	N/A	60.0	No	--	--	--	No
Acenaphthene	6.71	110	22.0	1.00	675	4.55	Yes	No	--	--	No
Acetone	N/A	61.0	5.00	1.00	N/A	20.0	N/A	--	--	--	N/A
Anthracene	57.2	420	22.0	10.0	638	45.5	Yes	Yes	N/A	Yes	Yes
Benzo(a)anthracene	108	430	22.0	16.0	1,118	72.7	Yes	Yes	N/A	Yes	Yes
Benzo(a)pyrene	150	570	22.0	17.0	1,173	77.3	Yes	Yes	N/A	Yes	Yes
Benzo(b)fluoranthene	N/A	1,500	22.0	17.0	N/A	77.3	N/A	--	--	--	N/A
Benzo(g,h,i)perylene	13.0	320	22.0	10.0	1,281	45.5	Yes	Yes	N/A	Yes	Yes
Benzo(k)fluoranthene	240	540	22.0	12.0	1,800	54.5	Yes	Yes	N/A	Yes	Yes

Table A.18
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond B-4

Analyte	ESL	MDC	Number of Samples	Number of Detectionss	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL ?	ECOPC
bis(2-ethylhexyl)phthalate	24,900	25,000	22.0	18.0	25,000	81.8	Yes	Yes	N/A	Yes	Yes
Butylbenzylphthalate	11,400	110	22.0	2.00	N/A	9.09	No	--	--	--	No
Chrysene	166	650	22.0	18.0	1,194	81.8	Yes	Yes	N/A	Yes	Yes
Dibenz(a,h)anthracene	33.0	110	22.0	3.00	1,800	13.6	Yes	Yes	N/A	Yes	Yes
Di-n-octylphthalate	N/A	250	22.0	3.00	N/A	13.6	N/A	--	--	--	N/A
Fluoranthene	423	1,400	22.0	18.0	1,649	81.8	Yes	Yes	N/A	Yes	Yes
Fluorene	77.4	94.0	22.0	1.00	1,800	4.55	Yes	No	--	--	No
gamma-BHC (Lindane)	2.37	25.0	7.00	1.00	25.0	14.3	Yes	Yes	N/A	Yes	Yes
Indeno(1,2,3-cd)pyrene	17.0	300	22.0	10.0	1,281	45.5	Yes	Yes	N/A	Yes	Yes
Aroclor-1254	60.0	3,100	27.0	15.0	1,479	55.6	Yes	Yes	N/A	Yes	Yes
Phenanthrene	204	760	22.0	18.0	1,230	81.8	Yes	Yes	N/A	Yes	Yes
Pyrene	195	1,200	22.0	16.0	1,800	72.7	Yes	Yes	N/A	Yes	Yes
Toluene	1,660	360	5.00	4.00	N/A	80.0	No	--	--	--	No
Total PAHs	40.0	3,100	N/A	N/A	3,100	N/A	Yes	N/A	N/A	Yes	Yes
Total PCBs	1,610	23,400	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Radionuclides (pCi/g)											
Americium-241	5,150	56.5	22.0	20.0	56.5	90.9	No	--	--	--	No
Cesium-137	3,120	0.832	8.00	8.00	0.890	100	No	--	--	--	No
Gross Alpha	N/A	49.0	8.00	8.00	57.4	100	N/A	--	--	--	N/A
Gross Beta	N/A	30.8	8.00	8.00	31.5	100	N/A	--	--	--	N/A
Plutonium-239/240	5,860	217	21.0	19.0	217	90.5	No	--	--	--	No
Radium-226	101	1.02	4.00	4.00	1.35	100	No	--	--	--	No
Radium-228	87.8	1.78	4.00	4.00	2.27	100	No	--	--	--	No
Strontium-89/90	582	0.217	4.00	4.00	0.295	100	No	--	--	--	No
Uranium-233/234	5,280	6.04	22.0	22.0	6.04	100	No	--	--	--	No
Uranium-235	3,730	0.143	22.0	8.00	0.293	36.4	No	--	--	--	No
Uranium-238	2,490	8.51	22.0	22.0	5.37	100	No	--	--	--	No

Table A.19
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond B-5

Analyte	ESL	MDC	Number of Samples	Number of Detections	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL ?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	24,000	14.0	14.0	26,912	100	Yes	Yes	Yes	Yes	Yes
Antimony	2.00	0.580	13.0	2.00	13.6	15.4	No	--	--	--	No
Arsenic	9.79	8.60	14.0	14.0	9.08	100	No	--	--	--	No
Barium	189	240	14.0	14.0	240	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	1.30	14.0	9.00	1.37	64.3	N/A	--	--	--	N/A
Boron	N/A	8.50	7.00	7.00	11.6	100	N/A	--	--	--	N/A
Cadmium	0.990	0.620	14.0	9.00	2.72	64.3	No	--	--	--	No
Calcium	N/A	16,900	14.0	14.0	15,871	100	N/A	--	--	--	N/A
Cesium	N/A	3.50	5.00	5.00	4.57	100	N/A	--	--	--	N/A
Chromium	43.4	27.0	14.0	14.0	29.0	100	No	--	--	--	No
Cobalt	N/A	11.0	14.0	14.0	12.1	100	N/A	--	--	--	N/A
Copper	31.6	29.9	14.0	14.0	32.9	100	No	--	--	--	No
Iron	20,000	22,000	14.0	14.0	22,000	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	36.8	14.0	14.0	38.0	100	Yes	Yes	Yes	Yes	Yes
Lithium	N/A	19.0	14.0	14.0	29.0	100	N/A	--	--	--	N/A
Magnesium	N/A	5,000	14.0	14.0	5,692	100	N/A	--	--	--	N/A
Manganese	630	350	14.0	14.0	389	100	No	--	--	--	No
Mercury	0.180	0.086	14.0	7.00	0.087	50.0	No	--	--	--	No
Molybdenum	N/A	1.40	14.0	8.00	4.70	57.1	N/A	--	--	--	No
Nickel	22.7	23.8	14.0	14.0	23.8	100	Yes	Yes	Yes	Yes	Yes
Potassium	N/A	3,600	14.0	14.0	3,820	100	N/A	--	--	--	N/A
Selenium	0.950	1.60	13.0	3.00	1.60	23.1	Yes	Yes	Yes	Yes	Yes
Silica	N/A	1,300	7.00	7.00	1,619	100	N/A	--	--	--	N/A
Silver	1.00	1.40	14.0	4.00	1.69	28.6	Yes	Yes	N/A	Yes	Yes
Sodium	N/A	510	14.0	13.0	587	92.9	N/A	--	--	--	N/A
Strontium	N/A	87.0	14.0	14.0	92.5	100	N/A	--	--	--	N/A
Thallium	N/A	0.720	14.0	3.00	0.720	21.4	N/A	--	--	--	N/A
Tin	N/A	39.5	14.0	2.00	39.5	14.3	N/A	--	--	--	N/A
Titanium	N/A	160	7.00	7.00	236	100	N/A	--	--	--	N/A
Vanadium	N/A	51.0	14.0	14.0	60.3	100	N/A	--	--	--	N/A
Zinc	121	240	14.0	14.0	222	100	Yes	Yes	Yes	Yes	Yes
Organics (ug/kg)											
2-Butanone	84.2	21.0	7.00	3.00	N/A	42.9	No	--	--	--	No
Acetone	N/A	87.0	7.00	1.00	N/A	14.3	N/A	--	--	--	N/A
bis(2-ethylhexyl)phthalate	24,900	270	5.00	2.00	N/A	40.0	No	--	--	--	No
Carbon Tetrachloride	7,890	440	7.00	2.00	N/A	28.6	No	--	--	--	No
Di-n-octylphthalate	N/A	240	5.00	1.00	N/A	20.0	N/A	--	--	--	N/A
Fluoranthene	423	190	5.00	2.00	N/A	40.0	No	--	--	--	No
Methylene Chloride	N/A	420	7.00	2.00	N/A	28.6	N/A	--	--	--	N/A
Pyrene	195	160	5.00	1.00	N/A	20.0	No	--	--	--	No
Toluene	1,660	47.0	6.00	5.00	N/A	83.3	No	--	--	--	No

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Table A.19
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond B-5

Analyte	ESL	MDC	Number of Samples	Number of Detections	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL>ESL ?	ECOPC
Total PAHs	1,610	5,030	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Radionuclides (pCi/g)											
Americium-241	5,150	0.337	12.0	9.00	0.337	75.0	No	--	--	--	No
Cesium-137	3,120	0.187	5.00	5.00	0.287	100	No	--	--	--	No
Gross Alpha	N/A	34.0	5.00	5.00	48.1	100	N/A	--	--	--	N/A
Gross Beta	N/A	28.6	5.00	5.00	35.3	100	N/A	--	--	--	N/A
Plutonium-239/240	5,860	0.895	12.0	10.0	0.895	83.3	No	--	--	--	No
Radium-226	101	0.961	5.00	5.00	1.13	100	No	--	--	--	No
Radium-228	87.8	1.84	5.00	5.00	2.09	100	No	--	--	--	No
Strontium-89/90	582	0.579	5.00	5.00	1.05	100	No	--	--	--	No
Uranium-233/234	5,280	1.83	12.0	12.0	1.83	100	No	--	--	--	No
Uranium-235	3,730	0.243	12.0	6.00	0.243	50.0	No	--	--	--	No
Uranium-238	2,490	1.53	12.0	12.0	1.68	100	No	--	--	--	No

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Table A.20
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond C-1

Analyte	ESL	MDC	Number of Samples	Number of Detects	Pond UTL	% Detect	MDC > ESL?	Detection Frequency > 5%	> Bkg	95th UTL > ESL?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	32,000	7	7	43,871	100	Yes	Yes	Yes	Yes	Yes
Antimony	2.00	0.820	6	1	4.35	16.7	No	--	--	--	No
Arsenic	9.79	8.90	7	7	10.0	100	No	--	--	--	No
Barium	189	330	7	7	389	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	6.70	7	7	6.70	100	N/A	--	--	--	N/A
Boron	N/A	11.0	5	5	13.6	100	N/A	--	--	--	N/A
Cadmium	0.990	0.850	6	5	1.18	83.3	No	--	--	--	No
Calcium	N/A	19,000	7	7	24,054	100	N/A	--	--	--	N/A
Chromium	43.4	30.0	7	7	37.1	100	No	--	--	--	No
Cobalt	N/A	13.0	7	7	14.5	100	N/A	--	--	--	N/A
Copper	31.6	30.0	7	7	32.7	100	No	--	--	--	No
Iron	20,000	31,000	7	7	36,981	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	38.0	7	7	40.6	100	Yes	Yes	Yes	Yes	Yes
Lithium	N/A	28.0	7	7	35.3	100	N/A	--	--	--	N/A
Magnesium	N/A	5,800	7	7	6,512	100	N/A	--	--	--	N/A
Manganese	630	970	7	7	1,380	100	Yes	Yes	Yes	Yes	Yes
Mercury	0.180	1.60	7	7	1.60	100	Yes	Yes	N/A	Yes	Yes
Molybdenum	N/A	2.00	6	3	3.56	50.0	N/A	--	--	--	No
Nickel	22.7	24.0	7	7	27.1	100	Yes	Yes	Yes	Yes	Yes
Nitrate / Nitrite	N/A	1.30	2	2		100	N/A	--	--	--	N/A
Potassium	N/A	4,200	7	7	4,991	100	N/A	--	--	--	N/A
Selenium	0.950	2.80	6	3	4.37	50.0	Yes	Yes	Yes	Yes	Yes
Silica	N/A	1,600	5	5	2,075	100	N/A	--	--	N/A	N/A
Sodium	N/A	290	7	4	290	57.1	N/A	--	--	--	No
Strontium	N/A	89.0	7	7	101	100	N/A	--	--	--	N/A
Thallium	N/A	10.0	6	2	10.0	33.3	N/A	--	--	--	N/A
Tin	N/A	11.0	7	2	11.0	28.6	N/A	--	--	--	No
Titanium	N/A	300	5	5	392	100	N/A	--	--	--	N/A
Vanadium	N/A	56.0	7	7	65.8	100	N/A	--	--	--	N/A
Zinc	121	140	7	7	140	100	Yes	Yes	Yes	Yes	Yes
Organics (ug/kg)											
1234678-HpCDF	TEQ	0.002	2	2	N/A	100	N/A	--	--	--	TEQ
123478-HxCDF	TEQ	0.001	2	1	N/A	50.0	N/A	--	--	--	TEQ
123678-HxCDF	TEQ	5.62E-04	2	1	N/A	50.0	N/A	--	--	--	TEQ
2,4-Dinitrophenol	TEQ	890	6	1	N/A	16.7	N/A	--	--	--	TEQ
234678-HxCDF	TEQ	7.81E-04	2	1	N/A	50.0	N/A	--	--	--	TEQ
23478-PeCDF	TEQ	0.001	2	1	N/A	50.0	N/A	--	--	--	TEQ
4,6-Dinitro-2-methylphenol	N/A	750	6	1	N/A	16.7	N/A	--	--	--	TEQ
Acenaphthene	6.71	360	6	3	761	50.0	Yes	Yes	N/A	Yes	Yes

Table A.20
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond C-1

Analyte	ESL	MDC	Number of Samples	Number of Detects	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL > ESL?	ECOPC
Anthracene	57.2	450	6	5	816	83.3	Yes	Yes	N/A	Yes	Yes
Benzo(a)anthracene	108	190	6	4	1,177	66.7	Yes	Yes	N/A	Yes	Yes
Benzo(a)pyrene	150	170	6	3	1,361	50.0	Yes	Yes	N/A	Yes	Yes
Benzo(b)fluoranthene	N/A	180	6	2	N/A	33.3	N/A	--	--	--	N/A
Benzo(g,h,i)perylene	13.0	150	6	1	1,272	16.7	Yes	Yes	N/A	Yes	Yes
Benzo(k)fluoranthene	240	150	6	1	N/A	16.7	No	--	--	--	No
Benzoic Acid	N/A	410	7	2	N/A	28.6	N/A	--	--	--	N/A
Chrysene	166	190	6	4	1,180	66.7	Yes	Yes	N/A	Yes	Yes
Dibenz(a,h)anthracene	33.0	530	5	1	1,020	20.0	Yes	Yes	N/A	Yes	Yes
Di-n-butylphthalate	612	110	6	1	N/A	16.7	No	--	--	--	No
Fluoranthene	423	330	6	4	N/A	66.7	No	--	--	--	No
Heptachlorodibenzo-p-dioxin	TEQ	0.005	2	2	N/A	100	N/A	--	--	--	TEQ
Indeno(1,2,3-cd)pyrene	17.0	500	6	3	1,071	50.0	Yes	Yes	N/A	Yes	Yes
OCDD	TEQ	0.031	2	2	N/A	100	N/A	--	--	--	TEQ
OCDF	TEQ	0.002	2	2	N/A	100	N/A	--	--	--	TEQ
Aroclor-1254	60.0	94.0	7	1	1,825	14.3	Yes	Yes	N/A	Yes	Yes
Pentachlorodibenzo-p-dioxin	TEQ	3.72E-04	2	1	N/A	50.0	N/A	--	--	--	TEQ
Pentachlorophenol	255	950	6	1	6,088	16.7	Yes	Yes	N/A	Yes	Yes
Phenanthrene	204	360	6	5	500	83.3	Yes	Yes	N/A	Yes	Yes
Pyrene	195	310	6	1	1,129	16.7	Yes	Yes	N/A	Yes	Yes
Toluene	1,660	520	2	2	N/A	100	No	--	--	--	No
PCBs	40.0	500	N/A	N/A	500	N/A	Yes	N/A	N/A	Yes	Yes
PAHs	1,610	9,985	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Radionuclides (pCi/g)											
Americium-241	5,150	0.442	9	9	0.442	100	No	--	--	--	No
Gross Alpha	N/A	59.0	4	4	86.1	100	N/A	Yes	Yes	N/A	N/A
Gross Beta	N/A	46.0	4	4	67.5	100	N/A	Yes	No	--	N/A
Plutonium-239/240	5,860	2.20	9	9	2.39	100	No	--	--	--	No
Uranium-233/234	5,280	3.50	9	9	4.42	100	No	--	--	--	No
Uranium-235	3,730	0.405	9	7	0.474	77.8	No	--	--	--	No
Uranium-238	2,490	3.36	9	9	3.78	100	No	--	--	--	No

TEQ = Dioxin and furan cogeners were evaluated using a total equivalent using a total equivalent quotient. Summary values are provided in Tables A.26 and A.27.

Table A.21
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond C-2

Analyte	ESL	MDC	Number of Samples	Number of Detects	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL >ESL?	ECOPC
Inorganics (mg/kg)											
Aluminum	15,900	22,000	11	11	27,078	100	Yes	Yes	Yes	Yes	Yes
Arsenic	9.79	9.80	11	11	10.2	100	Yes	Yes	Yes	Yes	Yes
Barium	189	226	11	11	272	100	Yes	Yes	Yes	Yes	Yes
Beryllium	N/A	1.20	10	9	1.57	90.0	N/A	--	--	--	N/A
Boron	N/A	10.0	8	8	11.5	100	N/A	--	--	--	N/A
Cadmium	0.990	0.130	10	1	0.950	10.0	No	--	--	--	No
Calcium	N/A	47,700	11	11	47,700	100	N/A	--	--	--	N/A
Chromium	43.4	25.0	11	11	28.3	100	No	--	--	--	No
Cobalt	N/A	12.0	11	11	14.3	100	N/A	--	--	--	N/A
Copper	31.6	35.9	11	11	37.8	100	Yes	Yes	Yes	Yes	Yes
Iron	20,000	29,000	11	11	31,283	100	Yes	Yes	Yes	Yes	Yes
Lead	35.8	34.6	11	11	37.3	100	No	--	--	--	No
Lithium	N/A	19.0	11	11	21.9	100	N/A	--	--	--	N/A
Magnesium	N/A	5,400	11	11	6,554	100	N/A	--	--	--	N/A
Manganese	630	602	11	11	710	100	No	--	--	--	No
Mercury	0.180	0.680	11	10	3.35	90.9	Yes	Yes	N/A	Yes	Yes
Molybdenum	N/A	1.10	10	7	2.25	70.0	N/A	--	--	--	No
Nickel	22.7	21.0	11	11	27.0	100	No	--	--	--	No
Nitrate / Nitrite	N/A	1.90	3	3		100	N/A	--	--	--	N/A
Potassium	N/A	3,900	11	11	4,469	100	N/A	--	--	--	N/A
Selenium	0.950	1.10	10	1	1.10	10.0	Yes	Yes	N/A	Yes	Yes
Silica	N/A	1,400	8	8	1,775	100	N/A	--	--	--	N/A
Sodium	N/A	460	11	9	457	81.8	N/A	--	--	--	No
Strontium	N/A	167	11	11	193	100	N/A	--	--	--	N/A
Titanium	N/A	160	8	8	194	100	N/A	--	--	--	N/A
Vanadium	N/A	50.0	11	11	59.0	100	N/A	--	--	--	N/A
Zinc	121	201	11	11	210	100	Yes	Yes	Yes	Yes	Yes
Organics (ug/kg)											
Benzoic Acid	N/A	240	2	1		50.0	N/A	--	--	--	N/A
Fluoranthene	423	140	2	1		50.0	No	--	--	--	No
Phenol	773	150	2	1		50.0	No	--	--	--	No
Toluene	1,660	410	3	3		100	No	--	--	--	No
Total PAHs	1,610	14,700	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Radionuclides (pCi/g)											
Americium-241	5,150	0.727	11	9	0.717	81.8	No	--	--	--	No
Gross Alpha	N/A	59.0	3	3	59.0	100	N/A	--	--	--	N/A
Gross Beta	N/A	44.0	3	3	44.0	100	N/A	--	--	--	N/A
Plutonium-239/240	5,860	2.96	11	10	3.39	90.9	No	--	--	--	No
Uranium-233/234	5,280	1.40	8	8	1.62	100	No	--	--	--	No

Table A.21
Summary of ECOPC Screening Steps for Sediment ECOPCs for Pond C-2

Analyte	ESL	MDC	Number of Samples	Number of Detects	Pond UTL	% Detect	MDC > ESL?	Detection Frequency >5%	> Bkg	95th UTL > ESL?	ECOPC
Uranium-235	3,730	0.219	8	1	0.324	12.5	No	--	--	--	No
Uranium-238	2,490	1.79	8	8	1.79	100	No	--	--	--	No

Table A.22
Total Maximum PCB Values by Pond for All Sediment

Pond	Location	Sample Number	Detected? (y/n)	PCB-1254
A-1	CR53-000	05F0792-001	No	20.5
A-1	CS53-000	05F0348-002	No	26
A-1	CS53-001	05F0792-002	No	26
A-1	CS53-002	05F0792-004	No	21
A-1	CS53-002	05F0792-005	Yes	5200
A-1	CS53-003	05F0792-006	No	22
A-1	CS53-003	05F0792-007	Yes	55
A-1	SED60092	SD00009ST	Yes	86
A-1	SED60092	SD60000WC	Yes	590
A-1	SED60192	SD00008ST	Yes	73
A-1	SED60192	SD60001WC	Yes	330
A-1	SED60292	SD00011ST	Yes	86
A-1	SED60292	SD60002WC	Yes	460
A-1	SED60392	SD00010ST	Yes	88
A-1	SED60392	SD60003WC	Yes	350
			Maximum	**5200**
A-2	CV54-000	05F0600-001	No	17.5
A-2	CW53-000	05F0599-008	No	41.5
A-2	CW53-000	05F0599-009	No	40
A-2	CW54-000	05F0275-001	No	70
A-2	CW54-000	05F0275-002	Yes	34
A-2	CW54-000	05F0275-003	Yes	36
A-2	CW54-002	05F0599-006	No	90
A-2	SED60692	SD00003ST	Yes	130
A-2	SED60692	SD60006WC	No	115
A-2	SED60792	SD00002ST	Yes	89
A-2	SED60792	SD60007WC	No	155
A-2	SED60892	SD60008WC	No	185
			Maximum	**185**
A-3	SED61092	SD00031ST	No	225
A-3	SED61092	SD60010WC	No	140
A-3	SED61192	SD00030ST	Yes	45
A-3	SED61192	SD60011WC	No	140
A-3	SED61292	SD00029ST	No	165
A-3	SED61292	SD60012WC	No	130
A-3	SED61392	SD00032ST	No	225
A-3	SED61392	SD60013WC	No	140
			Maximum	**225**
A-4	A4	NP50590WC	No	210
A-4	SED61592	SD00050ST	No	130
A-4	SED61592	SD60015WC	No	120
A-4	SED61692	SD00049ST	No	265
A-4	SED61692	SD60016WC	No	160
A-4	SED61792	SD00047ST	No	120
A-4	SED61792	SD60017WC	No	115
A-4	SED61892	SD00048ST	No	230
A-4	SED61892	SD60018WC	No	240
			Maximum	**265**
A-5	SED64592	SD60045WC	No	130
A-5	SED64692	SD60046WC	No	120
A-5	SED64792	SD60047WC	No	145
A-5	SED64892	SD60048WC	No	130
A-5	SED64992	SD60049WC	No	125
			Maximum	**145**
B-2	SED11004	04D1170-005	No	22
B-4	DB47-000	05F0618-001	No	31
B-4	DB47-001	05F0597-001	No	22.5
B-4	DB47-001	05F0597-002	Yes	210

Table A.22
Total Maximum PCB Values by Pond for All Sediment

Pond	Location	Sample Number	Detected? (y/n)	PCB-1254
B-4	DB47-001	05F0597-003	No	23.5
B-4	DB47-002	05F0599-001	Yes	160
B-4	DB47-002	05F0599-002	Yes	220
B-4	DB47-002	05F0599-003	Yes	3100
B-4	DB47-002	05F0599-004	No	20.5
B-4	DB47-002	05F0599-005	No	20
B-4	DB47-003	05F0618-003	No	27.5
B-4	DB47-004	05F0618-005	No	35
B-4	DB47-004	05F0618-006	No	27
B-4	DB47-004	05F0618-007	Yes	820
B-4	DB47-005	05F0597-004	No	37.5
B-4	SED63592	SD00014ST	Yes	210
B-4	SED63592	SD60035WC	Yes	230
B-4	SED63592	SD60111WC	No	115
B-4	SED63692	SD00012ST	Yes	120
B-4	SED63692	SD60036WC	No	110
B-4	SED63792	SD00015ST	Yes	190
B-4	SED63792	SD60037WC	Yes	440
B-4	SED63792	SD60114WC	Yes	560
B-4	SED63892	SD00016ST	Yes	200
B-4	SED63892	SD60038WC	No	150
B-4	SED63892	SD60110WC	Yes	1100
B-4	SED63992	SD00013ST	Yes	220
B-4	SED63992	SD60039WC	Yes	300
			Maximum	**3100**
B-5	B5	NP50591WC	No	205
B-5	SED64092	SD00018ST	No	115
B-5	SED64092	SD60040WC	No	110
B-5	SED64192	SD00019ST	No	125
B-5	SED64192	SD60041WC	No	125
B-5	SED64292	SD00021ST	No	140
B-5	SED64292	SD60042WC	No	135
B-5	SED64392	SD60043WC	No	185
B-5	SED64492	SD00017ST	No	120
B-5	SED64492	SD60044WC	No	120
			Maximum	**215**
C-1	C1	NP50593WC	No	265
C-1	CR31-005	05F0600-002	No	36.5
C-1	CR31-006	05F0600-003	No	38
C-1	CR31-006	05F0600-004	No	30
C-1	CR31-007	05F0600-006	No	29
C-1	CR31-008	05F0630-001	Yes	94
C-1	SED510	SD50017WC	No	500
			Maximum	**500**
C-2	C2	NP50592WC	No	325
C-2	SED511	SD50023WC	No	335
C-2	SED512	SD50024WC	No	500
			Maximum	**500**

For the non-detected values, 1/2 of the reported value (detection limit) was provic

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Table A.23
Total Maximum PCB Values by Pond for Surface Sediment

Pond	Location	Sample Number	Detected ? (yes/no)	Aroclor-1254
A-1	CR53-000	05F0792-001	No	20.5
A-1	CS53-001	05F0792-002	No	26
A-1	CS53-002	05F0792-004	No	21
A-1	CS53-003	05F0792-006	No	22
A-1	SED60092	SD00009ST	Yes	86
A-1	SED60192	SD00008ST	Yes	73
A-1	SED60292	SD00011ST	Yes	86
A-1	SED60392	SD00010ST	Yes	88
		Maximum Detected Value		**88**
A-2	CV54-000	05F0600-001	No	17.5
A-2	CW53-000	05F0599-008	No	41.5
A-2	CW54-000	05F0275-001	No	70
A-2	CW54-002	05F0599-006	No	90
A-2	SED60692	SD00003ST	Yes	130
A-2	SED60692	SD60006WC	No	115
A-2	SED60792	SD00002ST	Yes	89
A-2	SED60792	SD60007WC	No	155
		Maximum Detected Value		**130**
A-3	SED61092	SD00031ST	No	225
A-3	SED61192	SD00030ST	Yes	45
A-3	SED61292	SD00029ST	No	165
A-3	SED61292	SD60012WC	No	130
A-3	SED61392	SD00032ST	No	225
		Maximum Detected Value		**45**
A-4	SED61592	SD00050ST	No	130
A-4	SED61592	SD60015WC	No	120
A-4	SED61692	SD00049ST	No	265
A-4	SED61692	SD60016WC	No	160
A-4	SED61792	SD00047ST	No	120
A-4	SED61792	SD60017WC	No	115
A-4	SED61892	SD00048ST	No	230
A-4	SED61892	SD60018WC	No	240
		Maximum Detected Value		**ND**
A-5	SED64592	SD60045WC	No	130
A-5	SED64792	SD60047WC	No	145
A-5	SED64892	SD60048WC	No	130
A-5	SED64992	SD60049WC	No	125
		Maximum Detected Value		**ND**
B-4	DB47-000	05F0618-001	No	31
B-4	DB47-001	05F0597-001	No	22.5
B-4	DB47-002	05F0599-001	Yes	160
B-4	DB47-003	05F0618-003	No	27.5
B-4	DB47-004	05F0618-005	No	35
B-4	DB47-005	05F0597-004	No	37.5
B-4	SED63592	SD00014ST	Yes	210
B-4	SED63692	SD00012ST	Yes	120
B-4	SED63792	SD00015ST	Yes	190

Table A.23
Total Maximum PCB Values by Pond for Surface Sediment

Pond	Location	Sample Number	Detected ? (yes/no)	Aroclor-1254
B-4	SED63892	SD00016ST	Yes	200
B-4	SED63992	SD00013ST	Yes	220
		Maximum Detected Value		**220**
B-5	B5	NP50591WC	No	205
B-5	SED64092	SD00018ST	No	115
B-5	SED64092	SD60040WC	No	110
B-5	SED64192	SD00019ST	No	125
B-5	SED64192	SD60041WC	No	125
B-5	SED64292	SD00021ST	No	140
B-5	SED64292	SD60042WC	No	135
B-5	SED64392	SD00020ST	No	215
B-5	SED64392	SD60043WC	No	185
B-5	SED64492	SD00017ST	No	120
B-5	SED64492	SD60044WC	No	120
		Maximum Detected Value		**ND**
C-1	C1	NP50593WC	No	265
C-1	CR31-005	05F0600-002	No	36.5
C-1	CR31-006	05F0600-003	No	38
C-1	CR31-007	05F0600-006	No	29
C-1	CR31-008	05F0630-001	Yes	94
C-1	SED510	SD50017WC	No	500
		Maximum Detected Value		**94**
C-2	C2	NP50592WC	No	325
C-2	SED511	SD50023WC	No	335
C-2	SED512	SD50024WC	No	500
		Maximum Detected Value		**ND**

ND - Not Detected

Table A.24
Total PAH Values for All Sediment by Sample

Pond	Location	Sample Number	Total PAH Value	Acenaphthene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd)pyrene	Phenanthrene	Pyrene
A-1	CR53-000	05F0792-001	2,985	205	205	120	150	180	100	100	150	415	300	415	90	140	415
A-1	CS53-000	05F0348-002	6,230	260	260	500	500	500	500	500	500	500	500	500	210	500	500
A-1	CS53-001	05F0792-002	2,940	255	255	92	110	120	77	72	110	500	200	500	62	87	500
A-1	CS53-002	05F0792-004	4,428	245	245	73	485	130	485	485	82	485	170	485	485	88	485
A-1	CS53-002	05F0792-005	3,892	250	52	190	210	260	160	120	220	500	510	500	140	280	500
A-1	CS53-003	05F0792-006	2,681	235	235	75	83	83	60	63	87	470	190	470	50	110	470
A-1	CS53-003	05F0792-007	5,590	215	215	430	430	430	430	430	430	430	430	430	430	430	430
A-1	SED60092	SD60000WC	4,999	89	310	270	310	420	210	200	350	310	790	310	200	520	710
A-1	SED60192	SD60001WC	3,952	305	88	190	190	305	305	99	210	305	590	305	150	480	430
A-1	SED60292	SD60002WC	4,208	310	68	220	240	300	150	180	270	310	600	310	310	390	550
A-1	SED60392	SD60003WC	3,650	300	300	170	190	240	150	110	220	300	510	300	140	300	420
A-2	CV54-000	05F0600-001	2,856	180	210	52	51	64	350	350	60	350	89	350	210	190	350
A-2	CW53-000	05F0599-008	11,030	415	415	850	850	850	850	850	850	850	850	850	850	850	850
A-2	CW53-000	05F0599-009	7,600	400	400	800	80	800	800	800	81	800	140	800	800	99	800
A-2	CW54-000	05F0275-001	18,800	700	700	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450
A-2	CW54-000	05F0275-002	12,990	495	495	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
A-2	CW54-000	05F0275-003	19,500	750	750	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
A-2	CW54-002	05F0599-006	22,800	900	900	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
A-2	SED60692	SD60006WC	3,360	240	240	240	240	240	240	240	240	240	240	240	240	240	240
A-2	SED60792	SD60007WC	4,231	320	320	320	320	320	320	320	320	320	320	320	320	320	71
A-2	SED60892	SD60008WC	5,088	385	385	385	385	385	385	385	385	385	385	385	385	385	83
A-3	SED61092	SD60010WC	3,840	290	290	290	150	260	290	290	180	290	400	290	290	200	330
A-3	SED61192	SD60011WC	4,480	295	295	295	240	370	295	295	250	295	540	295	295	260	460
A-3	SED61292	SD60012WC	3,710	275	275	275	170	240	275	275	170	275	390	275	275	200	340
A-3	SED61392	SD60013WC	3,885	295	295	295	295	240	295	295	170	295	360	295	295	170	290
A-4	SED61592	SD60015WC	3,360	240	240	240	240	240	240	240	240	240	240	240	240	240	240
A-4	SED61692	SD60016WC	4,480	320	320	320	320	320	320	320	320	320	320	320	320	320	320
A-4	SED61792	SD60017WC	3,290	235	235	235	235	235	235	235	235	235	235	235	235	235	235
A-4	SED61892	SD60018WC	6,930	495	495	495	495	495	495	495	495	495	495	495	495	495	495
A-5	SED64592	SD60045WC	3,710	265	265	265	265	265	265	265	265	265	265	265	265	265	265
A-5	SED64692	SD60046WC	3,570	255	255	255	255	255	255	255	255	255	255	255	255	255	255
A-5	SED64792	SD60047WC	4,200	300	300	300	300	300	300	300	300	300	300	300	300	300	300
A-5	SED64892	SD60048WC	3,710	265	265	265	265	265	265	265	265	265	265	265	265	265	265
A-5	SED64992	SD60049WC	3,570	255	255	255	255	255	255	255	255	255	255	255	255	255	255
B-4	DB47-000	05F0618-001	15,600	600	600	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
B-4	DB47-001	05F0597-001	23,400	900	900	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
B-4	DB47-001	05F0597-002	6,415	225	60	330	430	810	310	450	470	450	880	450	250	430	870
B-4	DB47-001	05F0597-003	12,350	700	420	330	450	630	1400	1400	480	1400	1000	1400	1400	420	920
B-4	DB47-002	05F0599-001	4,328	310	73	240	290	270	200	270	330	65	580	600	150	370	580
B-4	DB47-002	05F0599-002	6,915	270	75	360	490	560	320	540	610	110	1200	550	280	550	1000
B-4	DB47-002	05F0599-003	3,457	260	260	98	150	180	95	200	210	500	450	500	84	160	310
B-4	DB47-002	05F0599-004	5,270	205	205	405	405	405	405	405	405	405	405	405	405	405	405
B-4	DB47-002	05F0599-005	5,200	200	200	400	400	400	400	400	400	400	400	400	400	400	400
B-4	DB47-003	05F0618-003	3,744	275	275	100	100	180	90	550	110	550	230	550	74	110	550
B-4	DB47-004	05F0618-005	6,734	350	350	80	700	700	700	700	74	700	170	700	700	110	700
B-4	DB47-004	05F0618-006	5,380	270	270	200	270	530	230	550	340	550	690	550	190	290	450
B-4	DB47-004	05F0618-007	7,830	440	440	220	300	720	290	900	460	900	1100	900	260	370	530
B-4	DB47-005	05F0597-004	4,496	110	140	300	320	230	270	310	350	92	750	94	200	630	700
B-4	SED63592	SD60035WC	5,989	235	79	350	420	660	200	280	490	235	1100	235	235	580	890
B-4	SED63592	SD60111WC	6,690	245	100	370	460	740	245	350	530	245	1200	245	200	760	1000
B-4	SED63692	SD60036WC	4,660	235	235	240	290	440	235	200	330	235	750	235	235	420	580
B-4	SED63792	SD60037WC	6,745	330	85	340	420	1000	330	290	500	330	1100	330	330	500	860
B-4	SED63792	SD60114WC	8,329	295	84	430	570	1500	270	350	650	295	1400	295	300	690	1200
B-4	SED63892	SD60038WC	6,145	315	315	315	370	660	315	220	470	315	950	315	315	450	820
B-4	SED63892	SD60110WC	6,945	315	315	315	400	770	315	360	520	315	1100	315	315	590	1000
B-4	SED63992	SD60039WC	6,279	250	99	350	440	710	250	290	490	250	1100	250	250	580	970
B-5	SED64092	SD60040WC	3,290	235	235	235	235	235	235	235	235	235	235	235	235	235	235
B-5	SED64192	SD60041WC	3,640	260	260	260	260	260	260	260	260	260	260	260	260	260	260
B-5	SED64292	SD60042WC	3,789	285	285	285	285	285	285	285	285	285	84	285	285	285	285
B-5	SED64392	SD60043WC	5,030	390	390	390	390	390	390	390	390	390	190	390	390	390	160
B-5	SED64492	SD60044WC	3,430	245	245	245	245	245	245	245	245	245	245	245	245	245	245
C-1	CR31-005	05F0600-002	4,710	360	440	190	170	170	150	150	190	530	120	700	500	340	700
C-1	CR31-006	05F0600-003	9,985	395	450	800	800	800	800	800	800	800	800	800	800	340	800
C-1	CR31-006	05F0600-004	6,093	360	410	83	79	700	700	700	81	700	130	700	400	350	700

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Table A.24
Total PAH Values for All Sediment by Sample

Pond	Location	Sample Number	Total PAH Value	Acenaphthene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd)pyrene	Phenanthrene	Pyrene
C-1	CR31-007	05F0600-006	5,240	320	350	69	66	600	600	600	65	600	120	600	340	310	600
C-1	CR31-008	05F0630-001	5,814	74	90	140	700	180	700	700	130	700	330	700	700	360	310
C-1	SED510	SD50017WC	6,500	500	500	500	500	500	500	500	500		500	500	500	500	500
C-2	SED511	SD50023WC	9,240	700	700	700	700	700	700	700	700	700	140	700	700	700	700
C-2	SED512	SD50024WC	14,700	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050

Table A.25
Total PAH Values for Surface Sediment by Location

Pond	Location	Total PAH Value	Acenaphthene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Phenanthrene	Pyrene
A-1	CR53-000	2985	205	205	120	150	180	100	100	150	415	300	415	90	140	415
A-1	CS53-001	2940	255	255	92	110	120	77	72	110	500	200	500	62	87	500
A-1	CS53-002	4428	245	245	73	485	130	485	485	82	485	170	485	485	88	485
A-1	CS53-003	2681	235	235	75	83	83	60	63	87	470	190	470	50	110	470
A-2	CV54-000	2856	180	210	52	51	64	350	350	60	350	89	350	210	190	350
A-2	CW53-000	11030	415	415	850	850	850	850	850	850	850	850	850	850	850	850
A-2	CW54-000	18800	700	700	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450
A-2	CW54-002	22800	900	900	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
A-2	SED60692	3360	240	240	240	240	240	240	240	240	240	240	240	240	240	240
A-2	SED60792	4231	320	320	320	320	320	320	320	320	320	320	320	320	320	71
A-3	SED61292	3710	275	275	275	170	240	275	275	170	275	390	275	275	200	340
A-4	SED61592	3360	240	240	240	240	240	240	240	240	240	240	240	240	240	240
A-4	SED61692	4480	320	320	320	320	320	320	320	320	320	320	320	320	320	320
A-4	SED61792	3290	235	235	235	235	235	235	235	235	235	235	235	235	235	235
A-4	SED61892	6930	495	495	495	495	495	495	495	495	495	495	495	495	495	495
A-5	SED64592	3710	265	265	265	265	265	265	265	265	265	265	265	265	265	265
A-5	SED64792	4200	300	300	300	300	300	300	300	300	300	300	300	300	300	300
A-5	SED64892	3710	265	265	265	265	265	265	265	265	265	265	265	265	265	265
A-5	SED64992	3570	255	255	255	255	255	255	255	255	255	255	255	255	255	255
B-4	DB47-000	15600	600	600	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
B-4	DB47-001	23400	900	900	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
B-4	DB47-002	4328	310	73	240	290	270	200	270	330	65	580	600	150	370	580
B-4	DB47-003	3744	275	275	100	100	180	90	550	110	550	230	550	74	110	550
B-4	DB47-004	6734	350	350	80	700	700	700	700	74	700	170	700	700	110	700
B-4	DB47-005	4496	110	140	300	320	230	270	310	350	92	750	94	200	630	700
B-5	SED64092	3290	235	235	235	235	235	235	235	235	235	235	235	235	235	235
B-5	SED64192	3640	260	260	260	260	260	260	260	260	260	260	260	260	260	260
B-5	SED64292	3789	285	285	285	285	285	285	285	285	285	84	285	285	285	285
B-5	SED64392	5030	390	390	390	390	390	390	390	390	390	190	390	390	390	160
B-5	SED64492	3430	245	245	245	245	245	245	245	245	245	245	245	245	245	245
C-1	CR31-005	4710	360	440	190	170	170	150	150	190	530	120	700	500	340	700
C-1	CR31-006	9985	395	450	800	800	800	800	800	800	800	800	800	800	340	800
C-1	CR31-007	5240	320	350	69	66	600	600	600	65	600	120	600	340	310	600
C-1	CR31-008	5814	74	90	140	700	180	700	700	130	700	330	700	700	360	310
C-1	SED510	6500	500	500	500	500	500	500	500	500		500	500	500	500	500
C-2	SED511	9240	700	700	700	700	700	700	700	700	700	140	700	700	700	700
C-2	SED512	14700	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050

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Table A.26
Summary of Dioxin TEQ Values by Pond for All Sediment

Sampling Location	Sample Number	Pond	Congener	Result	Detect?	Validation Qualifier	Aquatic	
							TEF[a]	TEQ Concentration[b]
Sediment (ug/kg)								
CR31-004	05F0140-005	C-1	1234678-HpCDF	0.000807	Yes	V	0.01	0.00000807
CR31-004	05F0140-005	C-1	1234789-HpCDF	0.00271	No	V	0.01	0
CR31-004	05F0140-005	C-1	123478-HxCDD	0.00271	No	V	0.5	0
CR31-004	05F0140-005	C-1	123478-HxCDF	0.00271	No	V	0.1	0
CR31-004	05F0140-005	C-1	123678-HxCDD	0.00271	No	V	0.01	0
CR31-004	05F0140-005	C-1	123678-HxCDF	0.00271	No	V	0.1	0
CR31-004	05F0140-005	C-1	123789-HxCDD	0.00271	No	V	0.01	0
CR31-004	05F0140-005	C-1	123789-HxCDF	0.00271	No	V	0.1	0
CR31-004	05F0140-005	C-1	12378-PeCDF	0.00271	No	V	0.05	0
CR31-004	05F0140-005	C-1	234678-HxCDF	0.00271	No	V	0.1	0
CR31-004	05F0140-005	C-1	23478-PeCDF	0.00271	No	V	0.5	0
CR31-004	05F0140-005	C-1	2378-TCDD	0.00108	No	V	1	0
CR31-004	05F0140-005	C-1	2378-TCDF	0.00108	No	V	0.05	0
CR31-004	05F0140-005	C-1	Heptachlorodibenzo-p-dioxin	0.00509	Yes	V	0.001	0.00000509
CR31-004	05F0140-005	C-1	OCDD	0.0306	Yes	V	0.0001	0.00000306
CR31-004	05F0140-005	C-1	OCDF	0.00128	Yes	V	0.0001	0.000000128
CR31-004	05F0140-005	C-1	Pentachlorodibenzo-p-dioxin	0.00271	No	V	1	0
Total 2,3,7,8-TCDD TEQ Concentration for Sample 05F0140-005:[c]								**0.000016348**
CR31-004	05F0140-006	C-1	1234678-HpCDF	0.00158	Yes	V	0.01	0.0000158
CR31-004	05F0140-006	C-1	1234789-HpCDF	0.00226	No	V	0.01	0
CR31-004	05F0140-006	C-1	123478-HxCDD	0.00226	No	V	0.5	0
CR31-004	05F0140-006	C-1	123478-HxCDF	0.00127	Yes	V	0.1	0.000127
CR31-004	05F0140-006	C-1	123678-HxCDD	0.00226	No	V	0.01	0
CR31-004	05F0140-006	C-1	123678-HxCDF	0.000562	Yes	V	0.1	0.0000562
CR31-004	05F0140-006	C-1	123789-HxCDD	0.00226	No	V	0.01	0
CR31-004	05F0140-006	C-1	123789-HxCDF	0.00226	No	V	0.1	0
CR31-004	05F0140-006	C-1	12378-PeCDF	0.00226	No	V	0.05	0
CR31-004	05F0140-006	C-1	234678-HxCDF	0.000781	Yes	V	0.1	0.0000781
CR31-004	05F0140-006	C-1	23478-PeCDF	0.00143	Yes	V	0.5	0.000715
CR31-004	05F0140-006	C-1	2378-TCDD	0.000904	No	V	1	0
CR31-004	05F0140-006	C-1	2378-TCDF	0.000904	No	V	0.05	0
CR31-004	05F0140-006	C-1	Heptachlorodibenzo-p-dioxin	0.00285	Yes	V	0.001	0.00000285
CR31-004	05F0140-006	C-1	OCDD	0.0133	Yes	V	0.0001	0.00000133
CR31-004	05F0140-006	C-1	OCDF	0.00176	Yes	V	0.0001	0.000000176
CR31-004	05F0140-006	C-1	Pentachlorodibenzo-p-dioxin	0.000372	Yes	V	1	0.000372
Total 2,3,7,8-TCDD TEQ Concentration for Sample 05F0140-006:[c]								**0.001368456**
CS53-000	05F0348-002	A-1	1234678-HpCDF	0.0298	Yes	V1	0.01	0.000298
CS53-000	05F0348-002	A-1	1234789-HpCDF	0.00243	Yes	V1	0.01	0.0000243
CS53-000	05F0348-002	A-1	123478-HxCDD	0.00126	Yes	V1	0.5	0.00063

Table A.26
Summary of Dioxin TEQ Values by Pond for All Sediment

Sampling Location	Sample Number	Pond	Congener	Result	Detect?	Validation Qualifier	Aquatic	
							TEF [a]	TEQ Concentration [b]
CS53-000	05F0348-002	A-1	123478-HxCDF	0.00371	Yes	V1	0.1	0.000371
CS53-000	05F0348-002	A-1	123678-HxCDD	0.00455	Yes	V1	0.01	0.0000455
CS53-000	05F0348-002	A-1	123678-HxCDF	0.0025	Yes	V1	0.1	0.00025
CS53-000	05F0348-002	A-1	123789-HxCDD	0.00329	Yes	V1	0.01	0.0000329
CS53-000	05F0348-002	A-1	123789-HxCDF	0.00184	No	V1	0.1	0
CS53-000	05F0348-002	A-1	12378-PeCDF	0.00197	Yes	V1	0.05	0.0000985
CS53-000	05F0348-002	A-1	234678-HxCDF	0.00199	Yes	V1	0.1	0.000199
CS53-000	05F0348-002	A-1	23478-PeCDF	0.00429	Yes	V1	0.5	0.002145
CS53-000	05F0348-002	A-1	2378-TCDD	0.00278	Yes	V1	1	0.00278
CS53-000	05F0348-002	A-1	2378-TCDF	0.00612	Yes	J1	0.05	0.000306
CS53-000	05F0348-002	A-1	Heptachlorodibenzo-p-dioxin	0.0946	Yes	V1	0.001	0.0000946
CS53-000	05F0348-002	A-1	OCDD	0.539	Yes	V1	0.0001	0.0000539
CS53-000	05F0348-002	A-1	OCDF	0.0409	Yes	V1	0.0001	0.00000409
CS53-000	05F0348-002	A-1	Pentachlorodibenzo-p-dioxin	0.00184	No	V1	1	0
Total 2,3,7,8-TCDD TEQ Concentration for Sample 05F0348-002:[c]								**0.00733279**
CW54-000	05F0275-001	A-2	1234678-HpCDF	0.00251	Yes	V1	0.01	0.0000251
CW54-000	05F0275-001	A-2	1234789-HpCDF	0.00286	No	V1	0.01	0
CW54-000	05F0275-001	A-2	123478-HxCDD	0.00286	No	V1	0.5	0
CW54-000	05F0275-001	A-2	123478-HxCDF	0.000566	Yes	V1	0.1	0.0000566
CW54-000	05F0275-001	A-2	123678-HxCDD	0.00122	Yes	V1	0.01	0.0000122
CW54-000	05F0275-001	A-2	123678-HxCDF	0.00286	No	V1	0.1	0
CW54-000	05F0275-001	A-2	123789-HxCDD	0.00106	Yes	V1	0.01	0.0000106
CW54-000	05F0275-001	A-2	123789-HxCDF	0.00286	No	V1	0.1	0
CW54-000	05F0275-001	A-2	12378-PeCDF	0.00286	No	V1	0.05	0
CW54-000	05F0275-001	A-2	234678-HxCDF	0.00286	No	V1	0.1	0
CW54-000	05F0275-001	A-2	23478-PeCDF	0.00286	No	V1	0.5	0
CW54-000	05F0275-001	A-2	2378-TCDD	0.00114	No	V1	1	0
CW54-000	05F0275-001	A-2	2378-TCDF	0.00114	No	V1	0.05	0
CW54-000	05F0275-001	A-2	Heptachlorodibenzo-p-dioxin	0.0199	Yes	V1	0.001	0.0000199
CW54-000	05F0275-001	A-2	OCDD	0.161	Yes	V1	0.0001	0.0000161
CW54-000	05F0275-001	A-2	OCDF	0.00883	Yes	V1	0.0001	0.000000883
CW54-000	05F0275-001	A-2	Pentachlorodibenzo-p-dioxin	0.00286	No	V1	1	0
Total 2,3,7,8-TCDD TEQ Concentration for Sample 05F0275-001:[c]								**0.000141383**
CW54-000	05F0275-002	A-2	1234678-HpCDF	0.00419	No	V1	0.01	0
CW54-000	05F0275-002	A-2	1234789-HpCDF	0.00074	Yes	V1	0.01	0.0000074
CW54-000	05F0275-002	A-2	123478-HxCDD	0.00419	No	V1	0.5	0
CW54-000	05F0275-002	A-2	123478-HxCDF	0.00419	No	V1	0.1	0
CW54-000	05F0275-002	A-2	123678-HxCDD	0.00419	No	V1	0.01	0
CW54-000	05F0275-002	A-2	123678-HxCDF	0.00419	No	V1	0.1	0
CW54-000	05F0275-002	A-2	123789-HxCDD	0.00419	No	V1	0.01	0

Table A.26
Summary of Dioxin TEQ Values by Pond for All Sediment

Sampling Location	Sample Number	Pond	Congener	Result	Detect?	Validation Qualifier	Aquatic	
							TEF[a]	TEQ Concentration[b]
CW54-000	05F0275-002	A-2	123789-HxCDF	0.000553	Yes	V1	0.1	0.0000553
CW54-000	05F0275-002	A-2	12378-PeCDF	0.00419	No	V1	0.05	0
CW54-000	05F0275-002	A-2	234678-HxCDF	0.00419	No	V1	0.1	0
CW54-000	05F0275-002	A-2	23478-PeCDF	0.00419	No	V1	0.5	0
CW54-000	05F0275-002	A-2	2378-TCDD	0.00168	No	V1	1	0
CW54-000	05F0275-002	A-2	2378-TCDF	0.00168	No	V1	0.05	0
CW54-000	05F0275-002	A-2	Heptachlorodibenzo-p-dioxin	0.00419	No	V1	0.001	0
CW54-000	05F0275-002	A-2	OCDD	0.0178	Yes	V1	0.0001	0.00000178
CW54-000	05F0275-002	A-2	OCDF	0.00838	No	V1	0.0001	0
CW54-000	05F0275-002	A-2	Pentachlorodibenzo-p-dioxin	0.00419	No	V1	1	0
Total 2,3,7,8-TCDD TEQ Concentration for Sample 05F0275-002:[c]								**0.00006448**
CW54-000	05F0275-003	A-2	1234678-HpCDF	0.00283	Yes	V1	0.01	0.0000283
CW54-000	05F0275-003	A-2	1234789-HpCDF	0.00077	Yes	V1	0.01	0.0000077
CW54-000	05F0275-003	A-2	123478-HxCDD	0.00474	No	V1	0.5	0
CW54-000	05F0275-003	A-2	123478-HxCDF	0.00055	Yes	V1	0.1	0.000055
CW54-000	05F0275-003	A-2	123678-HxCDD	0.00474	No	V1	0.01	0
CW54-000	05F0275-003	A-2	123678-HxCDF	0.00474	No	V1	0.1	0
CW54-000	05F0275-003	A-2	123789-HxCDD	0.00474	No	V1	0.01	0
CW54-000	05F0275-003	A-2	123789-HxCDF	0.00474	No	V1	0.1	0
CW54-000	05F0275-003	A-2	12378-PeCDF	0.00474	No	V1	0.05	0
CW54-000	05F0275-003	A-2	234678-HxCDF	0.00474	No	V1	0.1	0
CW54-000	05F0275-003	A-2	23478-PeCDF	0.00474	No	V1	0.5	0
CW54-000	05F0275-003	A-2	2378-TCDD	0.0019	No	V1	1	0
CW54-000	05F0275-003	A-2	2378-TCDF	0.0019	No	V1	0.05	0
CW54-000	05F0275-003	A-2	Heptachlorodibenzo-p-dioxin	0.0198	Yes	V1	0.001	0.0000198
CW54-000	05F0275-003	A-2	OCDD	0.114	Yes	V1	0.0001	0.0000114
CW54-000	05F0275-003	A-2	OCDF	0.00583	Yes	V1	0.0001	0.000000583
CW54-000	05F0275-003	A-2	Pentachlorodibenzo-p-dioxin	0.00474	No	V1	1	0
Total 2,3,7,8-TCDD TEQ Concentration for Sample 05F0275-003:[c]								**0.000122783**
2,3,7,8-TCDD TEQ Concentration used in Sediment ESL Screen[c]:								**0.00733279**

a : Toxicity Equivalency Factor (WHO, 1997).
b : TEQ (Toxicity Equivalence) Concentration = Sediment Concentration x TEF. For non-detects, the TEQ Concentration equals zero.
c: The TEQ concentration used in the ESL screen is the maximum of all sampling locations for the medium.

Table A.27
Summary of Dioxin TEQ Values by Pond for Surface Sediment

Sampling Location	Sample Number	Pond	Congener	Result	Detect?	Validation Qualifier	Aquatic TEF[a]	Aquatic TEQ Concentration[b]
Sediment (ug/kg)								
CR31-004	05F0140-005	C-1	1234678-HpCDF	0.000807	Yes	V	0.01	0.00000807
CR31-004	05F0140-005	C-1	1234789-HpCDF	0.00271	No	V	0.01	0
CR31-004	05F0140-005	C-1	123478-HxCDD	0.00271	No	V	0.5	0
CR31-004	05F0140-005	C-1	123478-HxCDF	0.00271	No	V	0.1	0
CR31-004	05F0140-005	C-1	123678-HxCDD	0.00271	No	V	0.01	0
CR31-004	05F0140-005	C-1	123678-HxCDF	0.00271	No	V	0.1	0
CR31-004	05F0140-005	C-1	123789-HxCDD	0.00271	No	V	0.01	0
CR31-004	05F0140-005	C-1	123789-HxCDF	0.00271	No	V	0.1	0
CR31-004	05F0140-005	C-1	12378-PeCDF	0.00271	No	V	0.05	0
CR31-004	05F0140-005	C-1	234678-HxCDF	0.00271	No	V	0.1	0
CR31-004	05F0140-005	C-1	23478-PeCDF	0.00271	No	V	0.5	0
CR31-004	05F0140-005	C-1	2378-TCDD	0.00108	No	V	1	0
CR31-004	05F0140-005	C-1	2378-TCDF	0.00108	No	V	0.05	0
CR31-004	05F0140-005	C-1	Heptachlorodibenzo-p-dioxin	0.00509	Yes	V	0.001	0.00000509
CR31-004	05F0140-005	C-1	OCDD	0.0306	Yes	V	0.0001	0.00000306
CR31-004	05F0140-005	C-1	OCDF	0.00128	Yes	V	0.0001	0.000000128
CR31-004	05F0140-005	C-1	Pentachlorodibenzo-p-dioxin	0.00271	No	V	1	0
Total 2,3,7,8-TCDD TEQ Concentration for Sample 05F0140-005:[c]								**0.000016348**
CW54-000	05F0275-001	A-2	1234678-HpCDF	0.00251	Yes	V1	0.01	0.0000251
CW54-000	05F0275-001	A-2	1234789-HpCDF	0.00286	No	V1	0.01	0
CW54-000	05F0275-001	A-2	123478-HxCDD	0.00286	No	V1	0.5	0
CW54-000	05F0275-001	A-2	123478-HxCDF	0.000566	Yes	V1	0.1	0.0000566
CW54-000	05F0275-001	A-2	123678-HxCDD	0.00122	Yes	V1	0.01	0.0000122
CW54-000	05F0275-001	A-2	123678-HxCDF	0.00286	No	V1	0.1	0
CW54-000	05F0275-001	A-2	123789-HxCDD	0.00106	Yes	V1	0.01	0.0000106
CW54-000	05F0275-001	A-2	123789-HxCDF	0.00286	No	V1	0.1	0
CW54-000	05F0275-001	A-2	12378-PeCDF	0.00286	No	V1	0.05	0
CW54-000	05F0275-001	A-2	234678-HxCDF	0.00286	No	V1	0.1	0
CW54-000	05F0275-001	A-2	23478-PeCDF	0.00286	No	V1	0.5	0
CW54-000	05F0275-001	A-2	2378-TCDD	0.00114	No	V1	1	0
CW54-000	05F0275-001	A-2	2378-TCDF	0.00114	No	V1	0.05	0
CW54-000	05F0275-001	A-2	Heptachlorodibenzo-p-dioxin	0.0199	Yes	V1	0.001	0.0000199
CW54-000	05F0275-001	A-2	OCDD	0.161	Yes	V1	0.0001	0.0000161
CW54-000	05F0275-001	A-2	OCDF	0.00883	Yes	V1	0.0001	0.000000883
CW54-000	05F0275-001	A-2	Pentachlorodibenzo-p-dioxin	0.00286	No	V1	1	0
Total 2,3,7,8-TCDD TEQ Concentration for Sample 05F0275-001:[c]								**0.000141383**
2,3,7,8-TCDD TEQ Concentration used in Sediment ESL Screen[c]:								**0.000141383**

a : Toxicity Equivalency Factor (WHO, 1997).
b : TEQ (Toxicity Equivalence) Concentration = Sediment Concentration x TEF. For non-detects, the TEQ Concentration equals zero.

Table A.27
Summary of Dioxin TEQ Values by Pond for Surface Sediment

Sampling Location	Sample Number	Pond	Congener	Result	Detect?	Validation Qualifier	Aquatic	
							TEF[a]	TEQ Concentration[b]

c: The TEQ concentration used in the ESL screen is the maximum of all sampling locations for the medium.

Table A.28
Pond A-1 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			A-Series Mean All Sediment HQs		
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	A-Series Mean	ESL-HQ	AT-HQ
Inorganics															
Aluminum	15,900	58,000	mg/kg	25,000	**2**	0	29,000	**2**	1	21,415	**1**	0	18,588	**1**	0
Antimony	2.00	3.20	mg/kg	ND	--	--	30.4	**15**	**10**	*	--	--	26.1	**13**	**8**
Barium	189	287	mg/kg	220	**1**	1	230	**1**	1	*	--	--	180	1	1
Cadmium	0.990	4.98	mg/kg	1.30	**1**	<1	8.30	**8**	**2**	4.21	**4**	1	1.22	**1**	<1
Copper	31.6	149	mg/kg	27.0	1	<1	43.0	**1**	<1	30.4	1	<1	23.3	1	<1
Iron	20,000	280,000	mg/kg	24,000	**1**	<1	24,000	**1**	<1	21,340	**1**	<1	20,573	**1**	<1
Lead	35.8	128	mg/kg	29.0	1	<1	39.0	**1**	<1	32.6	1	<1	25.5	1	<1
Mercury	0.180	1.06	mg/kg	0.180	**1**	<1	0.470	**3**	<1	0.315	**2**	<1	0.116	1	<1
Nickel	22.7	48.6	mg/kg	22.0	1	<1	26.4	**1**	1	22.3	1	<1	19.4	1	<1
Selenium	0.950	1.73	mg/kg	1.80	**2**	**1**	1.80	**2**	**1**	1.44	**2**	1	1.66	**2**	**1**
Silver	1.00	1.60	mg/kg	0.810	1	1	2.00	**2**	**1**	1.16	**1**	1	1.26	**1**	1
Zinc	121	459	mg/kg	140	**1**	<1	140	**1**	<1	122	**1**	<1	115	1	<1
Organics															
Acenaphthene	6.71	89.0	ug/kg	ND	--	--	89.0	**13**	**1**	*	--	--	135.0	**20**	**2**
Anthracene	57.2	845	ug/kg	ND	--	--	88.0	**2**	<1	*	--	--	105.0	**2**	<1
Benzo(a)anthracene	108	1,050	ug/kg	120	**1**	<1	270	**3**	<1	*	--	--	145.0	**1**	<1
Benzo(a)pyrene	150	1,450	ug/kg	150	**1**	<1	310	**2**	<1	*	--	--	165.0	**1**	<1
Benzo(g,h,i)perylene	13.0	280	ug/kg	100	**8**	<1	210	**16**	**1**	*	--	--	126.0	**10**	<1
Chrysene	166	1,290	ug/kg	150	1	<1	350	**2**	<1	315	**2**	<1	174.0	**1**	<1
Fluoranthene	423	2,230	ug/kg	300	1	<1	790	**2**	<1	544	**1**	<1	385.0	1	<1
Indeno(1,2,3-cd)pyrene	17.0	250	ug/kg	90	**5**	<1	210	**12**	1	*	--	--	139.0	**8**	1
Phenanthrene	204	1,170	ug/kg	140	1	<1	520	**3**	<1	397	**2**	<1	237.0	**1**	<1
Pyrene	195	1,520	ug/kg	ND	--	--	710	**4**	<1	538	**3**	<1	368.0	**2**	<1
Aroclor 1254	60.0	300	ug/kg	88	**1**	<1	5,200	**87**	**17**	1,835	**31**	**6**	510.0	**9**	**2**
Aroclor 1260	5.00	200	ug/kg	ND	--	--	150	**30**	**1**	*	--	--	150.0	**30**	**1**
Total PCBs	40.0	676	ug/kg	88	**2**	0	5,200	**130**	<1	*	--	--	1204	**30**	**2**
Total PAHs	1,610	22,800	ug/kg	1050	<1	<1	6,230	**5**	<1	NA	--	--	N/A	--	--
TEQ - Dioxins	8.50E-04	0.022	ug/kg	NA	--	--	0.007	**9**	<1	NA	--	--	NA	--	--

95 UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
NA - Not analyzed for, due to lack of data
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

Table A.29

Pond A-2 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			A-Series Mean All	
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	A-Series Mean	ESL-HQ
Inorganics														
Aluminum	15,900	58,000	mg/kg	26,000	**2**	<1	49,000	**3**	1	27,153	**2**	<1	18,588	**1**
Arsenic	9.79	33.0	mg/kg	11.0	**1**	<1	12.0	**1**	<1	9.54	1	<1	6.93	1
Barium	189	287	mg/kg	260	**1**	1	390	**2**	**1**	267	**1**	**1**	180	1
Cadmium	0.990	4.98	mg/kg	0.950	1	<1	3.20	**3**	1	1.66	**2**	<1	1.22	**1**
Chromium	43.4	111	mg/kg	26.0	1	<1	44.0	**1**	<1	28.5	1	<1	19.8	<1
Copper	31.6	149	mg/kg	30.0	1	<1	56.0	**2**	<1	36.1	**1**	<1	23.3	1
Iron	20,000	280,000	mg/kg	28,000	**1**	<1	39,000	**2**	<1	26,681	**1**	<1	20,573	**1**
Lead	35.8	128	mg/kg	33.0	1	<1	45.0	**1**	<1	34.2	1	<1	25.5	1
Manganese	630	1,700	mg/kg	1,100	**2**	1	1,100	**2**	1	713	**1**	<1	399	1
Nickel	22.7	48.6	mg/kg	22.0	1	<1	34.0	**1**	1	24.6	**1**	**1**	19.4	**1**
Silver	1.00	1.60	mg/kg	0.098	<1	<1	3.90	**4**	**2**	2.08	**2**	**1**	1.26	**1**
Zinc	121	459	mg/kg	110	1	<1	170	**1**	<1	125	**1**	<1	115	1
Organics														
Acenaphthene	6.71	89.0	ug/kg	180	**27**	**2**	180	**27**	**2**	*	--	--	135	**20**
Anthracene	57.2	845	ug/kg	210	**4**	<1	210	**4**	<1	*	--	--	105	**2**
Bis(2-ethylhexyl)phthlate	24,900	NA	ug/kg	4,200	<1	--	47,000	**2**	--	28,796	**1**	--	4,037	<1
Indeno(1,2,3-cd)pyrene	17.0	250	ug/kg	210	**12**	1	210	**12**	1	*	--	--	139	**8**
Aroclor-1254	60.0	300	ug/kg	130	**2**	<1	130	**2**	<1	111.0	**2**	<1	510	**9**
Total PCBs	40.0	676	ug/kg	130	**3**	<1	185	**5**	<1	NA	--	--	1,204	**30**
Total PAHs	1,610	22,800	ug/kg	652	<1	<1	22,800	**14.0**	1.00	N/A	--	--	N/A	--
TEQ - Dioxins	8.50E-04	0.022	ug/kg	1.41E-04	<1	<1	1.41E-04	<1	<1	NA	--	--	NA	--

95 UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
NA -Not analyzed for due to lack of data
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

Sediment HQs
AT-HQ
[illegible]
<1
<1
1
<1
<1
<1
<1
<1
<1
<1
1
<1
[illegible]
2
<1
--
1
2
2
--
--

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Table A.30
Pond A-3 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			A-Series Mean All Sediment HQs		
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	A-Series Mean	ESL-HQ	AT-HQ
Inorganics															
Aluminum	15,900	58,000	mg/kg	25,000	2	<1	27,400	2	<1	24,743	2	<1	18,588	1	<1
Antimony	2.00	3.20	mg/kg	26	**13**	**8**	26.0	**13**	**8**	16.1	**8**	**5**	26.1	**13**	**8**
Barium	189	287	mg/kg	200	1	1	200	1	1	188	1	1	180	1	1
Iron	20,000	280,000	mg/kg	22,000	1	<1	25,000	1	<1	23,302	1	<1	20,573	1	<1
Nickel	22.7	48.6	mg/kg	21	1	<1	25.6	1	1	21.8	1	<1	19.4	1	<1
Selenium	0.950	1.73	mg/kg	1.8	2	1	1.8	2	1	1.1	1	1	1.66	2	1
Zinc	121	459	mg/kg	540	4	1	540	4	1	287.0	2	1	115	1	<1
Organics															
Benzo(a)pyrene	150	1,450	ug/kg	170	1	<1	240	2	<1	*	--	--	165	1	<1
Chrysene	166	1,290	ug/kg	170	1	<1	250	2	<1	*	--	--	174	1	<1
Fluoranthene	423	2,230	ug/kg	390	1	<1	540	1	<1	517.0	1	<1	385	1	<1
Phenanthrene	204	1,170	ug/kg	200	1	<1	260	1	<1	252.0	1	<1	237	1	<1
Pyrene	195	1,520	ug/kg	340	2	<1	460	2	<1	441.0	2	<1	368	2	<1
Aroclor 1254	60.0	300	ug/kg	45	<1	<1	45	1	<1	*	--	--	510	9	2
Total PAHs	1610.0	22800	ug/kg	1270	1	<1	4480	3	<1	N/A	--	--	N/A	--	--
Total PCBs	40.0	676	ug/kg	45	1	<1	225	6	<1	*	--	--	1,204	30	2

95UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

Table A.31
Pond A-4 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			A-Series Mean All Sediment HQs		
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	A-Series Mean	ESL-HQ	AT-HQ
Inorganics															
Aluminum	15,900	58,000	mg/kg	26,000	2	<1	26,000	2	<1	19,604	1	<1	18,588	1	<1
Antimony	2.00	3.20	mg/kg	41.4	21	13	41.4	21	13	*	--	--	26.1	13	8
Arsenic	9.79	33.0	mg/kg	10.2	1	<1	10.2	1	<1	7.26	1	<1	180	18	5
Barium	189	287	mg/kg	206	1	1	206	1	1	182	1	1	180	1	1
Cadmium	0.990	4.98	mg/kg	3.10	3	1	3.10	3	1	1.81	2	<1	1.22	1	<1
Copper	31.6	149	mg/kg	33.4	1	<1	33.4	1	<1	21.4	1	<1	23.3	1	<1
Iron	20,000	280,000	mg/kg	22,900	1	<1	55,000	3	<1	26,996	1	<1	20,573	1	<1
Nickel	22.7	48.6	mg/kg	25.5	1	1	25.5	1	1	20.0	1	<1	19.4	1	<1
Selenium	0.950	1.73	mg/kg	1.90	2	1	1.90	2	1	1.52	2	1	1.66	2	1
Zinc	121	459	mg/kg	169	1	<1	169	1	<1	103	1	<1	115	1	<1
Organics															
Atrazine	16.8	230.4	ug/kg	ND	--	--	120	7	1	NA	--	--	120.0	7	1
Total PAHs	1,610	22,800	ug/kg	ND	--	--	6930	4	<1	N/A	--	--	N/A	--	--

95 UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
NA - Not analyzed for due to lack of data
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

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Table A.32
Pond A-5 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			A-Series Mean All Sediment HQs		
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	A-Series Mean	ESL-HQ	AT-HQ
Inorganics															
Aluminum	15,900	58,000	mg/kg	21,000	1	<1	21,000	1	<1	15,334	1	<1	18,588	1	<1
Barium	189	287	mg/kg	220	1	1	220	1	1	178	1	1	180	1	1
Iron	20,000	280,000	mg/kg	22,000	1	<1	22,000	1	<1	17,616	1	<1	20,573	1	<1
Silver	1	1.6	mg/kg	1.2	1	1	1.2	1	1	1.1	1	1	1.3	1	1
Zinc	121	459	mg/kg	130	1	<1	130	1	<1	89.5	1	<1	115.0	1	<1
Total PAHs	1610	22800	ug/kg	ND	--	<1	4200	3	<1	NA	--	<1	NA	--	<1

95 UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

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Table A.33
Pond B-4 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			B-Series Mean All Sediment HQs		
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	B-Series Mean	ESL-HQ	AT-HQ
Inorganics															
Aluminum	15,900	58,000	mg/kg	29,000	2	1	29,000	2	1	17,687	1	<1	15,376	1	<1
Antimony	2.00	3.20	mg/kg	2.60	1	1	25.6	13	8	23.3	12	7	10.9	5	3
Barium	189	287	mg/kg	220	1	1	230	1	1	182	1	1	171	1	1
Cadmium	0.990	4.98	mg/kg	1.80	2	<1	44.0	44	9	22.6	23	5	3.77	4	1
Chromium	43.4	111	mg/kg	29.0	1	<1	140	3	1	48.1	1	<1	23.0	1	<1
Copper	31.6	149	mg/kg	32.0	1	<1	120	4	1	37.0	1	<1	29.2	1	<1
Iron	20,000	280,000	mg/kg	24,000	1	<1	24,000	<1	<1	18,423	1	<1	17,043	1	<1
Lead	35.8	128	mg/kg	39.0	1	<1	110	3	1	46.6	1	<1	38.1	1	<1
Mercury	0.180	1.06	mg/kg	0.091	1	<1	1.70	9	2	0.880	5	1	0.186	1	<1
Nickel	22.7	48.6	mg/kg	23.0	1	<1	31.0	1	1	18.9	1	<1	17.4	1	<1
Selenium	0.950	1.73	mg/kg	1.80	2	1	3.60	4	2	1.46	2	1	2.30	2	1
Silver	1.00	1.60	mg/kg	3.10	3	2	3,100	3100	1938	1,548	1548	968	296	296	185
Zinc	121	459	mg/kg	510	4	1	510	4	1	255	2	1	205	2	<1
Organics															
Anthracene	57.2	845	ug/kg	140	2	<1	420	7	<1	339	6	<1	122	2	<1
Benzo(a)anthracene	108	1,050	ug/kg	300	3	<1	430	4	<1	*	--	--	266	2	<1
Benzo(a)pyrene	150	1,450	ug/kg	320	2	<1	570	4	<1	*	--	--	359	2	<1
Benzo(g,h,i)perylene	13.0	280	ug/kg	270	21	1	320	25	1	*	--	--	228	18	1
Benzo(k)fluoranthene	240	750	ug/kg	310	1	<1	540	2	1	*	--	--	302	1	<1
Bis(2-ethylhexyl)phthalate	24,900		ug/kg	710	<1	--	25,000	1	--	4,783	<1	--	3,341	<1	--
Chrysene	166	1,290	ug/kg	350	2	<1	650	4	1	*	--	--	407	2	<1
Dibenz(a,h)anthracene	33.0	240	ug/kg	92.0	3	<1	110	3	<1	*	--	--	89.0	3	<1
Fluoranthene	423	2,230	ug/kg	750	2	<1	1,400	3	1	1,037	2	<1	830	2	<1
gamma-BHC	2.37		ug/kg	ND	--		25.0	11		20.7	9		25.0	11	
Indeno(1,2,3-cd)pyrene	17.0	250	ug/kg	200	12	1	300	18	1	*	--	--	199	12	1
Phenanthrene	204	1,170	ug/kg	630	3	1	760	4	1	684	3	1	437	2	<1
Pyrene	195	1,520	ug/kg	700	4	<1	1,200	6	1	931	5	1	779	4	1
Aroclor-1254	60.0	300	ug/kg	220	4	1	3,100	52	10	696	12	2	539	9	2
Total PAHs	1,610	22,800	ug/kg	3,620	15	1	23,400	15	1	N/A	--	--	N/A	--	--
Total PCBs	40.0	676	ug/kg	220	6	<1	3,100	78	5	1,230	31	2	1,658	41	2

95 UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
NA - Not analyzed for due to lack of available data
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

Table A.34
Pond B-5 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			B-Series Mean All Sediment HQs		
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	B-Series Mean	ESL-HQ	AT-HQ
Inorganics															
Aluminum	15,900	58,000	mg/kg	24,000	1	<1	24,000	1	<1	21,415	1	<1	15,376	1	<1
Barium	189	287	mg/kg	240	1	1	240	1	1	*	--	--	171	1	1
Iron	20,000	280,000	mg/kg	22,000	1	<1	22,000	<1	<1	21,340	1	<1	17,043	1	<1
Lead	35.8	128	mg/kg	36.8	1	<1	36.8	1	<1	32.6	1	<1	38.1	1	<1
Nickel	22.7	48.6	mg/kg	23.8	1	<1	23.8	1	<1	22.3	1	<1	17.4	1	<1
Selenium	0.950	1.73	mg/kg	1.6	2	1	1.60	2	1	1.44	2	1	2.30	2	1
Silver	1.00	1.60	mg/kg	1.4	<1	<1	1.40	1	1	1.16	1	1	296	296	185
Zinc	121	459	mg/kg	240	2	<1	240	2	1	122	1	0	205	2	<1

95 UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
NA - Not analyzed for due to lack of available data
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

Table A.35
Pond C-1 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			C-Series Mean All Sediment HQs		
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	C-Series Mean	ESL-HQ	AT-HQ
Inorganics															
Aluminum	15,900	58,000	mg/kg	31,000	2	1	32,000	2	1	29,035	2	1	17,181	1	<1
Barium	189	287	mg/kg	330	2	1	330	2	1	305	2	1	201	1	1
Iron	20,000	280,000	mg/kg	31,000	2	<1	31,000	<1	<1	28,990	1	<1	21,488	1	<1
Lead	35.8	128	mg/kg	38.0	1	<1	38.0	1	<1	33.2	1	<1	23.9	1	<1
Manganese	630	1,700	mg/kg	970	2	1	970	2	1	588	1	<1	418	1	<1
Mercury	0.180	1.06	mg/kg	1.600	9	<1	1.60	9	2	*	--	--	0.308	2	<1
Nickel	22.7	48.6	mg/kg	24.0	1	<1	24.0	1	<1	22.2	1	<1	17.3	1	<1
Selenium	0.950	1.73	mg/kg	2.80	3	2	2.80	3	2	2.4	2	1	2.03	2	1
Zinc	121	459	mg/kg	140	1	<1	140	1	<1	120.0	1	<1	93.8	1	<1
Organics															
Acenaphthene	6.71	89.0	ug/kg	320	48	4	360	54	4	*	--	--	251	37	3
Anthracene	57.2	845	ug/kg	450	8	1	450	8	1	*	--	--	348	6	<1
Benzo(a)anthracene	108	1,050	ug/kg	190	2	<1	190	2	<1	*	--	--	121	1	<1
Benzo(a)pyrene	150	1,450	ug/kg	170	1	<1	170	1	<1	*	--	--	105	1	<1
Benzo(g,h,i)perylene	13.0	280	ug/kg	150	12	1	150	12	1	*	--	--	150	12	1
Chrysene	166	1,290	ug/kg	190	1	<1	190	1	<1	*	--	--	117	1	<1
Dibenz(a,h)anthracene	33.0	240	ug/kg	530	16	2	530	16	2	*	--	--	530	16	2
Indeno(1,2,3-cd)pyrene	17.0	250	ug/kg	500	29	2	500	29	2	*	--	--	413	24	2
Pentachlorophenol	255	360	ug/kg	950	4	3	950	4	3	*	--	--	950	4	3
Phenanthrene	204	1,170	ug/kg	360	2	<1	360	2	<1	*	--	--	340	2	<1
Pyrene	195	1,520	ug/kg	310	2	<1	310	2	<1	*	--	--	310	2	<1
Aroclor 1254	60.0	300	ug/kg	94.0	2	<1	94.0	2	<1	*	--	--	94.0	2	<1
Total PCBs	40.0	676	ug/kg	94.0	2	<1	94.0	2	<1	*	--	--	500	13	1
Total PAHs	1,610	22,800	ug/kg	3,460	6	<1	9,985	6	<1	N/A	--	--	N/A	--	--
TEQ - Dioxins	8.50E-04	0.022	ug/kg	1.60E-05	<1	<1	0.001	2	<1	NA	--	--	NA	--	--

95 UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
NA - Not analyzed for due to lack of available data
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

Table A.36
Pond C-2 Hazard Quotients for Sediment ECOPCs

ECOPC	ESL	Alternative Toxicity Threshold	Units	MDC Surface Sediment HQs			MDC All Sediment HQs			95 UCL All Sediment HQs			C-Series Mean All Sediment HQs		
				MDC	ESL-HQ	AT-HQ	MDC	ESL-HQ	AT-HQ	95 UCL	ESL-HQ	AT-HQ	C-Series Mean	ESL-HQ	AT-HQ
Inorganics															
Aluminum	15,900	58,000	mg/kg	22,000	1	<1	22,000	1	<1	16,434	1	<1	17,181	1	<1
Arsenic	9.79	33.0	mg/kg	9.80	1	<1	9.80	1	<1	6.81	1	<1	6.02	1	<1
Barium	189	287	mg/kg	226	1	1	226	1	1	181	1	1	201	1	1
Copper	31.6	149	mg/kg	35.9	1	<1	35.9	1	<1	22.9	1	<1	21.5	1	<1
Iron	20,000	280,000	mg/kg	29,000	1	<1	29,000	<1	<1	21,617	1	<1	21,488	1	<1
Mercury	0.180	1.06	mg/kg	0.680	**4**	1	0.68	**4**	1	*	--	--	0.3	**2**	<1
Selenium	0.950	1.73	mg/kg	1.10	1	1	1.1	1	1	0.7	1	<1	2.0	**2**	1
Zinc	121	459	mg/kg	201	**2**	<1	201	**2**	<1	115.0	1	<1	93.8	1	<1
Total PAHs	1,610	22,800	ug/kg	ND	9	1	14,700	9	1	N/A	--	--	N/A	--	--

95 UCLs based on proxy values which include NDs at 1/2 DL.
HQ = Hazard Quotient, rounded to nearest whole number
Values in bold indicate HQs > 1
ND - Not Detected in this media
NA - Not analyzed for due to lack of available data
* If the 95 UCL was > MDC, HQs were not calculated for the 95 UCL.

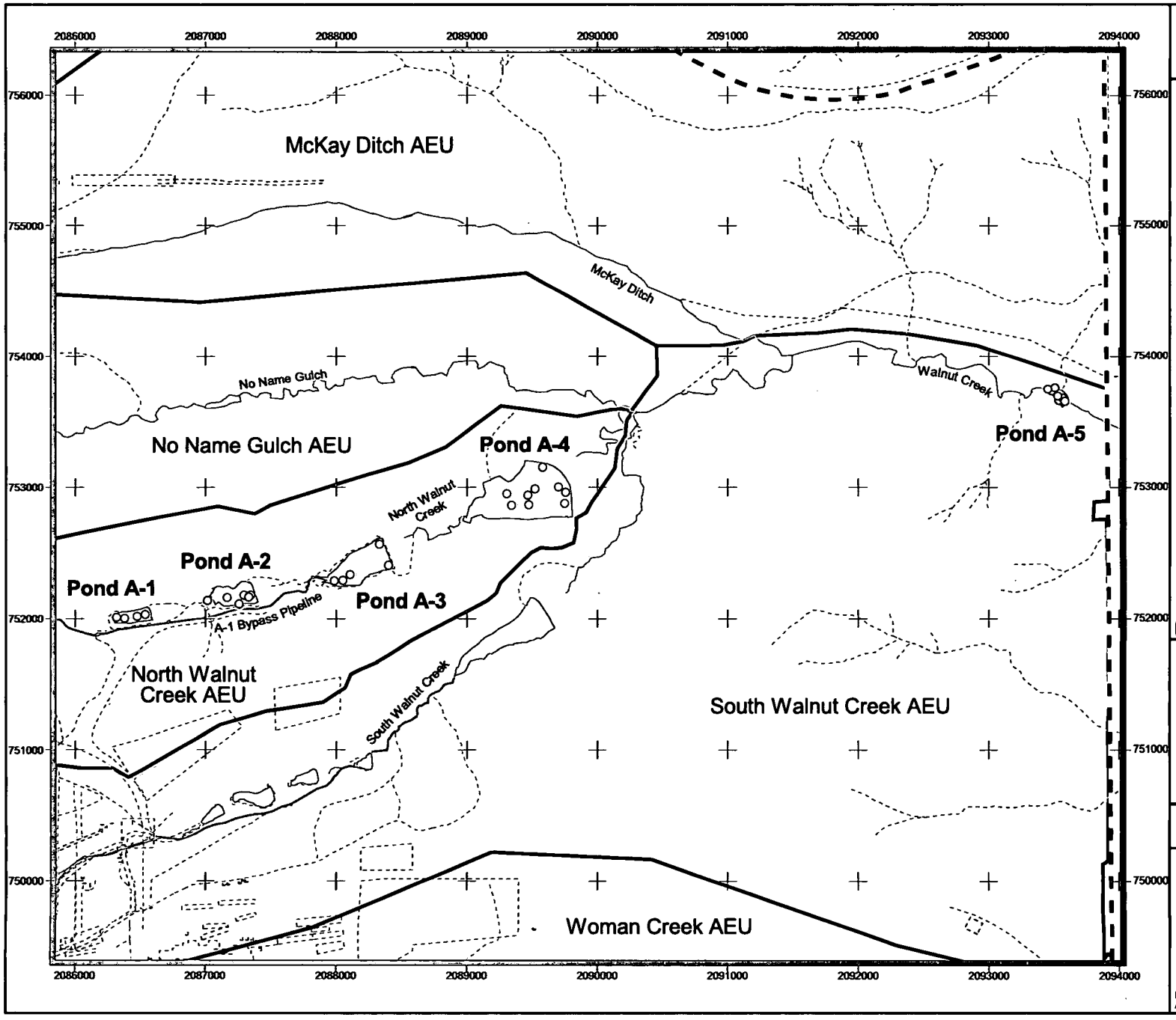

Figure A.1
A Ponds
Surface Sediment Results
for Aluminum

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 15900 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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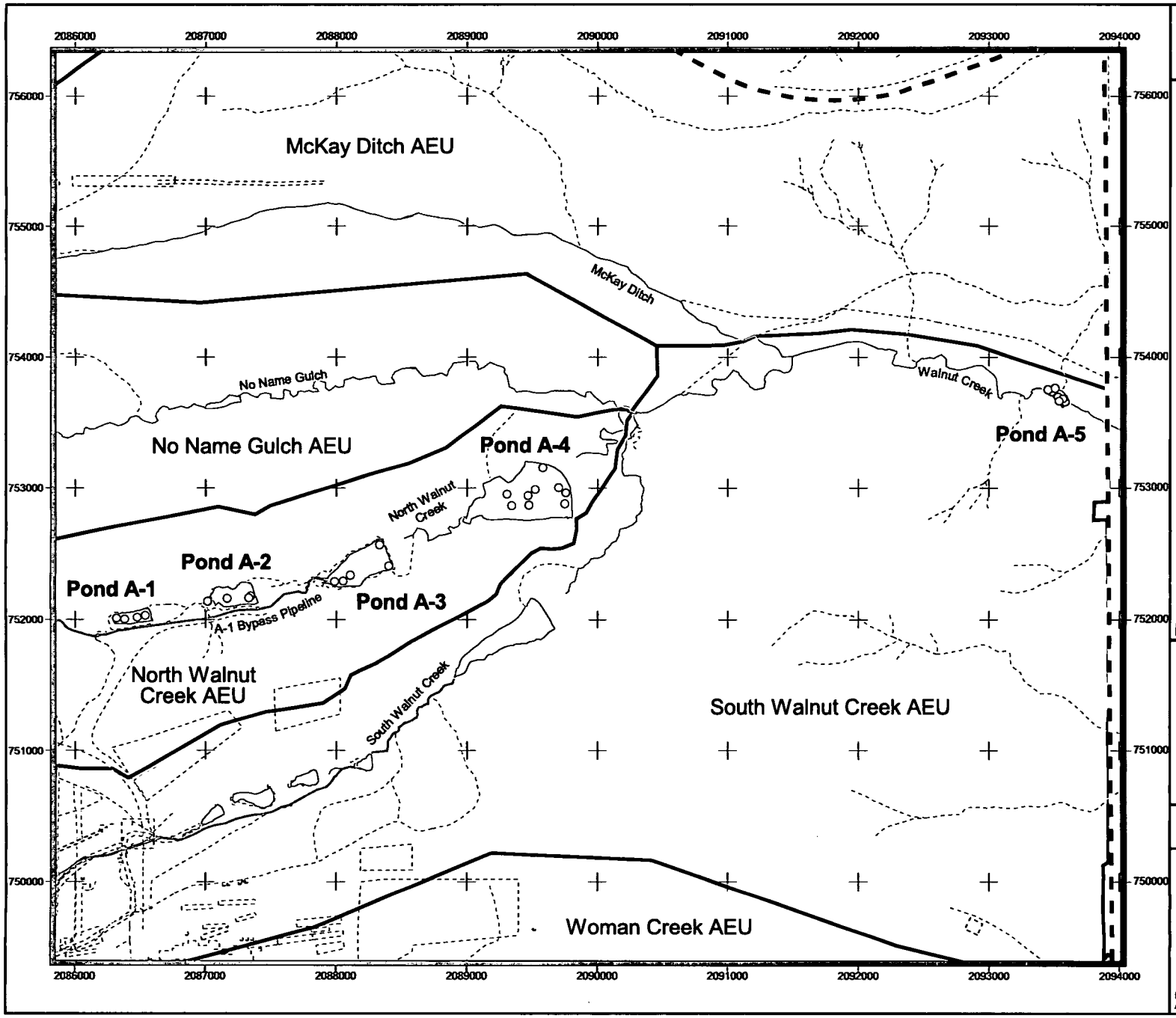

Figure A.2
A Ponds
Surface Sediment Results
for Antimony

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 2 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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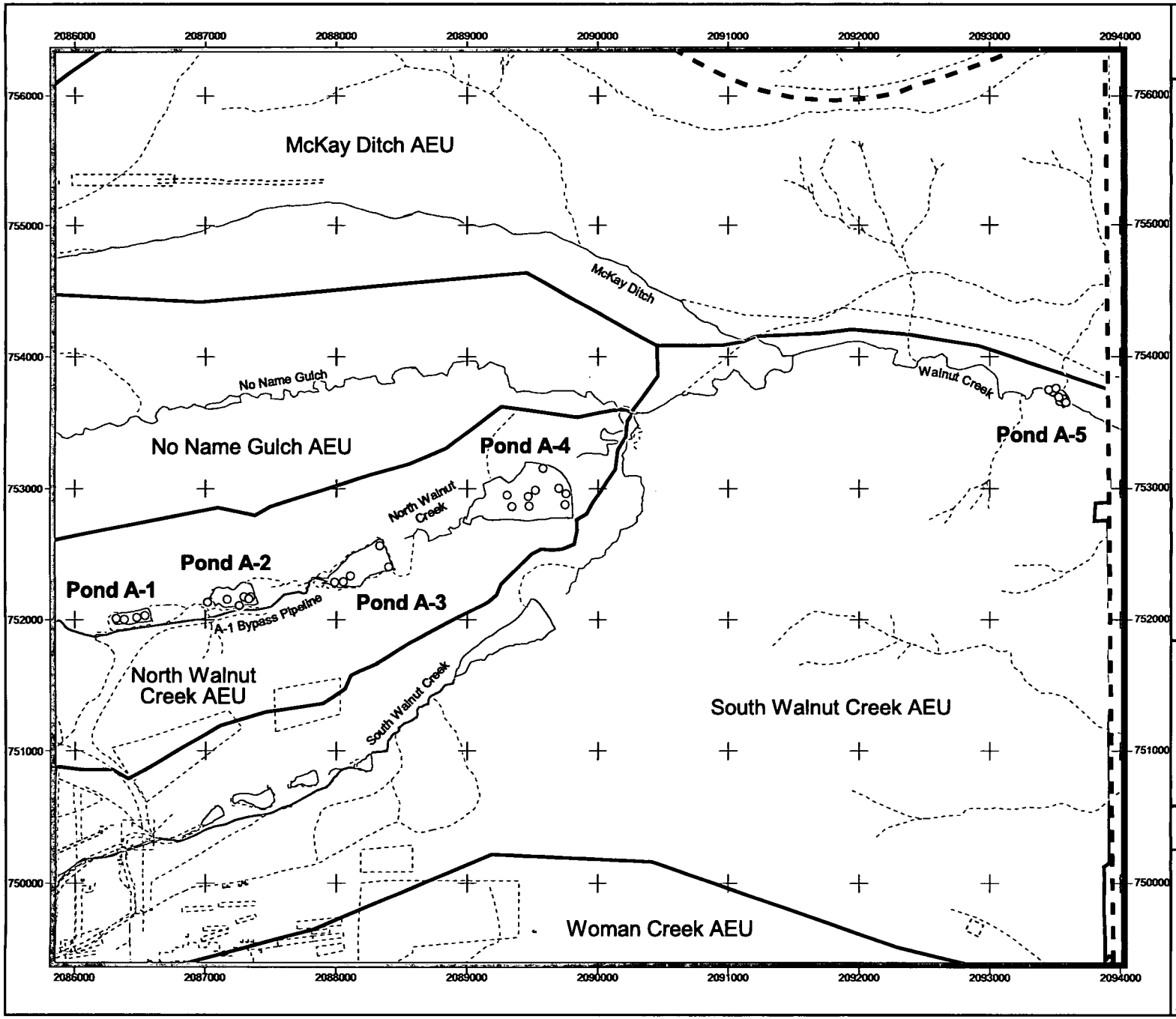

Figure A.3
A Ponds
Surface Sediment Results
for Arsenic

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 9.79 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
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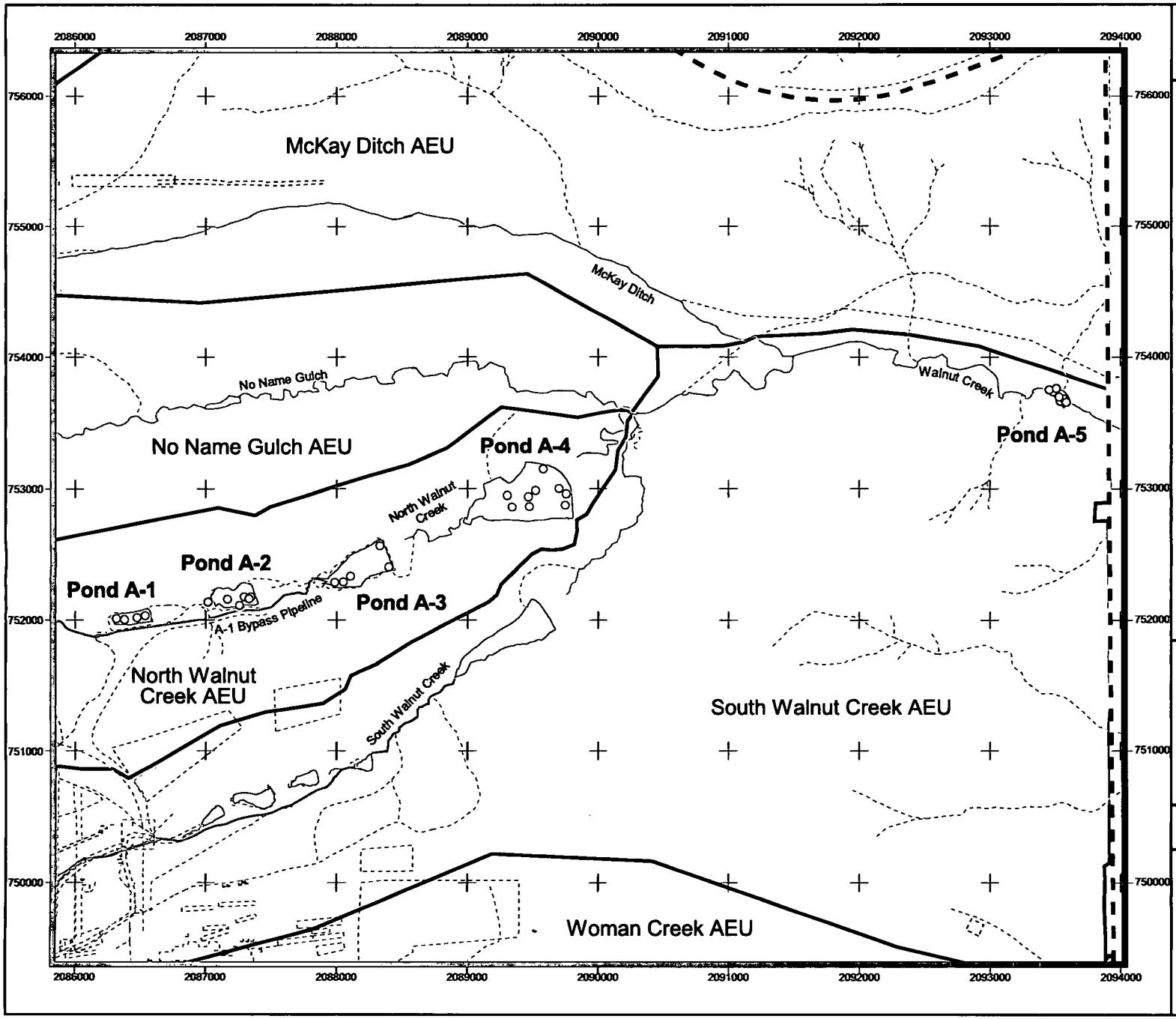

Figure A.4
A Ponds
Surface Sediment Results
for Barium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 189 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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274

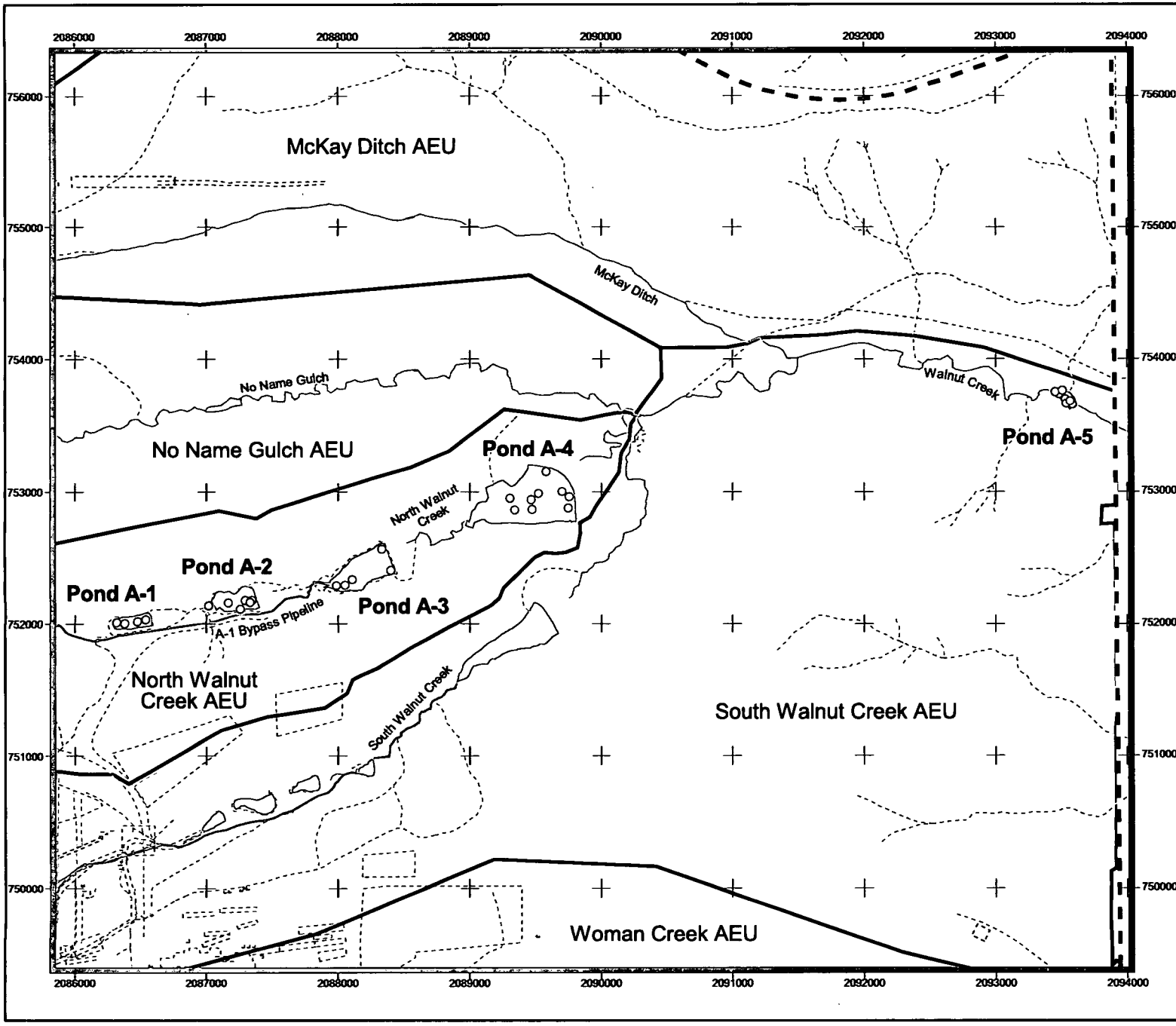

Figure A.5
A Ponds
Surface Sediment Results
for Cadmium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.99 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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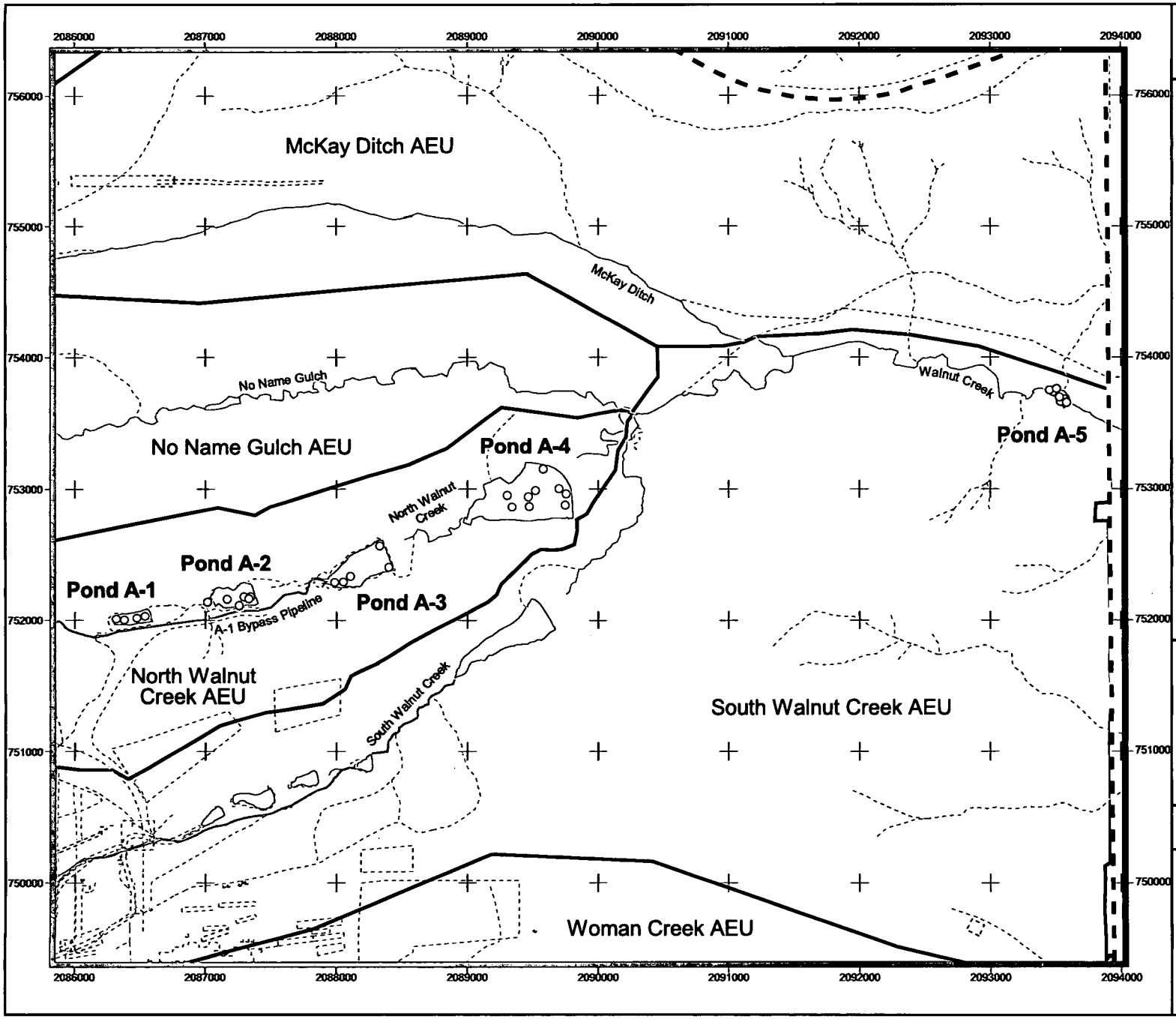

Figure A.6
A Ponds
Surface Sediment Results
for Chromium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 43.4 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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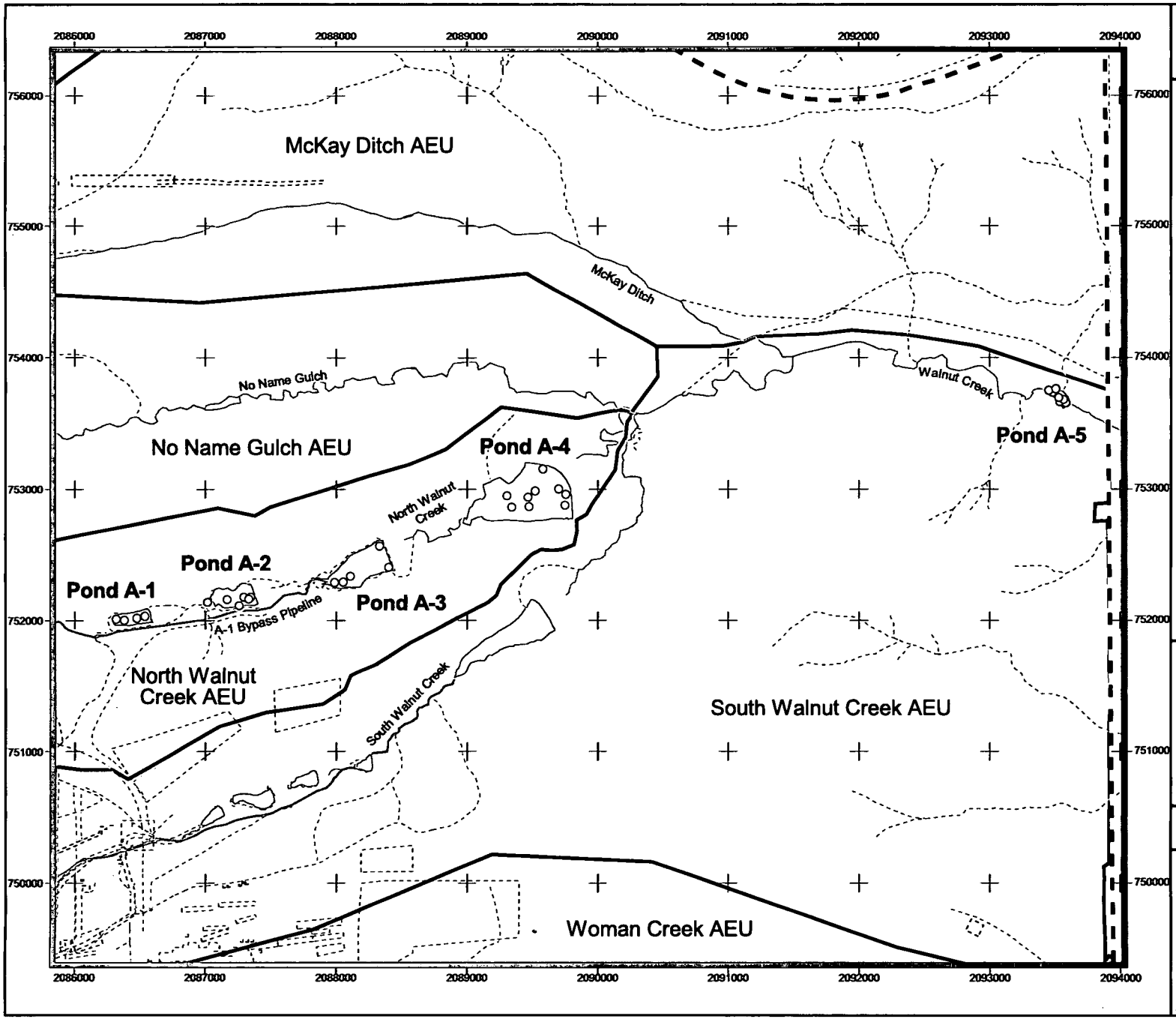

Figure A.7
A Ponds
Surface Sediment Results
for Copper

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 31.6 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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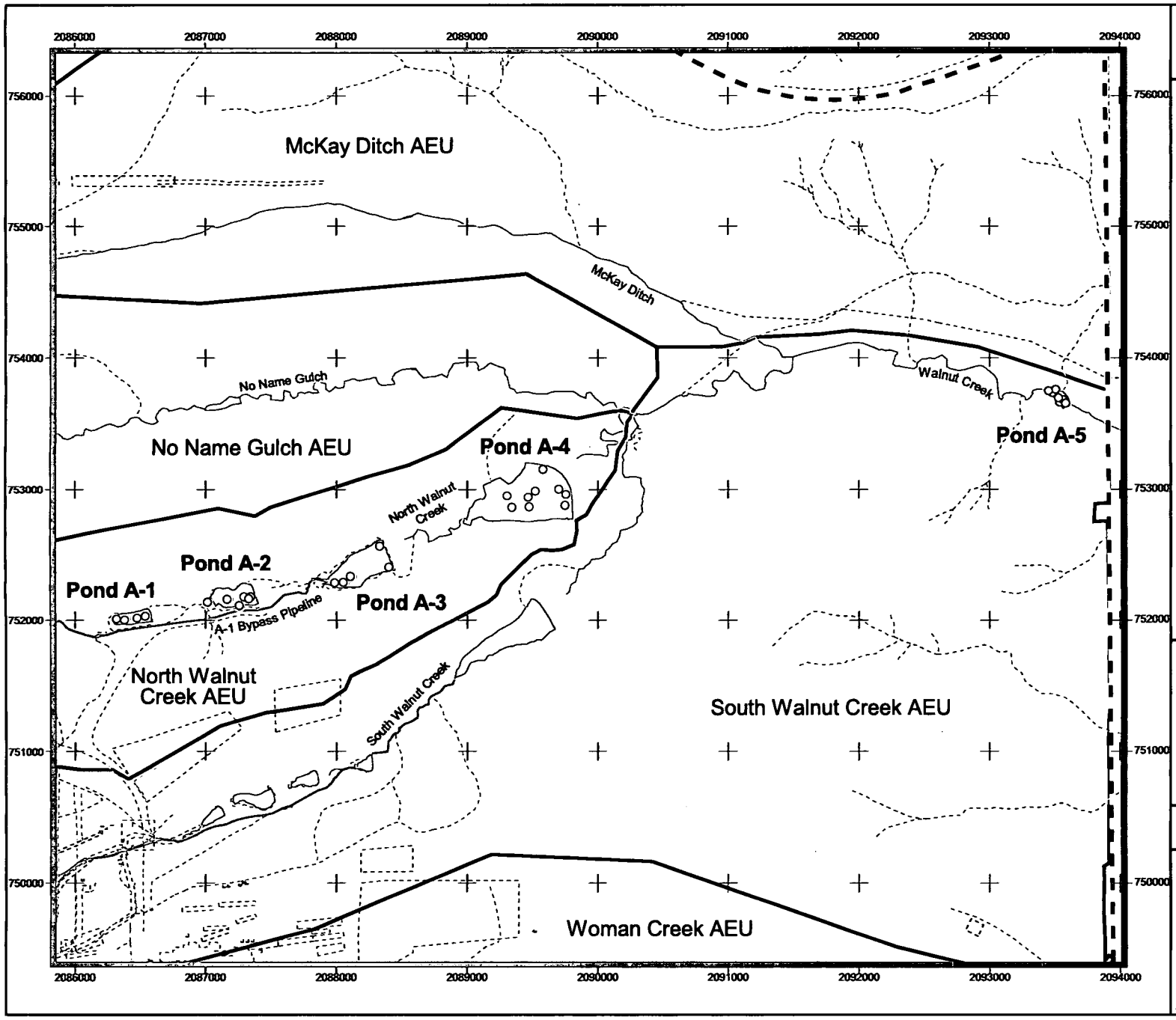

Figure A.8
A Ponds
Surface Sediment Results
for Iron

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 20000 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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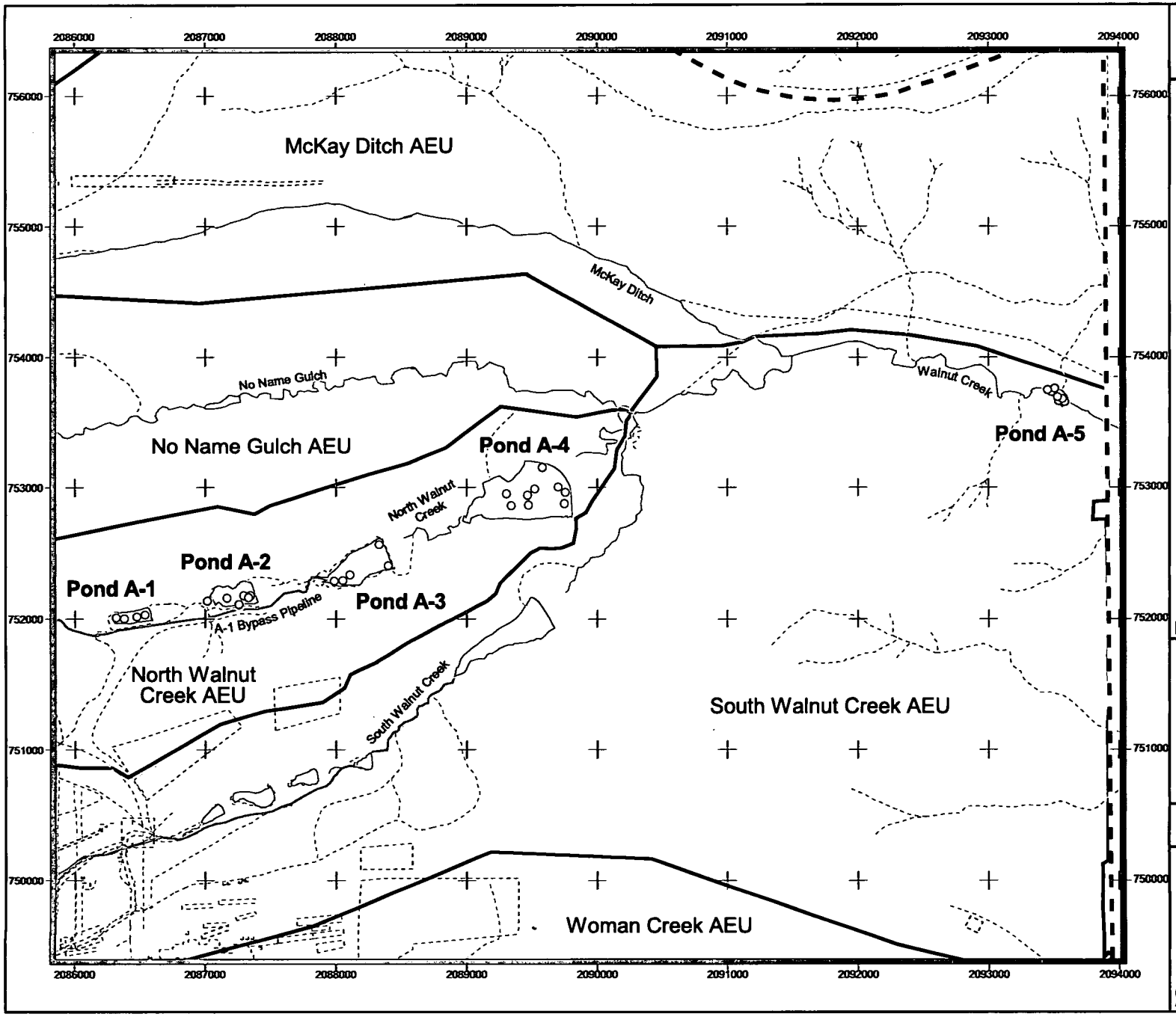

Figure A.9
A Ponds
Surface Sediment Results
for Lead

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 35.8 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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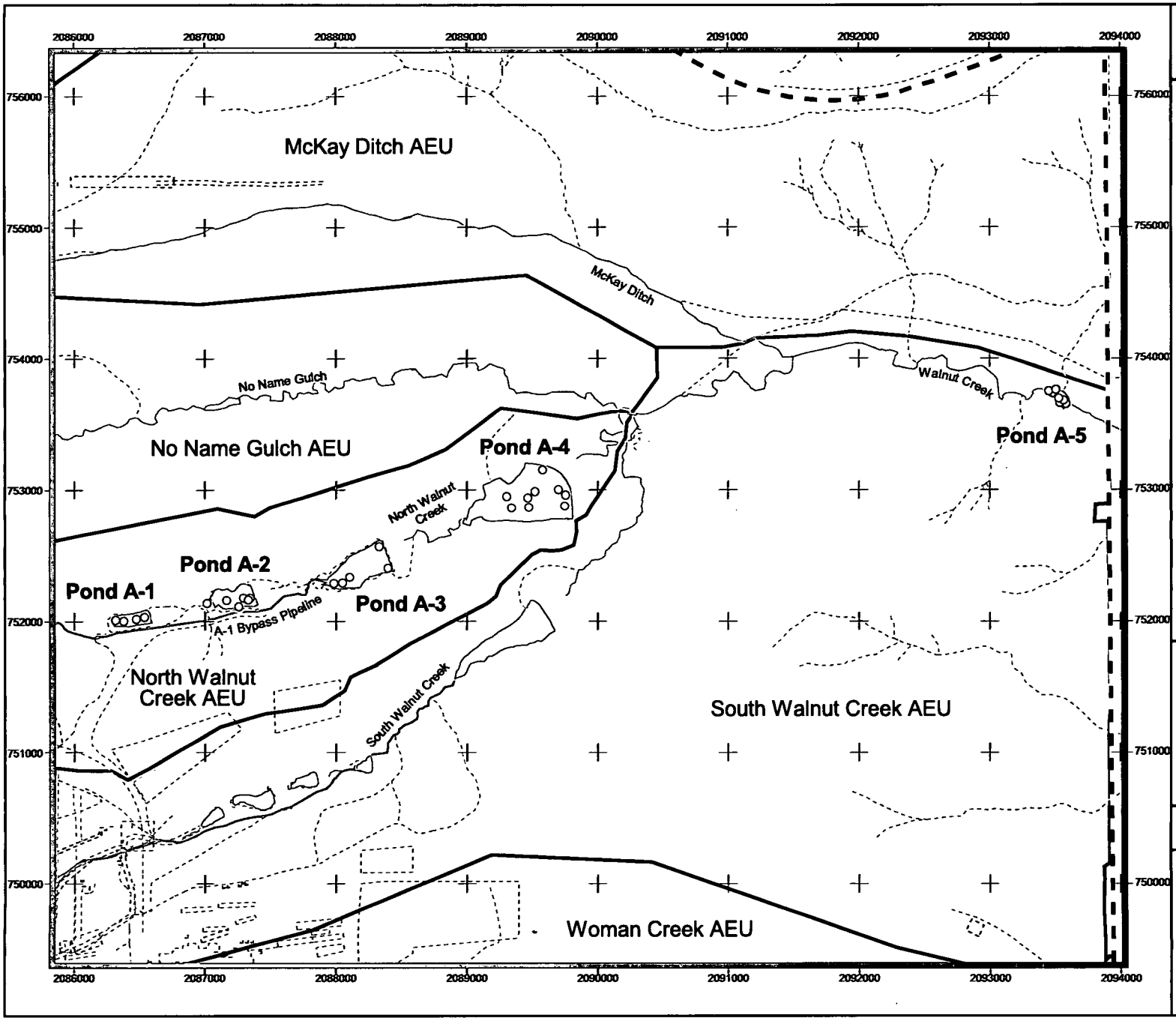

Figure A.10
A Ponds
Surface Sediment Results
for Manganese

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 630 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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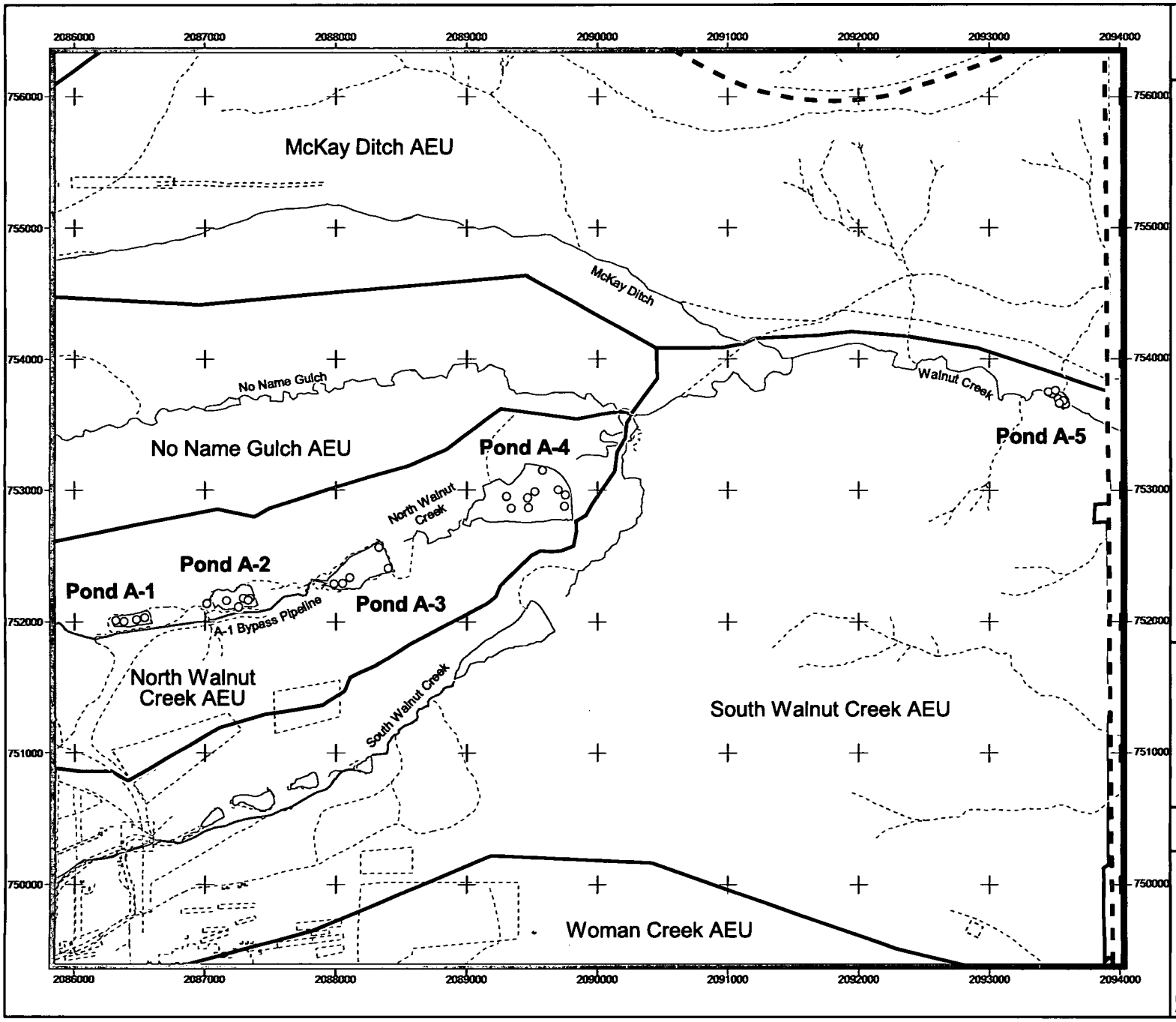

Figure A.11
A Ponds
Surface Sediment Results
for Mercury

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.18 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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KAISER-HILL COMPANY

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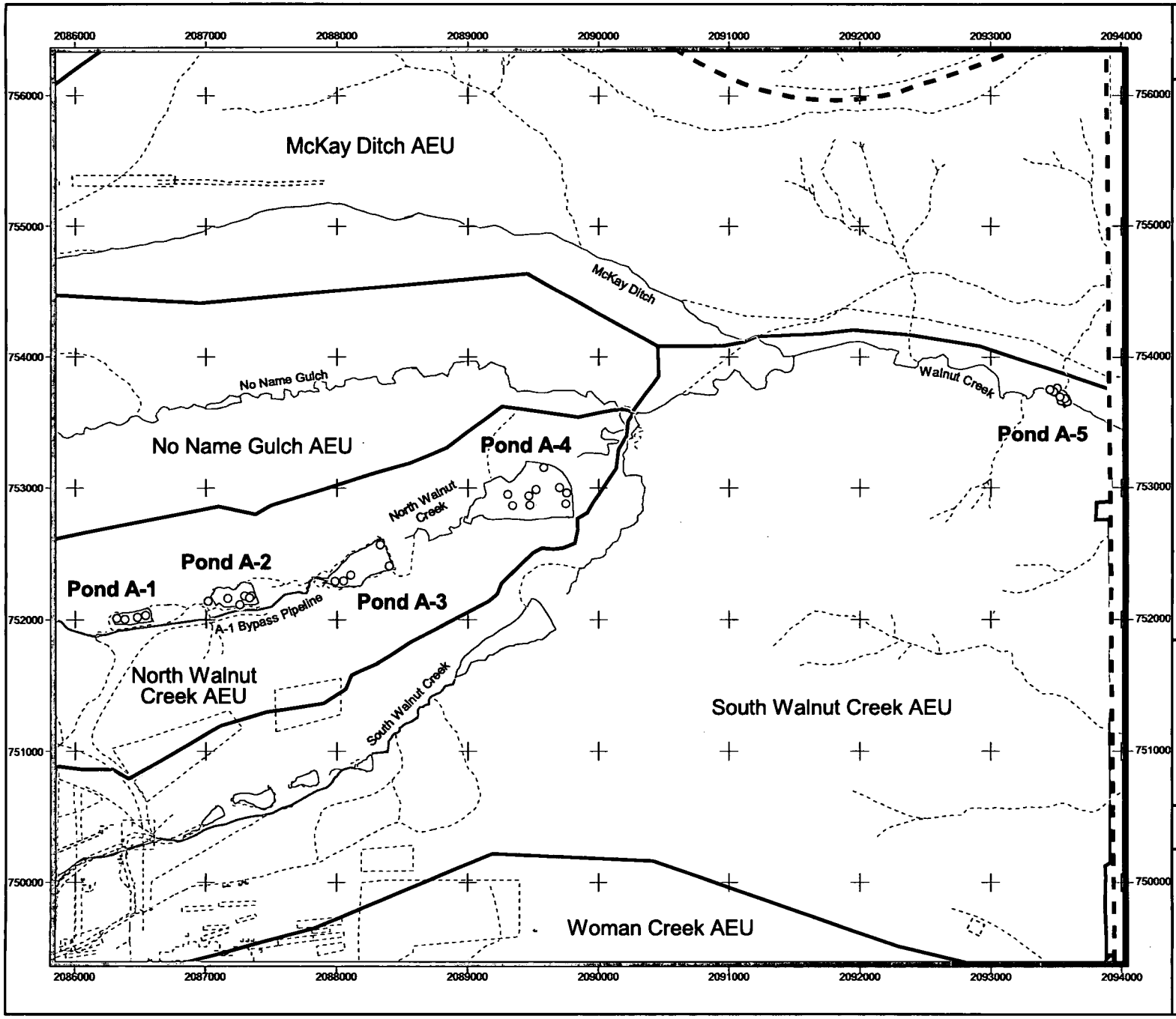

Figure A.12
A Ponds
Surface Sediment Results
for Nickel

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 22.7 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

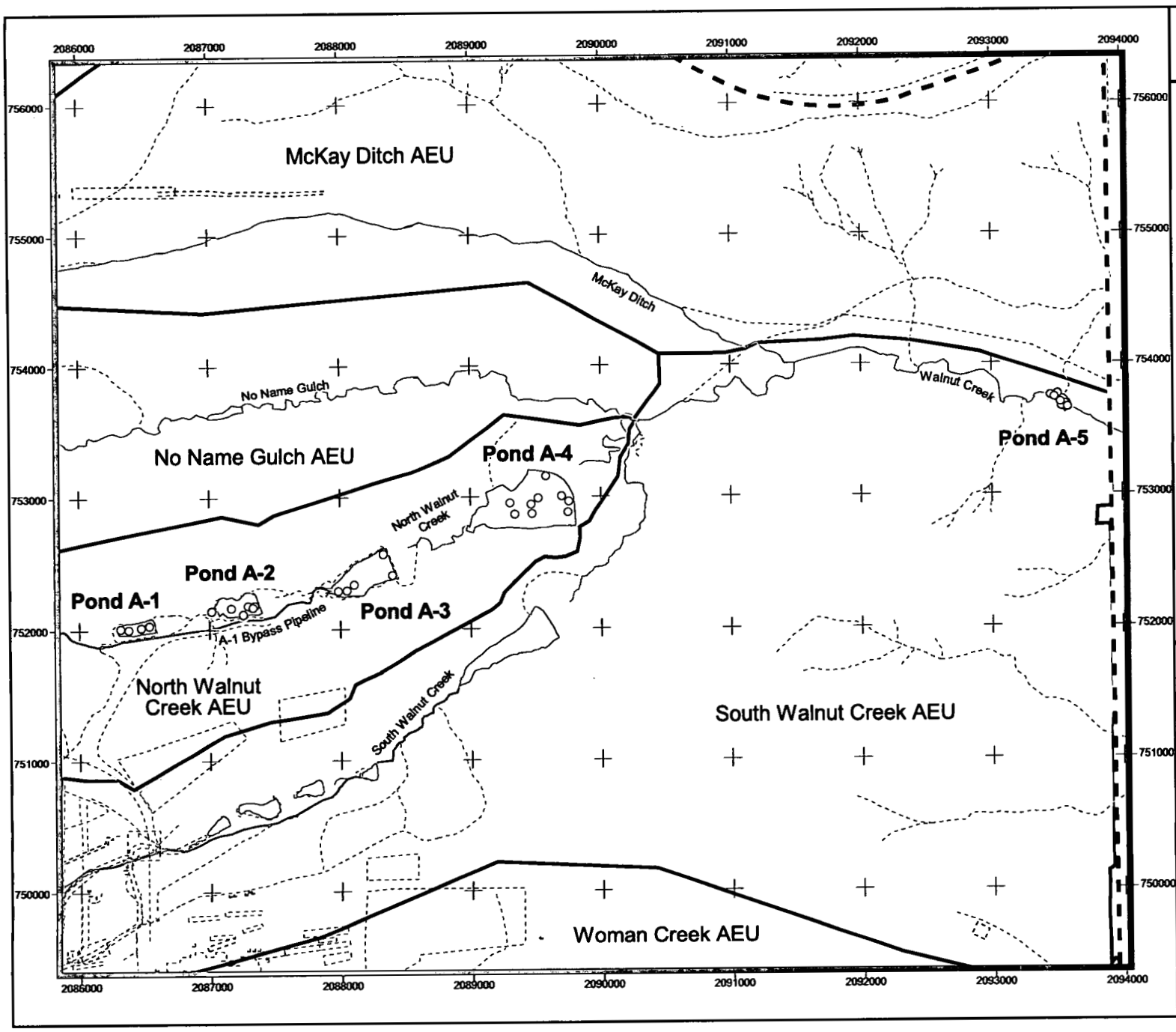

Figure A.13
A Ponds
Surface Sediment Results
for Selenium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.95 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for: KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

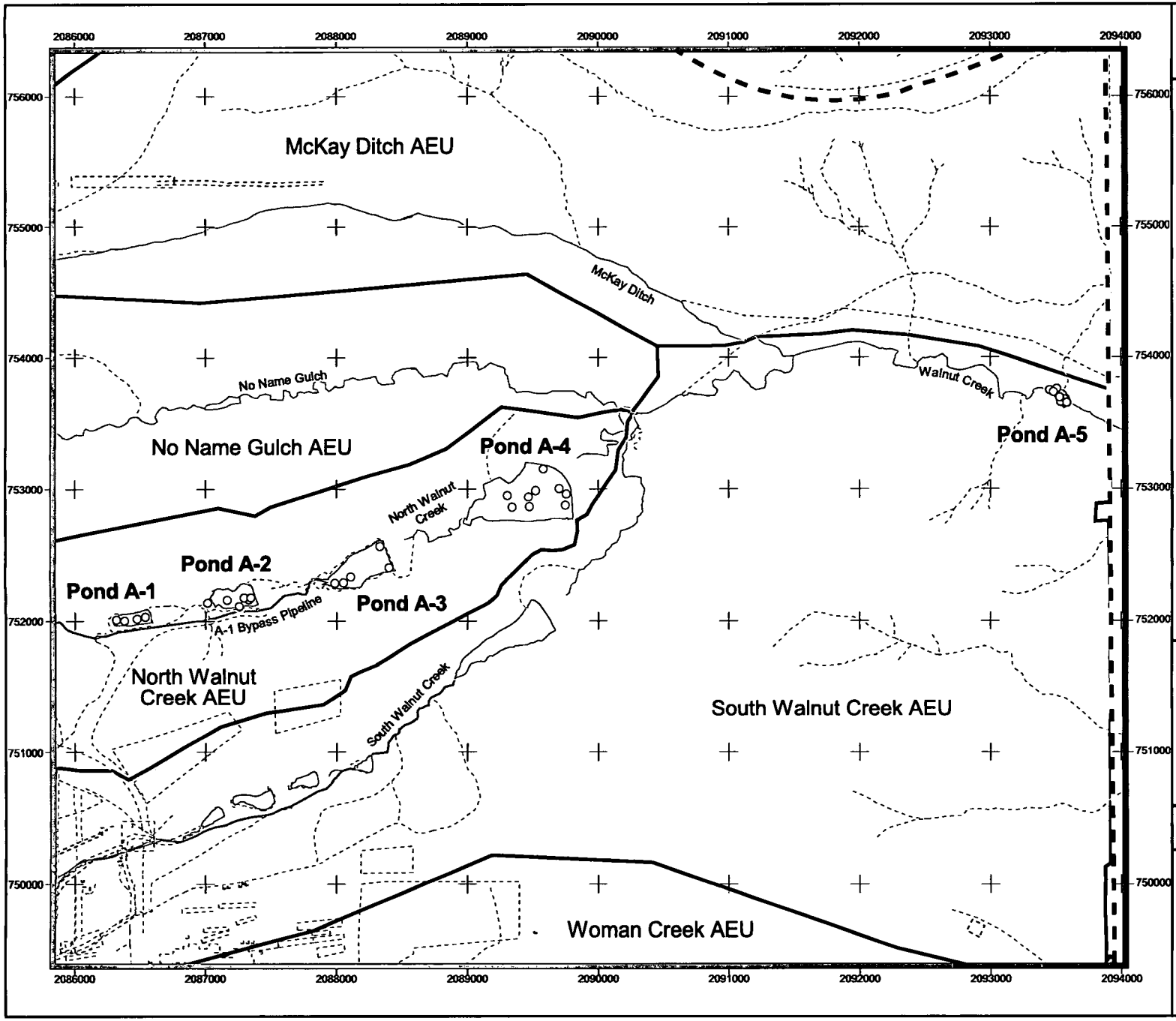

Figure A.14
A Ponds
Surface Sediment Results
for Silver

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 1 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

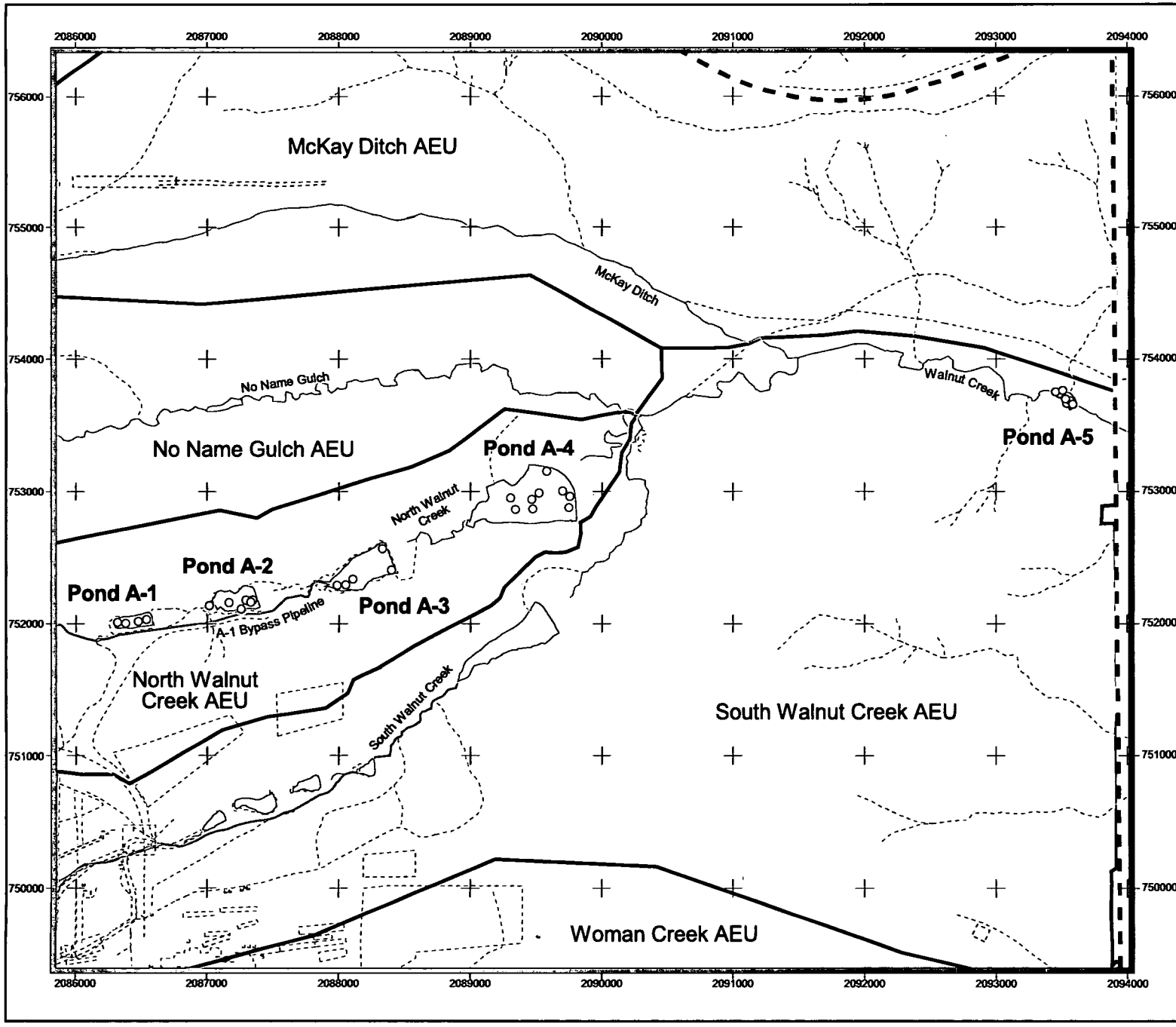

Figure A.15
A Ponds
Surface Sediment Results
for Zinc

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 121 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

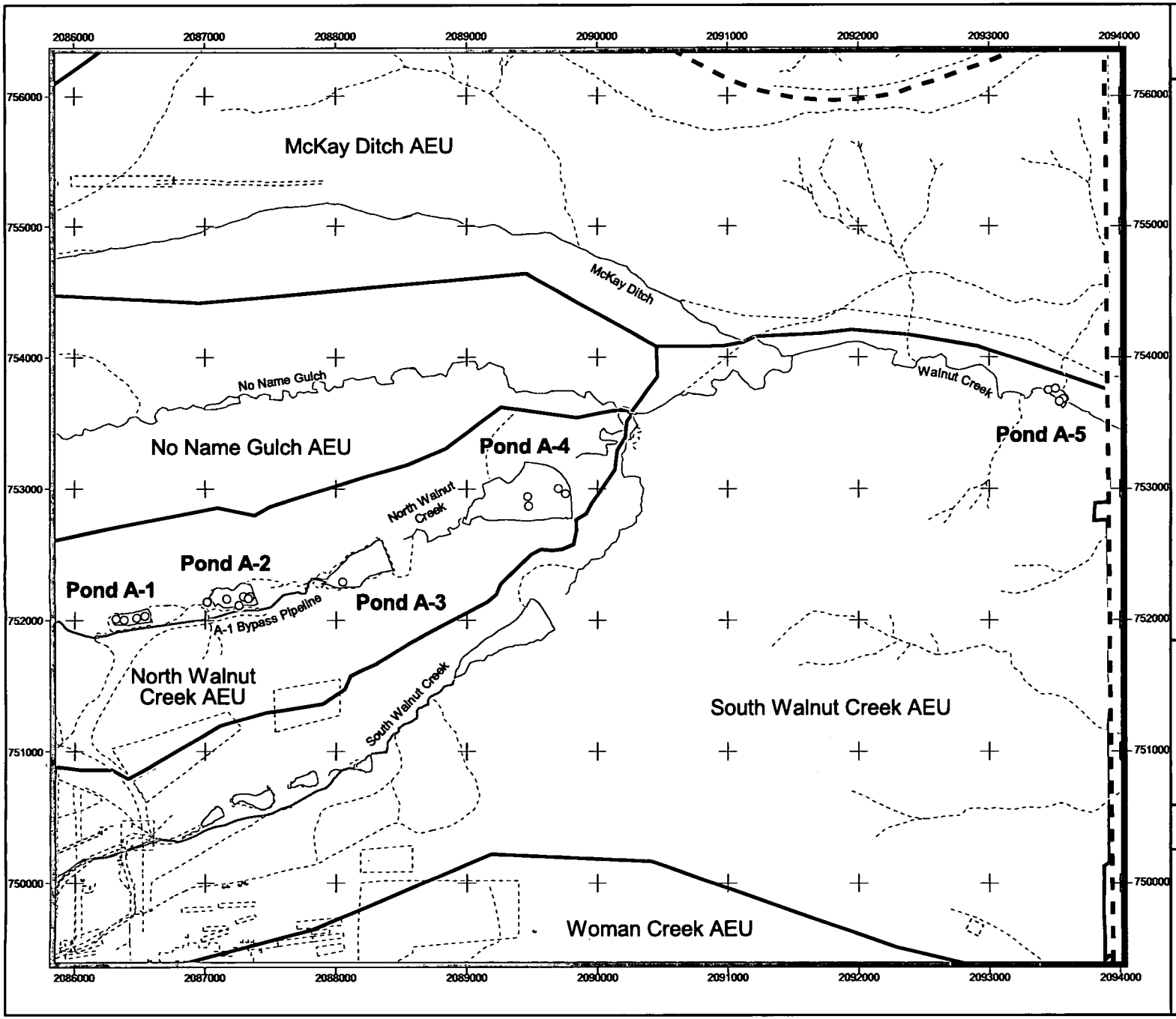

Figure A.16
A Ponds
Surface Sediment Results
for Acenaphthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 6.71 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

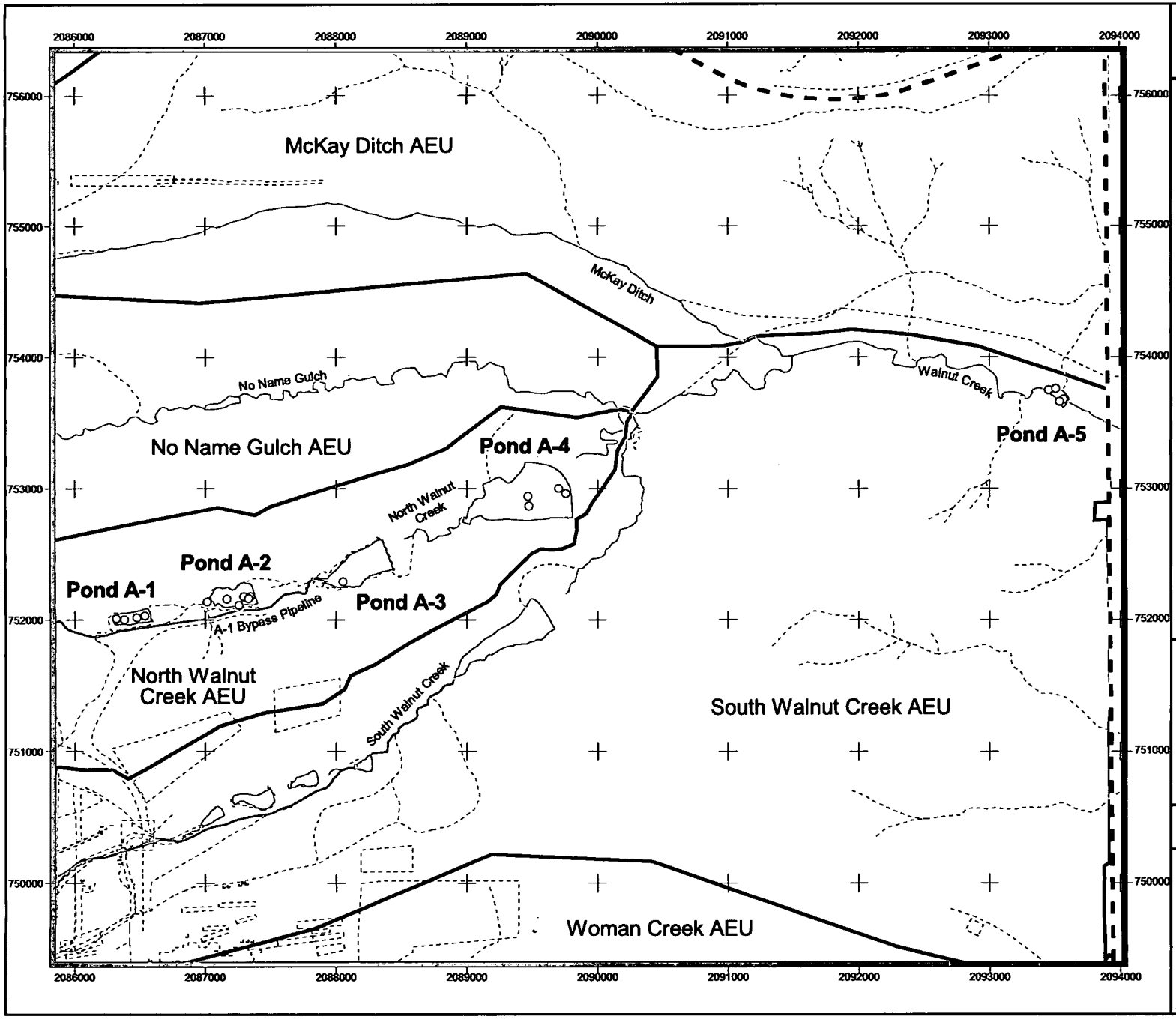

Figure A.17
A Ponds
Surface Sediment Results
for Anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 57.2 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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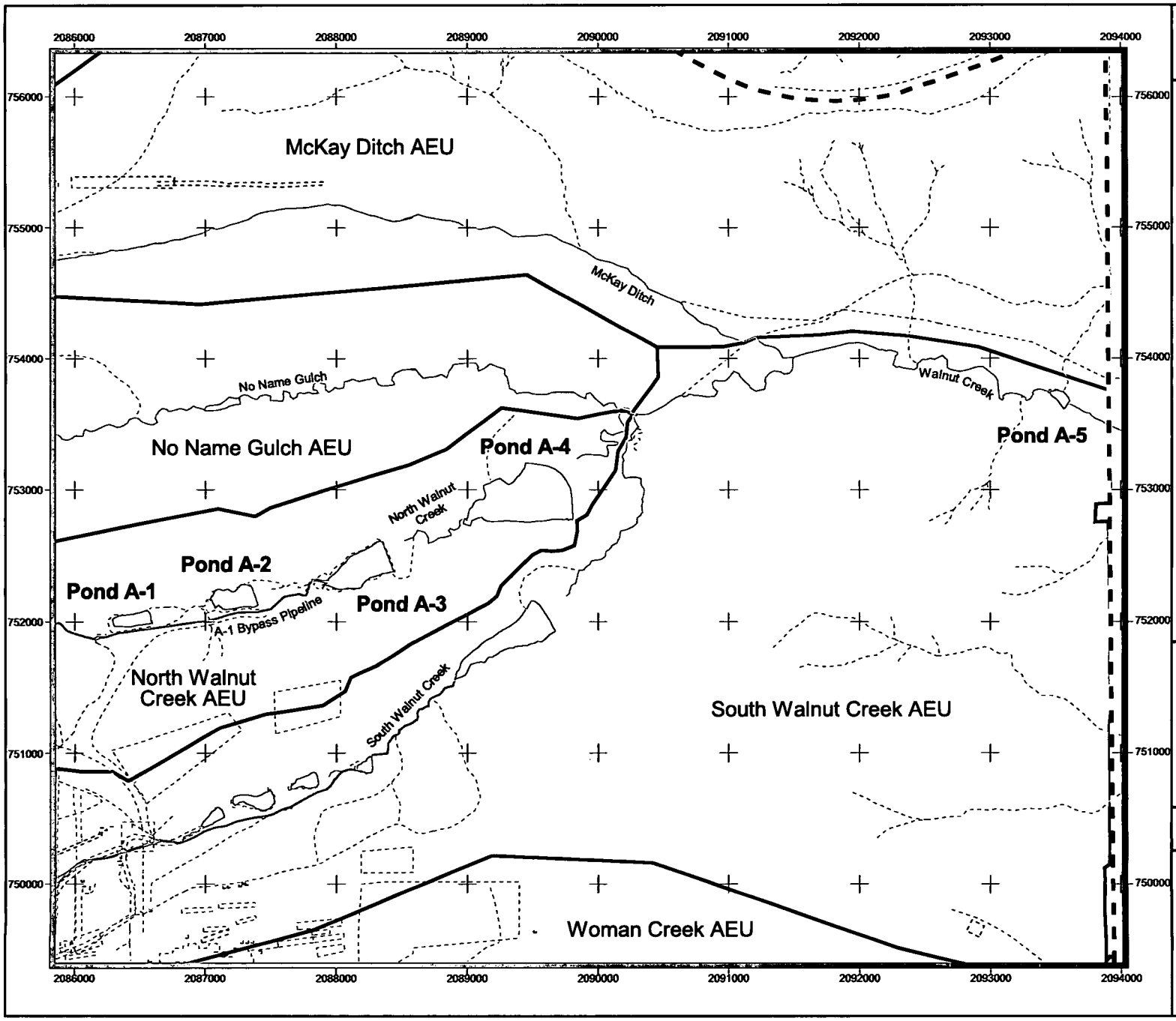

Figure A.18
A Ponds
Surface Sediment Results
for Atrazine

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 16.8192 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

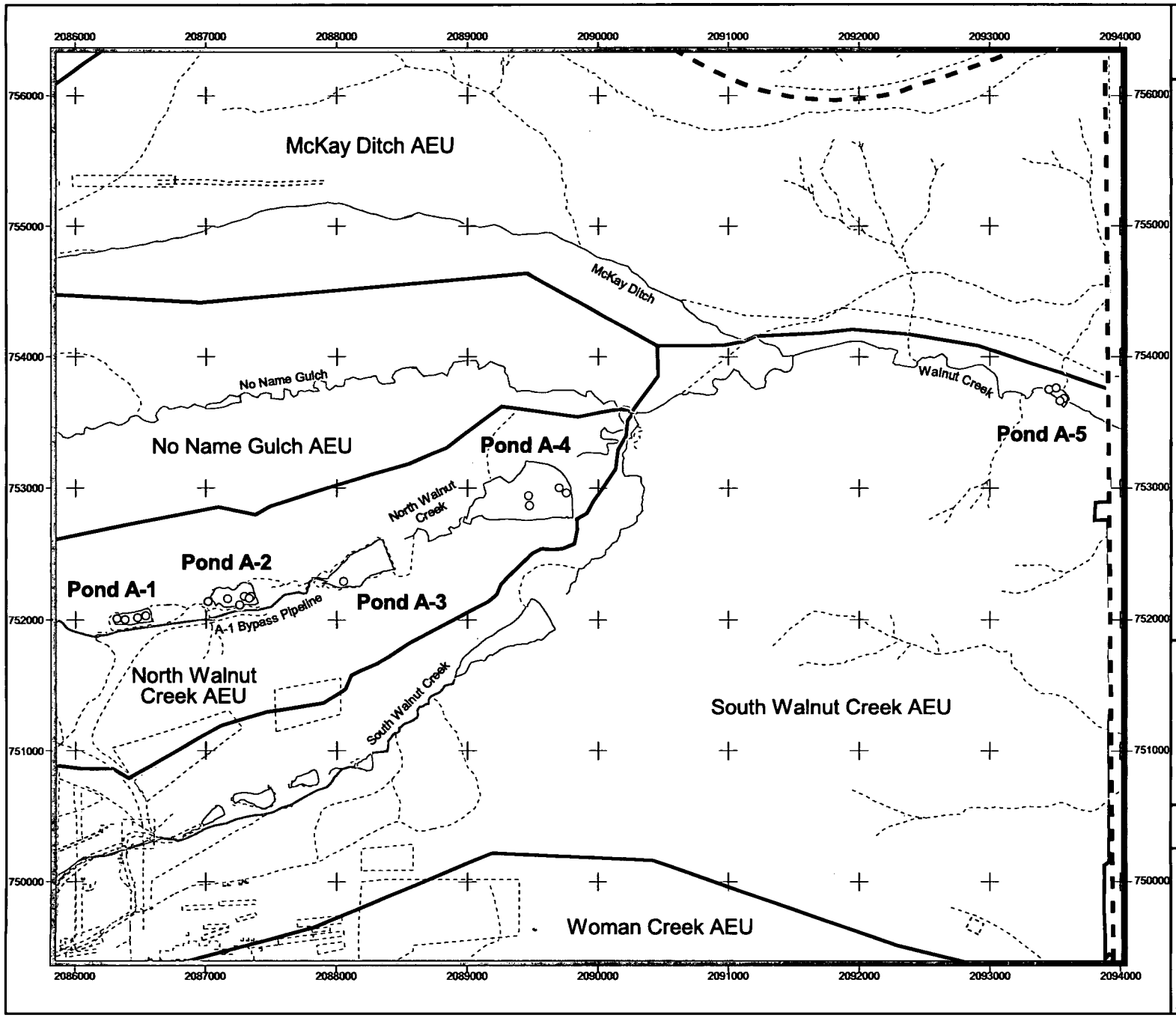

Figure A.19
A Ponds
Surface Sediment Results
for Benzo(a)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 108 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

Prepared for:

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

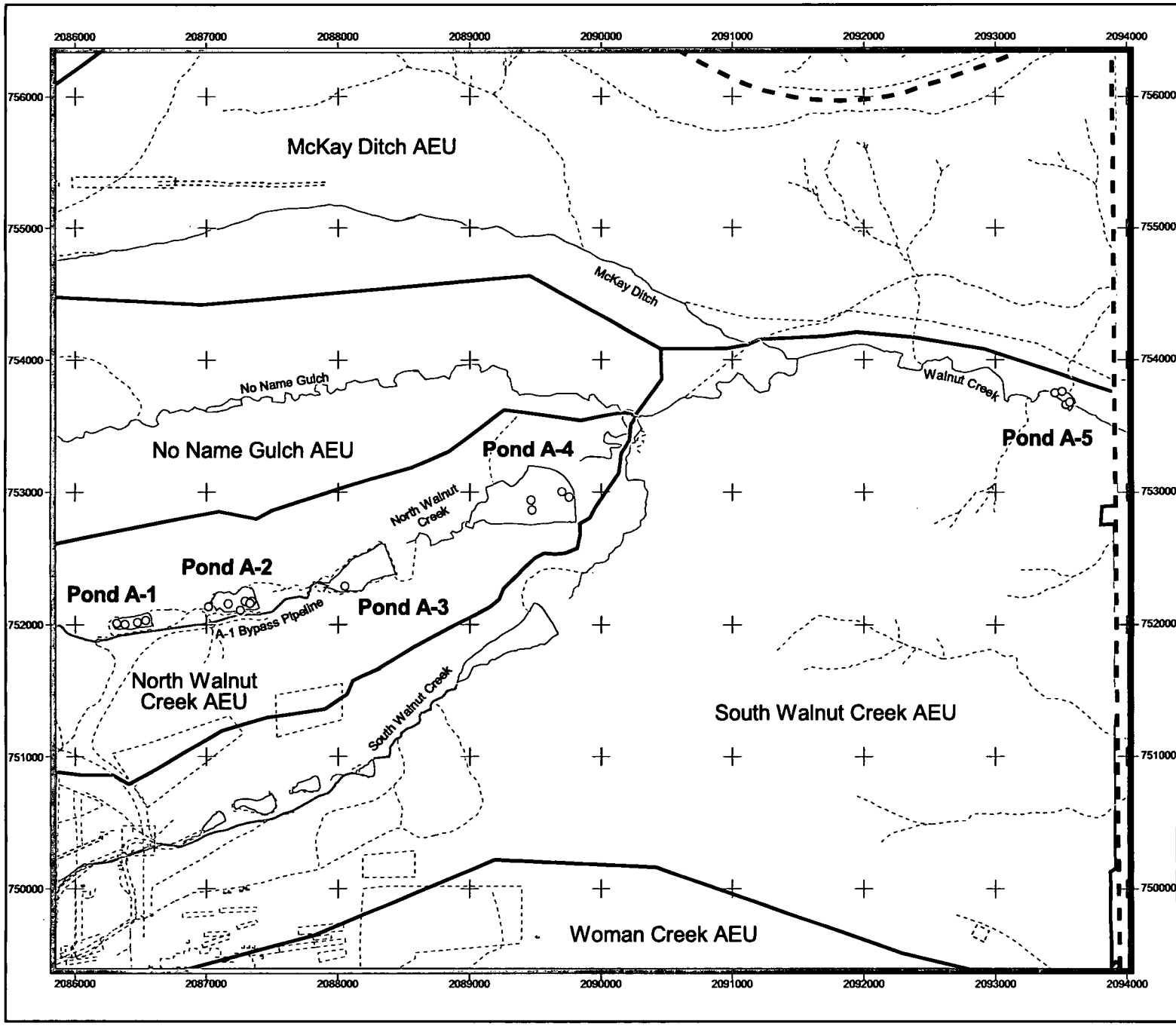

Figure A.20
A Ponds
Surface Sediment Results
for Benzo(a)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 150 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

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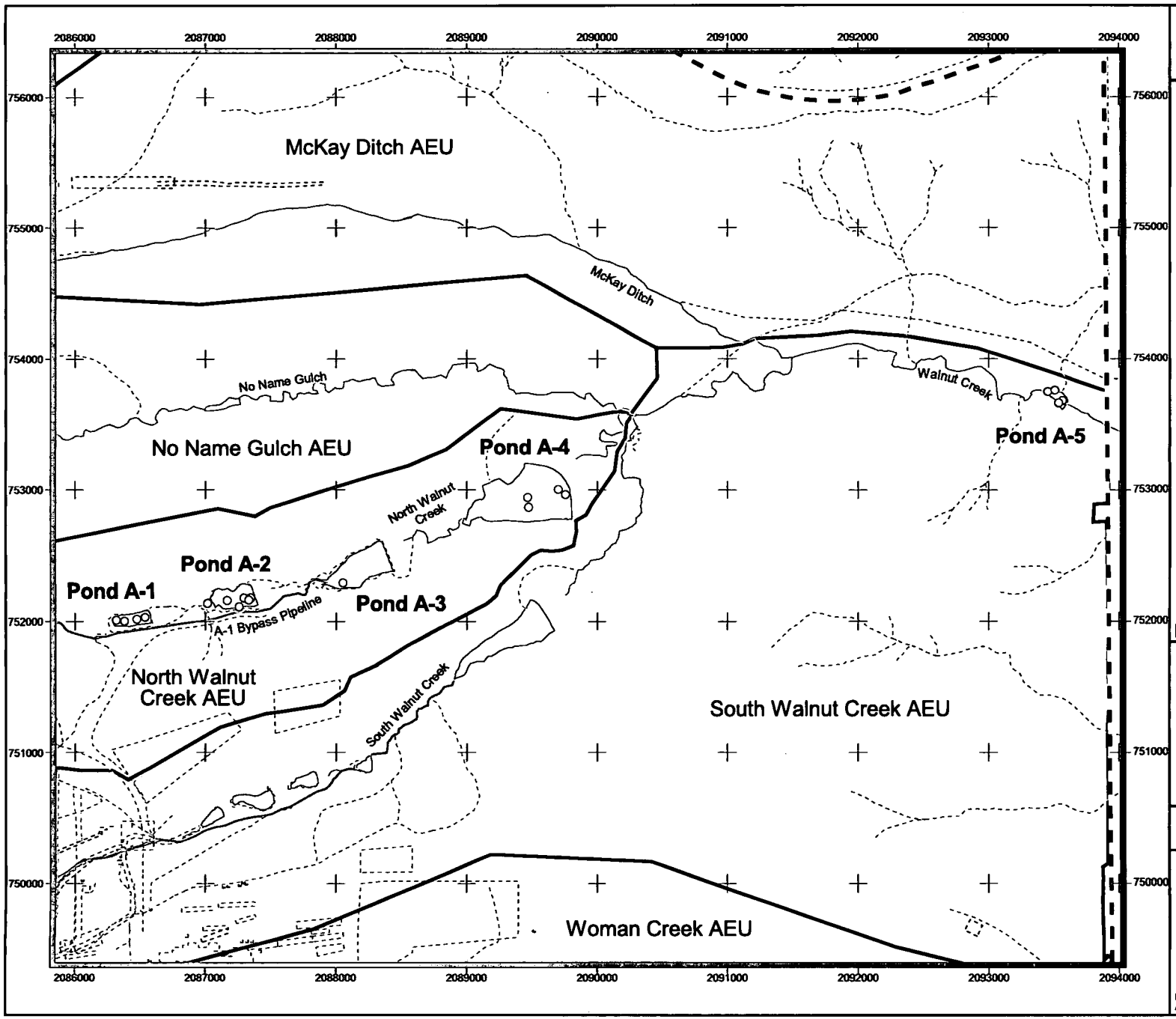

Figure A.21
A Ponds
Surface Sediment Results
for Benzo(g,h,i)perylene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 13 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

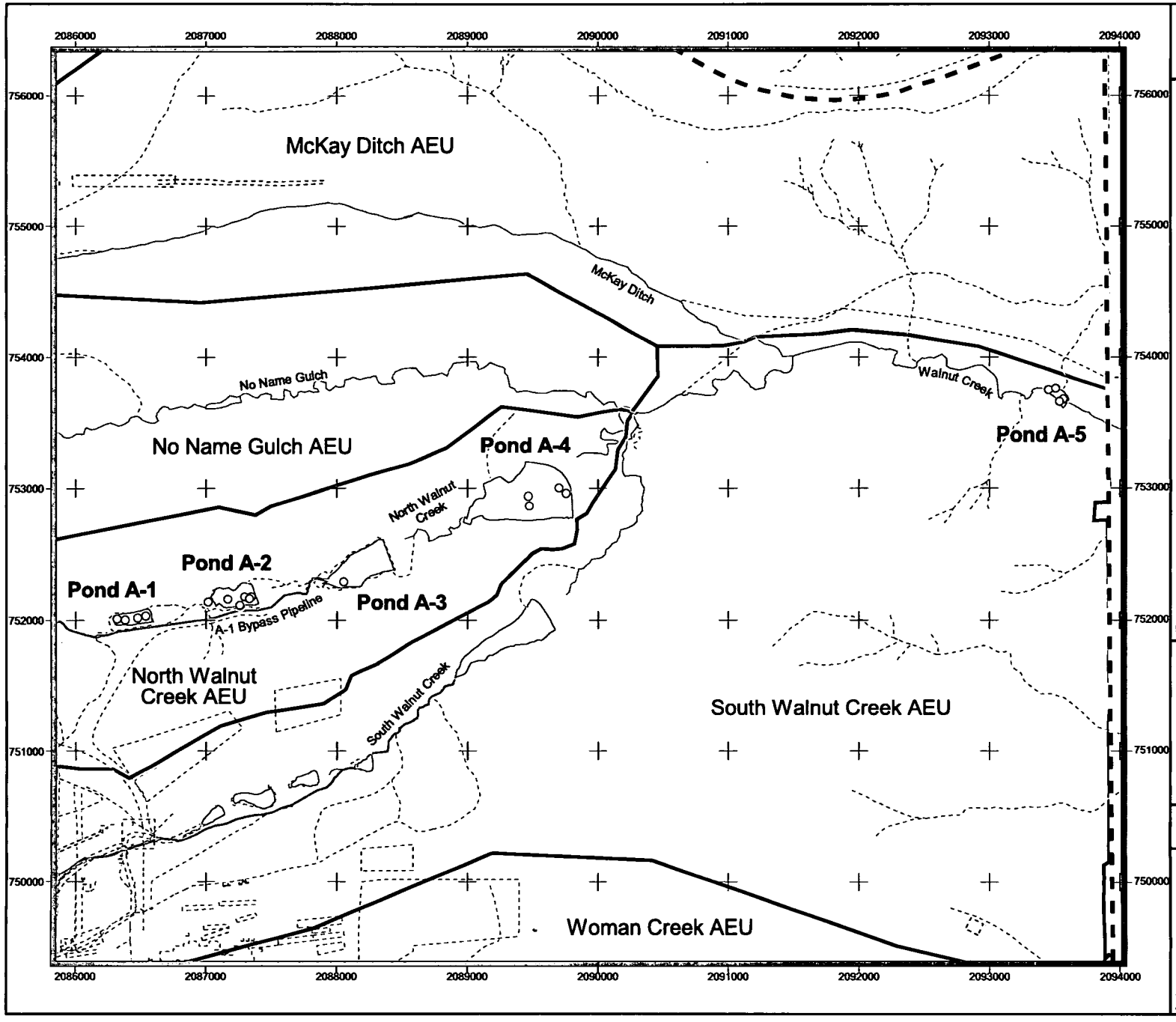

Figure A.22
A Ponds
Surface Sediment Results
for bis(2-ethylhexyl)phthalate

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 24900 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

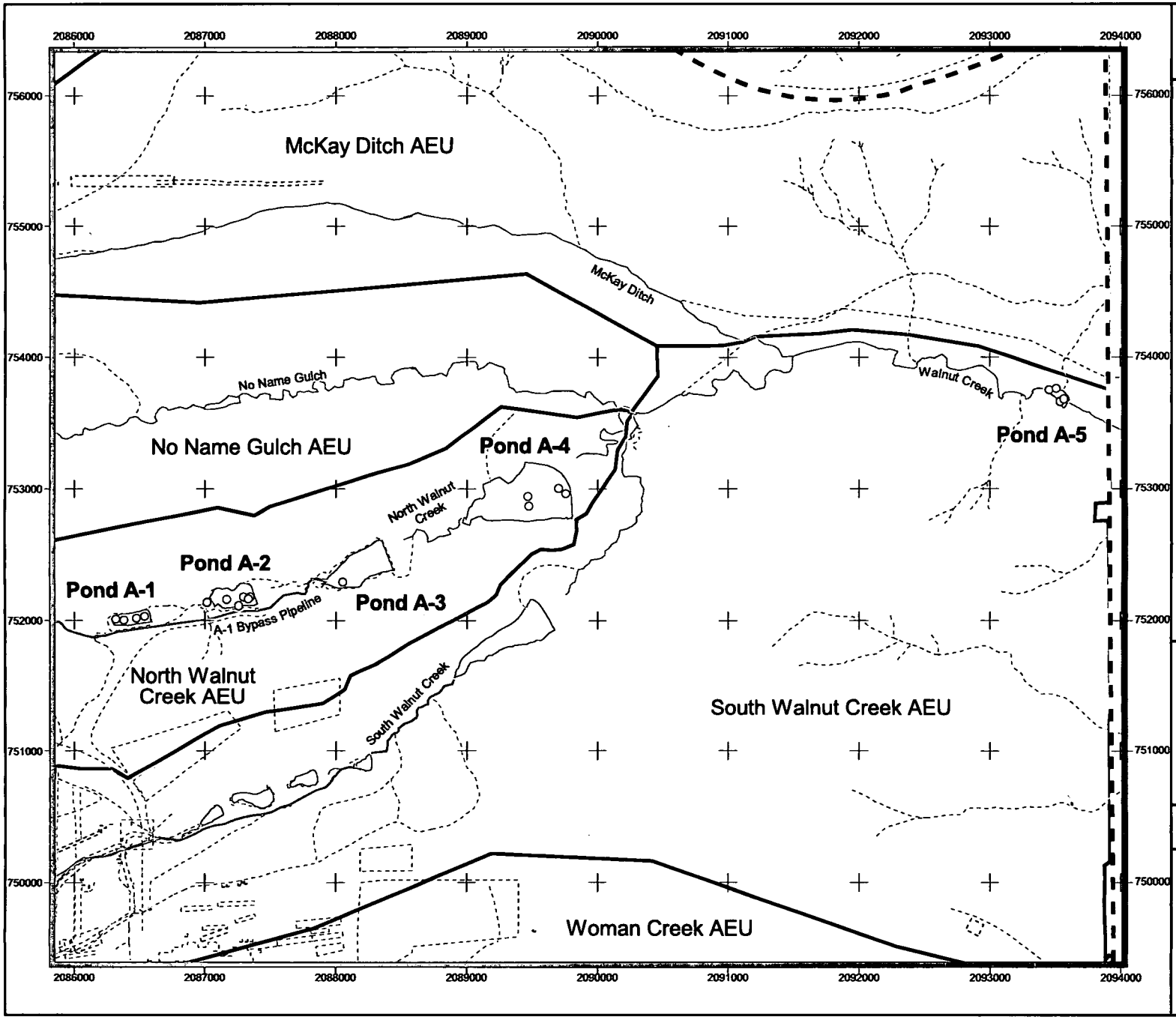

Figure A.23
A Ponds
Surface Sediment Results
for Chrysene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 166 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

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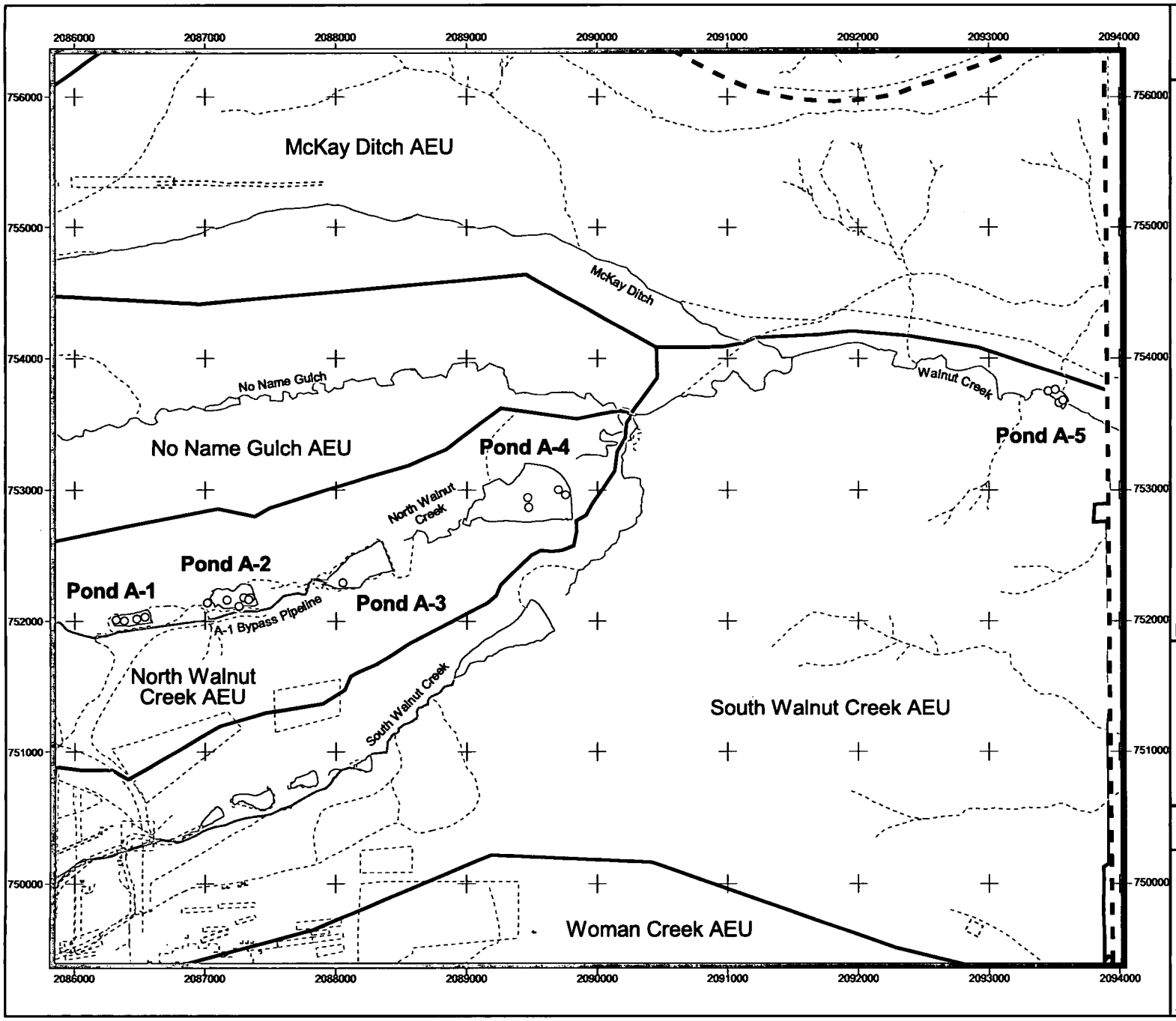

Figure A.24
A Ponds
Surface Sediment Results
for Fluoranthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 423 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

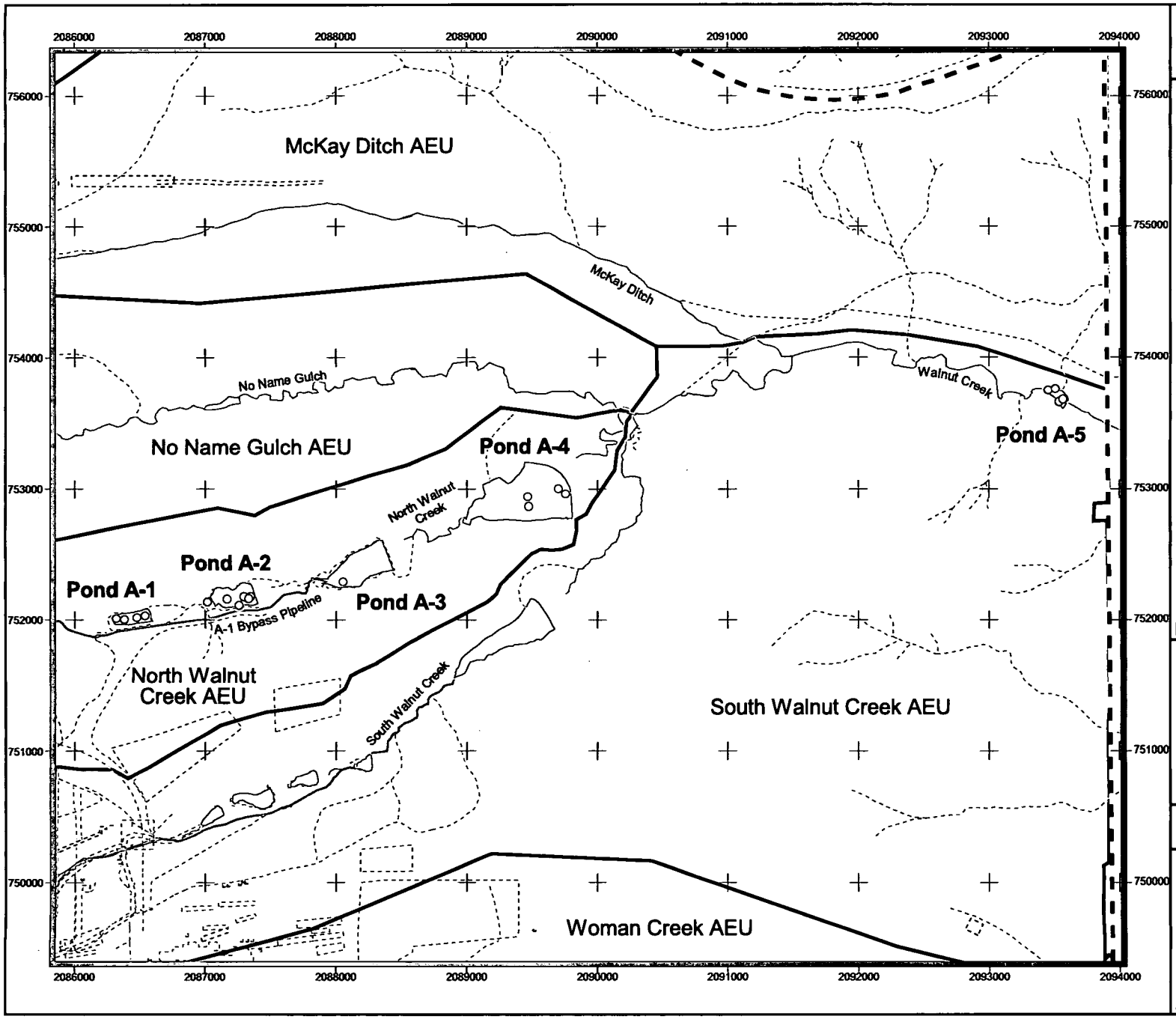

Figure A.25
A Ponds
Surface Sediment Results
for Indeno(1,2,3-cd)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 17 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

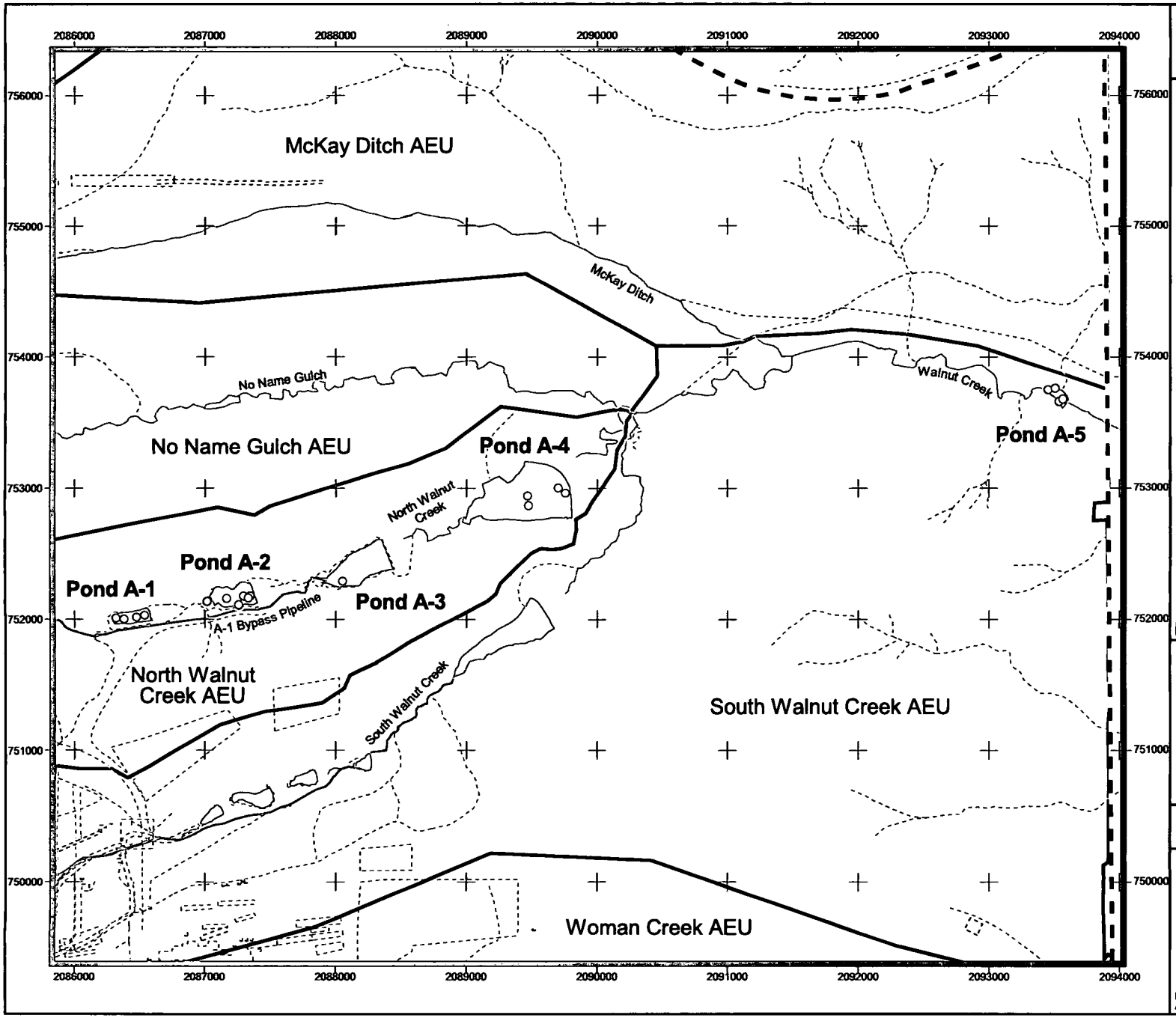

Figure A.26
A Ponds
Surface Sediment Results
for Phenanthrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 204 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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KAISER•HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

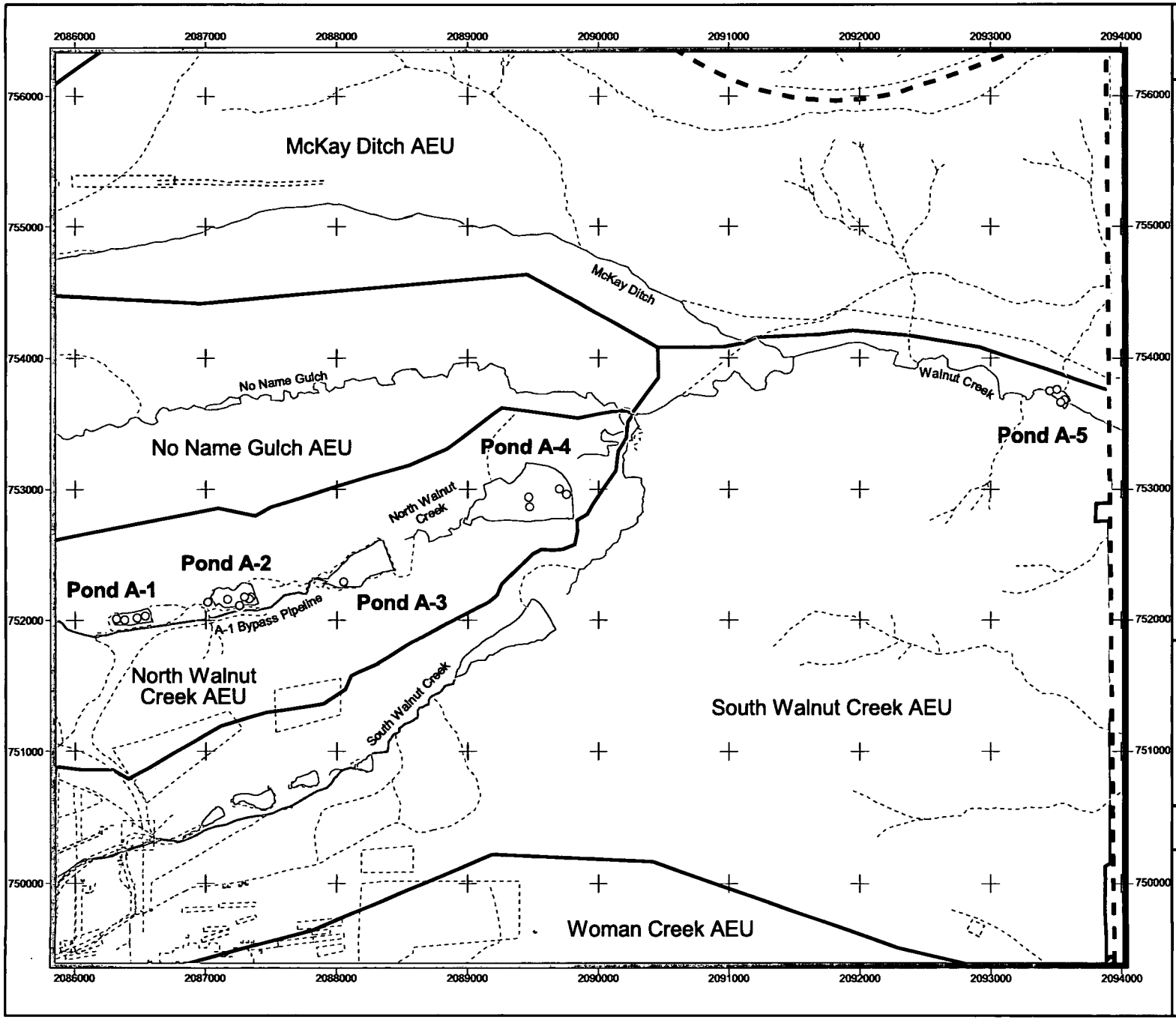

Figure A.27
A Ponds
Surface Sediment Results
for Pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 195 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

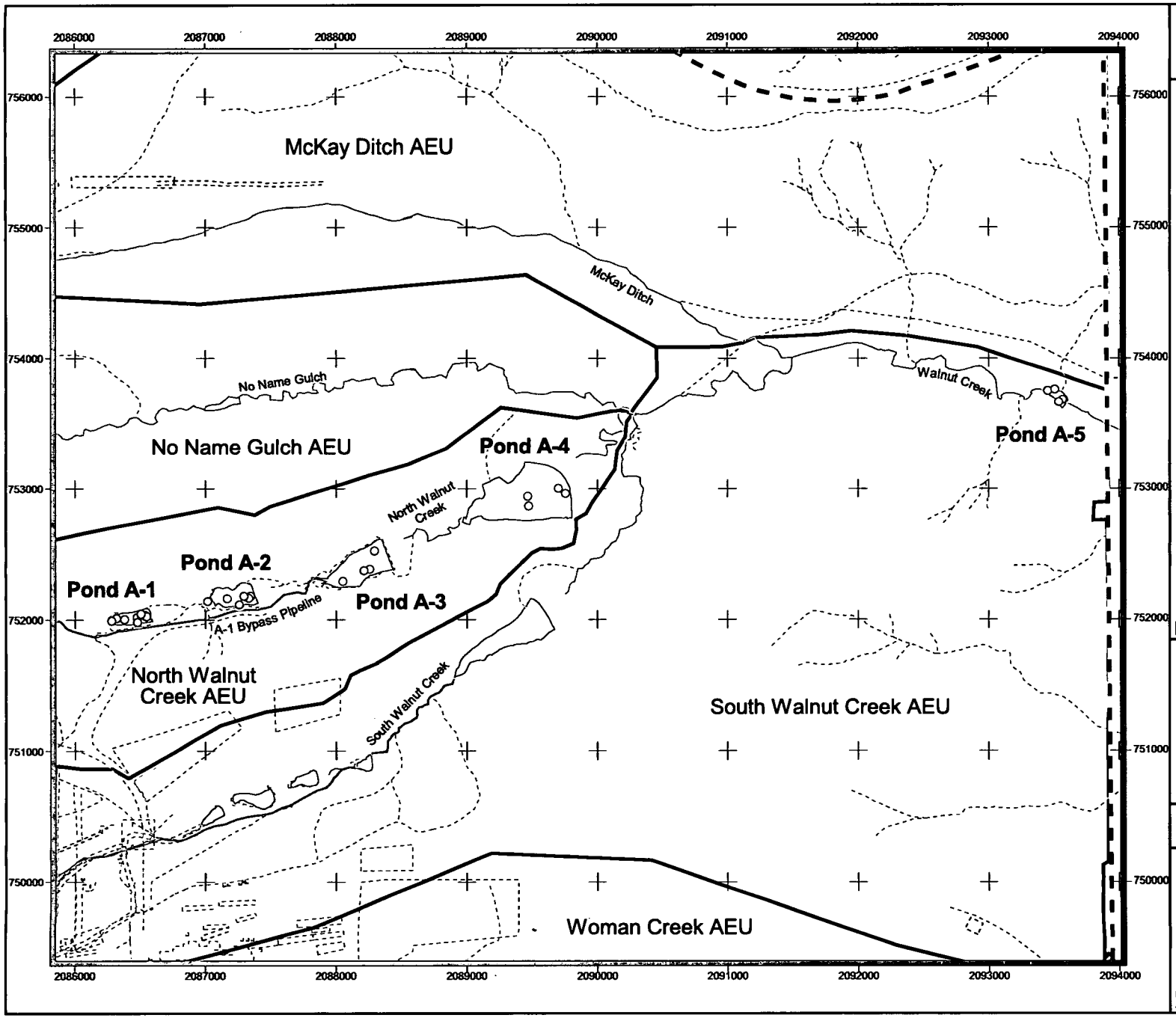

Figure A.28
A Ponds
Surface Sediment Results
for Aroclor-1254

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 40 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

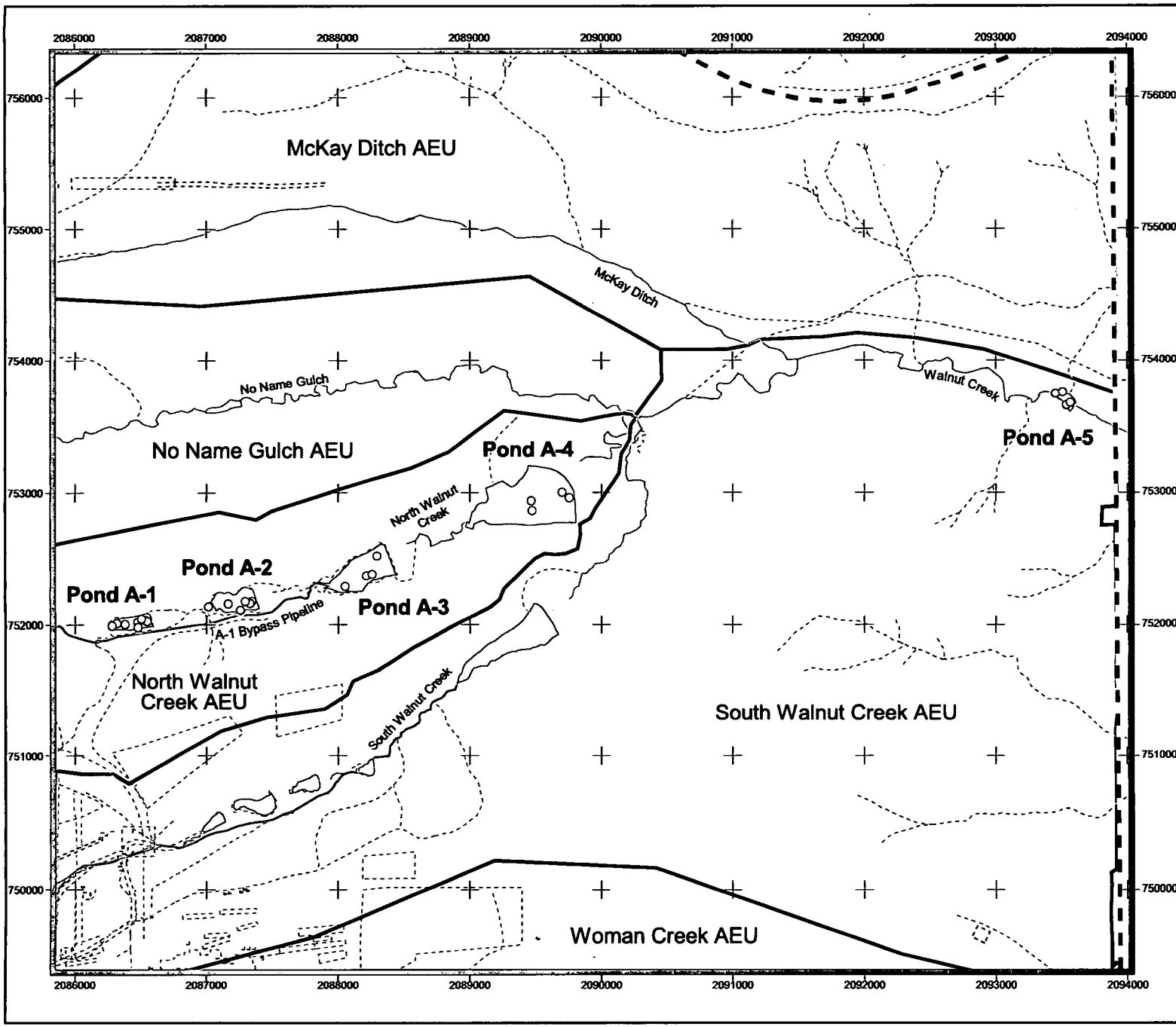

Figure A.29
A Ponds
Surface Sediment Results
for Aroclor-1260

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 40 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

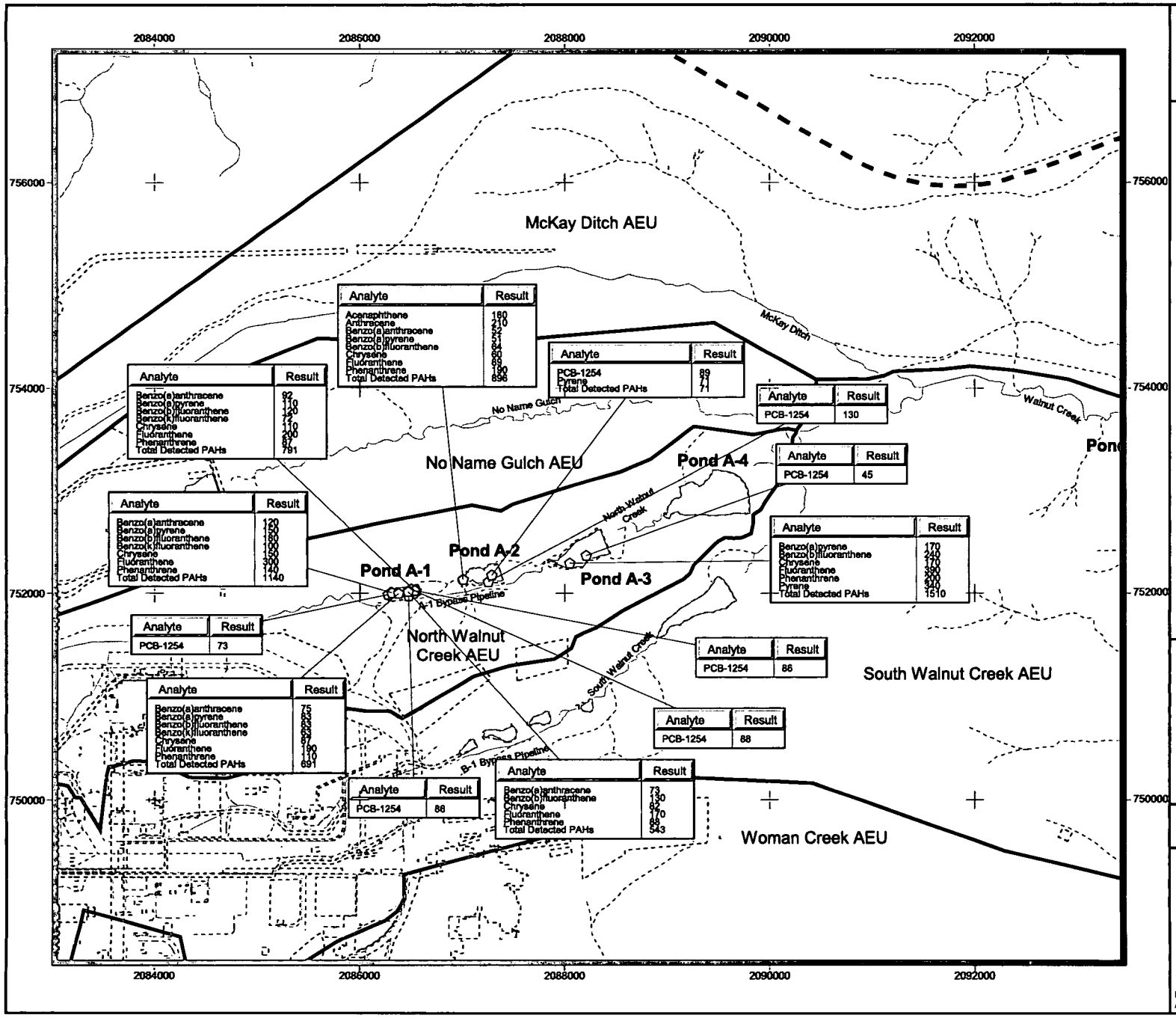

Figure A.30
PAH and PCB Constituent Results Within the A-Series Surface Sediment

KEY

- Surface sediment sampling location
- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams

- Perennial
- Intermittent
- Ephemeral

Units = ug/kg

DRAFT

Data Set: 08/10/05 A1

N W E S

350 0 350 700 1050 1400 Feet

Scale 1: 16,800

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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300

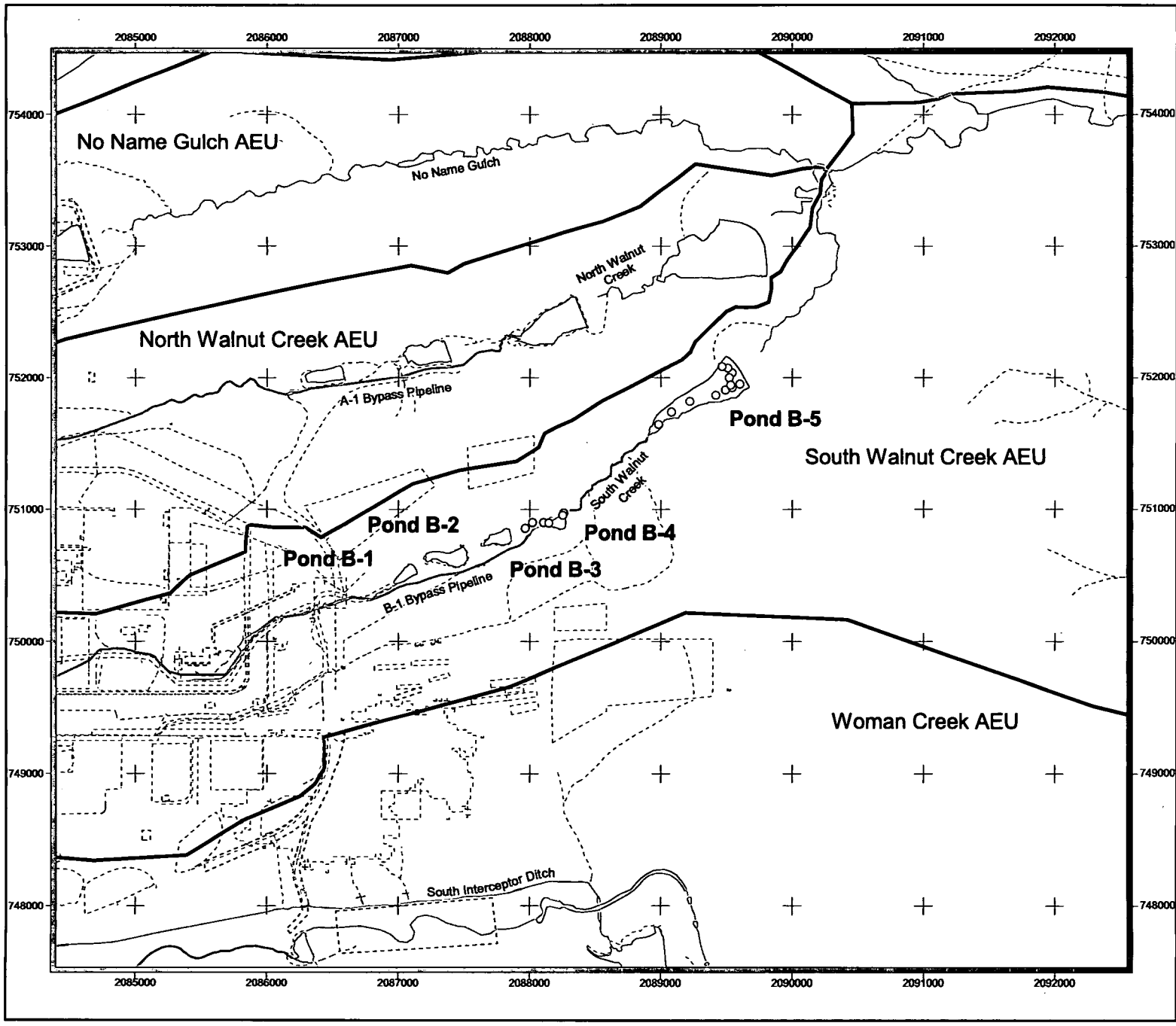

Figure A.31
B Ponds
Surface Sediment Results
for Aluminum

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 15900 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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301

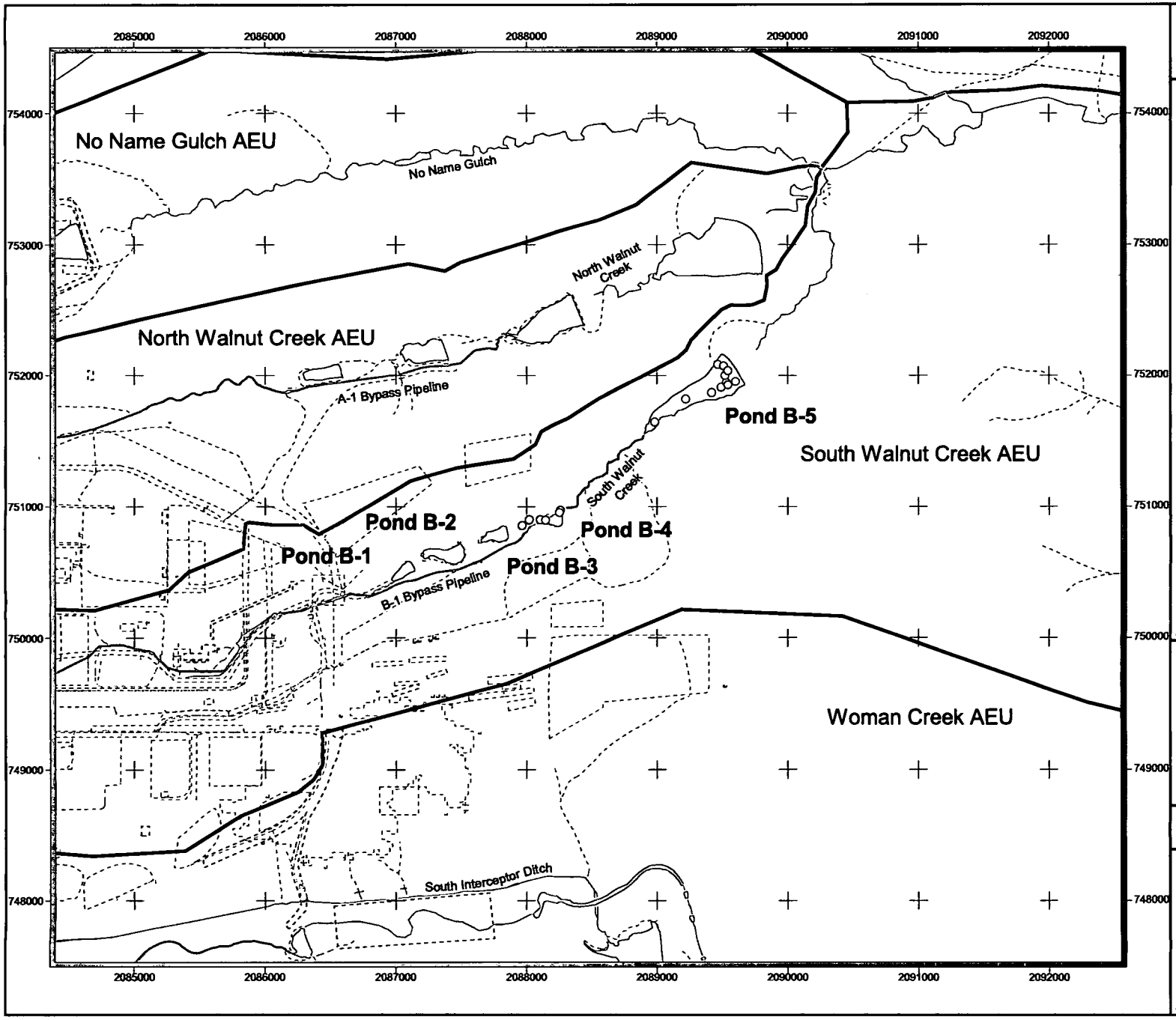

Figure A.32
B Ponds
Surface Sediment Results
for Antimony

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 2 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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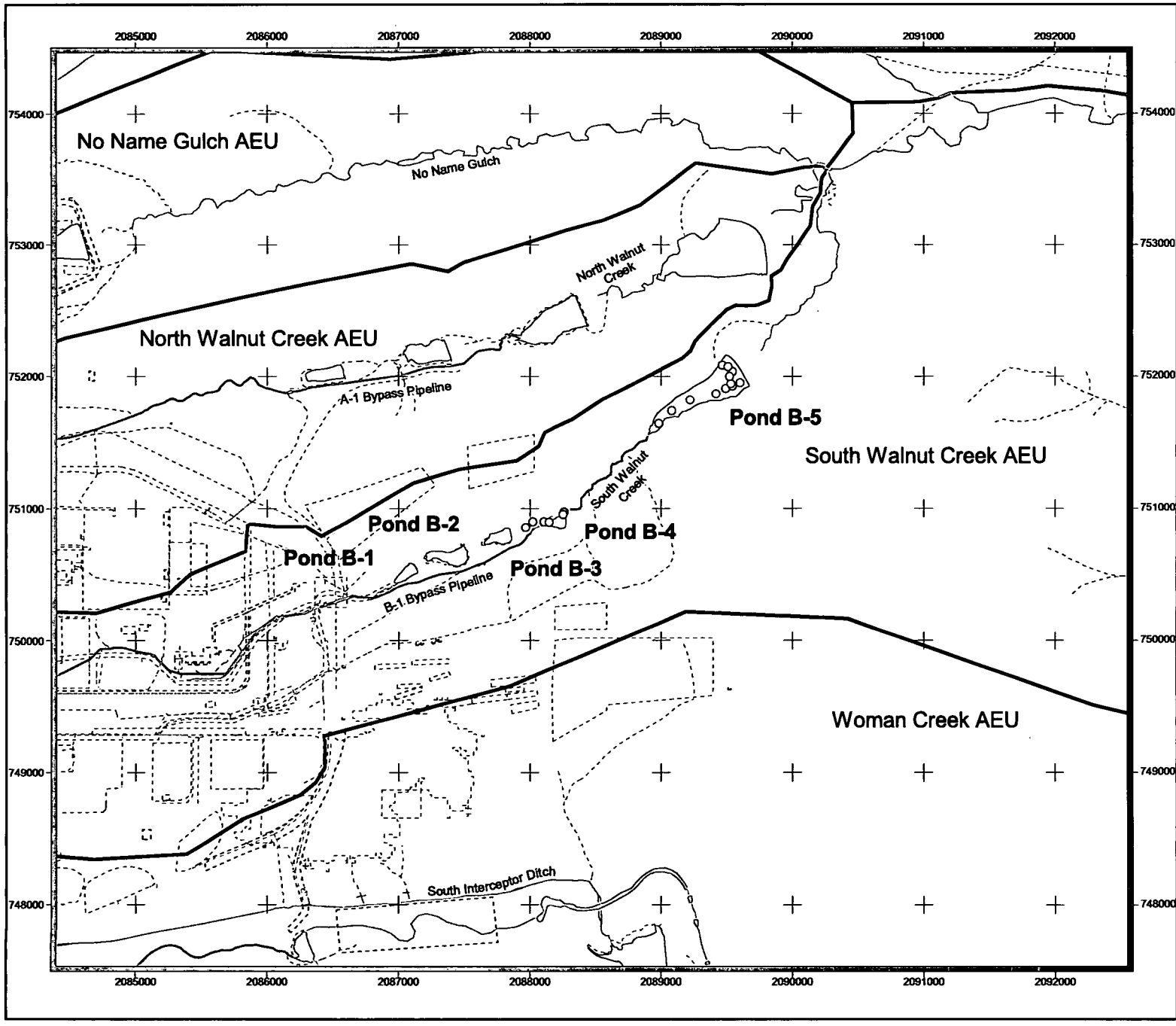

Figure A.33
B Ponds
Surface Sediment Results
for Barium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 189 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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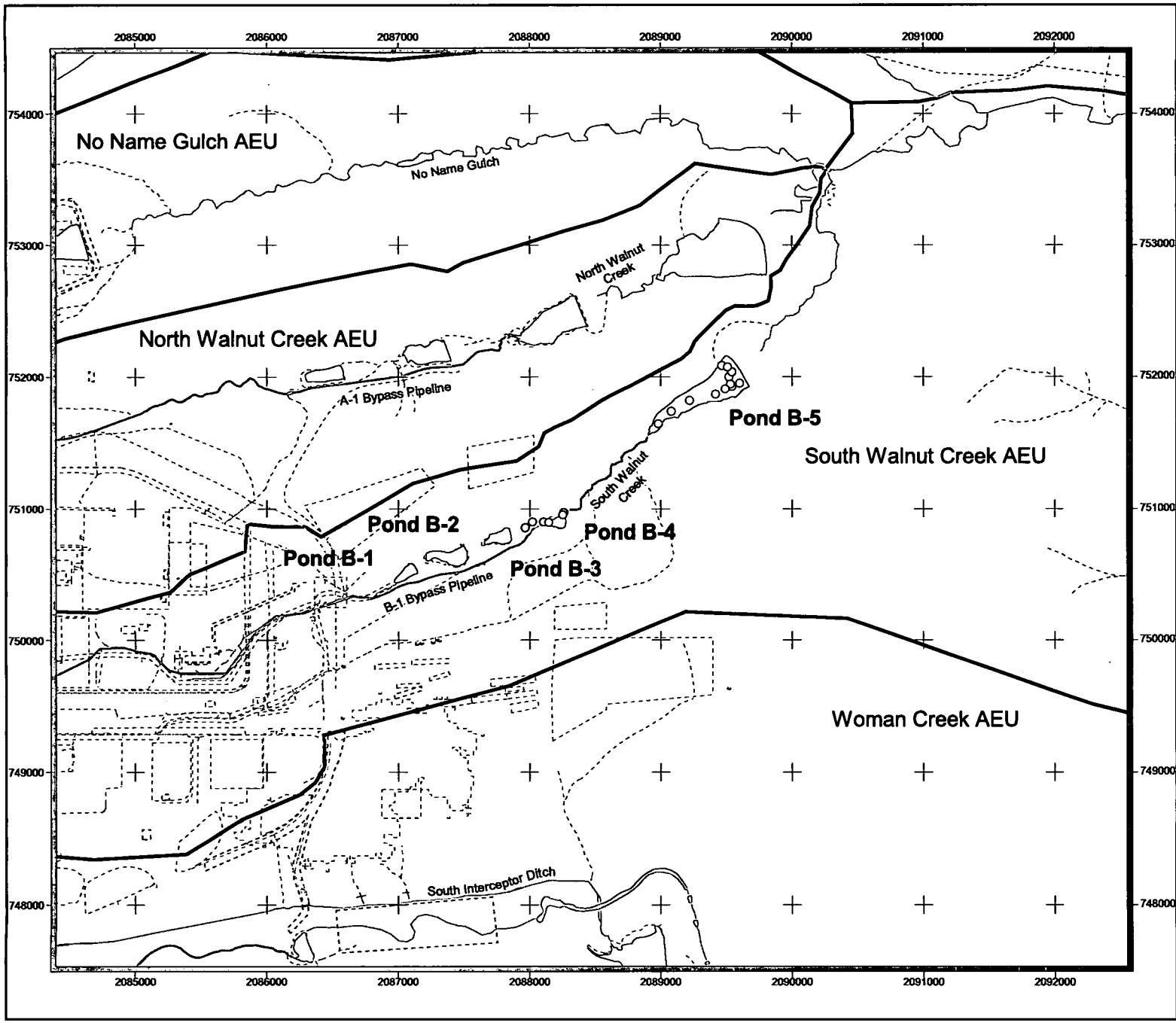

Figure A.34
B Ponds
Surface Sediment Results
for Cadmium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.99 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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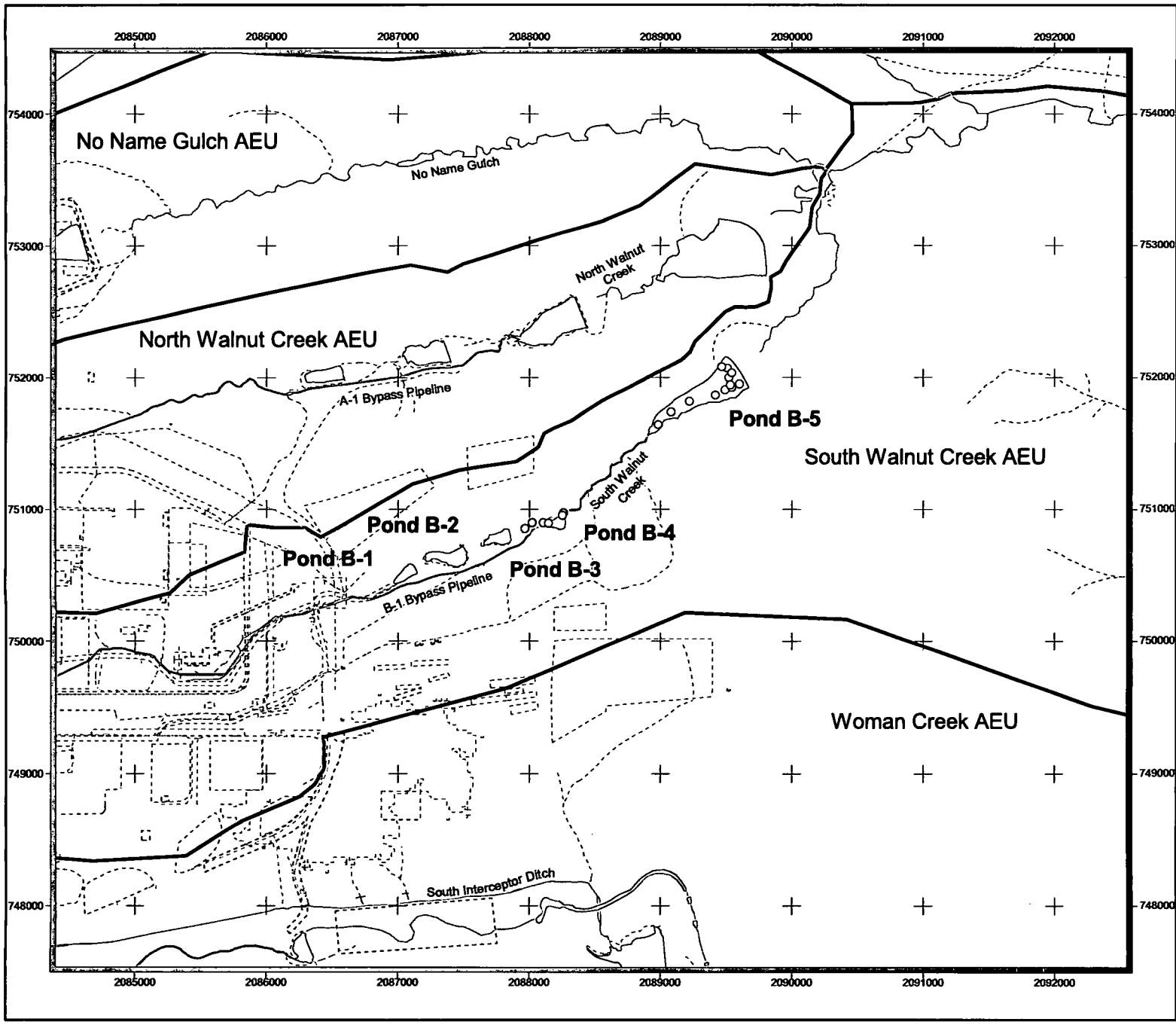

Figure A.35
B Ponds
Surface Sediment Results
for Chromium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 43.4 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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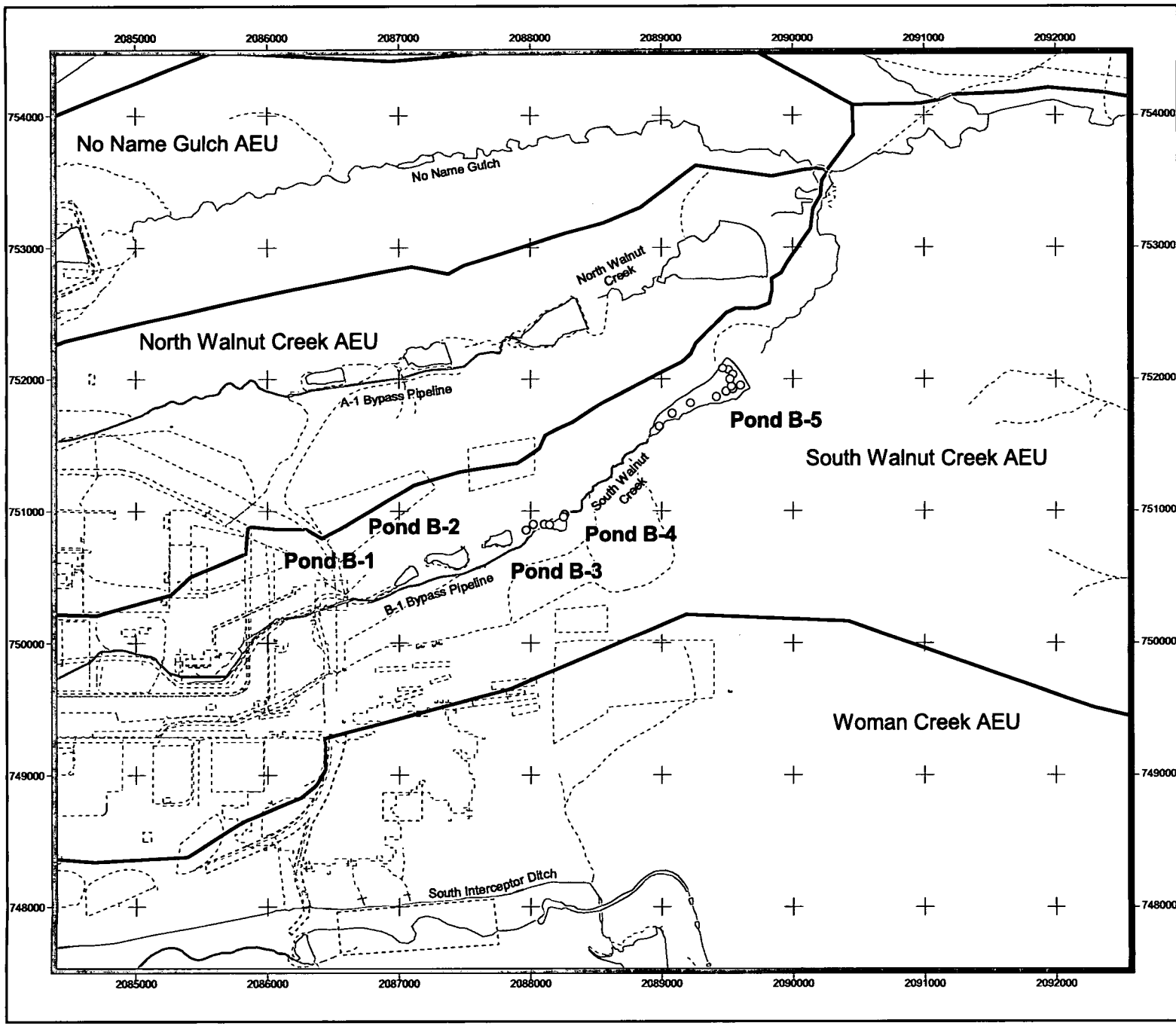

Figure A.36
B Ponds
Surface Sediment Results
for Copper

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 31.6 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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Datum: NAD 27

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Date: 08/11/05

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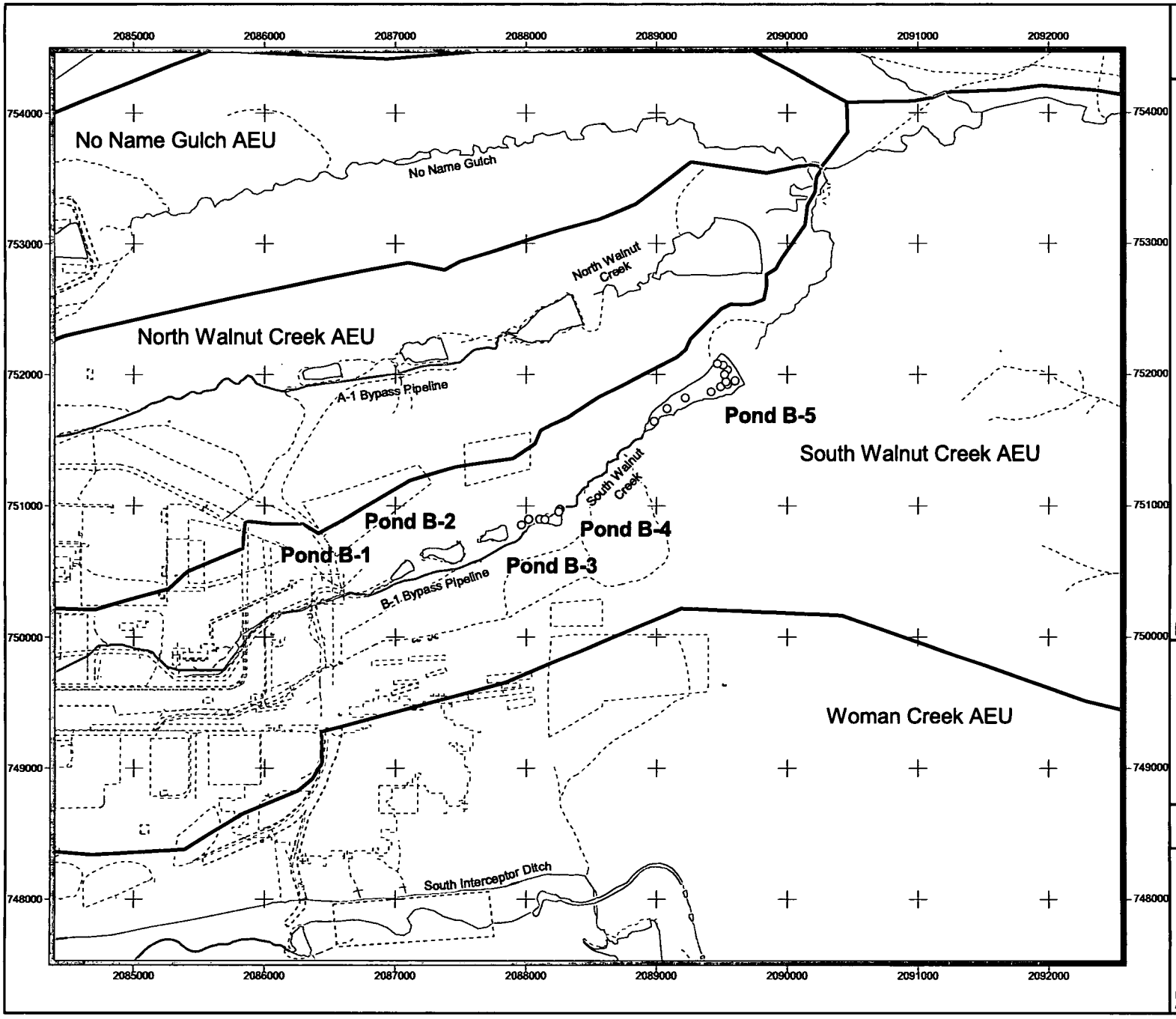

Figure A.37
B Ponds
Surface Sediment Results
for Iron

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 20000 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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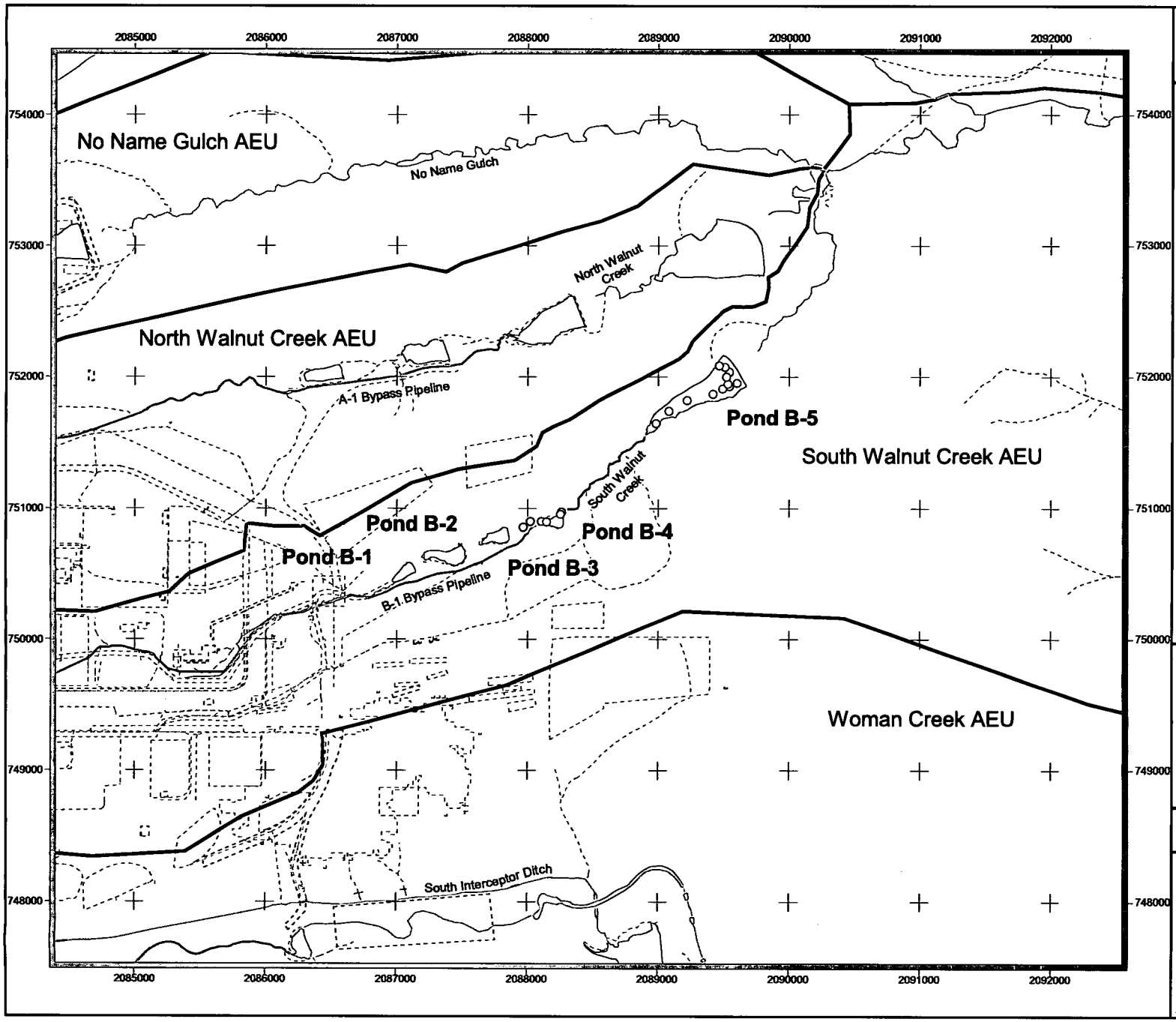

Figure A.38
B Ponds
Surface Sediment Results
for Lead

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 35.8 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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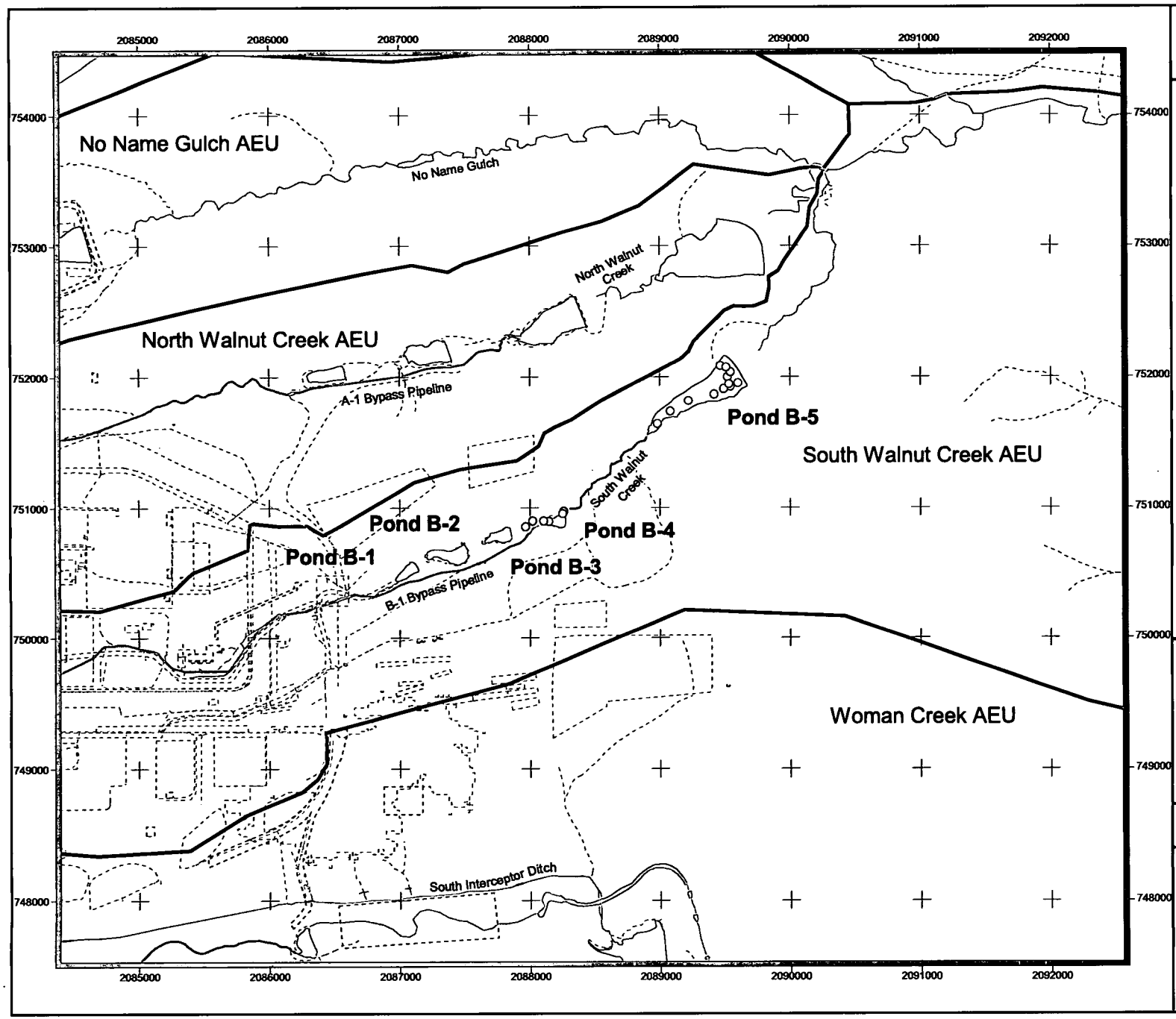

Figure A.39
B Ponds
Surface Sediment Results
for Mercury

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.18 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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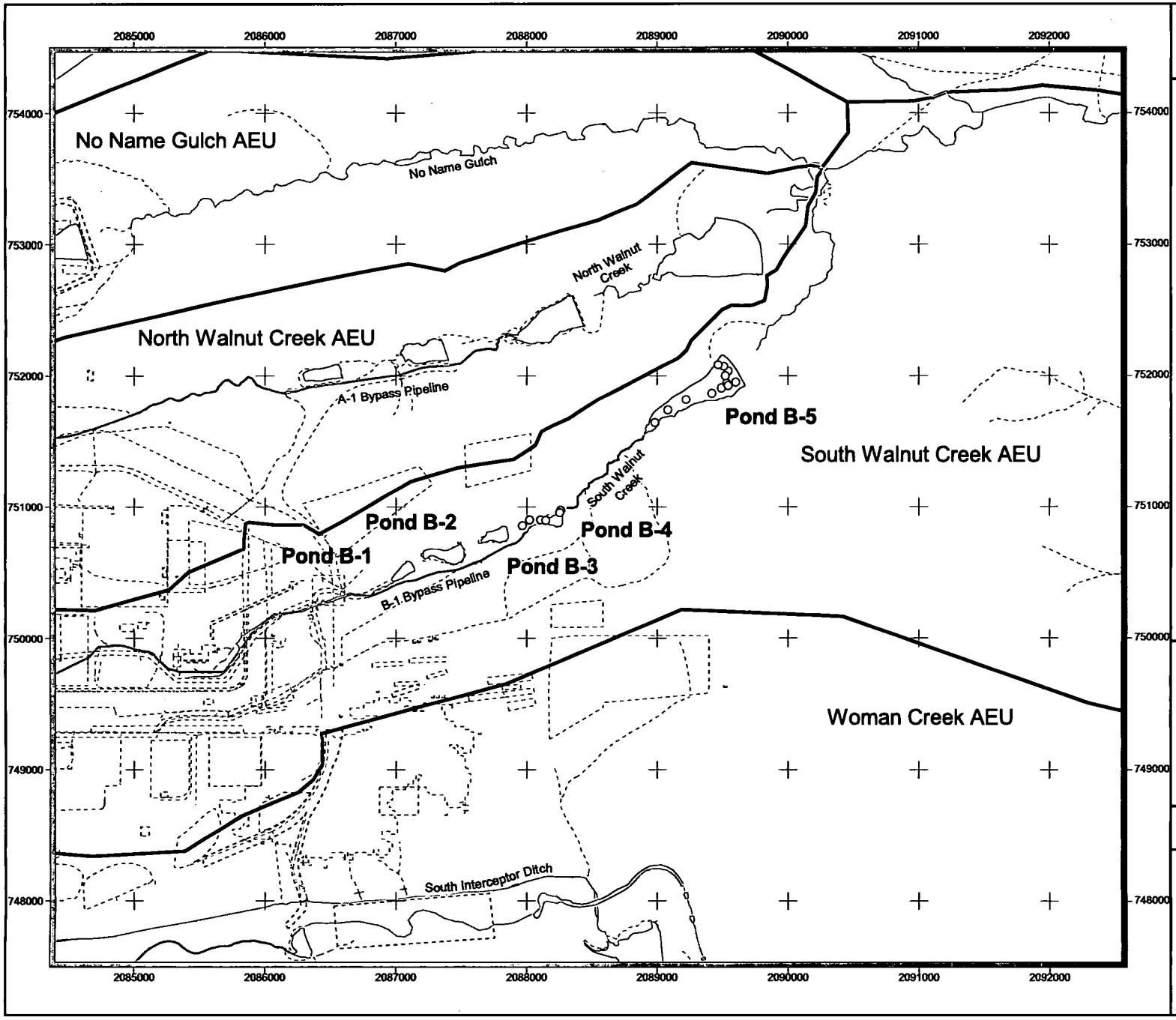

Figure A.40
B Ponds
Surface Sediment Results
for Nickel

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 22.7 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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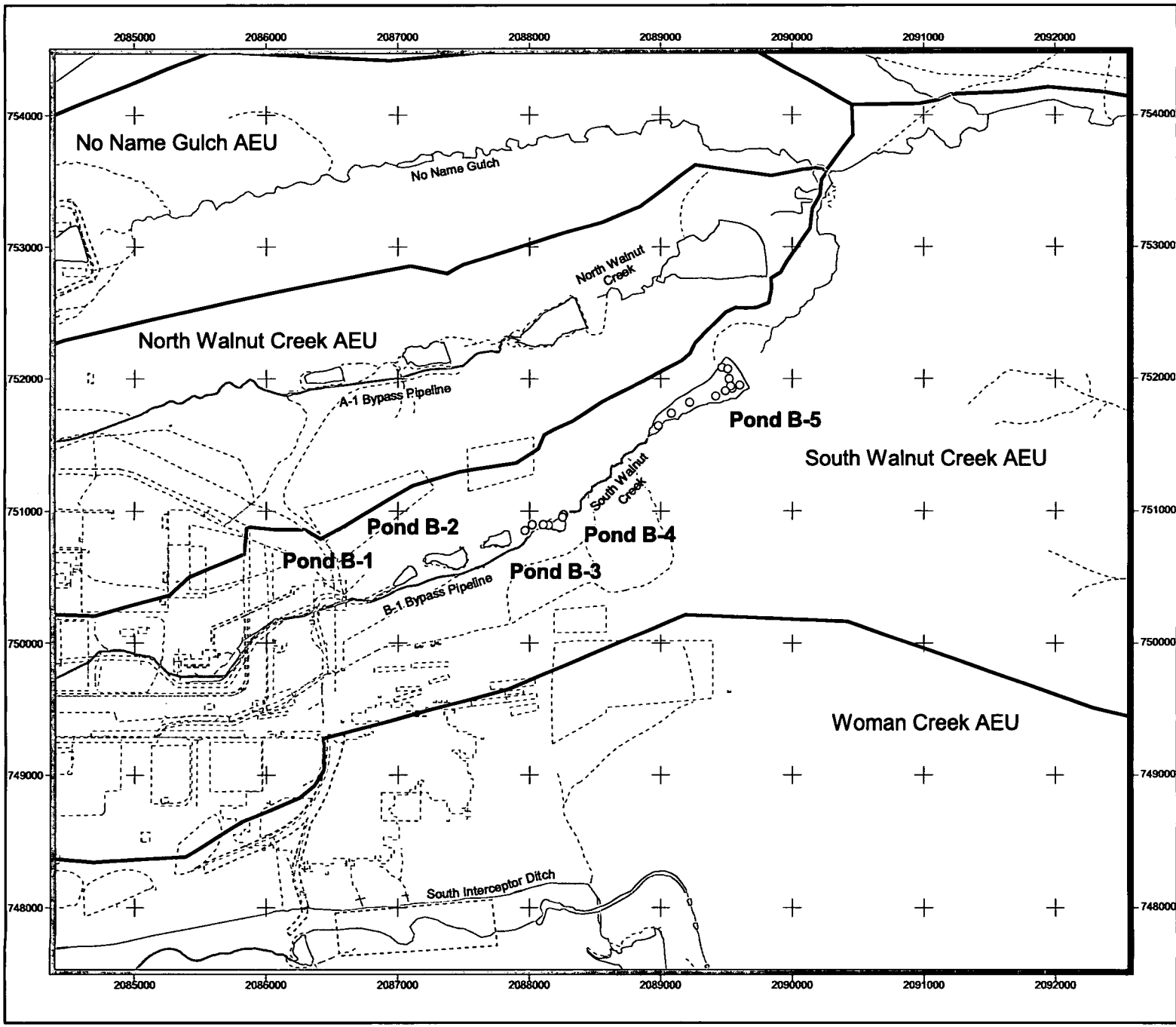

Figure A.41
B Ponds
Surface Sediment Results
for Selenium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.95 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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311

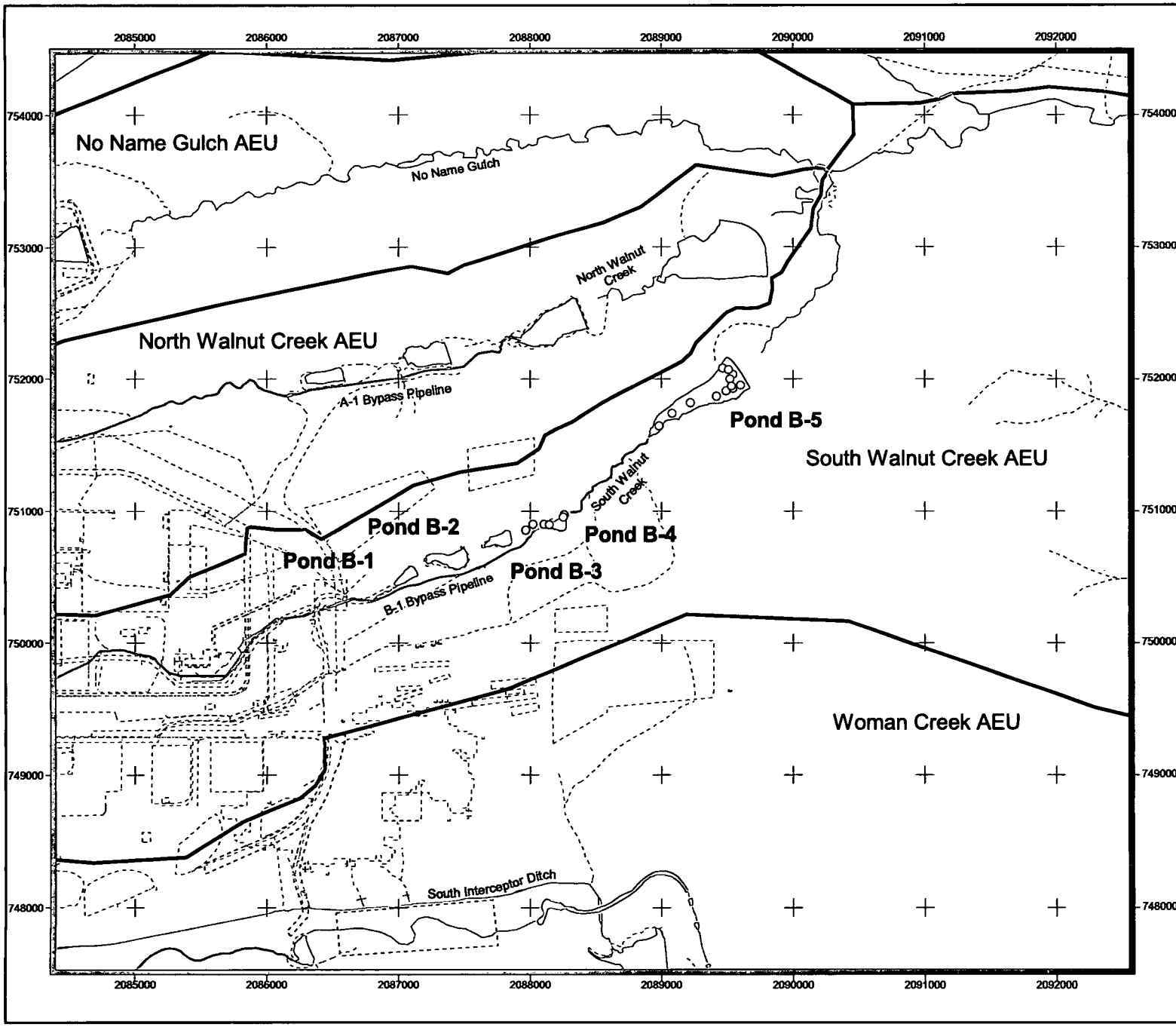

Figure A.42
B Ponds
Surface Sediment Results
for Silver

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 1 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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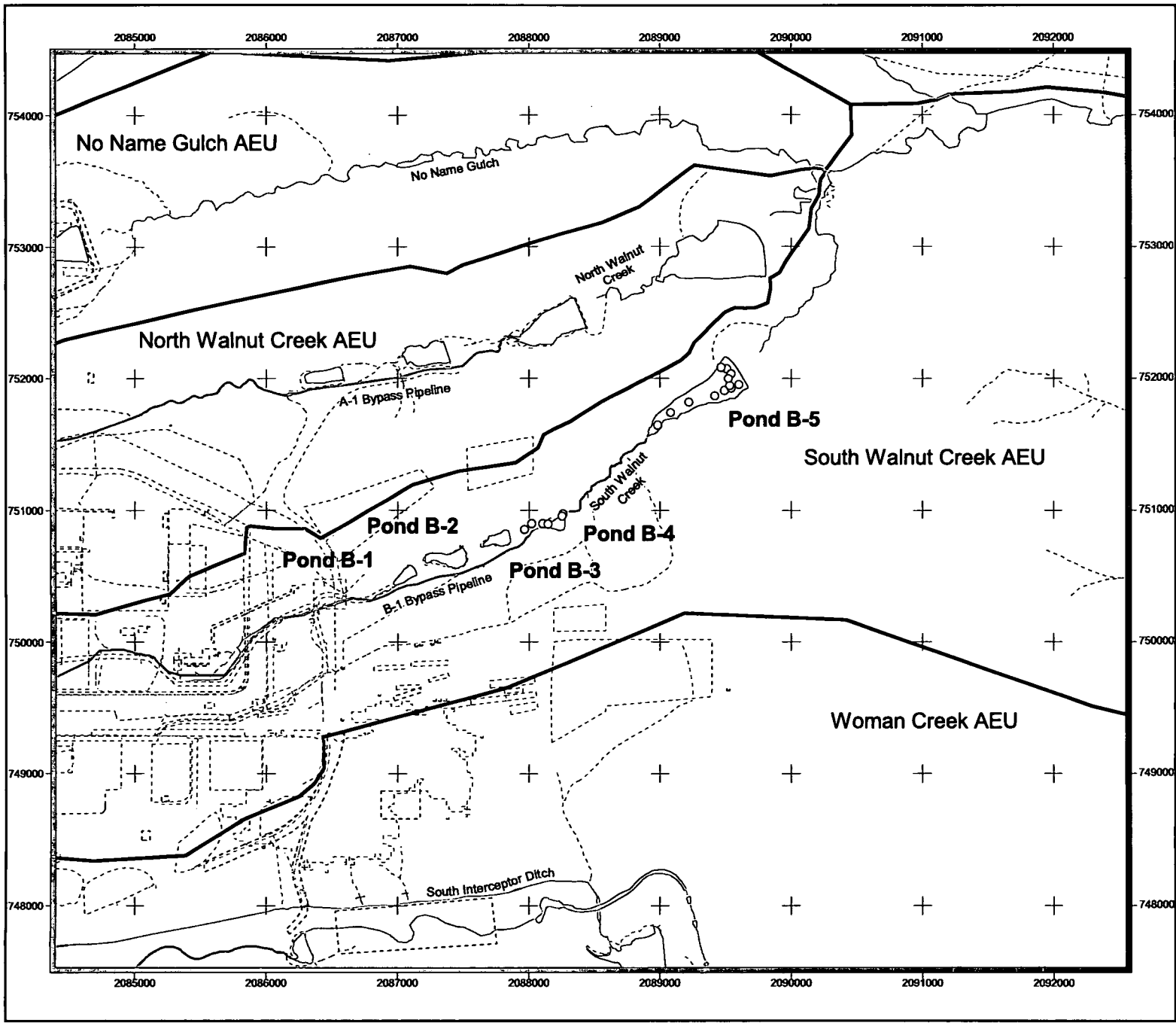

Figure A.43
B Ponds
Surface Sediment Results
for Zinc

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 121 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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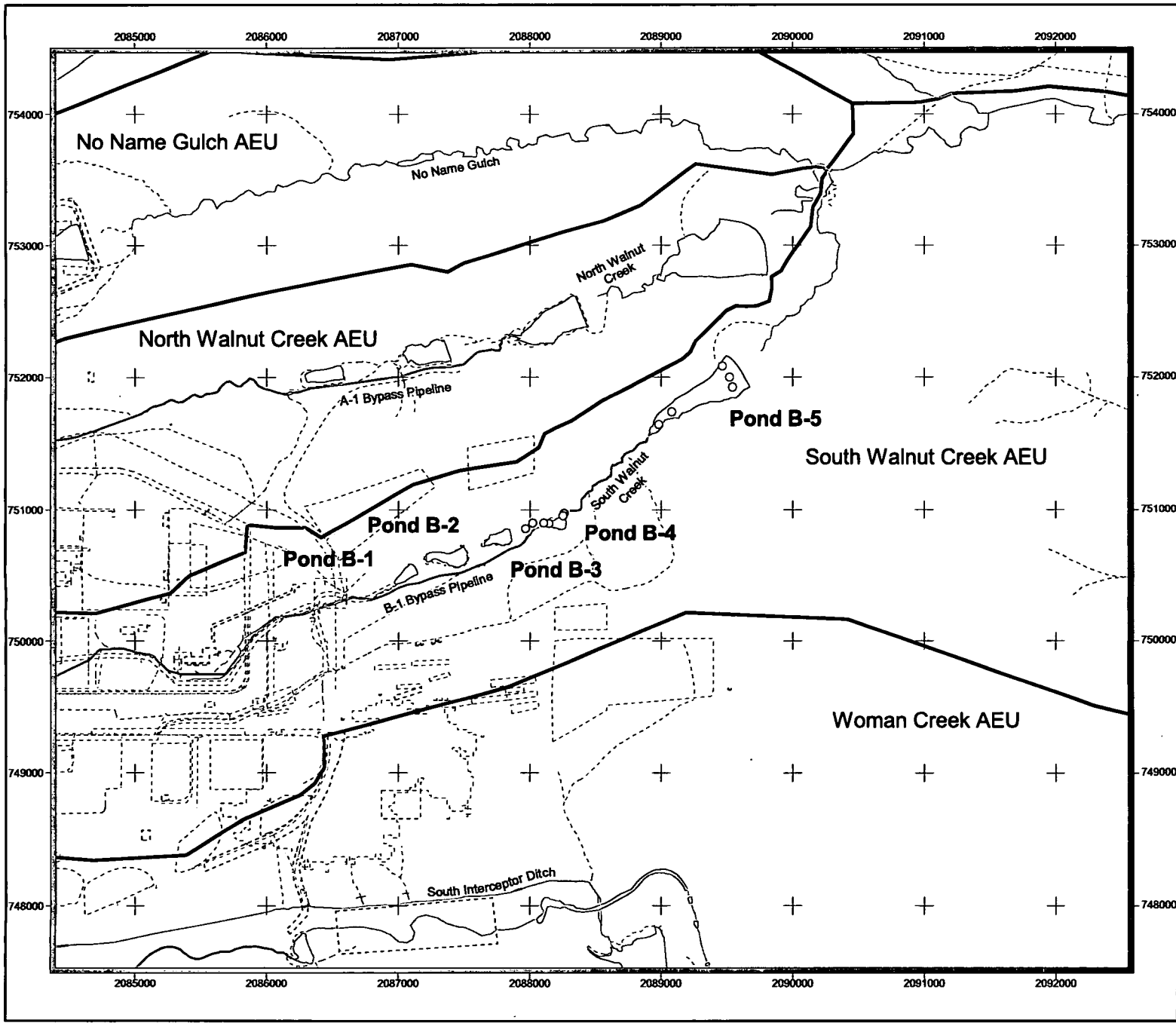

Figure A.44
B Ponds
Surface Sediment Results
for Anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 57.2 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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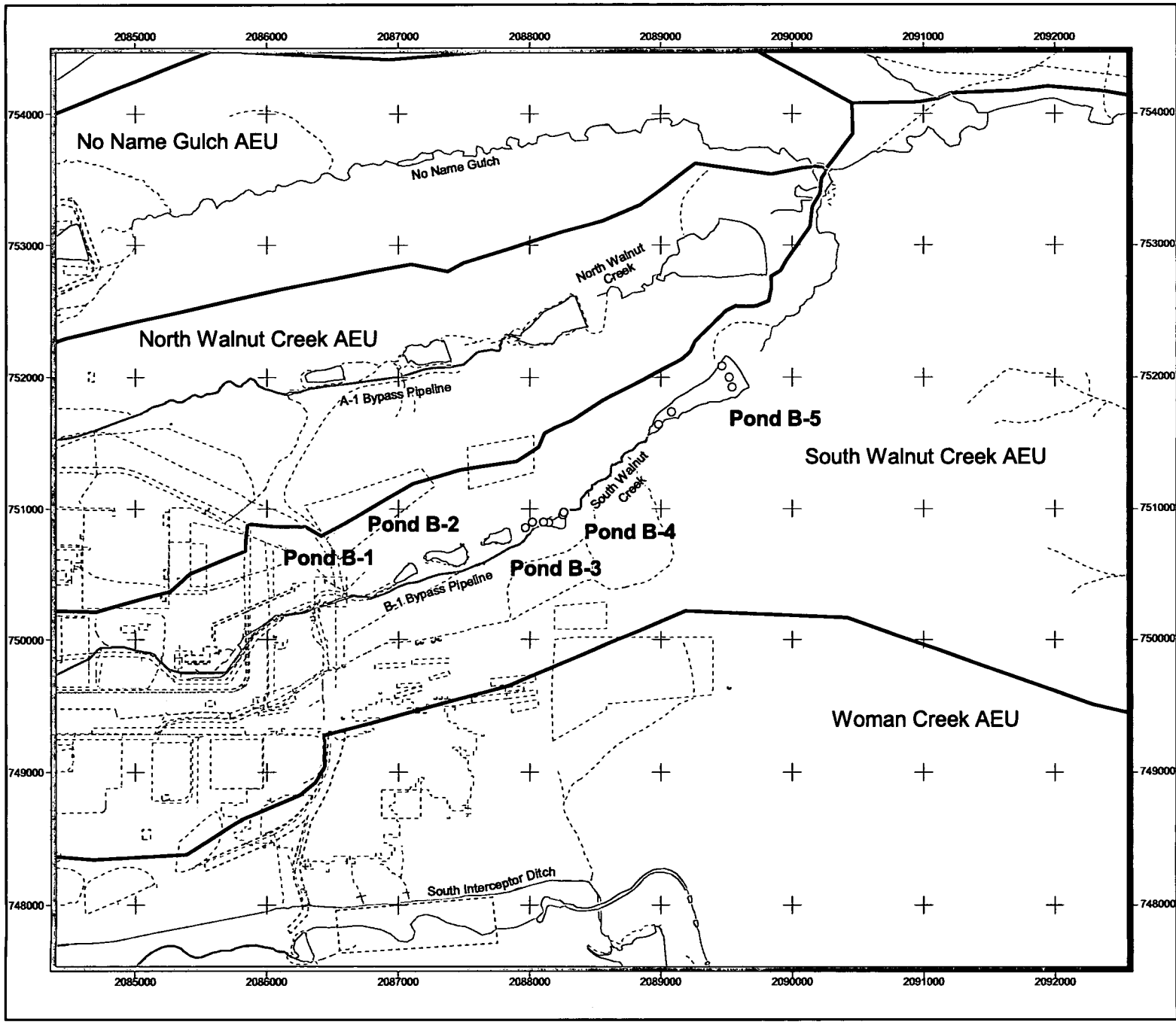

Figure A.45
B Ponds
Surface Sediment Results
for Benzo(a)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 108 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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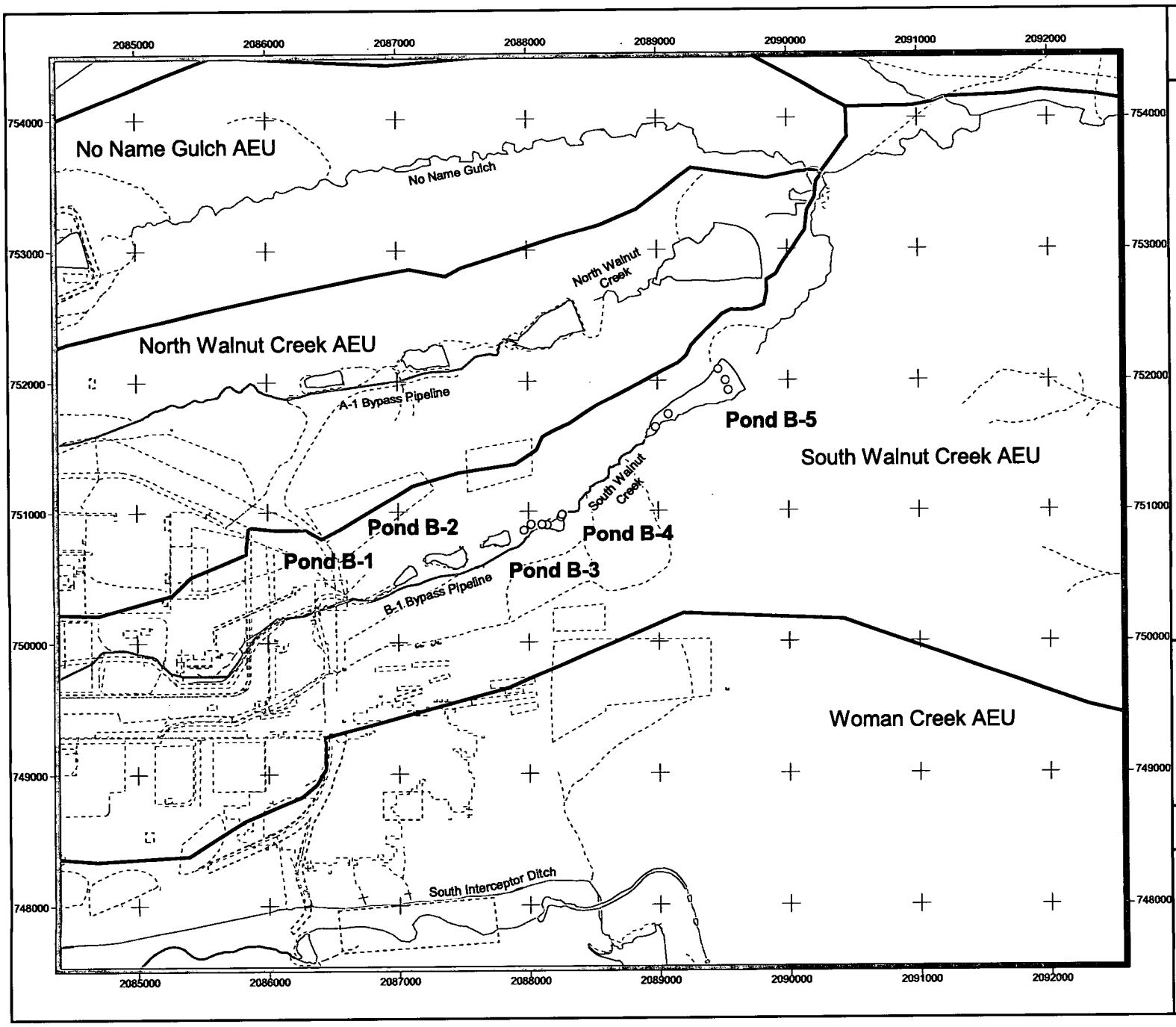

Figure A.46
B Ponds
Surface Sediment Results
for Benzo(a)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 150 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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316

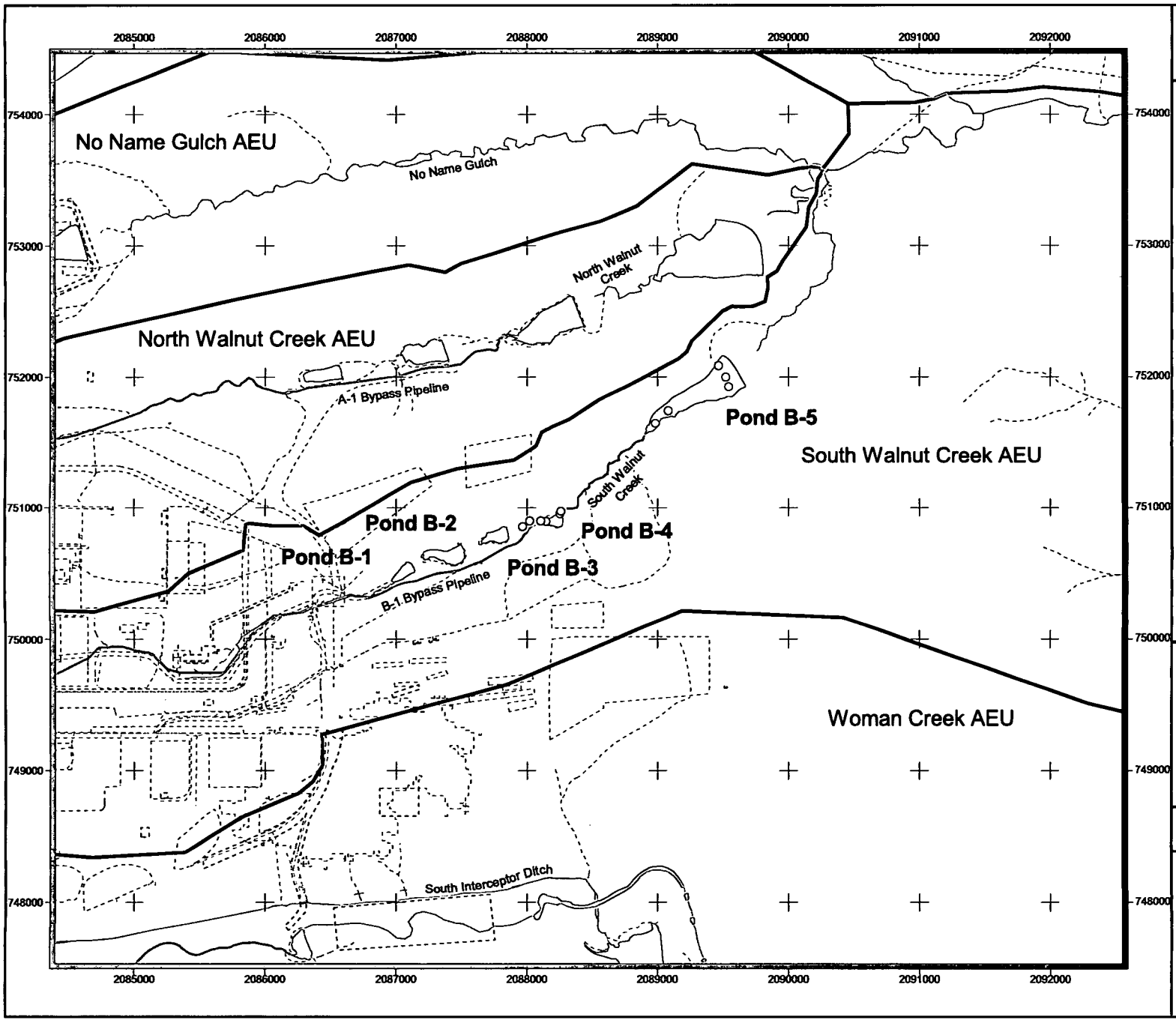

Figure A.47
B Ponds
Surface Sediment Results
for Benzo(g,h,i)perylene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 13 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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317

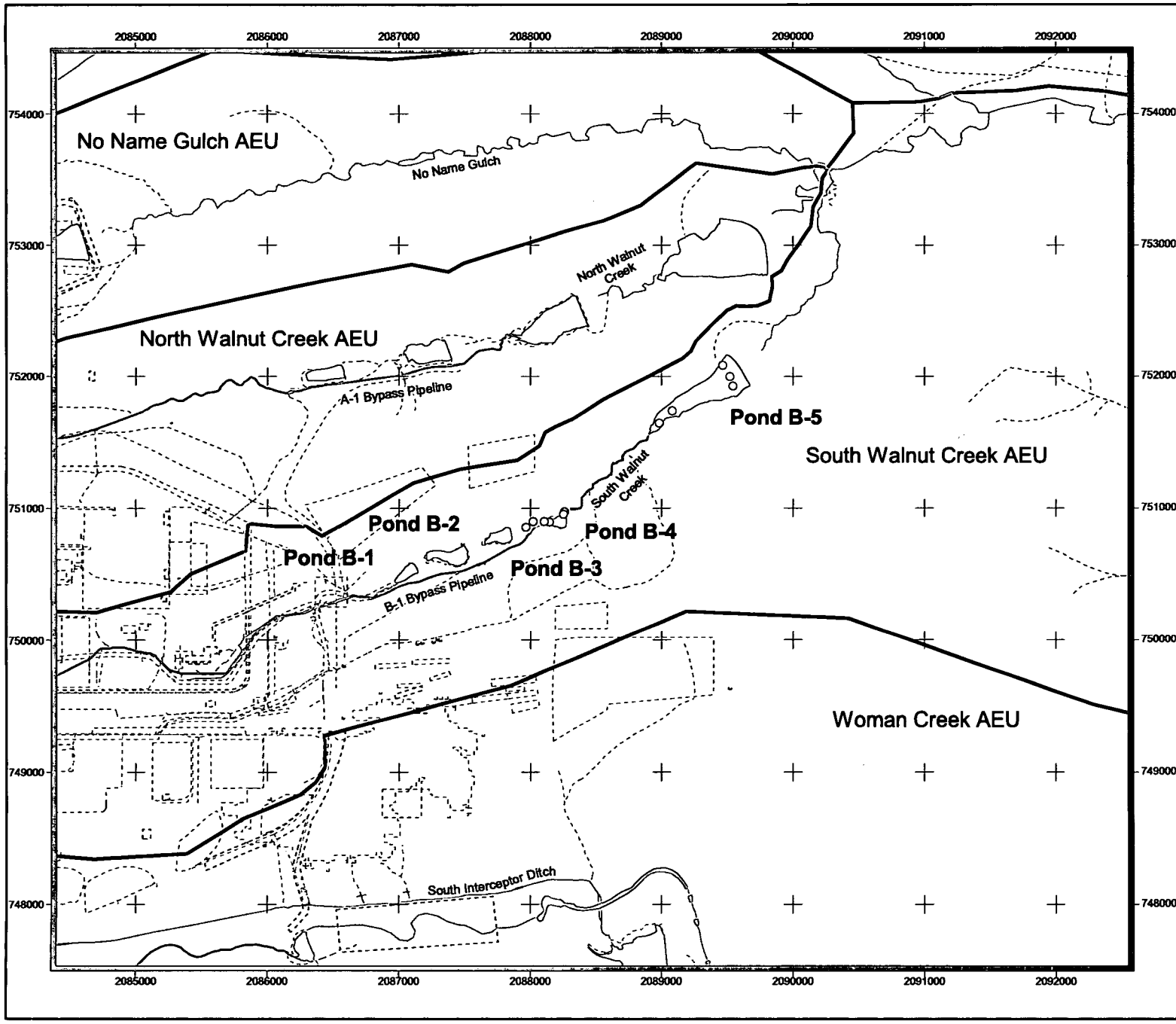

Figure A.48
B Ponds
Surface Sediment Results
for Benzo(k)fluoranthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 240 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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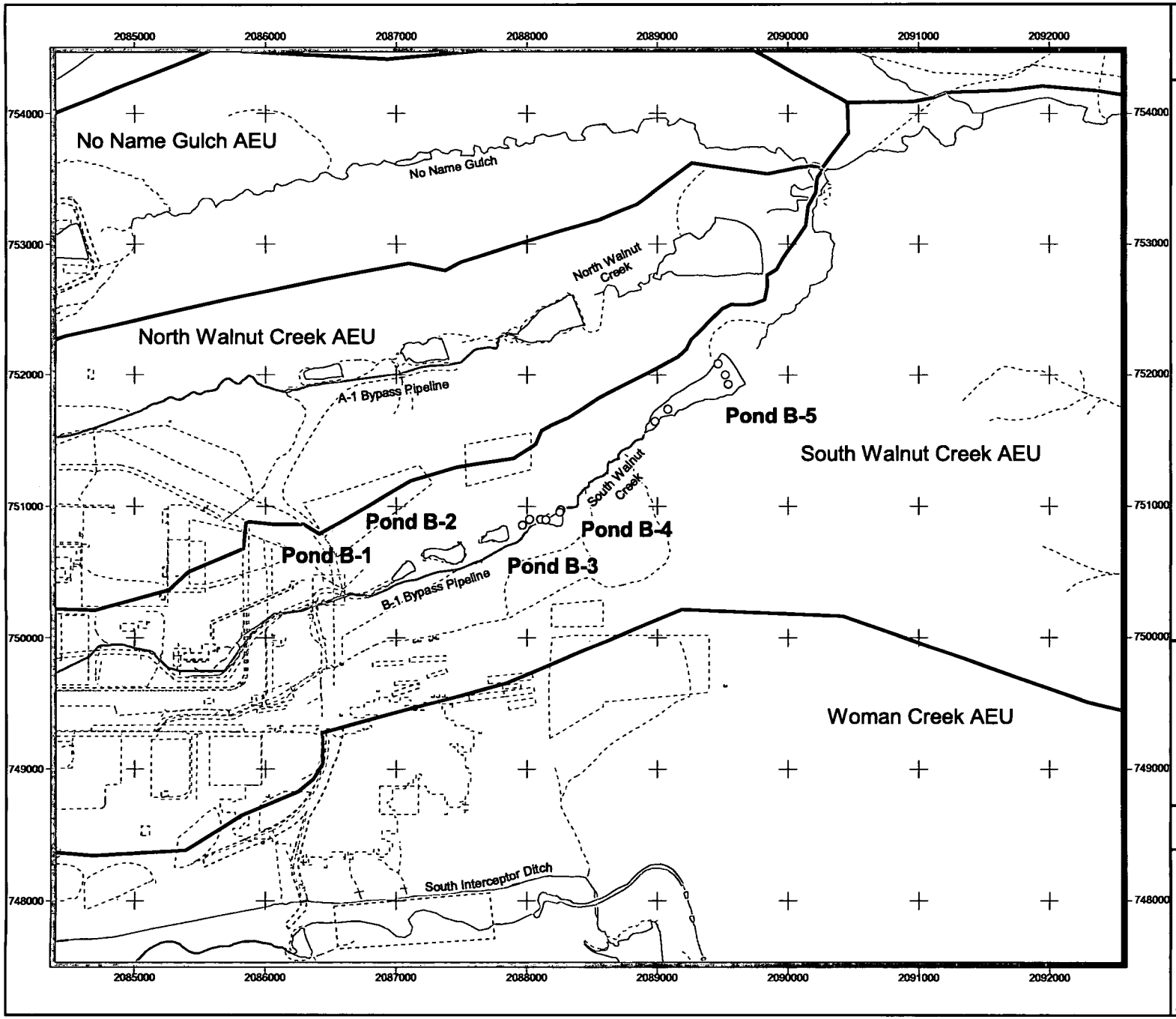

Figure A.49
B Ponds
Surface Sediment Results
for bis(2-ethylhexyl)phthalate

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 24900 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
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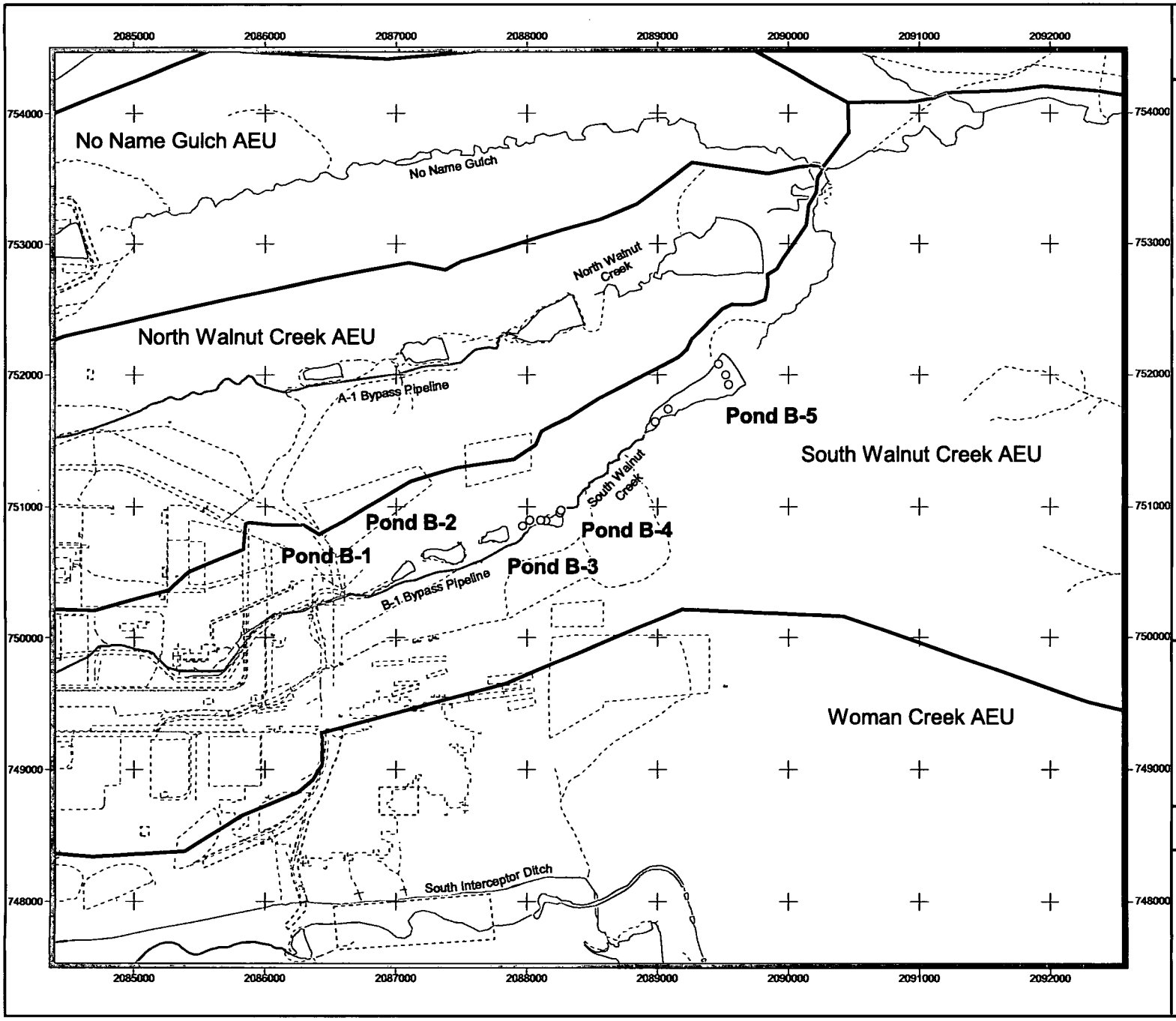

Figure A.50
B Ponds
Surface Sediment Results
for Chrysene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 166 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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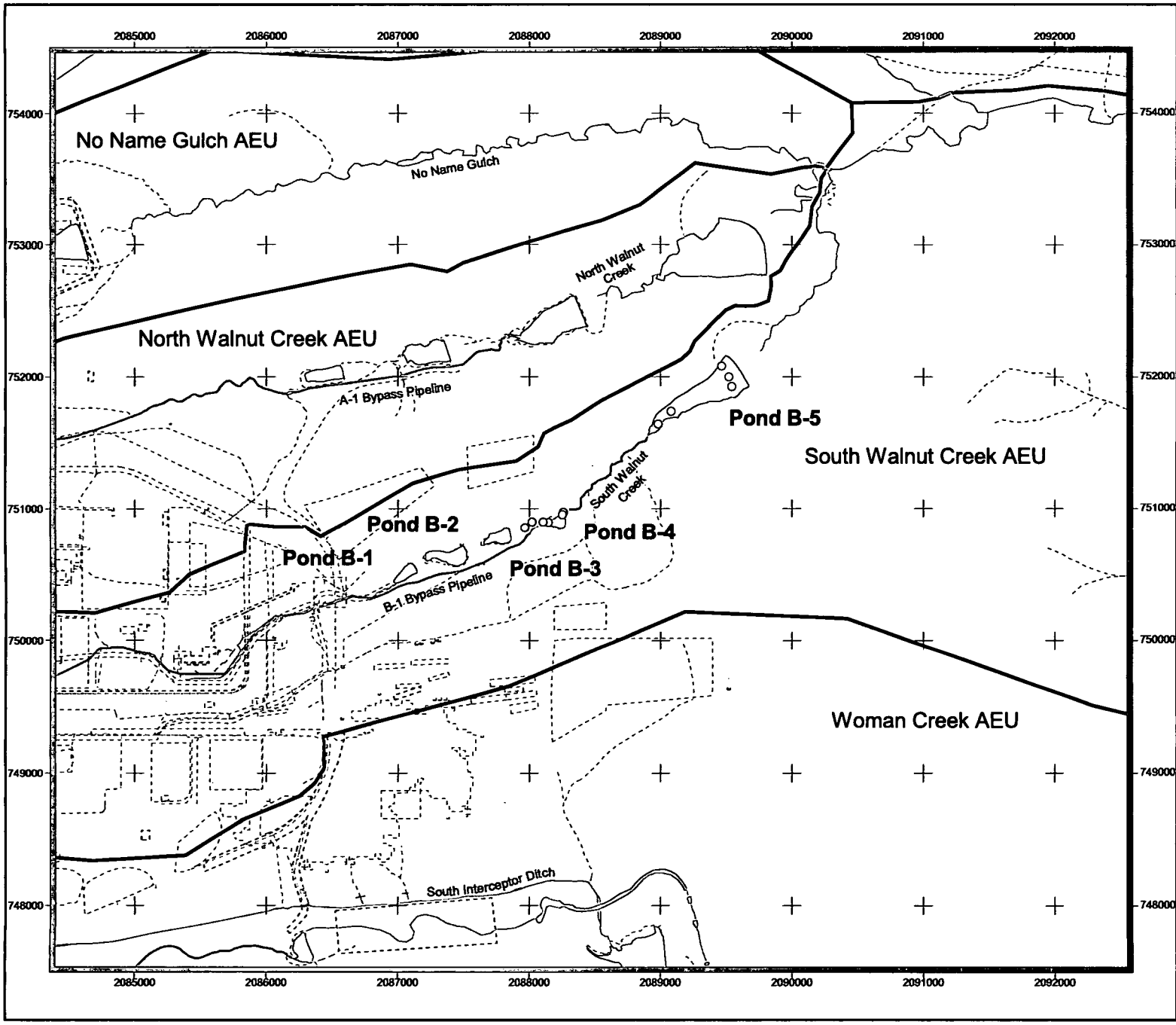

Figure A.51
B Ponds
Surface Sediment Results
for Dibenz(a,h)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 33 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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321

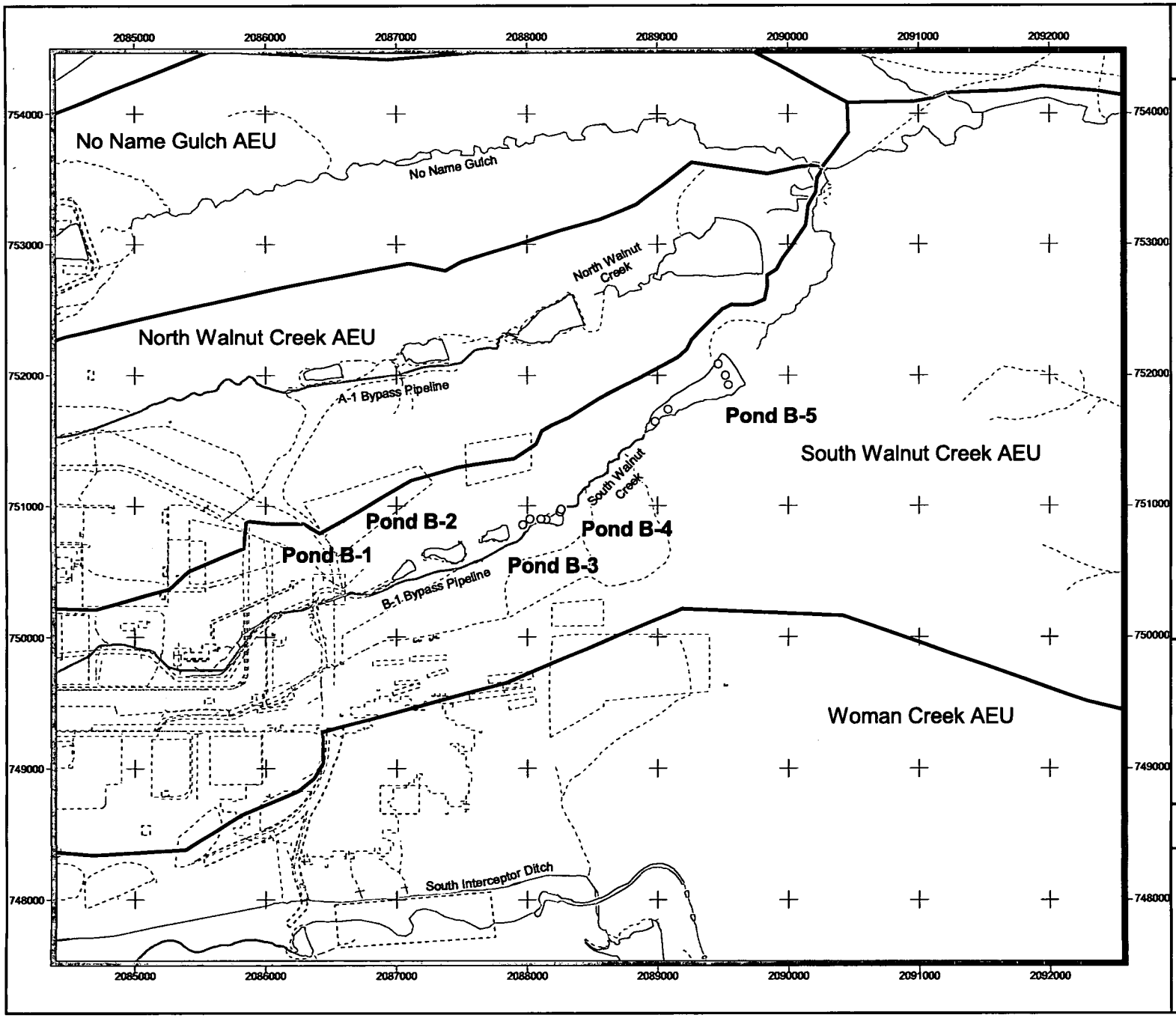

Figure A.52
B Ponds
Surface Sediment Results
for Fluoranthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 423 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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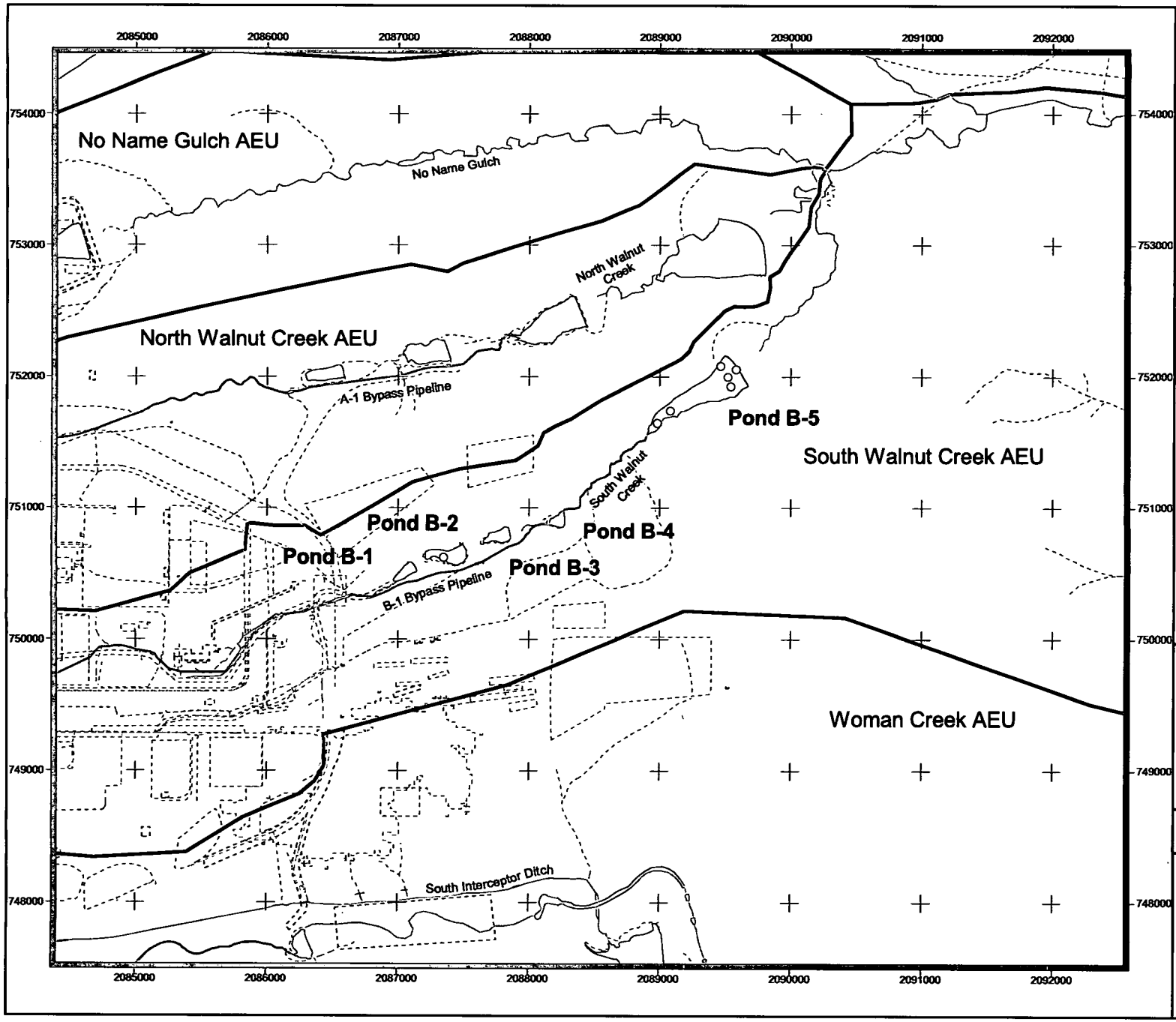

Figure A.53
B Ponds
Surface Sediment Results
for gamma-BHC (Lindane)

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 2.37 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
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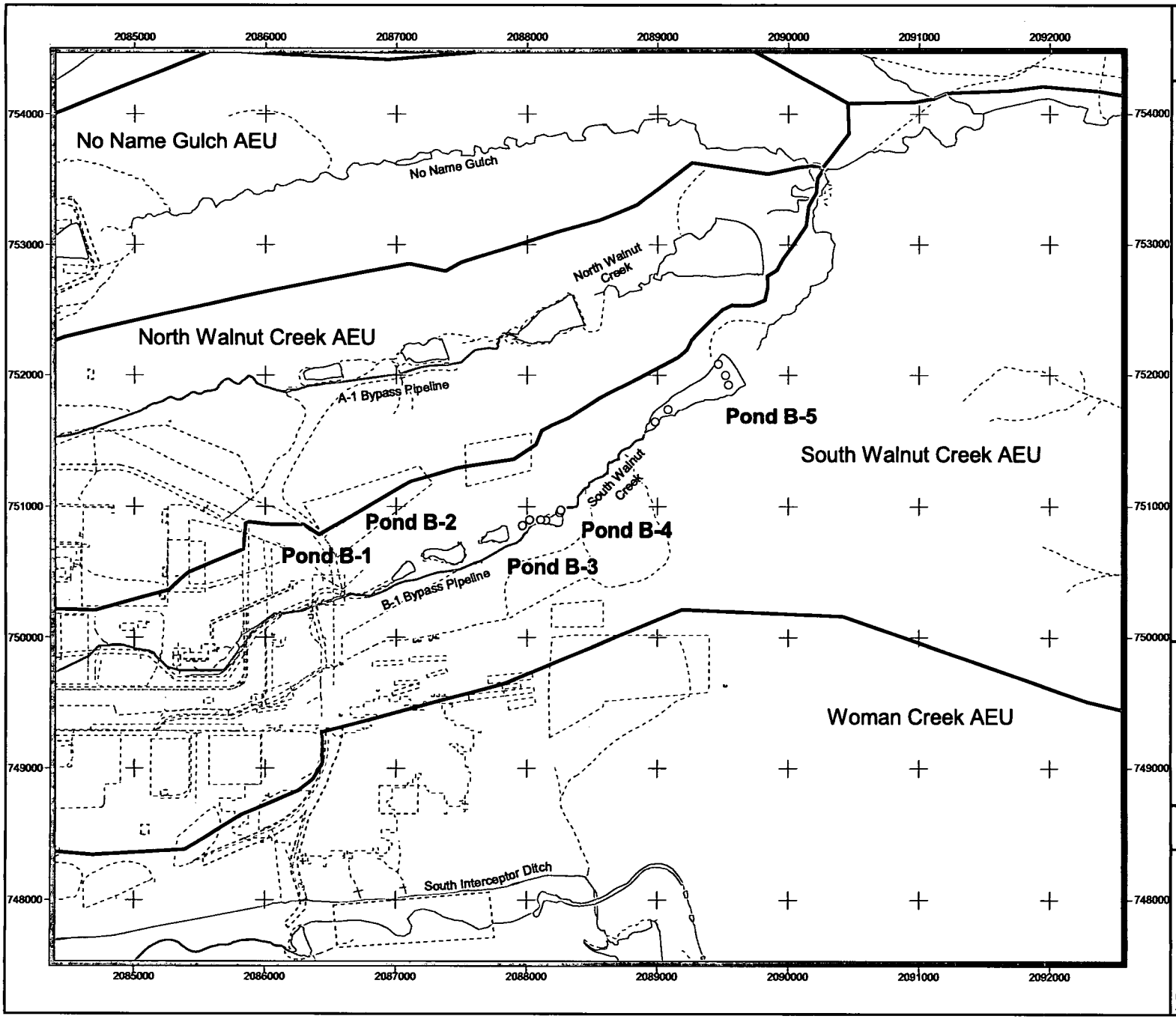

Figure A.54
B Ponds
Surface Sediment Results
for Indeno(1,2,3-cd)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 17 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

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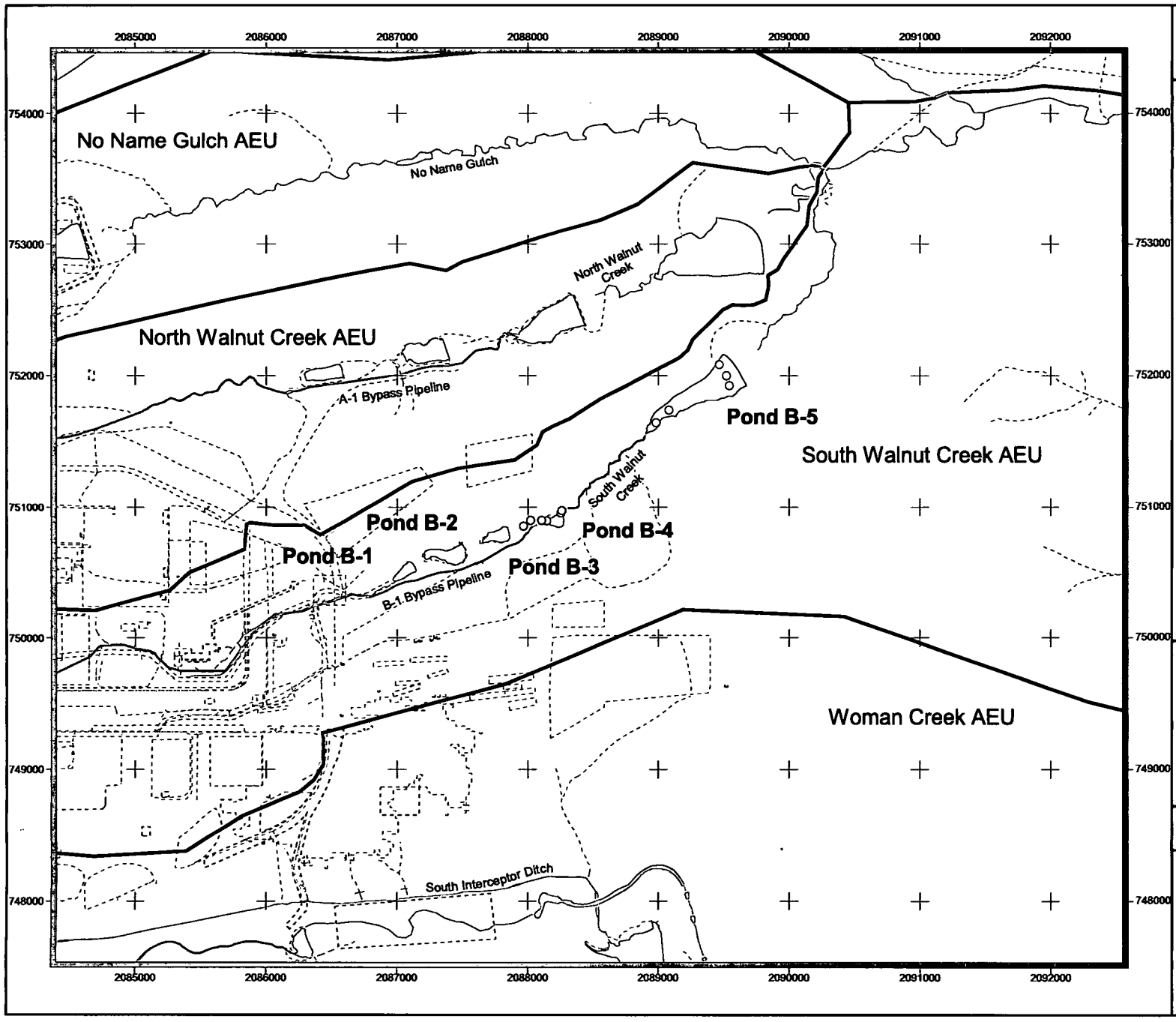

Figure A.55
B Ponds
Surface Sediment Results
for Phenanthrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 204 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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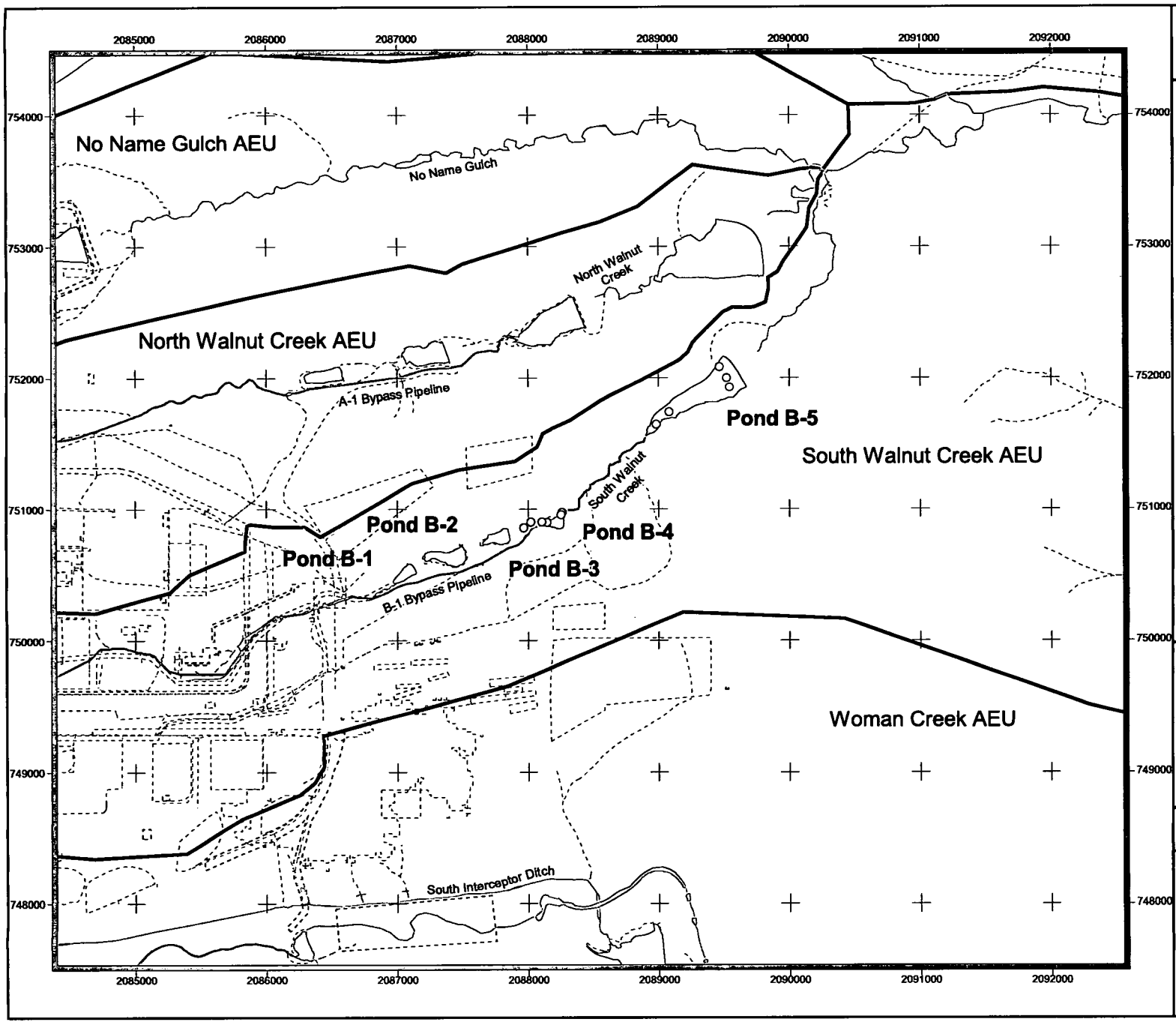

Figure A.56
B Ponds
Surface Sediment Results
for Pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 195 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

Prepared for:

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326

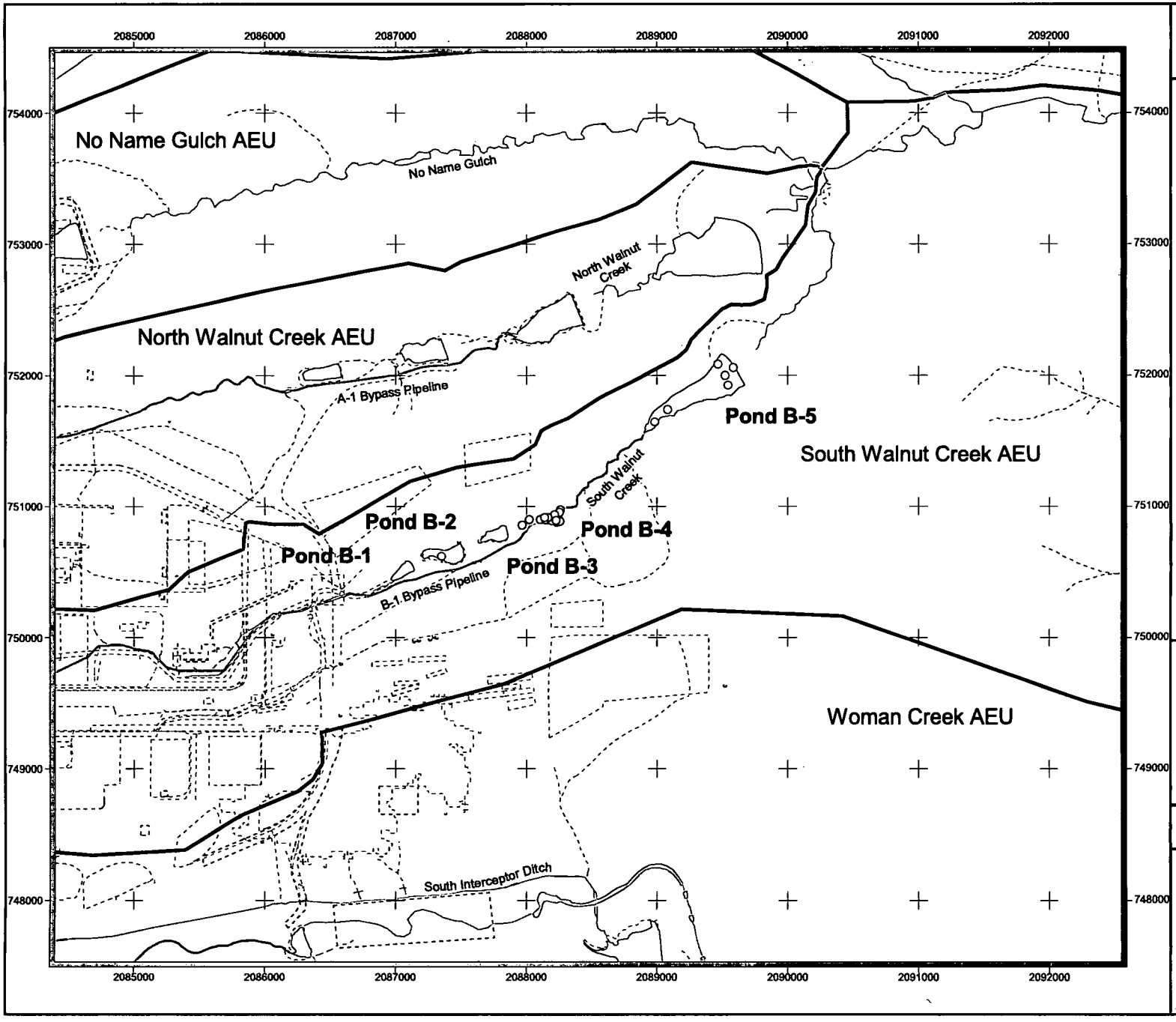

Figure A.57
B Ponds
Surface Sediment Results
for Aroclor-1254

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 40 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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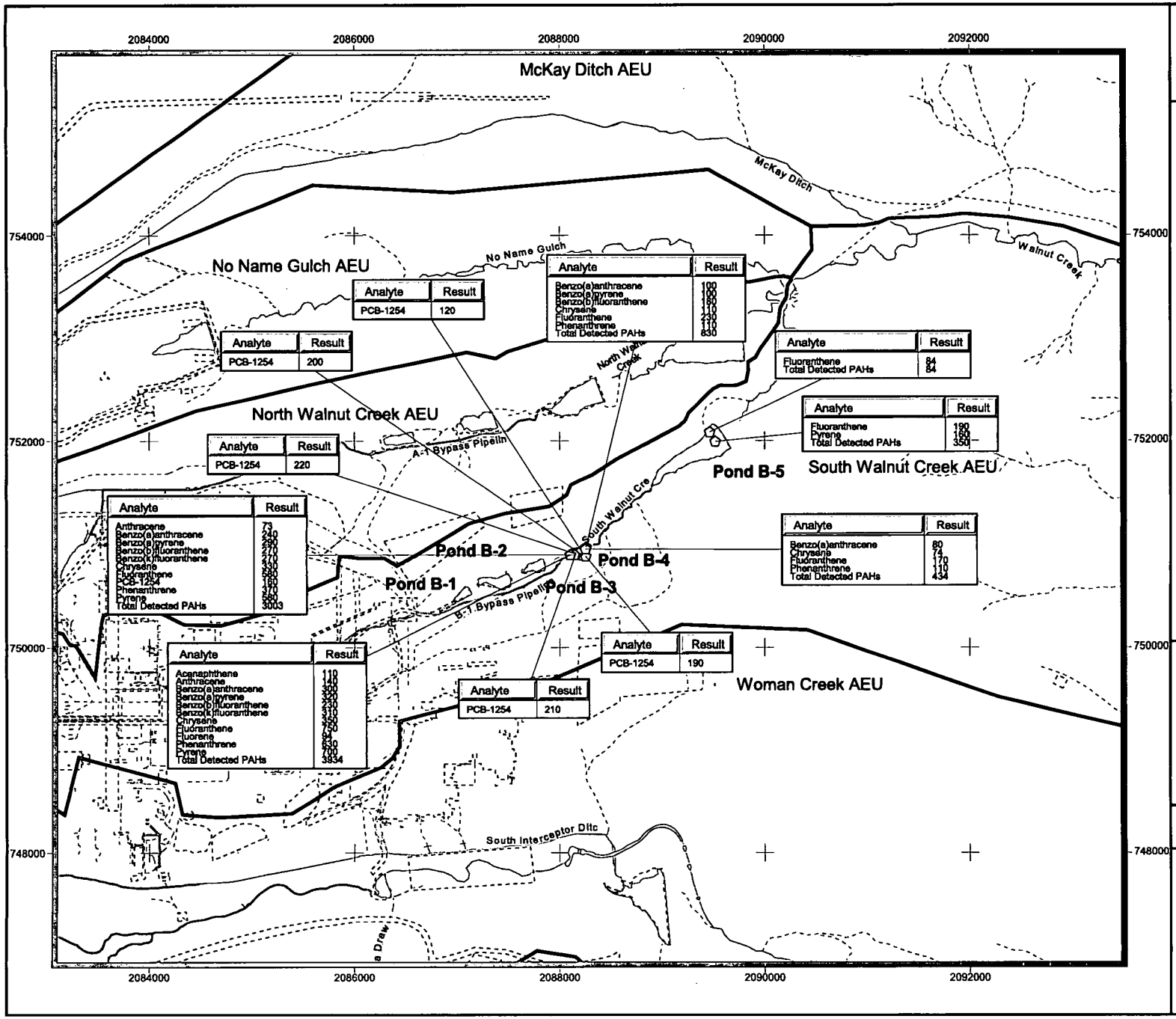

Figure A.58
PAH and PCB Constituent Results Within the B-Series Surface Sediment

KEY

- Surface sediment sampling location
- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

Units = ug/kg

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Data Set: 08/10/05 A1

N W E S

350 0 350 700 1050 1400 Feet

Scale 1: 16,800
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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328

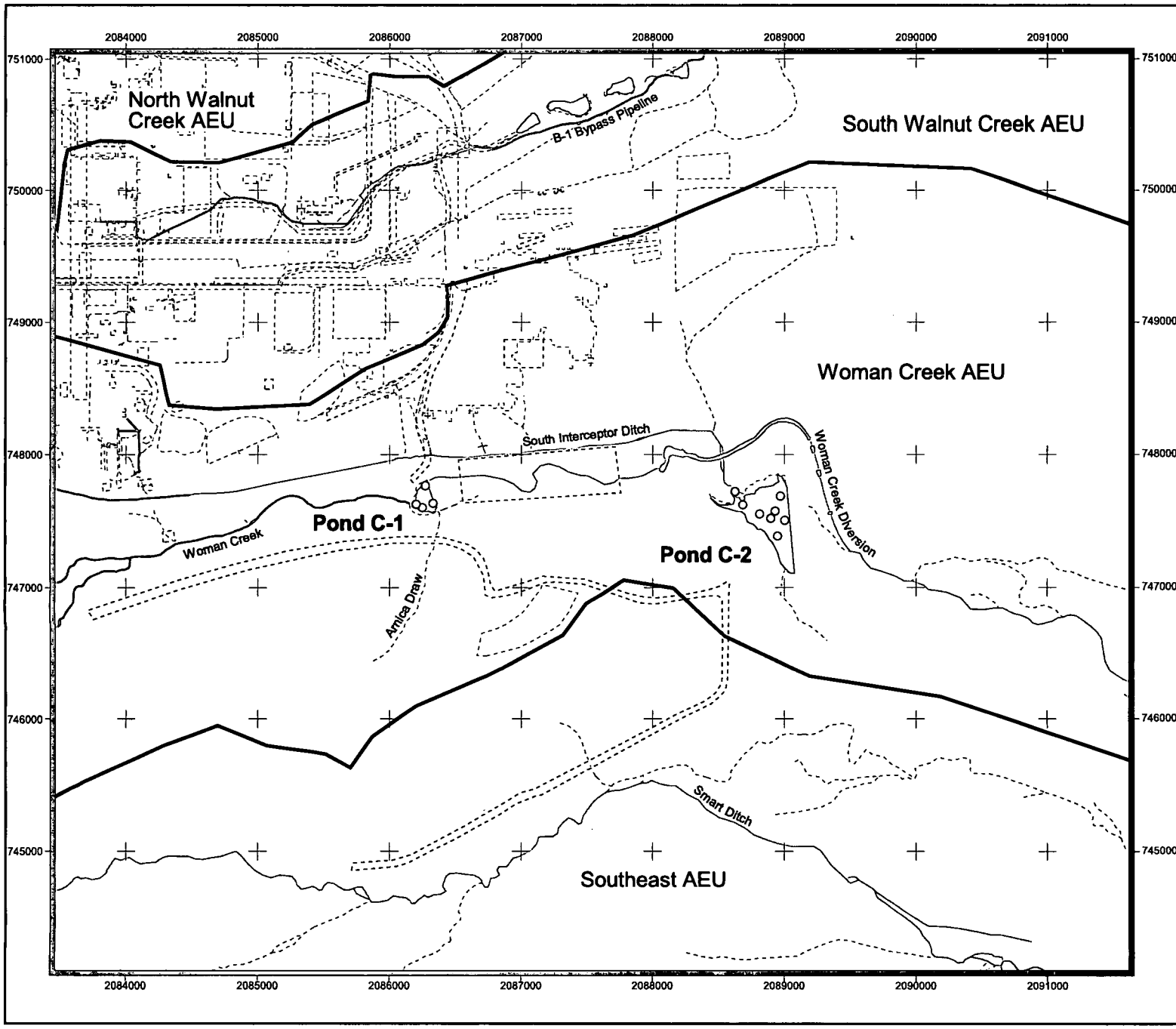

Figure A.59
C Ponds
Sediment Sampling Locations
for Aluminum

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 15900 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

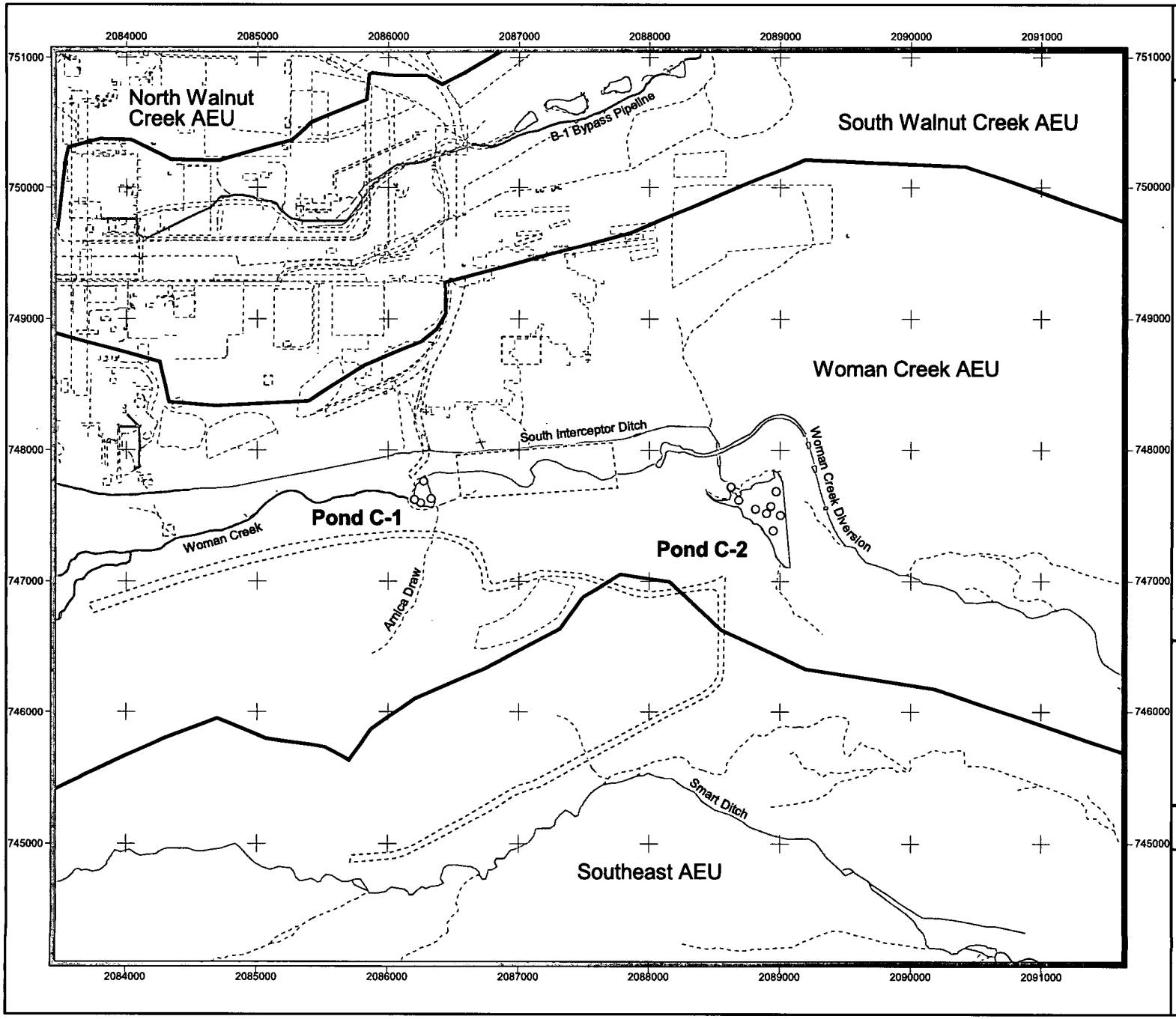

Figure A.60
C Ponds
Sediment Sampling Locations
for Arsenic

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 9.79 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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330

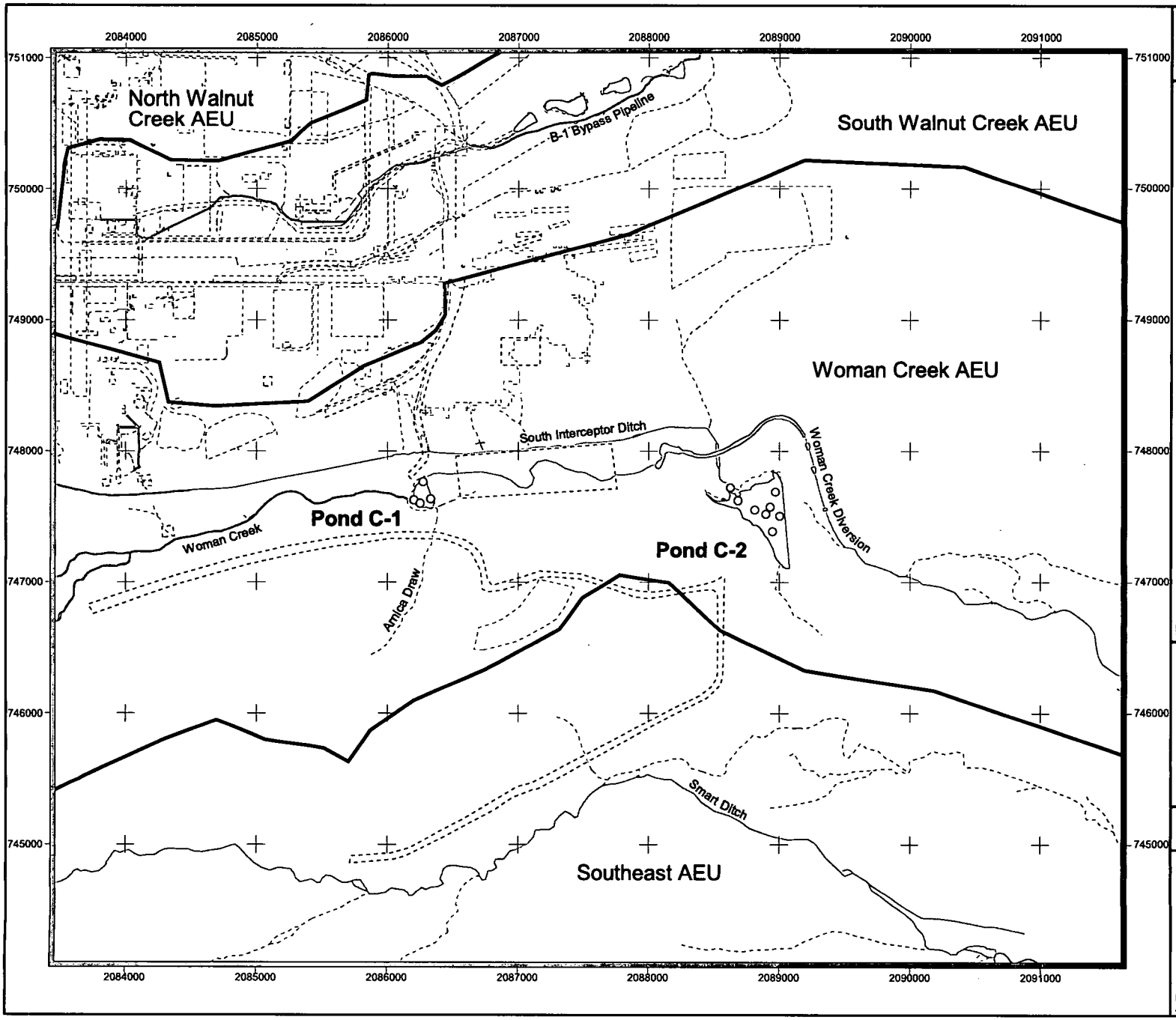

Figure A.61
C Ponds
Sediment Sampling Locations
for Barium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 189 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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331

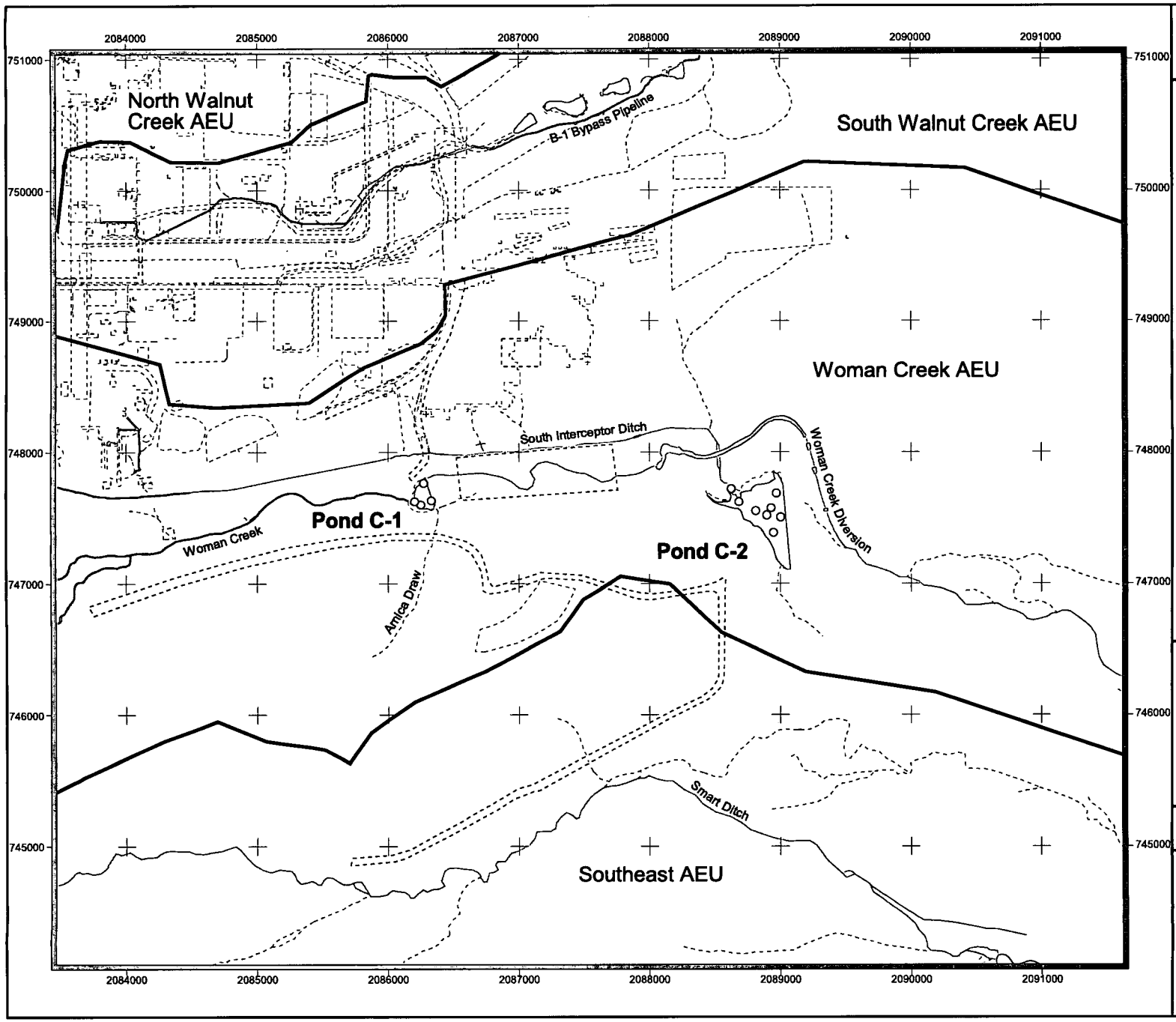

Figure A.62
C Ponds
Sediment Sampling Locations
for Copper

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 31.6 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

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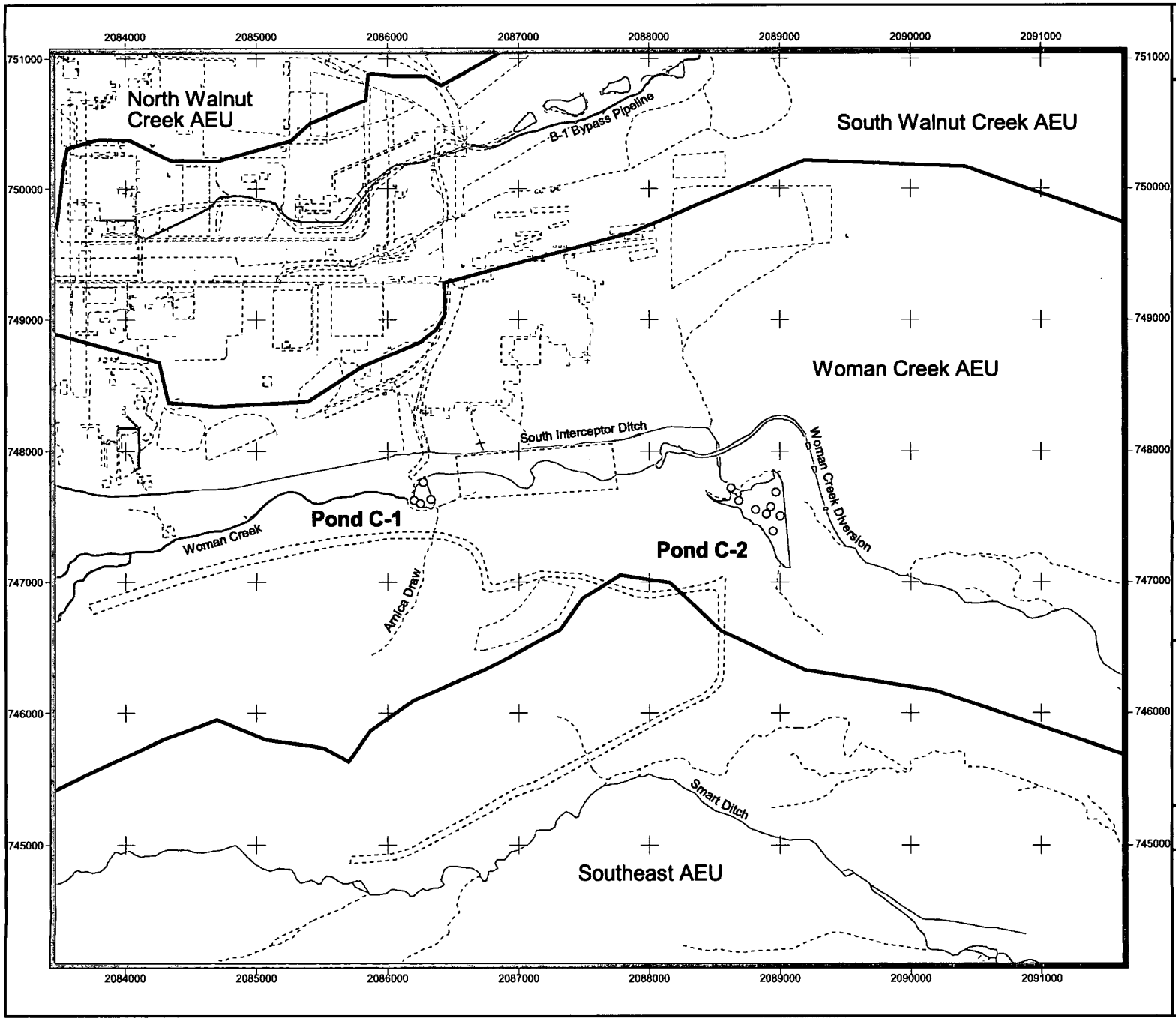

Figure A.63
C Ponds
Sediment Sampling Locations
for Iron

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 20000 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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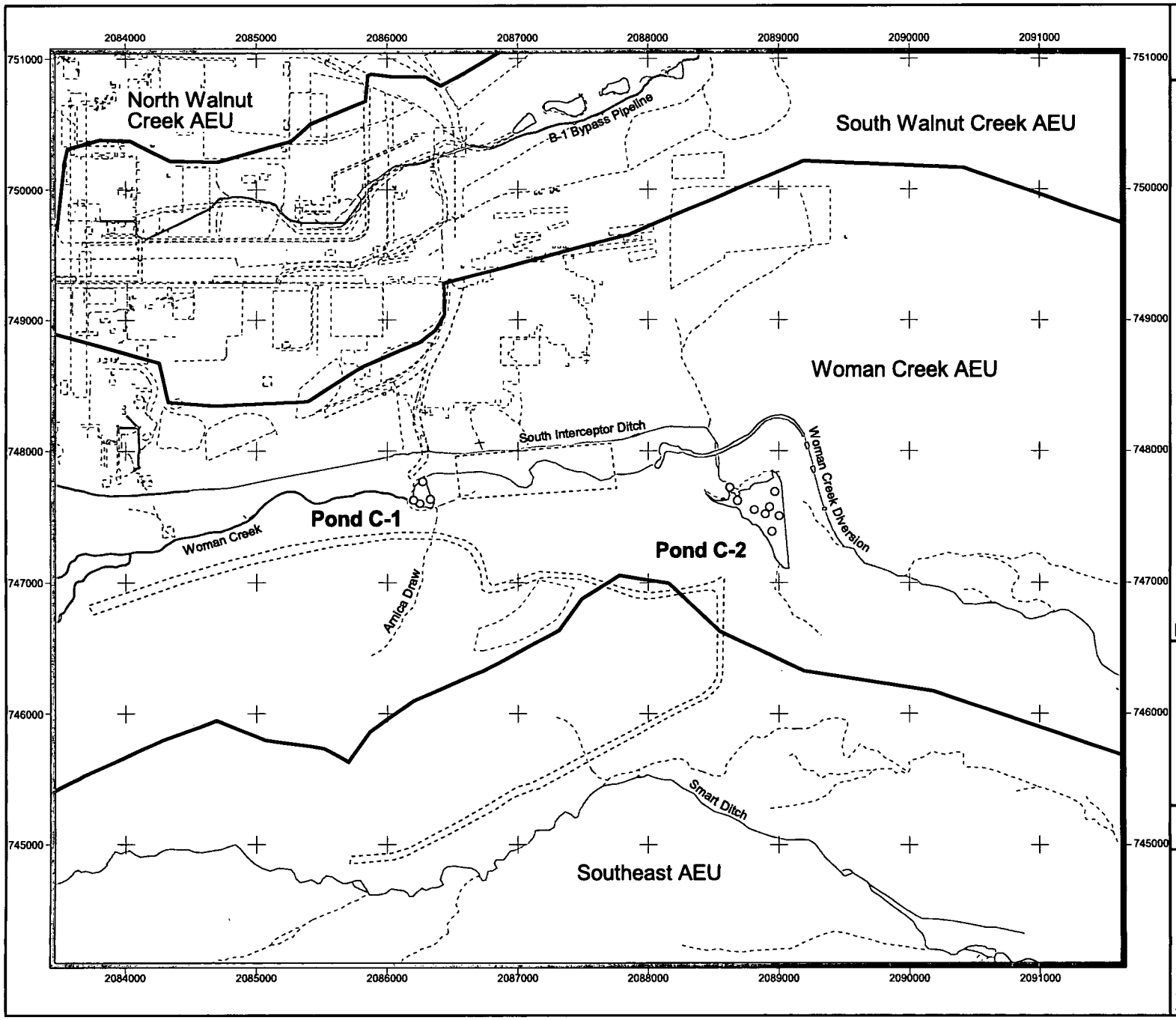

Figure A.64
C Ponds
Sediment Sampling Locations
for Lead

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 35.8 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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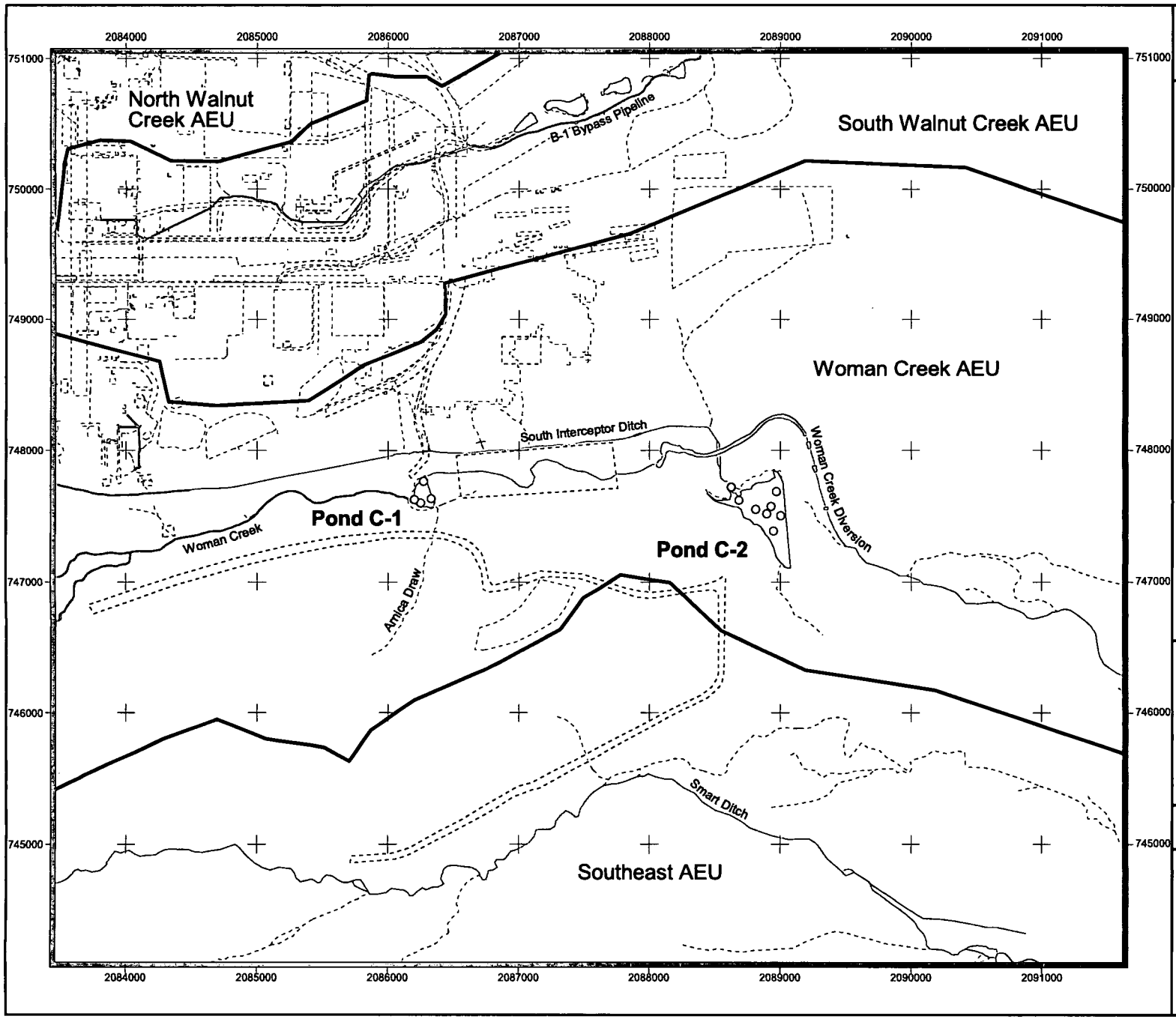

Figure A.65
C Ponds
Sediment Sampling Locations
for Manganese

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 630 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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335

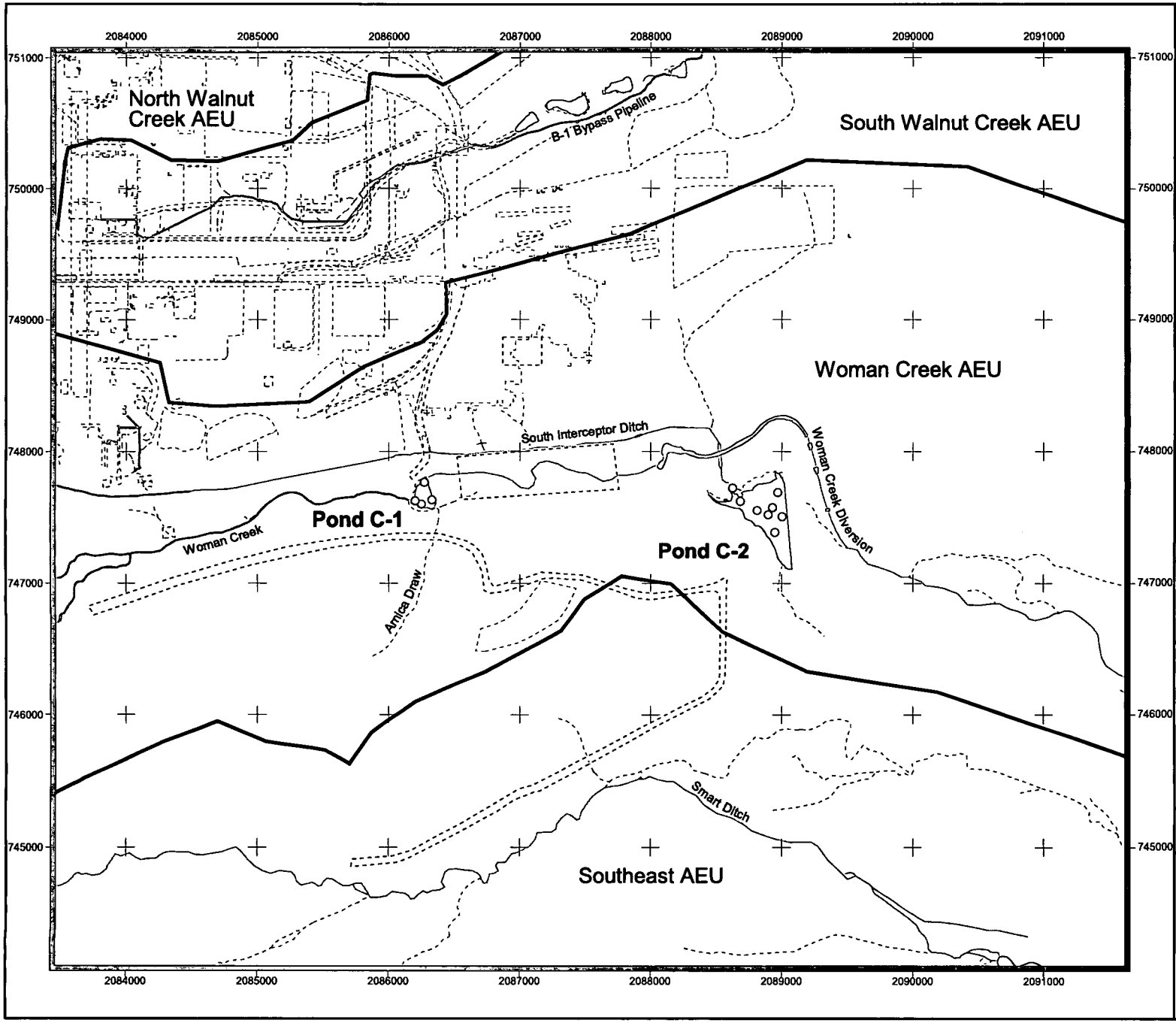

Figure A.66
C Ponds
Sediment Sampling Locations
for Mercury

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.18 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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330

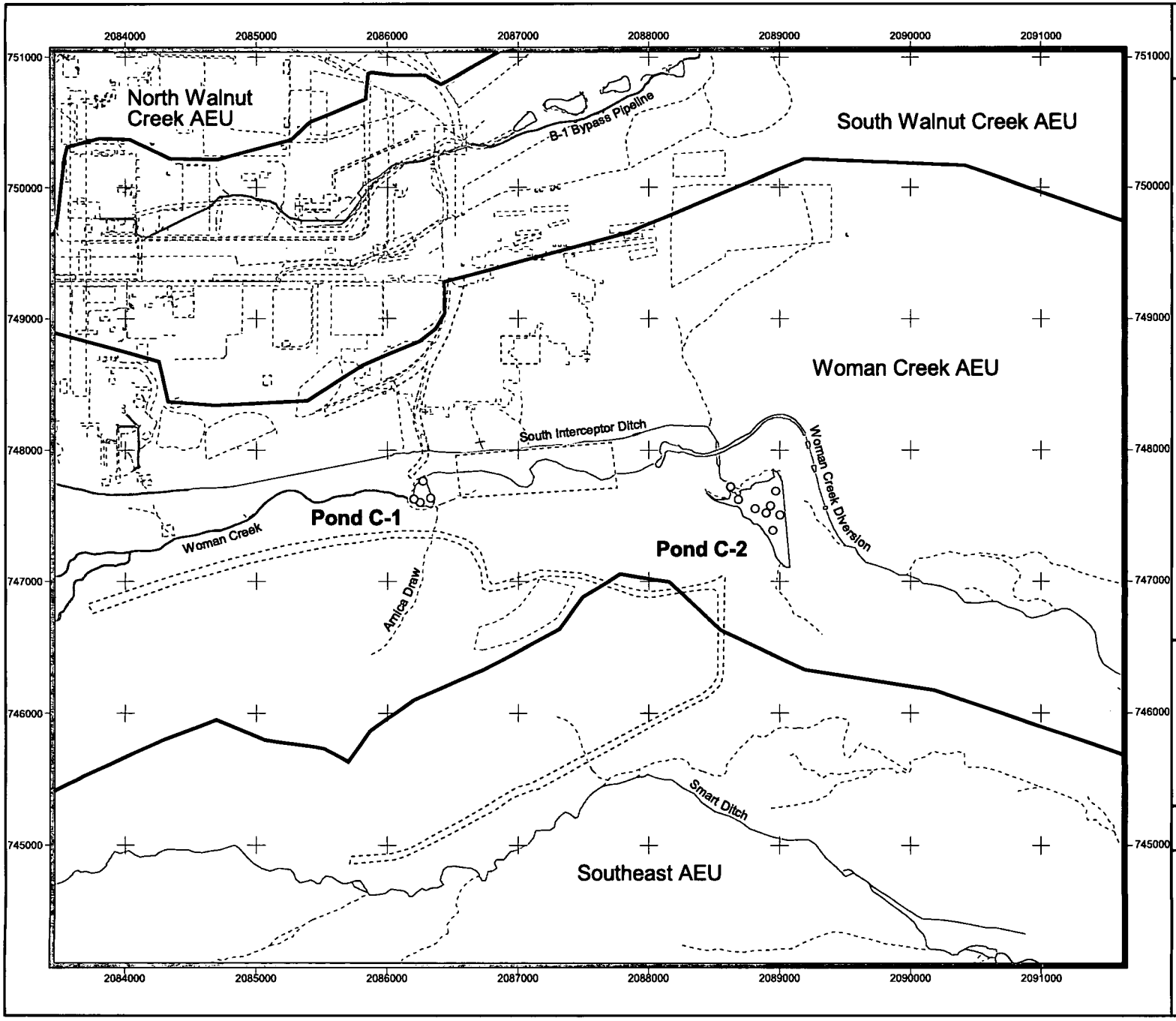

Figure A.67
C Ponds
Sediment Sampling Locations
for Nickel

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 22.7 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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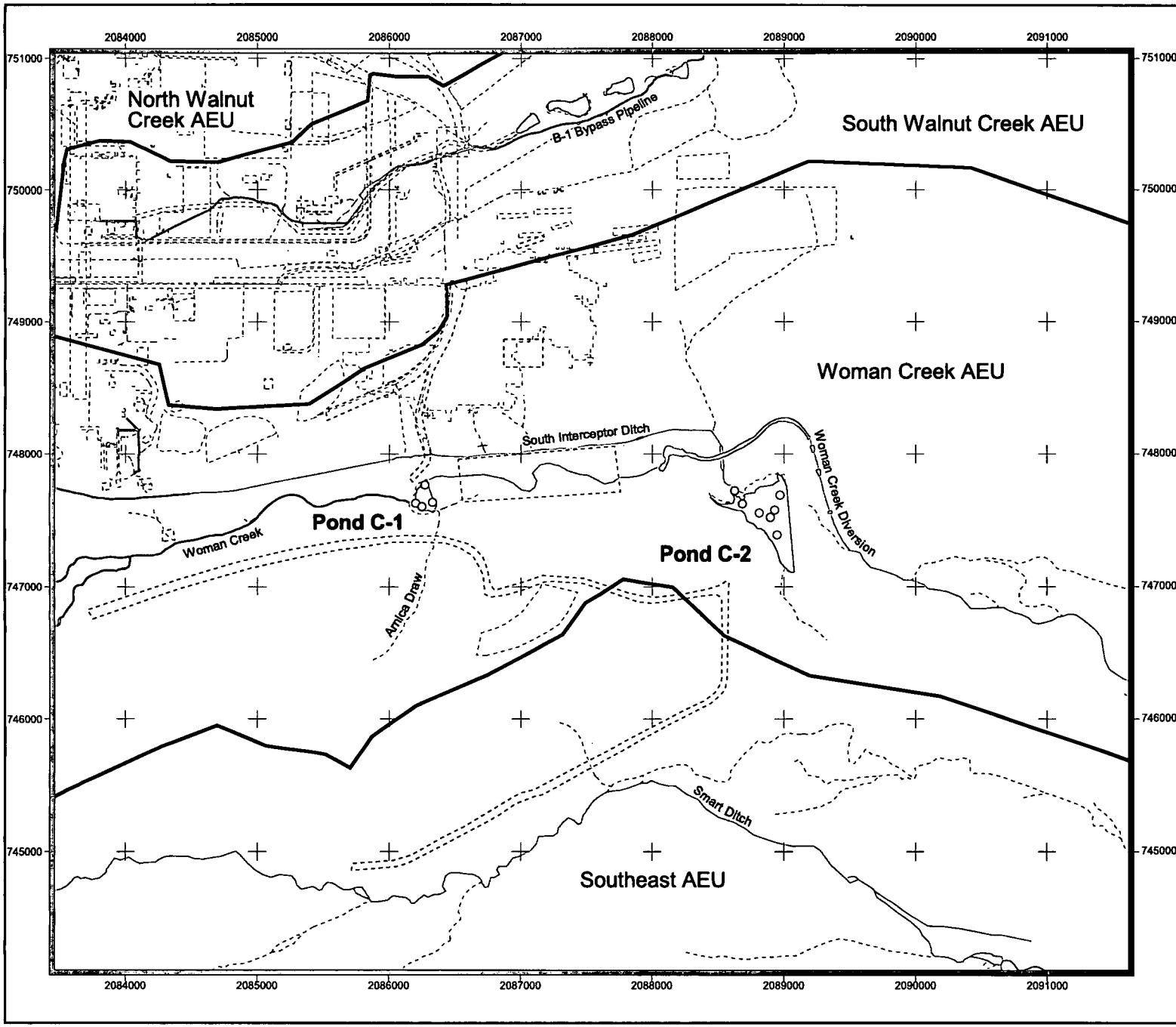

Figure A.68
C Ponds
Sediment Sampling Locations
for Selenium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.95 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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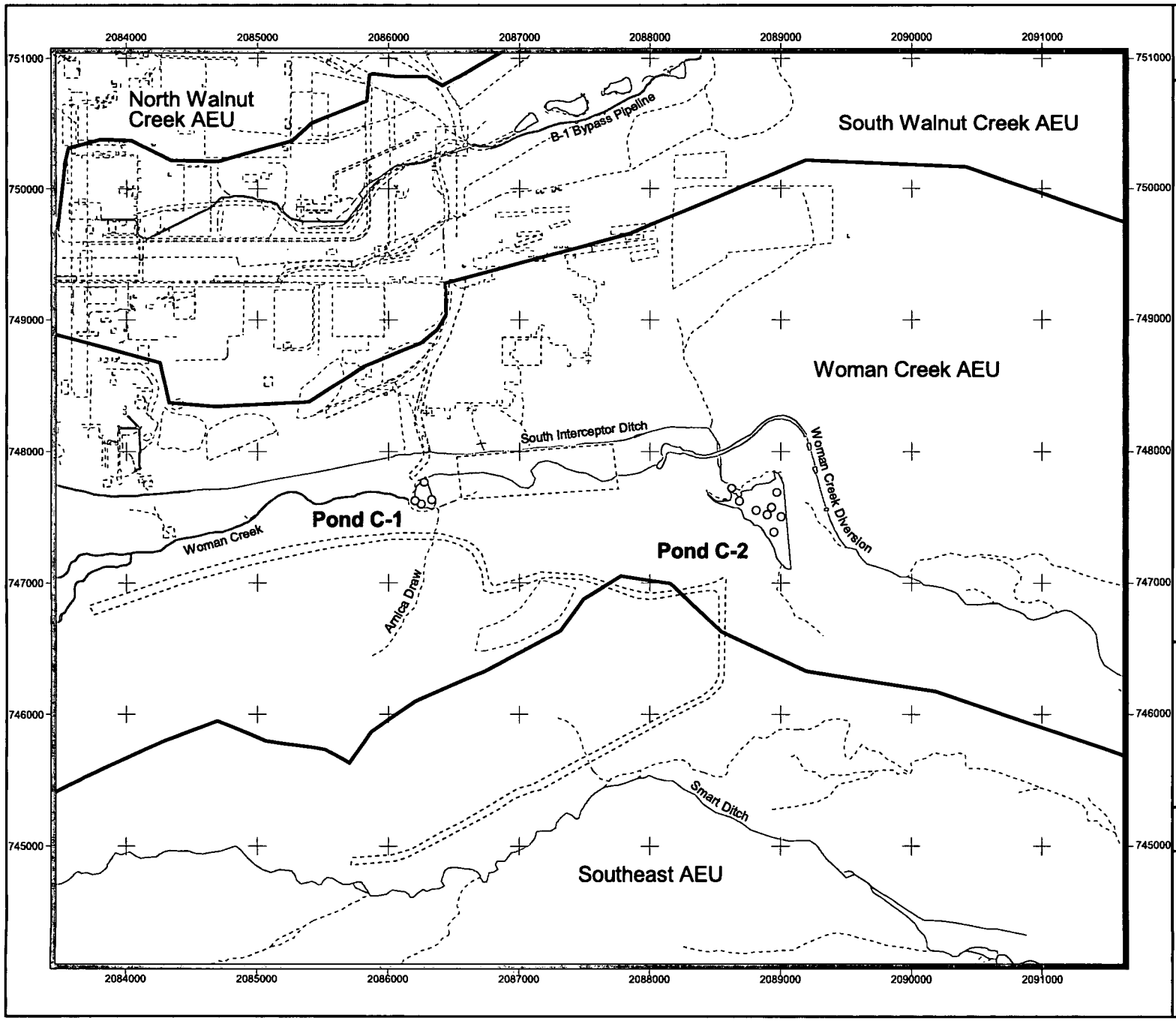

Figure A.69
C Ponds
Sediment Sampling Locations
for Zinc

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 121 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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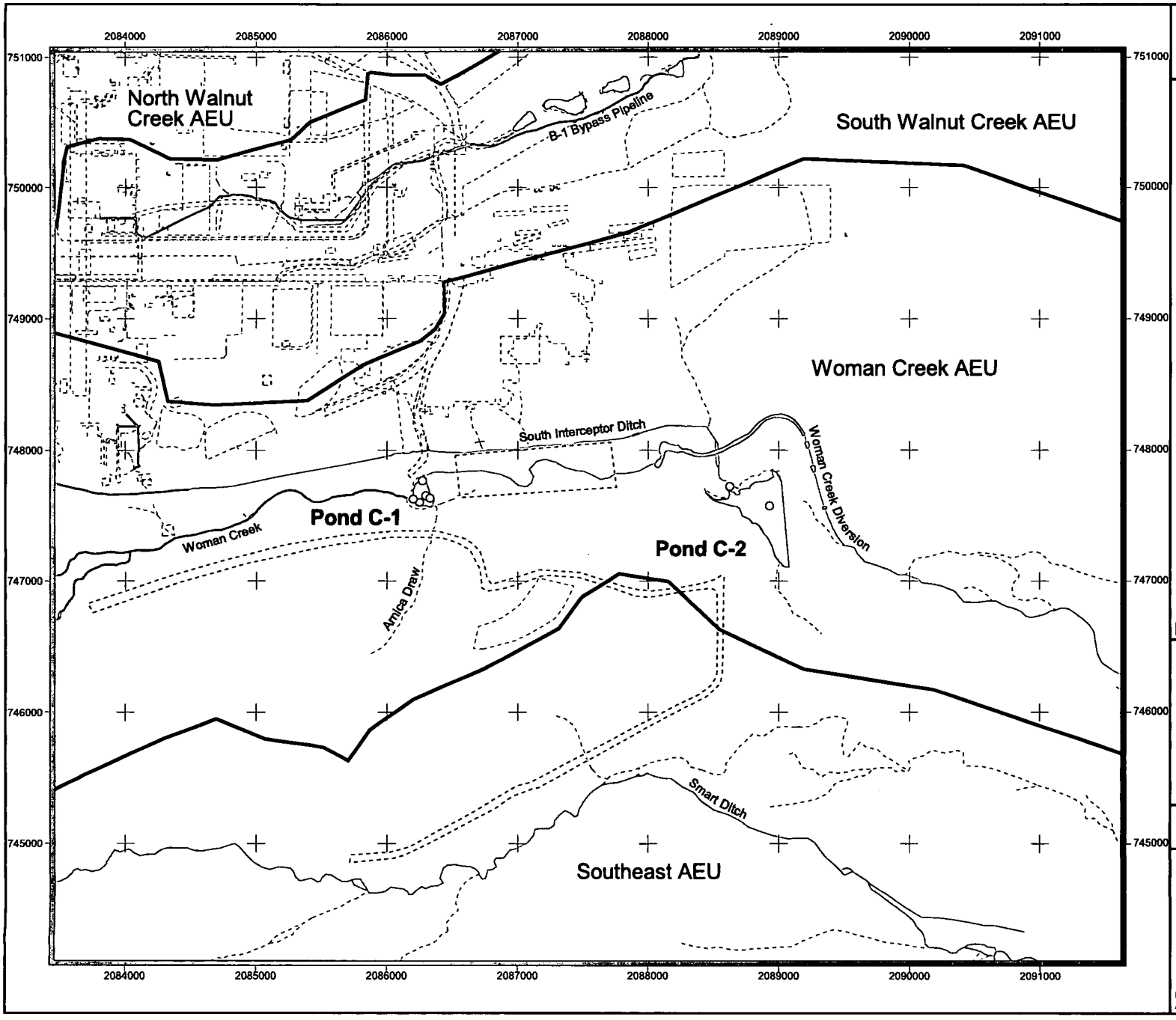

Figure A.70
C Ponds
Sediment Sampling Locations
for Acenaphthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 6.71 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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340

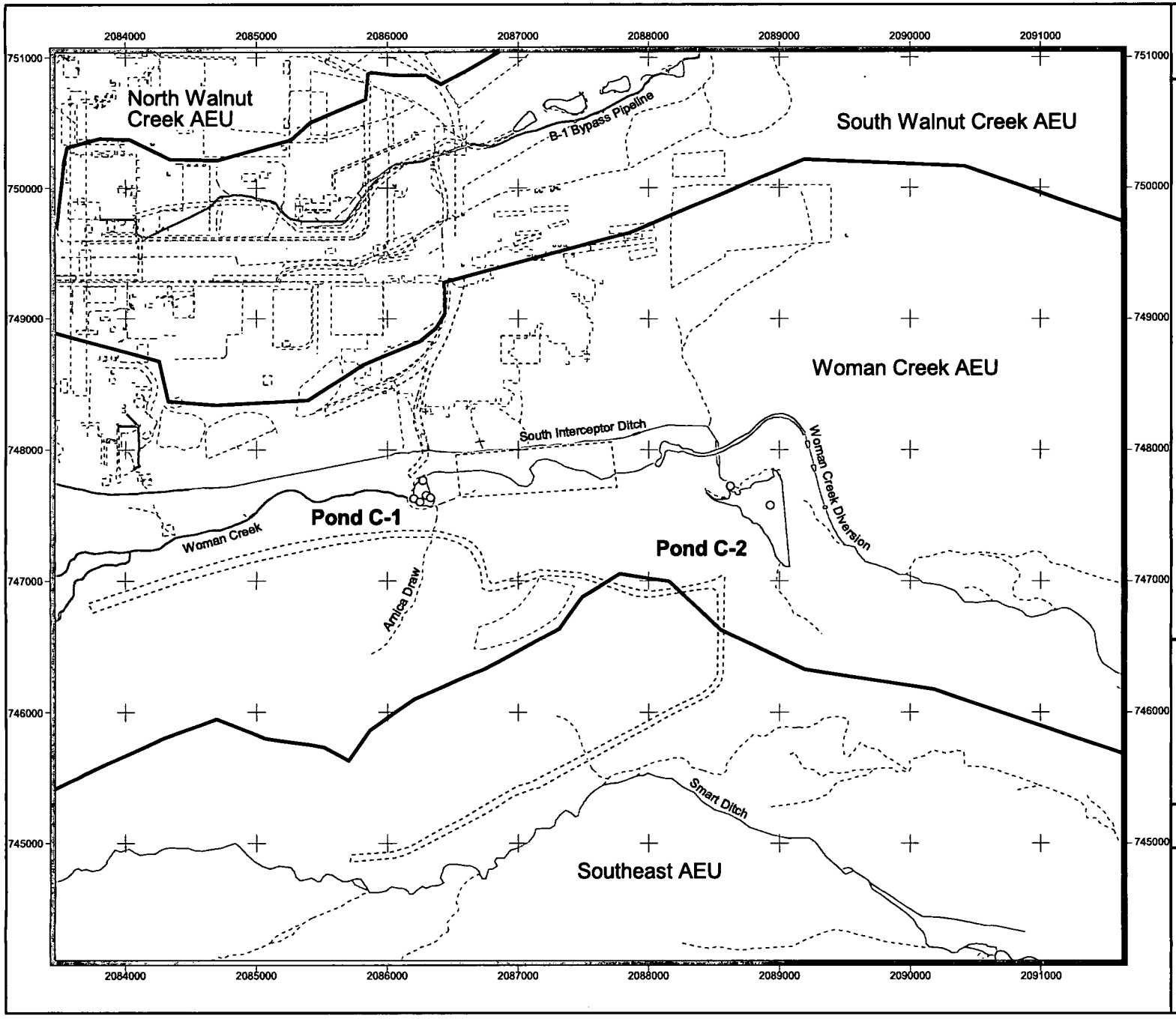

Figure A.71
C Ponds
Sediment Sampling Locations
for Anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 57.2 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

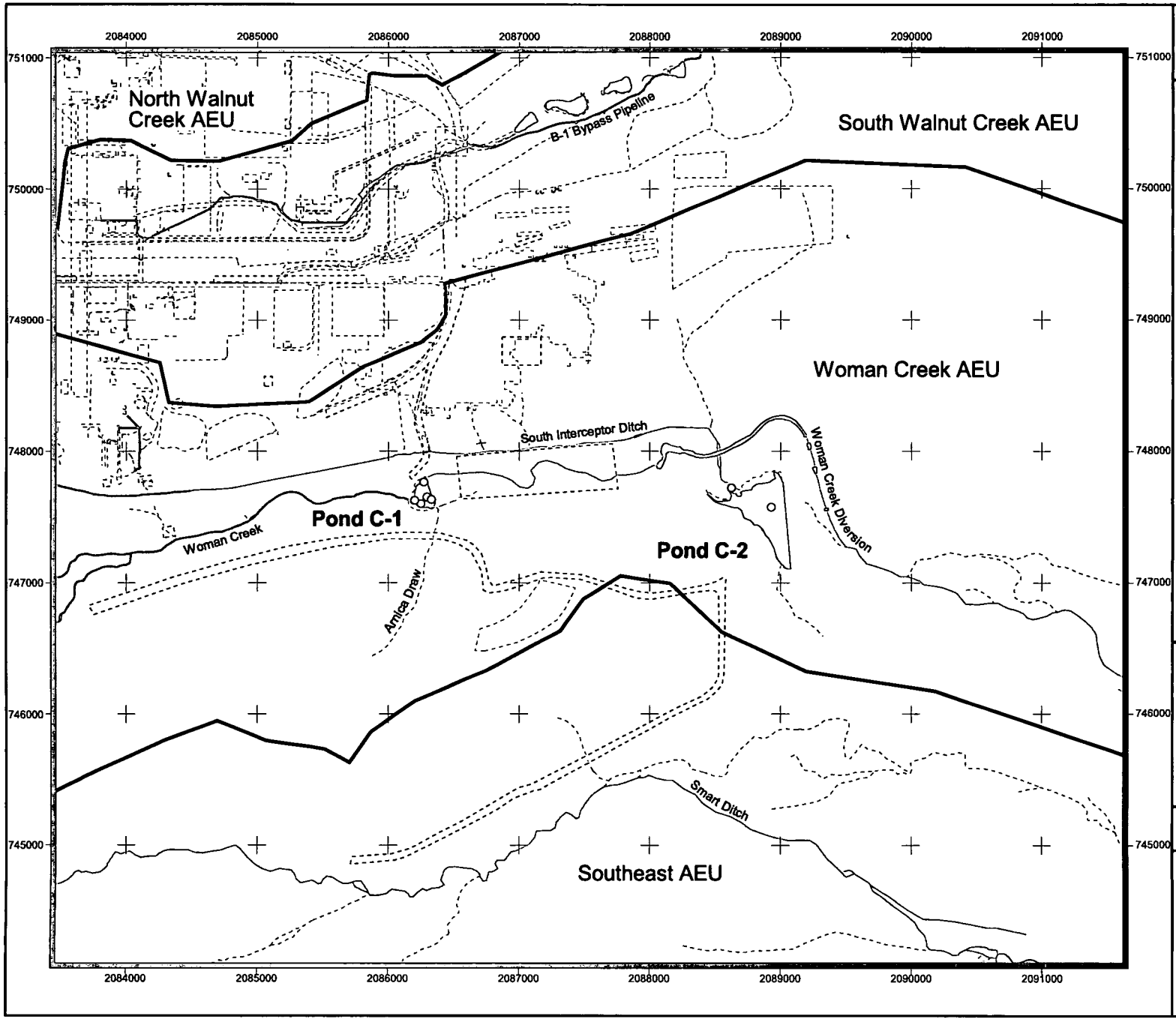

Figure A.72
C Ponds
Sediment Sampling Locations
for Benzo(a)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 108 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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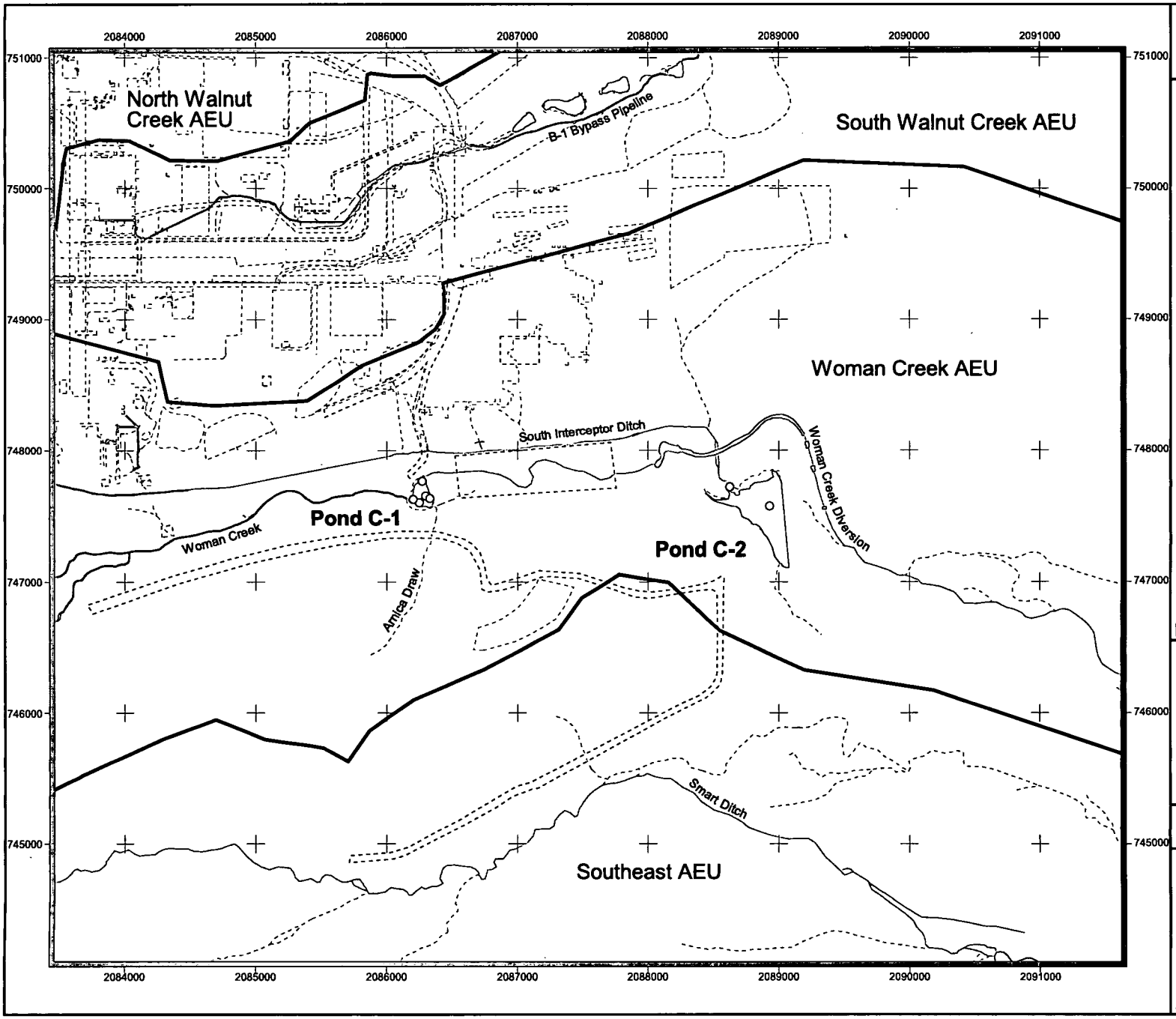

Figure A.73
C Ponds
Sediment Sampling Locations
for Benzo(a)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 150 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Rocky Flats Environmental Technology Site

Date: 08/11/05

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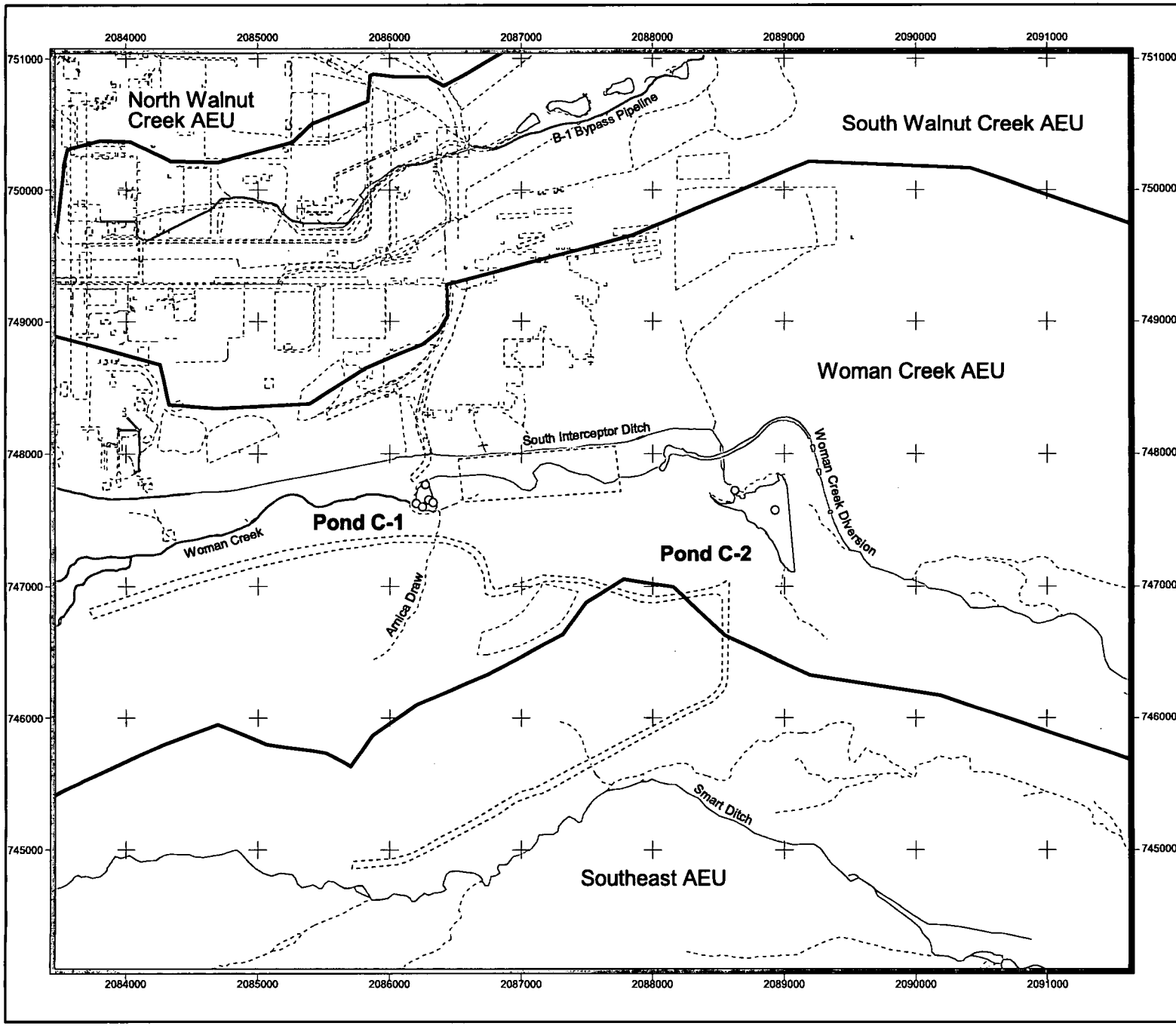

Figure A.74
C Ponds
Sediment Sampling Locations
for Benzo(g,h,i)perylene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 13 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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344

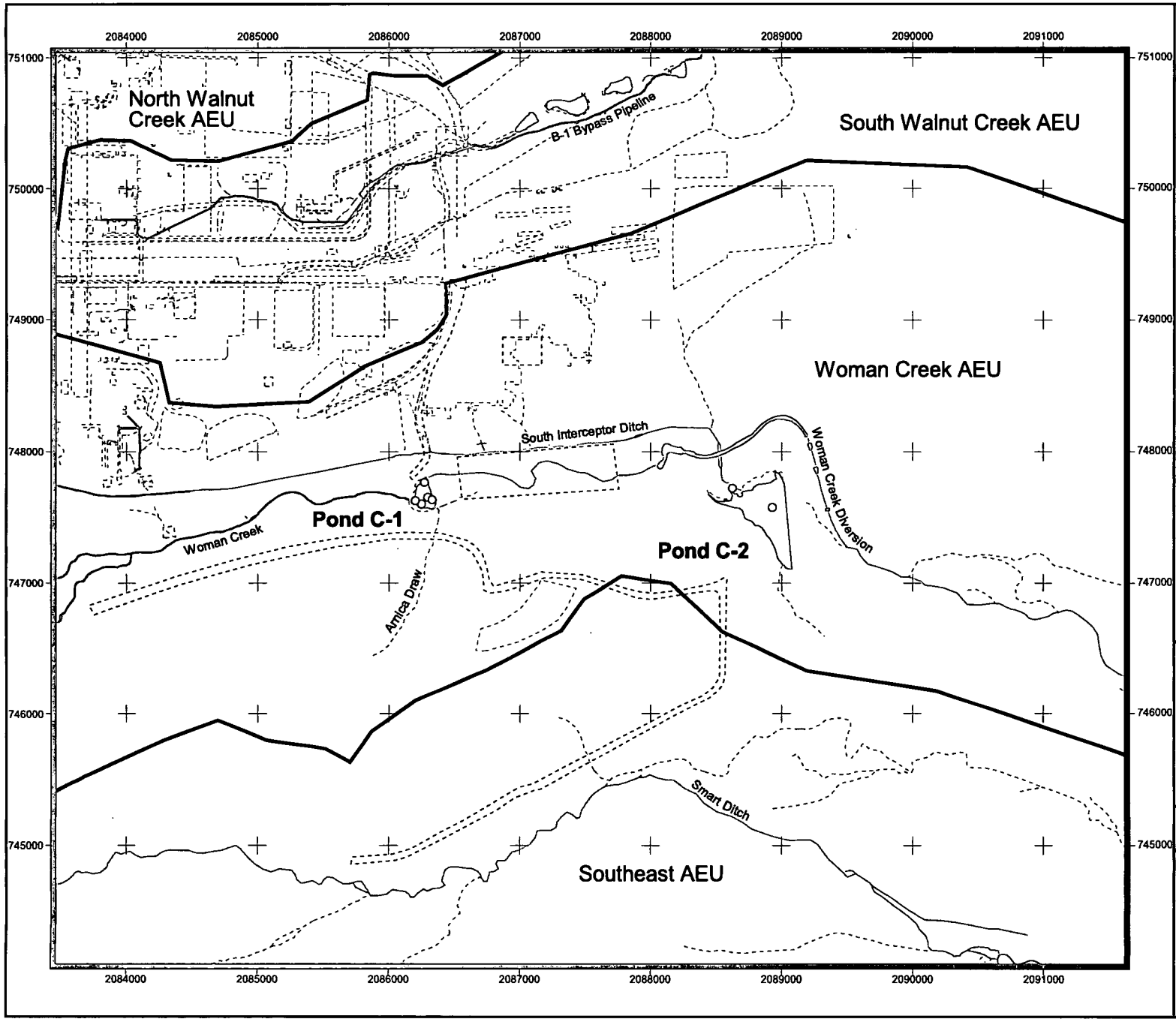


Figure A.75
C Ponds
Sediment Sampling Locations
for Chrysene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 166 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

345

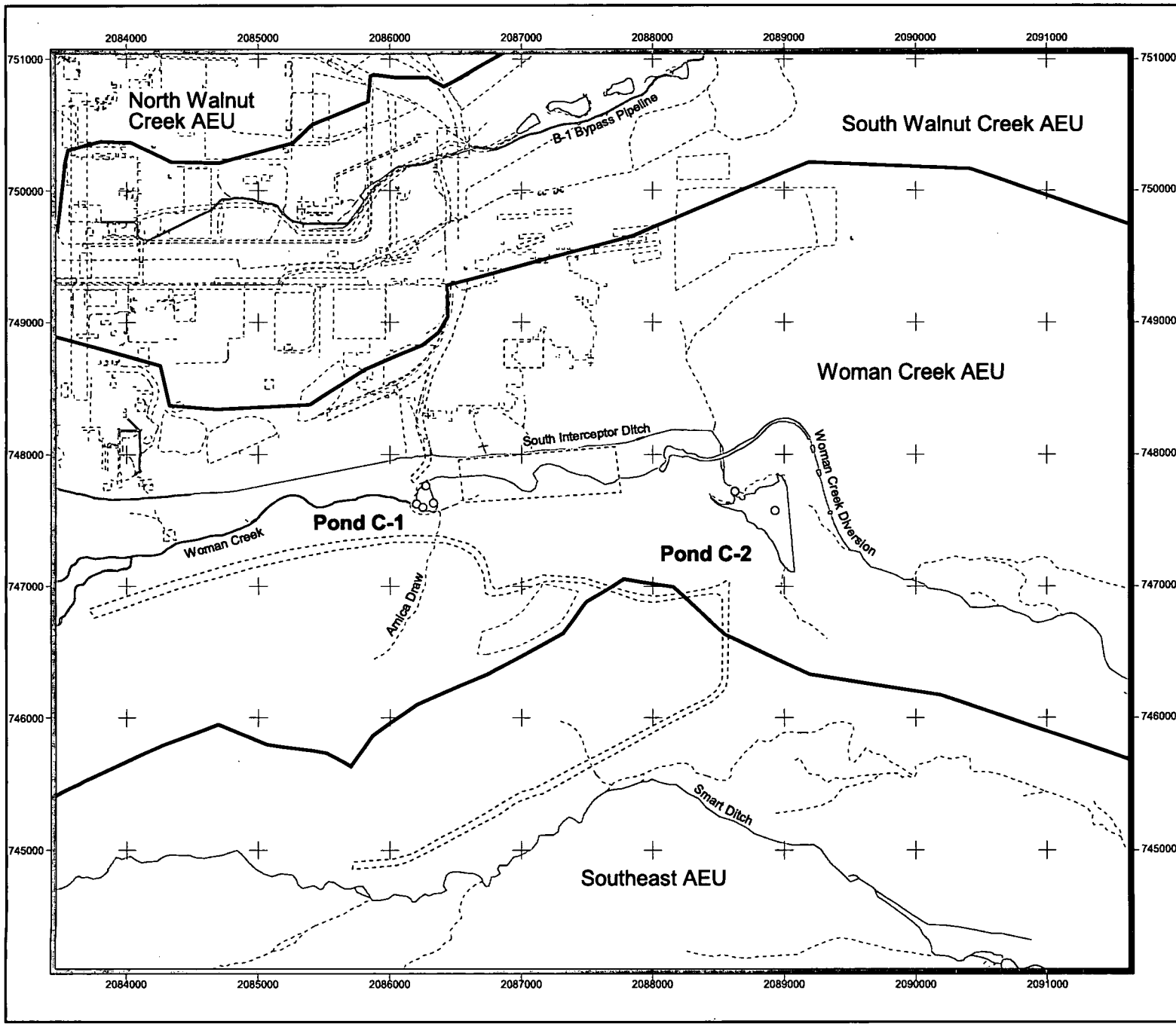


Figure A.76
C Ponds
Sediment Sampling Locations
for Dibenz(a,h)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 33 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

346

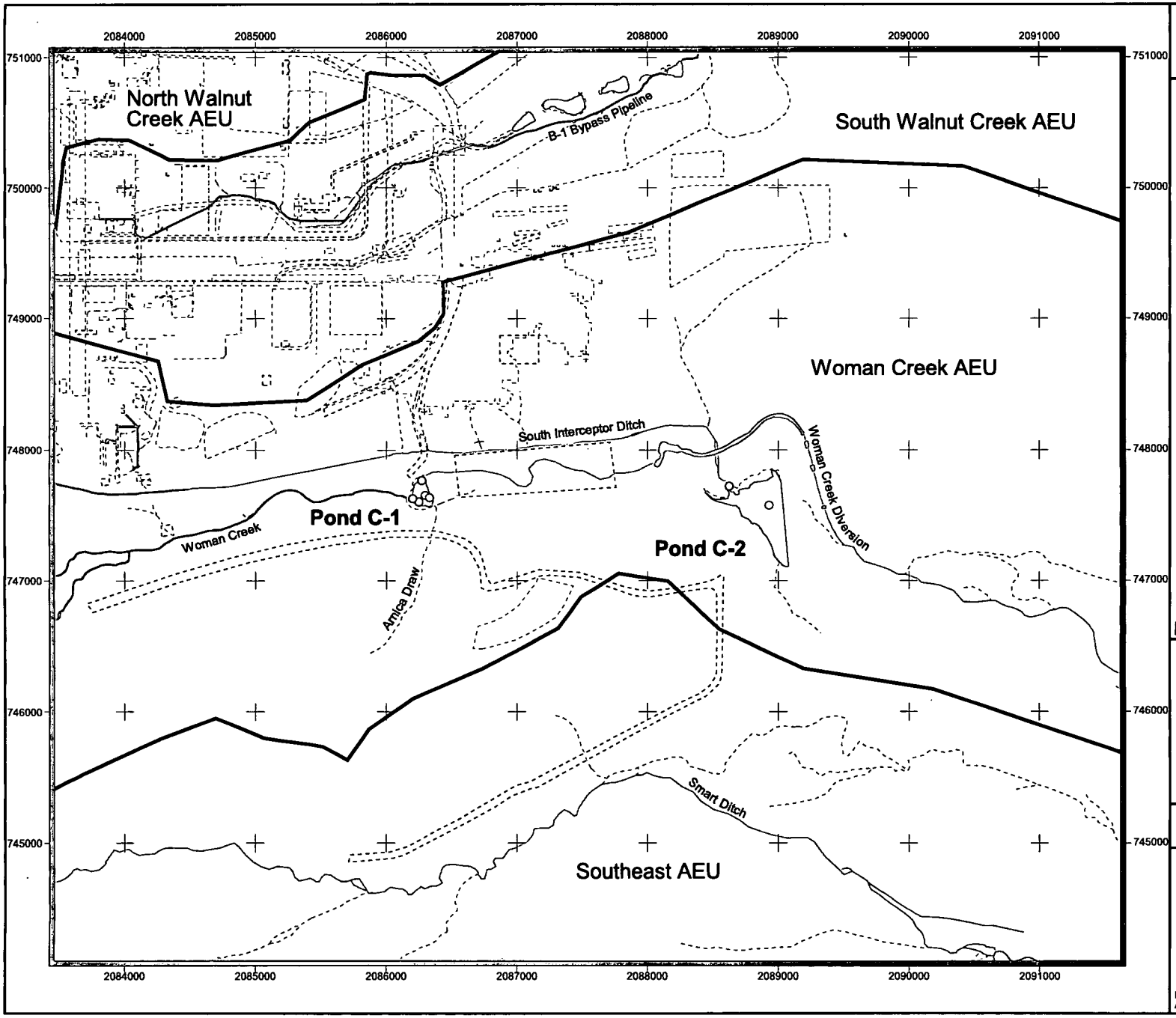


Figure A.77
C Ponds
Sediment Sampling Locations
for Indeno(1,2,3-cd)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 17 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

347

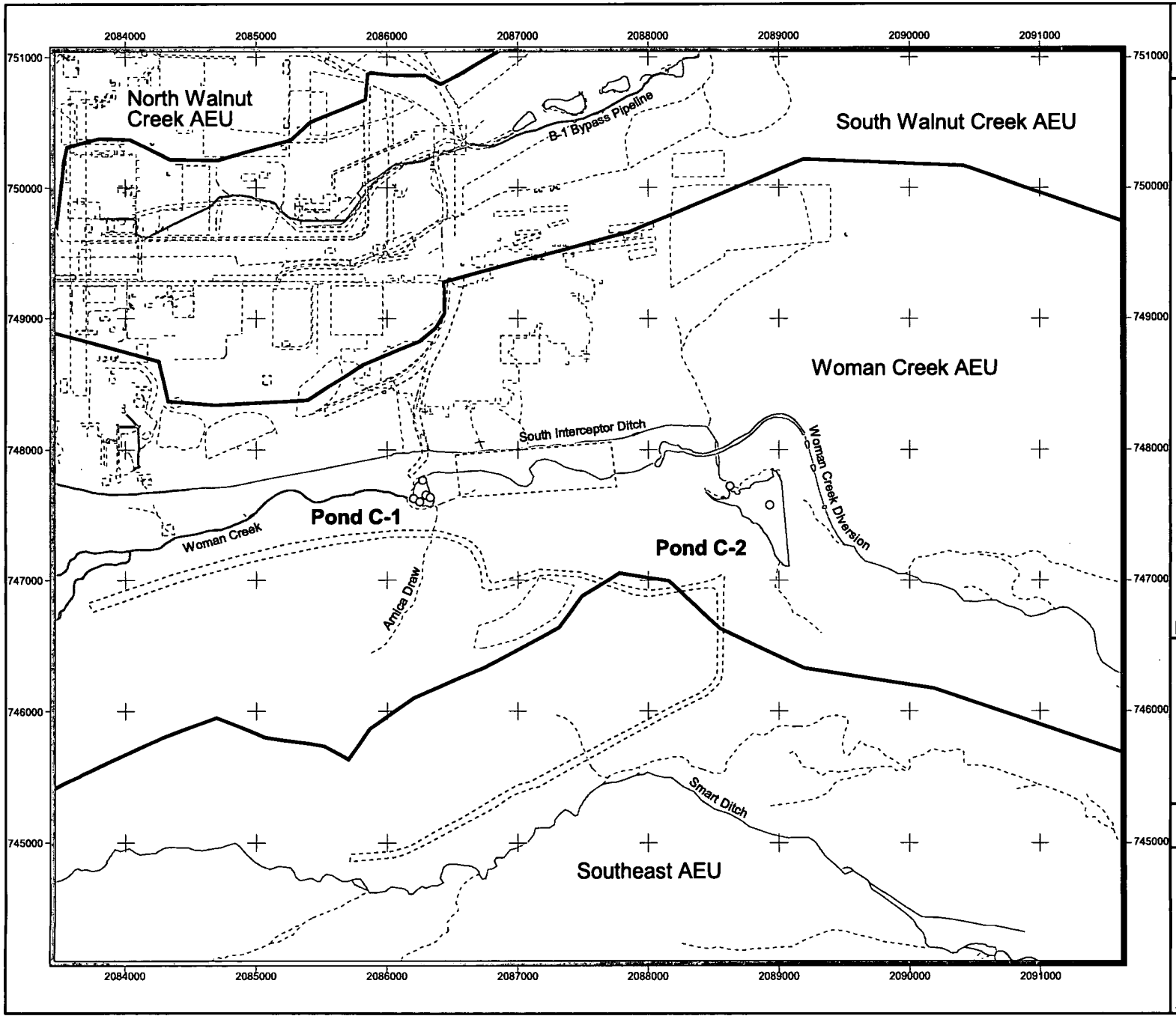


Figure A.78
C Ponds
Sediment Sampling Locations
for Pentachlorophenol

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 255 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

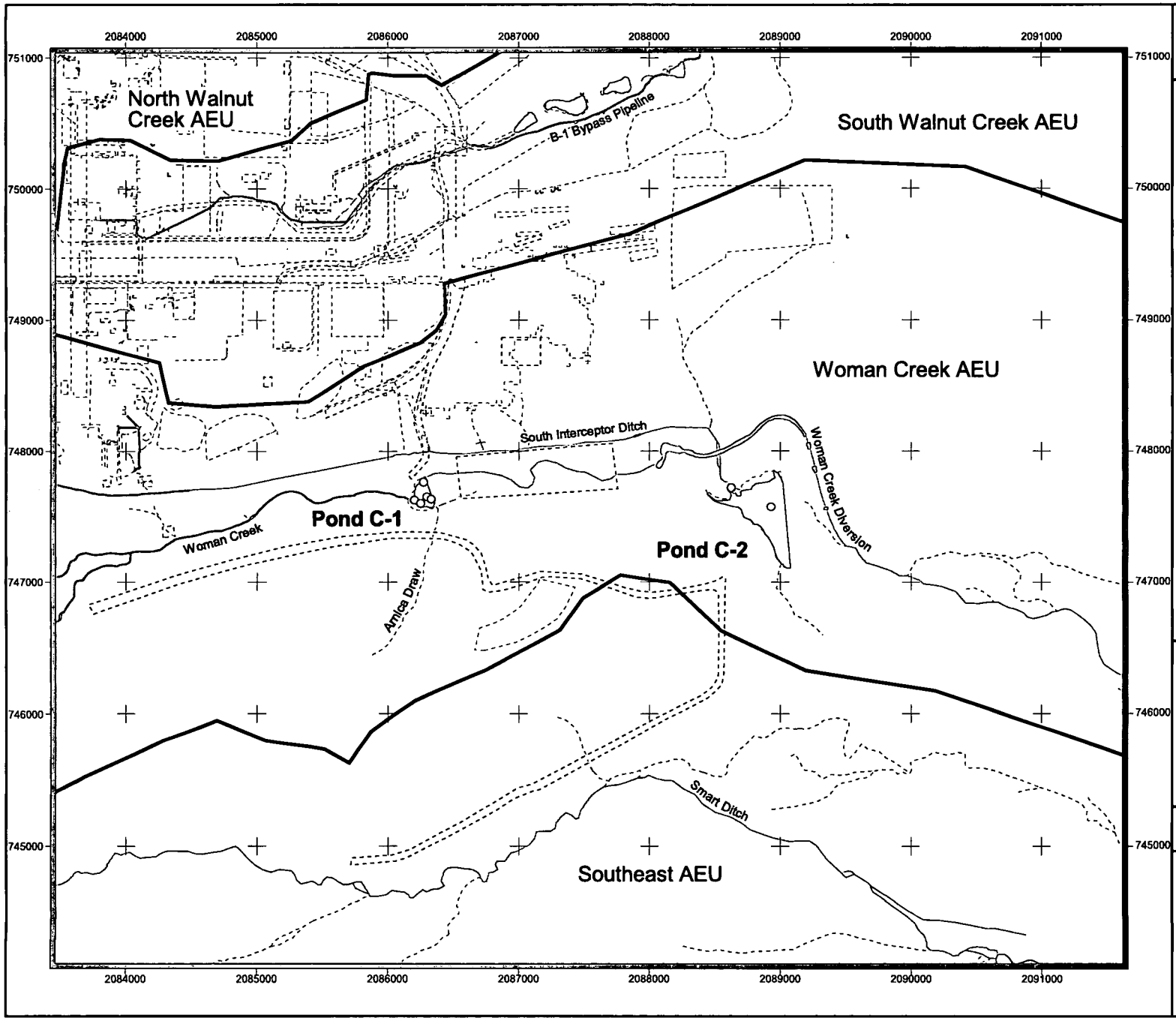


Figure A.79
C Ponds
Sediment Sampling Locations
for Phenanthrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 204 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER-HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

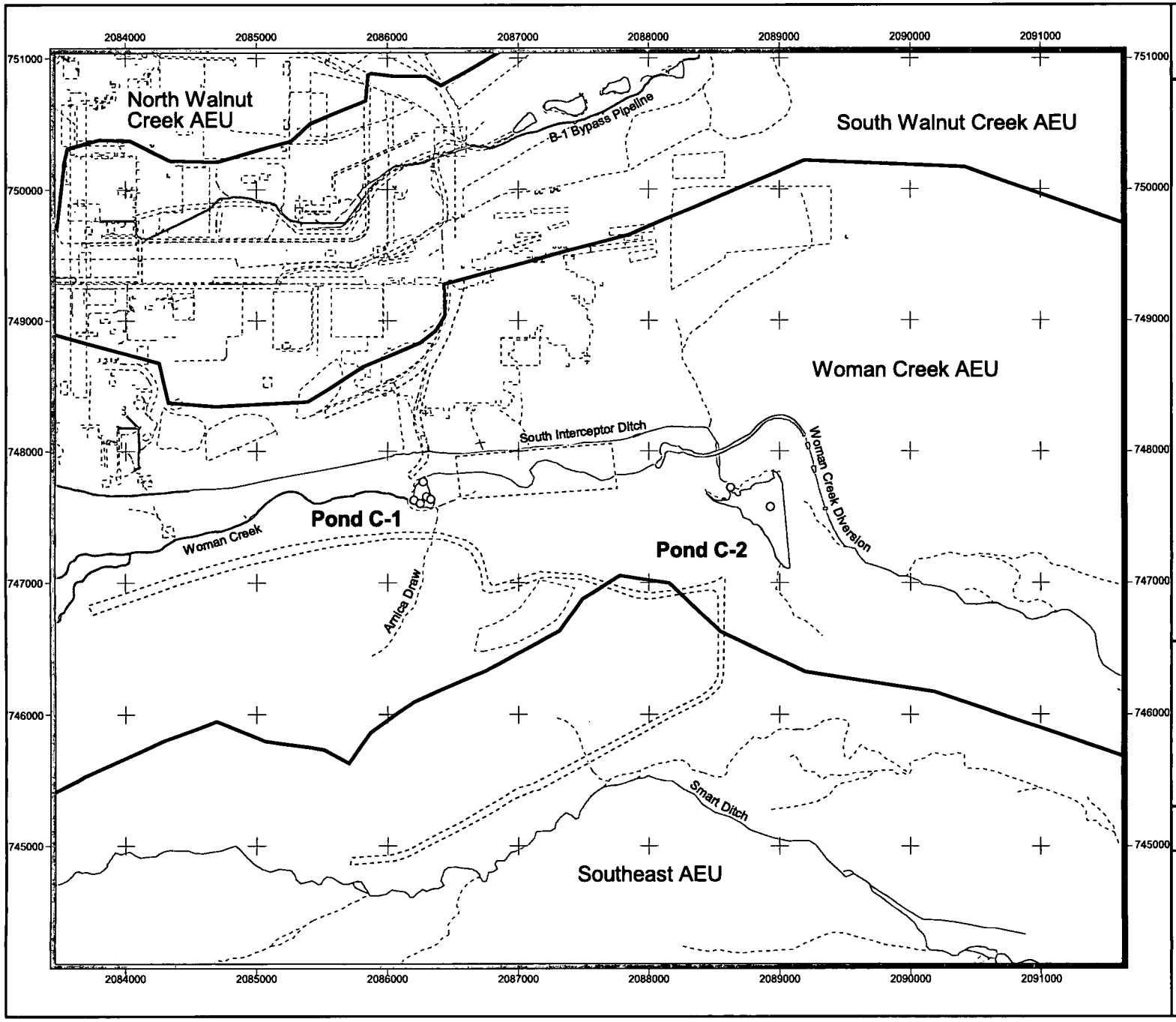


Figure A.80
C Ponds
Sediment Sampling Locations
for Pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 195 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER•HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

350

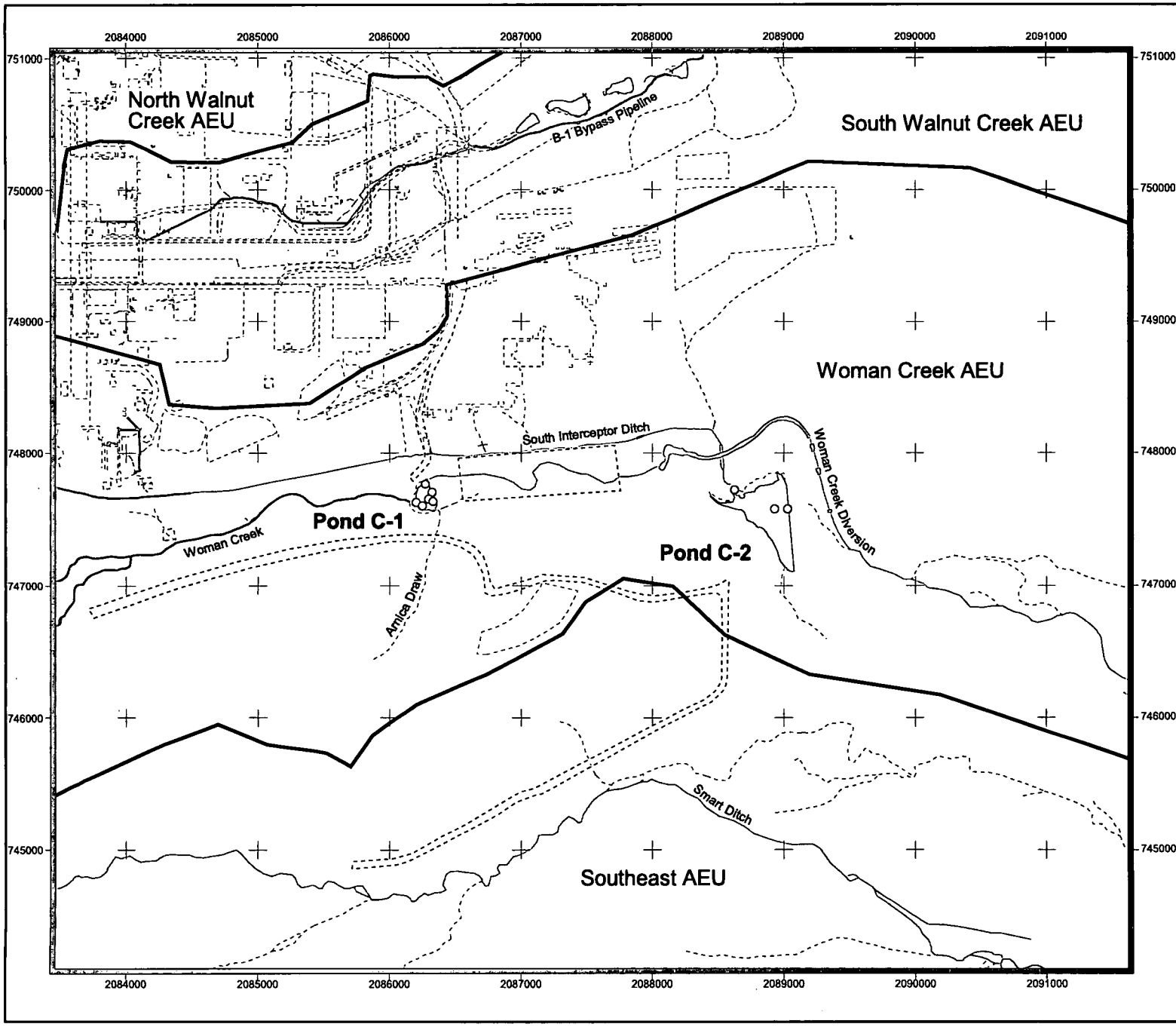


Figure A.81
C Ponds
Sediment Sampling Locations
for PCB-1254

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 40 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

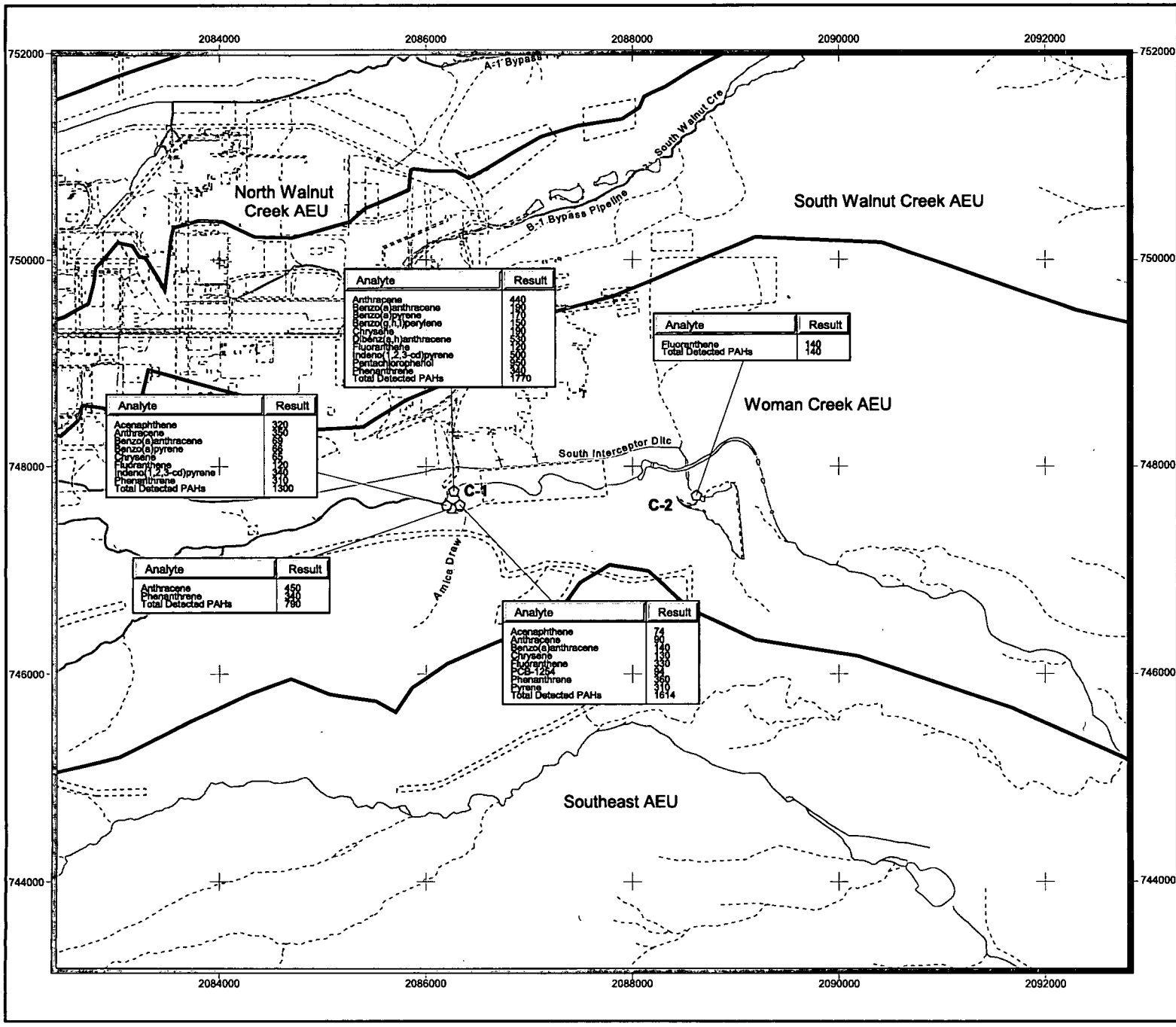
Date: 08/11/05

Prepared for:

KAISER•HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

351



Analyte	Result
Anthracene	440
Benzo(a)anthracene	190
Benzo(a)pyrene	170
Benzo(g,h,i)perylene	150
Chrysene	190
Dibenz(a,h)anthracene	530
Fluoranthene	120
Indeno(1,2,3-cd)pyrene	500
Pentachlorophenol	950
Phenanthrene	340
Total Detected PAHs	1770

Analyte	Result
Acenaphthene	320
Anthracene	350
Benzo(a)anthracene	69
Benzo(a)pyrene	66
Chrysene	55
Fluoranthene	120
Indeno(1,2,3-cd)pyrene	340
Phenanthrene	310
Total Detected PAHs	1300

Analyte	Result
Fluoranthene	140
Total Detected PAHs	140

Analyte	Result
Anthracene	450
Phenanthrene	340
Total Detected PAHs	790

Analyte	Result
Acenaphthene	74
Anthracene	90
Benzo(a)anthracene	140
Chrysene	130
Fluoranthene	330
PCB-1254	84
Phenanthrene	360
Pyrene	310
Total Detected PAHs	1614

Figure A.82
PAH and PCB Constituent Results Within the C-Series Surface Sediment

KEY

- Surface sediment sampling location
- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams

- Perennial
- Intermittent
- Ephemeral

Units = ug/kg

DRAFT

Data Set: 08/10/05 A1

N W E S

350 0 350 700 1050 1400 Feet

Scale 1: 16,800
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

KAISER•HILL COMPANY

File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure_Sed_Locations.apr

ECOLOGICAL SCREENING SUMMARY

APPENDIX A, ATTACHMENT 1

Background Statistical Analyses

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1.0 INTRODUCTION

This document describes the methods and results of the statistical analyses evaluation used to select ecological contaminants of potential concern (ECOPCs) as part of the Ecological Risk Assessment (ERA) for nine ponds within three Aquatic Exposure Units (EUs) (AEUs) at the Rocky Flats Environmental Technology Site (RFETS or Site). These AEUs are the North Walnut Creek AEU (NW AEU), South Walnut Creek AEU (SW AEU), and Woman Creek AEU (WC AEU).

2.0 OVERVIEW OF STATISTICAL ANALYSIS PROCEDURES AND PROFESSIONAL JUDGMENT

Statistical analyses were performed for ecological contaminants of interest (ECOIs) whose maximum detected concentrations (MDCs) exceed the ecological screening levels (ESLs) and detection frequencies are greater than 5 percent. The methods and procedures used are documented in the Comprehensive Risk Assessment (CRA) Work Plan and Methodology (DOE 2004) (CRA Methodology) and in a Regulatory Contact Record (under development). The following process is used to select ECOPCs for each environmental medium:

1. Compare the ECOI MDC to the ESL.
2. Calculate the detection frequency.
3. For each ECOI with an MDC that exceeds its ESL and a detection frequency greater than 5 percent, use the data distributions for the AEU and background data sets recommended by ProUCL to identify the most appropriate statistical test for conducting an AEU/background comparison, and perform the test.
4. If the ECOI concentrations in the AEUs are statistically greater than background, calculate the 95 percent upper confidence limit (UCL) of the 90th percentile (upper tolerance limit [UTL]).
5. Compare the UTL to the ESL.
6. If the UTL exceeds the ESL, conduct a professional judgment evaluation to determine whether the ECOI should be an ECOPC or excluded from further consideration based on the weight-of-evidence approach.

2.1 Data Distribution Testing

Data distribution testing for pond and background data was conducted to identify the appropriate statistical methods and tests for the background analyses, and to calculate exposure point concentrations (EPCs). Data distribution testing was conducted according to U.S. Environmental Protection Agency (EPA) guidance (EPA 2002) and EPA QA/G-9 methods (EPA 2000) using the ProUCL (Version 3) computer program (Singh et al. 2004), as required by the CRA Methodology. ProUCL statistical software was developed for EPA's Technical Support Center to support risk assessment and cleanup decisions at contaminated sites.

ProUCL tests for normality, lognormality, gamma, and nonparametric distribution of the data using the following statistical tests:

- Shapiro-Wilk W-Test (n < 50);
- Lilliefors Test (n > 50; Note: can be used for n < 50 as well);
- Anderson-Darling Test for gamma distribution (n < 2,500); and
- Kolmogorov-Smirnov Test for gamma distribution (n < 2,500).

The ProUCL output recommends a distribution type for each tested data set, which is used for subsequent analyses in the CRA.

2.2 Background Comparison Testing

The background comparisons consist of two-sample tests that evaluate whether the mean or median of the ECOI concentration in a pond data set is significantly elevated over the corresponding background statistic. The S-Plus statistical software package (Insightful 2002) is used for all calculations. If the two data sets to be compared are both normally or lognormally distributed, the two-sample t-test is used; if the data sets have different distributions or a nonparametric distribution, the Wilcoxon Rank Sum (WRS) test is used. The tests evaluate the null hypothesis that no difference exists between the population means (t-test) or medians (WRS test) of the background and pond data sets at the specified level of significance. As specified in the CRA Methodology, the level of significance for the background comparisons in the CRA is 0.1 (that is, 1-p is less than or equal to 0.1).

2.3 Calculation of Upper Confidence Limits and Upper Tolerance Limits

UCLs used in the risk characterization are estimated using ProUCL, which computes parametric UCLs based on normal, lognormal, or gamma distributions and nonparametric UCLs using one of several nonparametric methods. ProUCL recommends the UCLs for use in the risk assessment, based on the data distribution and the associated skewness. The UCL chosen by the ProUCL output is used as an EPC, as called for in the CRA Methodology, unless the UCL exceeds the MDC, in which case the MDC is used as the EPC. EPCs can also be UTLs, which are calculated using S-Plus.

3.0 RESULTS OF STATISTICAL COMPARISONS TO BACKGROUND FOR THE AQUATIC EXPOSURE UNITS

The results of the distribution testing and background comparisons for inorganics and radionuclides in pond sediment samples are presented in this section.

3.1 Pond A-1

Aluminum, antimony, barium, cadmium, copper, iron, lead, mercury, nickel, selenium, silver, and zinc have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond A-1 AEU sediment data to background data is presented in Table 1.1, while summary statistics for Pond A-1 sediment data are provided in Table 1.2. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

3.2 Pond A-2

Aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, nickel, silver, and zinc have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond A-2 AEU sediment data to background data is presented in Table 1.3, while summary statistics for Pond A-2 sediment data are provided in Table 1.4. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

3.3 Pond A-3

Aluminum, antimony, barium, iron, nickel, silver, and zinc have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond A-3 AEU sediment data to background data is presented in Table 1.5, while summary statistics for Pond A-3 sediment data are provided in Table 1.6. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

3.4 Pond A-4

Aluminum, antimony, arsenic, barium, cadmium, copper, iron, lead, nickel, selenium, and zinc have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond A-4 AEU sediment data to background data is presented in Table 1.7, while summary statistics for Pond A-4 sediment data are provided in Table 1.8. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

3.5 Pond A-5

Aluminum, barium, iron, lead, silver, and zinc have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond A-5 AEU sediment data to background data is presented in Table 1.9, while summary statistics for Pond A-5 sediment data are provided in Table1.10. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

3.6 Pond B-4

Aluminum, antimony, barium, cadmium, chromium, copper, iron, mercury, nickel, selenium, silver, and zinc have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond B-4 AEU sediment data to

background data is presented in Table 1.11, while summary statistics for Pond B-4 sediment data are provided in Table 1.12. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

3.7 Pond B-5

Aluminum, barium, iron, lead, and manganese have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond B-5 AEU sediment data to background data is presented in Table 1.13, while summary statistics for Pond B-5 sediment data are provided in Table 1.14. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

3.8 Pond C-1

Aluminum, barium, iron, lead, manganese, mercury, nickel, selenium, and zinc have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond C-1 AEU sediment data to background data is presented in Table 1.15, while summary statistics for Pond C-1 sediment data are provided in Table 1.16. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

3.9 Pond C-2

Aluminum, arsenic, barium, copper, iron, mercury, selenium, and zinc have MDCs that exceed their ESLs and detection frequencies greater than 5 percent. These ECOIs were carried forward into the statistical background comparison. The statistical comparison of the Pond C-2 AEU sediment data to background data is presented in Table 1.17, while summary statistics for Pond C-2 sediment data are provided in Table 1.18. Results of the statistical comparisons of the pond data to background data indicate that concentrations for all ECOIs are statistically greater than background at the 0.1 significance level. As a result, these ECOIs were evaluated further in the UTL comparison step.

4.0 REFERENCES

DOE, 2004, Final Comprehensive Risk Assessment Work Plan and Methodology, Rocky Flats Environmental Technology Site, Golden, Colorado. September.

EPA, 2000, Guidance for Data Quality Assessment: Practical Methods for Data Analysis, QA/G-9, EPA/600-R-96/084, U.S. Environmental Protection Agency, Washington, D.C., September.

EPA, 2002, Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites, OSWER 9285.6-10, U.S. Environmental Protection Agency, Washington, D.C., December.

Insightful Corporation, 2002, S-Plus 6 for Windows, Seattle, Washington.

Singh, A., A.K. Singh, and R.W. Maichle, 2004, ProUCL Version 3.0 Users Guide, Las Vegas, Nevada, April.

Table 1.1
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond A-1

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond A1 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Aluminum	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	1.82E-05	Yes
Antimony	mg/kg	47	LOGNORMAL	11	11	NONPARAMETRIC	18	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	11	NORMAL	100	WRS	1.55E-06	Yes
Barium	mg/kg	54	GAMMA	100	11	NONPARAMETRIC	100	WRS	1.04E-04	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	11	NORMAL	82	WRS	0.002	Yes
Boron	mg/kg	N/A	N/A	N/A	7	NORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	11	LOGNORMAL	73	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	1.68E-07	Yes
Cesium	mg/kg	51	NONPARAMETRIC	14	4	NORMAL	100	N/A	N/A	N/A
Chromium	mg/kg	55	GAMMA	85	11	NORMAL	100	WRS	1.41E-04	Yes
Cobalt	mg/kg	54	NORMAL	80	11	NORMAL	100	t-Test_N	0.002	Yes
Copper	mg/kg	55	GAMMA	80	11	NORMAL	100	WRS	8.47E-06	Yes
Iron	mg/kg	55	GAMMA	100	11	NONPARAMETRIC	100	WRS	3.96E-04	Yes
Lead	mg/kg	55	LOGNORMAL	100	11	NORMAL	100	WRS	2.44E-05	Yes
Lithium	mg/kg	52	GAMMA	79	11	LOGNORMAL	64	WRS	0.011	Yes
Magnesium	mg/kg	55	GAMMA	95	11	NORMAL	100	WRS	5.09E-06	Yes
Manganese	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	0.007	Yes
Mercury	mg/kg	46	NONPARAMETRIC	4	11	NORMAL	100	N/A	N/A	N/A
Molybdenum	mg/kg	52	NONPARAMETRIC	29	11	GAMMA	64	WRS	0.757	No
Nickel	mg/kg	53	GAMMA	72	11	GAMMA	82	WRS	1.46E-04	Yes
Potassium	mg/kg	54	GAMMA	80	11	NORMAL	100	WRS	2.66E-05	Yes
Selenium	mg/kg	54	NONPARAMETRIC	28	11	NONPARAMETRIC	27	WRS	3.54E-04	Yes
Silica	mg/kg	19	NONPARAMETRIC	100	7	NORMAL	100	WRS	1.20E-04	Yes
Silver	mg/kg	48	NONPARAMETRIC	6	11	NORMAL	27	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	11	NORMAL	100	WRS	6.38E-07	Yes
Strontium	mg/kg	55	LOGNORMAL	87	11	NORMAL	100	WRS	2.67E-06	Yes
Thallium	mg/kg	47	NONPARAMETRIC	6	11	NONPARAMETRIC	0	N/A	N/A	N/A
Tin	mg/kg	50	NONPARAMETRIC	28	11	NONPARAMETRIC	55	WRS	0.933	No
Titanium	mg/kg	N/A	N/A	N/A	7	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	7	NONPARAMETRIC	0	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	11	NORMAL	100	WRS	7.33E-05	Yes
Zinc	mg/kg	55	NONPARAMETRIC	98	11	NORMAL	100	WRS	4.87E-05	Yes
Acenaphthene	ug/kg	N/A	N/A	5	11	NORMAL	9	N/A	N/A	N/A
Anthracene	ug/kg	N/A	N/A	9	11	NORMAL	27	N/A	N/A	N/A
Benzo(a)anthracene	ug/kg	N/A	N/A	12	11	NORMAL	82	N/A	N/A	N/A
Benzo(a)pyrene	ug/kg	N/A	N/A	9	11	NORMAL	73	N/A	N/A	N/A
Benzo(g,h,i)perylene	ug/kg	N/A	N/A	5	11	NORMAL	64	N/A	N/A	N/A
Chrysene	ug/kg	N/A	N/A	12	11	NORMAL	82	N/A	N/A	N/A
Fluoranthene	ug/kg	N/A	N/A	14	11	NORMAL	82	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	ug/kg	N/A	N/A	5	11	NORMAL	73	N/A	N/A	N/A
PCB-1254	ug/kg	N/A	N/A	5	15	LOGNORMAL	67	N/A	N/A	N/A
PCB-1260	ug/kg	N/A	N/A	N/A	15	NONPARAMETRIC	7	N/A	N/A	N/A
Phenanthrene	ug/kg	N/A	N/A	9	11	NORMAL	82	N/A	N/A	N/A
Pyrene	ug/kg	N/A	N/A	14	11	GAMMA	36	N/A	N/A	N/A
Americium-241	pCi/g	42	NONPARAMETRIC	100	15	GAMMA	100	WRS	5.67E-09	Yes
Cesium-134	pCi/g	7	GAMMA	100	4	GAMMA	100	WRS	0.648	No
Cesium-137	pCi/g	37	NONPARAMETRIC	100	8	NORMAL	100	WRS	0.011	Yes
Gross Alpha	pCi/g	45	GAMMA	100	8	NORMAL	100	WRS	0.011	Yes
Gross Beta	pCi/g	46	NORMAL	100	8	NORMAL	100	t-Test_N	0.976	No
Plutonium-239/240	pCi/g	46	NONPARAMETRIC	100	15	GAMMA	100	WRS	3.75E-09	Yes
Radium-226	pCi/g	19	NORMAL	100	4	NORMAL	100	t-Test_N	3.50E-05	Yes
Radium-228	pCi/g	20	NORMAL	100	4	NORMAL	100	t-Test_N	0.610	No
Strontium-89/90	pCi/g	39	NORMAL	100	5	NORMAL	100	t-Test_N	3.31E-05	Yes
Uranium-233/234	pCi/g	47	GAMMA	100	15	GAMMA	100	WRS	0.032	Yes
Uranium-235	pCi/g	46	NONPARAMETRIC	100	15	GAMMA	100	WRS	0.002	Yes

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Table 1.1
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond A-1

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond A1 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Uranium-238	pCi/g	47	GAMMA	100	15	NORMAL	100	WRS	6.01E-04	Yes

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
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Table 1.2
Statistical Concentrations in Sediments (including background samples)
Pond A-1

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]
Aluminum	mg/kg	11	95% Student's-t UCL	NORMAL	17,345	13,200	24,000	27,000	21,415	34,291	29,000
Antimony	mg/kg	11	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	7.61	0.300	10.9	30.0	43.1	30.4	30.4
Arsenic	mg/kg	11	95% Student's-t UCL	NORMAL	6.84	6.50	7.80	9.10	7.70	10.4	9.30
Barium	mg/kg	11	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	171	190	210	225	250	230	230
Beryllium	mg/kg	11	95% Student's-t UCL	NORMAL	0.956	1.20	1.35	1.45	1.21	2.03	1.50
Boron	mg/kg	7	95% Student's-t UCL	NORMAL	8.79	10.0	10.5	11.7	10.9	16.8	12.0
Cadmium	mg/kg	11	95% Chebyshev (MVUE) UCL	LOGNORMAL	1.80	0.800	1.65	5.85	4.21	11.4	8.30
Calcium	mg/kg	11	95% Student's-t UCL	NORMAL	15,164	13,500	16,100	25,500	18,339	28,386	27,000
Cesium	mg/kg	4	95% Student's-t UCL	NORMAL	3.15	2.50	3.70	5.38	5.32	10.8	5.80
Chromium	mg/kg	11	95% Student's-t UCL	NORMAL	19.3	19.4	24.5	29.0	23.1	35.4	30.0
Cobalt	mg/kg	11	95% Student's-t UCL	NORMAL	8.76	9.20	9.95	12.0	10.2	14.7	13.0
Copper	mg/kg	11	95% Student's-t UCL	NORMAL	26.3	25.0	28.2	38.0	30.4	43.1	43.0
Iron	mg/kg	11	95% Student's-t UCL	NONPARAMETRIC	18,045	20,000	22,000	23,500	21,340	24,000	24,000
Lead	mg/kg	11	95% Student's-t UCL	NORMAL	28.9	29.0	35.0	38.0	32.6	44.3	39.0
Lithium	mg/kg	11	95% H-UCL	LOGNORMAL	12.6	8.90	19.5	21.0	21.0	45.1	22.0
Magnesium	mg/kg	11	95% Student's-t UCL	NORMAL	4,175	4,270	5,100	5,250	4,763	6,626	5,300
Manganese	mg/kg	11	95% Student's-t UCL	NORMAL	319	330	373	455	380	574	500
Mercury	mg/kg	11	95% Student's-t UCL	NORMAL	0.231	0.180	0.355	0.470	0.315	0.583	0.470
Molybdenum	mg/kg	11	95% Approximate Gamma UCL	GAMMA	2.10	1.20	3.70	3.88	3.22	3.95	3.95
Nickel	mg/kg	11	95% Approximate Gamma UCL	GAMMA	16.8	20.0	22.0	25.2	22.3	26.4	26.4
Potassium	mg/kg	11	95% Student's-t UCL	NORMAL	2,593	2,810	3,250	3,620	3,119	4,782	3,700
Selenium	mg/kg	11	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.760	0.550	0.900	1.70	1.44	1.80	1.80
Silica	mg/kg	7	95% Student's-t UCL	NORMAL	1,243	1,200	1,400	1,470	1,383	1,767	1,500
Silver	mg/kg	11	95% Student's-t UCL	NORMAL	0.864	0.810	1.18	1.63	1.16	2.11	2.00
Sodium	mg/kg	11	95% Student's-t UCL	NORMAL	633	620	695	981	758	1,157	1,200
Strontium	mg/kg	11	95% Student's-t UCL	NORMAL	94.5	81.8	110	140	110	157	140
Thallium	mg/kg	11	95% Student's-t UCL	NONPARAMETRIC	0.329	0.400	0.430	0.473	0.397	0.500	0.500
Tin	mg/kg	11	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	7.52	1.70	17.6	18.5	32.6	18.8	18.8
Titanium	mg/kg	7	95% Student's-t UCL	NORMAL	114	130	140	161	149	246	170
Uranium	mg/kg	7	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	4.39	4.85	4.98	5.70	7.18	6.00	6.00
Vanadium	mg/kg	11	95% Student's-t UCL	NORMAL	40.3	36.8	49.0	54.5	46.1	64.4	57.0
Zinc	mg/kg	11	95% Student's-t UCL	NORMAL	107	110	125	140	122	171	140
Acenaphthene	ug/kg	11	95% Student's-t UCL	NORMAL	243	250	280	308	276	383	310
Anthracene	ug/kg	11	95% Student's-t UCL	NORMAL	203	235	258	305	253	412	310
Benzo(a)anthracene	ug/kg	11	95% Student's-t UCL	NORMAL	212	190	245	465	289	532	500
Benzo(a)pyrene	ug/kg	11	95% Student's-t UCL	NORMAL	263	210	370	493	344	599	500
Benzo(g,h,i)perylene	ug/kg	11	95% Student's-t UCL	NORMAL	239	160	368	493	329	613	500
Chrysene	ug/kg	11	95% Student's-t UCL	NORMAL	239	220	310	465	315	554	500
Fluoranthene	ug/kg	11	95% Student's-t UCL	NORMAL	435	500	550	695	544	889	790
Indeno(1,2,3-cd)pyrene	ug/kg	11	95% Student's-t UCL	NORMAL	206	150	260	458	285	535	485
PCB-1254	ug/kg	15	99% Chebyshev (MVUE) UCL	LOGNORMAL	496	86.0	340	1,973	1,835	2,868	5,200
PCB-1260	ug/kg	15	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	121	150	163	262	359	265	265
Phenanthrene	ug/kg	11	95% Student's-t UCL	NORMAL	302	300	455	510	397	695	520
Pyrene	ug/kg	11	95% Approximate Gamma UCL	GAMMA	492	485	500	630	538	710	710
Americium-241	pCi/g	15	95% Approximate Gamma UCL	GAMMA	4.60	2.71	7.20	12.5	8.24	13.2	13.2
Cesium-134	pCi/g	4	95% Approximate Gamma UCL	GAMMA	0.045	0.045	0.050	0.050	0.055	0.050	0.050
Cesium-137	pCi/g	8	95% Student's-t UCL	NORMAL	0.384	0.296	0.542	0.639	0.505	0.851	0.685
Gross Alpha	pCi/g	8	95% Student's-t UCL	NORMAL	40.4	35.8	50.4	69.9	53.8	92.2	70.7
Gross Beta	pCi/g	8	95% Student's-t UCL	NORMAL	29.0	28.9	29.8	31.2	30.0	32.9	31.5
Plutonium-239/240	pCi/g	15	95% Approximate Gamma UCL	GAMMA	12.5	7.91	20.0	35.7	22.0	36.2	36.2
Radium-226	pCi/g	4	95% Student's-t UCL	NORMAL	1.95	1.92	2.01	2.08	2.09	2.45	2.10
Radium-228	pCi/g	4	95% Student's-t UCL	NORMAL	1.72	1.73	1.77	1.82	1.83	2.13	1.83
Strontium-89/90	pCi/g	5	95% Student's-t UCL	NORMAL	0.601	0.600	0.750	0.812	0.806	1.33	0.827
Uranium-233/234	pCi/g	15	95% Approximate Gamma UCL	GAMMA	2.07	1.91	2.31	3.12	2.37	3.87	3.87
Uranium-235	pCi/g	15	95% Approximate Gamma UCL	GAMMA	0.113	0.099	0.117	0.241	0.153	0.352	0.352
Uranium-238	pCi/g	15	95% Student's-t UCL	NORMAL	2.54	2.14	3.07	4.45	3.08	5.02	5.35

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be a detect.
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Table 1.3
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond A-2

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond A2 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Aluminum	mg/kg	55	GAMMA	100	10	NORMAL	100	WRS	3.15E-04	Yes
Antimony	mg/kg	47	LOGNORMAL	11	7	NORMAL	0	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	10	NORMAL	100	WRS	2.06E-05	Yes
Barium	mg/kg	54	GAMMA	100	10	NORMAL	100	WRS	4.96E-05	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	10	NORMAL	70	WRS	8.17E-04	Yes
Boron	mg/kg	N/A	N/A	N/A	7	NORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	10	GAMMA	70	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	10	NORMAL	100	WRS	6.03E-07	Yes
Cesium	mg/kg	51	NONPARAMETRIC	14	3	0	0	N/A	N/A	N/A
Chromium	mg/kg	55	GAMMA	85	10	NORMAL	100	WRS	0.002	Yes
Cobalt	mg/kg	54	NORMAL	80	10	NORMAL	100	t-Test_N	9.80E-04	Yes
Copper	mg/kg	55	GAMMA	80	10	NORMAL	100	WRS	1.70E-04	Yes
Iron	mg/kg	55	GAMMA	100	10	NORMAL	100	WRS	1.71E-04	Yes
Lead	mg/kg	55	LOGNORMAL	100	10	NORMAL	100	WRS	3.72E-04	Yes
Lithium	mg/kg	52	GAMMA	79	10	NORMAL	100	WRS	0.002	Yes
Magnesium	mg/kg	55	GAMMA	95	10	NORMAL	100	WRS	8.89E-06	Yes
Manganese	mg/kg	55	GAMMA	100	10	LOGNORMAL	100	WRS	8.37E-05	Yes
Mercury	mg/kg	46	NONPARAMETRIC	4	10	NORMAL	70	N/A	N/A	N/A
Molybdenum	mg/kg	52	NONPARAMETRIC	29	10	NORMAL	60	WRS	0.466	No
Nickel	mg/kg	53	GAMMA	72	10	NORMAL	90	WRS	3.91E-05	Yes
Nitrate	mg/kg	49	LOGNORMAL	59	3	0	0	N/A	N/A	N/A
Potassium	mg/kg	54	GAMMA	80	10	NORMAL	100	WRS	6.96E-06	Yes
Selenium	mg/kg	54	NONPARAMETRIC	28	10	NORMAL	0	N/A	N/A	N/A
Silica	mg/kg	19	NONPARAMETRIC	100	7	NORMAL	100	WRS	1.51E-04	Yes
Silver	mg/kg	48	NONPARAMETRIC	6	10	GAMMA	40	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	10	NORMAL	100	WRS	7.24E-07	Yes
Strontium	mg/kg	55	LOGNORMAL	87	10	NORMAL	100	WRS	4.57E-06	Yes
Thallium	mg/kg	47	NONPARAMETRIC	6	10	NORMAL	0	N/A	N/A	N/A
Tin	mg/kg	50	NONPARAMETRIC	28	10	LOGNORMAL	10	N/A	N/A	N/A
Titanium	mg/kg	N/A	N/A	N/A	7	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	7	NORMAL	43	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	10	NORMAL	100	WRS	7.35E-04	Yes
Zinc	mg/kg	55	NONPARAMETRIC	98	10	NORMAL	100	WRS	0.001	Yes
Acenaphthene	ug/kg	N/A	N/A	5	10	NORMAL	10	N/A	N/A	N/A
Anthracene	ug/kg	N/A	N/A	9	10	NORMAL	10	N/A	N/A	N/A
bis(2-ethylhexyl)phthalate	ug/kg	N/A	N/A	43	10	LOGNORMAL	90	WRS	N/A	N/A
Indeno(1,2,3-cd)pyrene	ug/kg	N/A	N/A	5	10	NORMAL	10	N/A	N/A	N/A
PCB-1254	ug/kg	N/A	N/A	5	12	NORMAL	33	N/A	N/A	N/A
Americium-241	pCi/g	42	NONPARAMETRIC	100	12	NONPARAMETRIC	100	WRS	7.85E-08	Yes
Cesium-134	pCi/g	7	GAMMA	100	3	0	100	WRS	0.213	No
Cesium-137	pCi/g	37	NONPARAMETRIC	100	6	NORMAL	100	WRS	0.012	Yes
Gross Alpha	pCi/g	45	GAMMA	100	6	NORMAL	100	WRS	0.037	Yes
Gross Beta	pCi/g	46	NORMAL	100	6	NORMAL	100	t-Test_N	0.931	No
Plutonium-239/240	pCi/g	46	NONPARAMETRIC	100	13	NORMAL	100	WRS	2.26E-08	Yes
Radium-226	pCi/g	19	NORMAL	100	3	0	100	WRS	0.003	Yes
Radium-228	pCi/g	20	NORMAL	100	3	0	100	WRS	0.428	No
Strontium-89/90	pCi/g	39	NORMAL	100	3	0	100	WRS	0.009	Yes
Uranium-233/234	pCi/g	47	GAMMA	100	13	NORMAL	100	WRS	0.011	Yes
Uranium-235	pCi/g	46	NONPARAMETRIC	100	13	NORMAL	100	WRS	4.54E-05	Yes
Uranium-238	pCi/g	47	GAMMA	100	13	NORMAL	100	WRS	1.01E-05	Yes

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
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Table 1.4
Statistical Concentrations in Sediments (including background samples)
Pond A-2

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]
Aluminum	mg/kg	10	95% Student's-t UCL	NORMAL	19,357	17,000	25,750	39,550	27,153	51,022	49,000
Antimony	mg/kg	7	95% Student's-t UCL	NORMAL	0.625	0.475	0.875	1.14	0.898	1.65	1.20
Arsenic	mg/kg	10	95% Student's-t UCL	NORMAL	7.55	7.70	10.8	11.6	9.54	15.6	12.0
Barium	mg/kg	10	95% Student's-t UCL	NORMAL	210	208	260	350	267	441	390
Beryllium	mg/kg	10	95% Student's-t UCL	NORMAL	1.13	1.07	1.50	2.19	1.55	2.81	2.50
Boron	mg/kg	7	95% Student's-t UCL	NORMAL	14.0	13.0	16.0	23.0	18.8	31.9	26.0
Cadmium	mg/kg	10	95% Approximate Gamma UCL	GAMMA	1.11	0.975	1.09	2.48	1.66	3.20	3.20
Calcium	mg/kg	10	95% Student's-t UCL	NORMAL	20,755	18,000	26,000	39,850	27,498	48,146	43,000
Cesium	mg/kg	3	Too Few Observations To Calculate UCLs	0	1.40	1.05	1.60	2.04	N/A	2.15	2.15
Chromium	mg/kg	10	95% Student's-t UCL	NORMAL	20.5	18.5	28.3	41.3	28.5	52.9	44.0
Cobalt	mg/kg	10	95% Student's-t UCL	NORMAL	9.35	9.70	10.5	13.7	11.2	16.9	15.0
Copper	mg/kg	10	95% Student's-t UCL	NORMAL	27.1	24.9	31.5	52.9	36.1	63.8	56.0
Iron	mg/kg	10	95% Student's-t UCL	NORMAL	21,410	21,000	26,750	34,050	26,681	42,822	39,000
Lead	mg/kg	10	95% Student's-t UCL	NORMAL	27.5	29.2	32.5	44.1	34.2	54.8	45.0
Lithium	mg/kg	10	95% Student's-t UCL	NORMAL	16.9	17.0	23.8	31.2	23.0	41.9	37.0
Magnesium	mg/kg	10	95% Student's-t UCL	NORMAL	5,059	5,020	6,175	8,840	6,577	11,225	11,000
Manganese	mg/kg	10	95% Student's-t UCL	LOGNORMAL	548	382	725	1,010	713	1,519	1,100
Mercury	mg/kg	10	95% Student's-t UCL	NORMAL	0.072	0.063	0.077	0.146	0.096	0.171	0.150
Molybdenum	mg/kg	10	95% Student's-t UCL	NORMAL	2.82	2.75	4.68	5.15	3.94	7.37	5.40
Nickel	mg/kg	10	95% Student's-t UCL	NORMAL	19.6	21.5	24.5	31.4	24.6	40.2	34.0
Nitrate	mg/kg	3	Too Few Observations To Calculate UCLs	0	0.197	0.229	0.229	0.230	N/A	0.230	0.230
Potassium	mg/kg	10	95% Student's-t UCL	NORMAL	3,191	3,220	3,950	5,375	4,100	6,882	6,500
Selenium	mg/kg	10	95% Student's-t UCL	NORMAL	0.896	0.725	1.09	1.92	1.26	2.37	2.30
Silica	mg/kg	7	95% Student's-t UCL	NORMAL	2,297	1,900	2,950	4,420	3,364	6,300	4,900
Silver	mg/kg	10	95% Approximate Gamma UCL	GAMMA	1.14	0.885	1.45	2.82	2.08	3.90	3.90
Sodium	mg/kg	10	95% Student's-t UCL	NORMAL	925	829	965	1,830	1,227	2,154	2,100
Strontium	mg/kg	10	95% Student's-t UCL	NORMAL	118	94.2	150	220	155	269	220
Thallium	mg/kg	10	95% Student's-t UCL	NORMAL	0.616	0.503	0.800	1.41	0.905	1.79	1.75
Tin	mg/kg	10	95% Chebyshev (MVUE) UCL	LOGNORMAL	7.17	2.28	11.1	23.0	21.2	81.6	23.2
Titanium	mg/kg	7	95% Student's-t UCL	NORMAL	159	150	180	271	217	378	310
Uranium	mg/kg	7	95% Student's-t UCL	NORMAL	11.8	9.50	17.8	19.9	16.7	30.4	20.0
Vanadium	mg/kg	10	95% Student's-t UCL	NORMAL	44.7	43.5	56.5	78.9	58.7	102	96.0
Zinc	mg/kg	10	95% Student's-t UCL	NORMAL	97.7	98.2	125	166	125	208	170
Acenaphthene	ug/kg	10	95% Student's-t UCL	NORMAL	479	408	649	833	614	1,028	900
Anthracene	ug/kg	10	95% Student's-t UCL	NORMAL	482	408	649	833	614	1,022	900
bis(2-ethylhexyl)phthalate	ug/kg	10	99% Chebyshev (MVUE) UCL	LOGNORMAL	6,211	480	3,400	29,360	28,796	80,294	47,000
Indeno(1,2,3-cd)pyrene	ug/kg	10	95% Student's-t UCL	NORMAL	851	825	1,338	1,638	1,179	2,186	1,750
PCB-1254	ug/kg	12	95% Student's-t UCL	NORMAL	83.6	79.5	119	169	111	202	185
Americium-241	pCi/g	12	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	1.46	1.35	1.57	2.65	2.44	3.47	3.47
Cesium-134	pCi/g	3	Too Few Observations To Calculate UCLs	0	0.077	0.080	0.090	0.098	N/A	0.100	0.100
Cesium-137	pCi/g	6	95% Student's-t UCL	NORMAL	0.424	0.445	0.568	0.605	0.573	0.971	0.610
Gross Alpha	pCi/g	6	95% Student's-t UCL	NORMAL	31.7	30.5	33.0	42.6	38.2	55.5	45.6
Gross Beta	pCi/g	6	95% Student's-t UCL	NORMAL	30.0	30.3	31.0	32.3	31.6	35.9	32.7
Plutonium-239/240	pCi/g	13	95% Student's-t UCL	NORMAL	4.32	4.07	4.75	8.66	5.56	9.72	10.5
Radium-226	pCi/g	3	Too Few Observations To Calculate UCLs	0	2.92	2.92	3.00	3.06	N/A	3.08	3.08
Radium-228	pCi/g	3	Too Few Observations To Calculate UCLs	0	1.81	1.85	1.87	1.89	N/A	1.89	1.89
Strontium-89/90	pCi/g	3	Too Few Observations To Calculate UCLs	0	0.542	0.491	0.635	0.750	N/A	0.779	0.779
Uranium-233/234	pCi/g	13	95% Student's-t UCL	NORMAL	2.36	2.03	3.20	3.68	2.80	4.28	3.70
Uranium-235	pCi/g	13	95% Student's-t UCL	NORMAL	0.165	0.161	0.219	0.306	0.209	0.357	0.338
Uranium-238	pCi/g	13	95% Student's-t UCL	NORMAL	3.70	3.68	5.15	6.01	4.54	7.36	6.10

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be detect.
CRA Dataset ID: Ponds_08102005a.mdb

Table 1.5
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond A-3

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond A3 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Aluminum	mg/kg	55	GAMMA	100	8	NORMAL	100	WRS	9.64E-06	Yes
Antimony	mg/kg	47	LOGNORMAL	11	7	NONPARAMETRIC	14	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	8	NORMAL	100	WRS	1.66E-05	Yes
Barium	mg/kg	54	GAMMA	100	8	NORMAL	100	WRS	3.77E-05	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	8	NORMAL	50	WRS	0.002	Yes
Boron	mg/kg	N/A	N/A	N/A	4	NORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	8	NORMAL	50	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	8	LOGNORMAL	100	WRS	6.03E-06	Yes
Cesium	mg/kg	51	NONPARAMETRIC	14	4	NORMAL	100	N/A	N/A	N/A
Chromium	mg/kg	55	GAMMA	85	8	NORMAL	100	WRS	1.19E-04	Yes
Cobalt	mg/kg	54	NORMAL	80	8	NORMAL	100	t-Test_N	2.81E-05	Yes
Copper	mg/kg	55	GAMMA	80	8	NORMAL	100	WRS	6.40E-04	Yes
Iron	mg/kg	55	GAMMA	100	8	NORMAL	100	WRS	4.39E-05	Yes
Lead	mg/kg	55	LOGNORMAL	100	8	NORMAL	100	WRS	5.53E-04	Yes
Lithium	mg/kg	52	GAMMA	79	8	NORMAL	100	WRS	8.37E-04	Yes
Magnesium	mg/kg	55	GAMMA	95	8	NORMAL	100	WRS	1.27E-05	Yes
Manganese	mg/kg	55	GAMMA	100	8	NORMAL	100	WRS	3.83E-04	Yes
Mercury	mg/kg	46	NONPARAMETRIC	4	8	NONPARAMETRIC	50	N/A	N/A	N/A
Molybdenum	mg/kg	52	NONPARAMETRIC	29	8	NONPARAMETRIC	50	WRS	0.721	No
Nickel	mg/kg	53	GAMMA	72	8	NORMAL	88	WRS	8.12E-05	Yes
Nitrate	mg/kg	49	LOGNORMAL	59	1	0	0	N/A	N/A	N/A
Potassium	mg/kg	54	GAMMA	80	8	NORMAL	100	WRS	4.50E-05	Yes
Selenium	mg/kg	54	NONPARAMETRIC	28	8	GAMMA	13	N/A	N/A	N/A
Silica	mg/kg	19	NONPARAMETRIC	100	4	NORMAL	100	WRS	0.001	Yes
Silver	mg/kg	48	NONPARAMETRIC	6	8	NONPARAMETRIC	0	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	8	NONPARAMETRIC	100	WRS	2.25E-04	Yes
Strontium	mg/kg	55	LOGNORMAL	87	8	GAMMA	100	WRS	6.70E-05	Yes
Thallium	mg/kg	47	NONPARAMETRIC	6	8	NORMAL	0	N/A	N/A	N/A
Tin	mg/kg	50	NONPARAMETRIC	28	8	NONPARAMETRIC	50	WRS	0.372	No
Titanium	mg/kg	N/A	N/A	N/A	4	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	4	NORMAL	0	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	8	NORMAL	100	WRS	3.31E-05	Yes
Zinc	mg/kg	55	NONPARAMETRIC	98	8	NONPARAMETRIC	100	WRS	5.43E-05	Yes
Benzo(a)pyrene	ug/kg	N/A	N/A	9	4	NORMAL	75	N/A	N/A	N/A
Chrysene	ug/kg	N/A	N/A	12	4	GAMMA	100	N/A	N/A	N/A
Fluoranthene	ug/kg	N/A	N/A	14	4	NORMAL	100	N/A	N/A	N/A
PCB-1254	ug/kg	N/A	N/A	5	8	NORMAL	13	N/A	N/A	N/A
Phenanthrene	ug/kg	N/A	N/A	9	4	NORMAL	100	N/A	N/A	N/A
Pyrene	ug/kg	N/A	N/A	14	4	NORMAL	100	N/A	N/A	N/A
Americium-241	pCi/g	42	NONPARAMETRIC	100	8	NORMAL	100	WRS	4.36E-06	Yes
Cesium-137	pCi/g	37	NONPARAMETRIC	100	4	NORMAL	100	WRS	0.330	No
Gross Alpha	pCi/g	45	GAMMA	100	4	NORMAL	100	WRS	0.558	No
Gross Beta	pCi/g	46	NORMAL	100	4	NORMAL	100	t-Test_N	0.930	No
Plutonium-239/240	pCi/g	46	NONPARAMETRIC	100	8	NORMAL	100	WRS	3.70E-06	Yes
Strontium-89/90	pCi/g	39	NORMAL	100	4	NORMAL	100	t-Test_N	0.702	No
Uranium-233/234	pCi/g	47	GAMMA	100	8	NORMAL	100	WRS	0.824	No
Uranium-235	pCi/g	46	NONPARAMETRIC	100	8	NORMAL	100	WRS	0.704	No
Uranium-238	pCi/g	47	GAMMA	100	8	NORMAL	100	WRS	0.658	No

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
CRA Dataset ID: Ponds_08102005a.mdb

Table 1.6
Statistical Concentrations in Sediments (including background samples)
Pond A-3

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]
Aluminum	mg/kg	8	95% Student's-t UCL	NORMAL	21,650	21,500	25,200	26,840	24,743	33,572	27,400
Antimony	mg/kg	7	95% Hall's Bootstrap UCL	NONPARAMETRIC	6.79	0.415	10.1	21.3	16.1	26.0	26.0
Arsenic	mg/kg	8	95% Student's-t UCL	NORMAL	7.11	7.30	7.53	7.73	7.58	8.91	7.80
Barium	mg/kg	8	95% Student's-t UCL	NORMAL	179	176	188	197	188	213	200
Beryllium	mg/kg	8	95% Student's-t UCL	NORMAL	0.906	0.900	1.13	1.27	1.10	1.67	1.30
Boron	mg/kg	4	95% Student's-t UCL	NORMAL	7.30	6.90	8.48	9.62	9.72	15.9	9.90
Cadmium	mg/kg	8	95% Student's-t UCL	NORMAL	0.588	0.595	0.750	0.783	0.709	1.05	0.800
Calcium	mg/kg	8	95% H-UCL	LOGNORMAL	17,213	11,550	15,150	41,550	31,401	69,727	51,000
Cesium	mg/kg	4	95% Student's-t UCL	NORMAL	4.30	4.50	4.60	4.84	5.12	7.18	4.90
Chromium	mg/kg	8	95% Student's-t UCL	NORMAL	21.9	22.0	25.2	28.5	25.4	35.4	29.9
Cobalt	mg/kg	8	95% Student's-t UCL	NORMAL	11.1	10.4	12.6	14.9	12.9	17.8	15.5
Copper	mg/kg	8	95% Student's-t UCL	NORMAL	22.2	23.1	23.5	24.1	23.5	27.2	24.1
Iron	mg/kg	8	95% Student's-t UCL	NORMAL	21,775	21,600	23,050	24,790	23,302	27,659	25,000
Lead	mg/kg	8	95% Student's-t UCL	NORMAL	25.4	25.6	27.4	29.2	27.5	33.7	29.3
Lithium	mg/kg	8	95% Student's-t UCL	NORMAL	14.1	14.5	16.2	17.5	16.3	22.5	18.0
Magnesium	mg/kg	8	95% Student's-t UCL	NORMAL	4,645	4,620	5,198	5,379	5,050	6,207	5,400
Manganese	mg/kg	8	95% Student's-t UCL	NORMAL	396	391	411	499	440	568	520
Mercury	mg/kg	8	95% Student's-t UCL	NONPARAMETRIC	0.047	0.045	0.045	0.060	0.053	0.068	0.068
Molybdenum	mg/kg	8	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	2.14	2.20	3.41	3.58	4.31	3.65	3.65
Nickel	mg/kg	8	95% Student's-t UCL	NORMAL	18.2	19.4	20.3	24.0	21.8	32.1	25.6
Nitrate	mg/kg	1	Too Few Observations To Calculate UCLs	0	0.317	0.317	0.317	0.317	N/A	N/A	0.317
Potassium	mg/kg	8	95% Student's-t UCL	NORMAL	2,583	2,610	2,925	3,391	2,993	4,164	3,440
Selenium	mg/kg	8	95% Approximate Gamma UCL	GAMMA	0.673	0.490	0.688	1.50	1.08	1.80	1.80
Silica	mg/kg	4	95% Student's-t UCL	NORMAL	1,725	1,800	1,925	1,985	2,089	3,013	2,000
Silver	mg/kg	8	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.747	0.800	1.06	1.13	1.32	1.15	1.15
Sodium	mg/kg	8	95% Student's-t UCL	NONPARAMETRIC	377	332	342	675	507	850	850
Strontium	mg/kg	8	95% Approximate Gamma UCL	GAMMA	80.7	72.2	81.2	126	101	140	140
Thallium	mg/kg	8	95% Student's-t UCL	NORMAL	0.374	0.365	0.486	0.648	0.505	0.879	0.700
Tin	mg/kg	8	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	9.54	9.80	16.3	17.1	35.6	17.4	17.4
Titanium	mg/kg	4	95% Student's-t UCL	NORMAL	150	145	155	167	167	209	170
Uranium	mg/kg	4	95% Student's-t UCL	NORMAL	6.25	6.00	6.88	7.78	7.81	11.8	8.00
Vanadium	mg/kg	8	95% Student's-t UCL	NORMAL	50.0	48.3	54.8	61.8	55.5	71.1	62.7
Zinc	mg/kg	8	95% Student's-t UCL	NONPARAMETRIC	192	148	159	411	287	540	540
Benzo(a)pyrene	ug/kg	4	95% Student's-t UCL	NORMAL	214	205	254	287	292	491	295
Chrysene	ug/kg	4	95% Approximate Gamma UCL	GAMMA	193	175	198	240	257	250	250
Fluoranthene	ug/kg	4	95% Student's-t UCL	NORMAL	423	395	435	519	517	756	540
PCB-1254	ug/kg	8	95% Student's-t UCL	NORMAL	151	140	180	225	190	300	225
Phenanthrene	ug/kg	4	95% Student's-t UCL	NORMAL	208	200	215	251	252	365	260
Pyrene	ug/kg	4	95% Student's-t UCL	NORMAL	355	335	370	442	441	660	460
Americium-241	pCi/g	8	95% Student's-t UCL	NORMAL	0.367	0.349	0.436	0.600	0.473	0.775	0.666
Cesium-137	pCi/g	4	95% Student's-t UCL	NORMAL	0.202	0.219	0.237	0.278	0.303	0.560	0.288
Gross Alpha	pCi/g	4	95% Student's-t UCL	NORMAL	18.1	17.4	19.5	21.8	21.9	31.3	22.4
Gross Beta	pCi/g	4	95% Student's-t UCL	NORMAL	28.7	28.7	29.7	30.1	30.3	34.6	30.2
Plutonium-239/240	pCi/g	8	95% Student's-t UCL	NORMAL	0.936	0.787	1.04	1.79	1.30	2.32	2.05
Strontium-89/90	pCi/g	4	95% Student's-t UCL	NORMAL	0.142	0.141	0.158	0.161	0.166	0.227	0.162
Uranium-233/234	pCi/g	8	95% Student's-t UCL	NORMAL	1.24	1.36	1.44	1.55	1.48	2.15	1.59
Uranium-235	pCi/g	8	95% Student's-t UCL	NORMAL	0.042	0.040	0.047	0.118	0.079	0.184	0.149
Uranium-238	pCi/g	8	95% Student's-t UCL	NORMAL	1.26	1.26	1.33	1.53	1.39	1.74	1.63

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be a detect.
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Table 1.7
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond A-4

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond A4 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Aluminum	mg/kg	55	GAMMA	100	12	NORMAL	100	WRS	1.64E-05	Yes
Antimony	mg/kg	47	LOGNORMAL	11	12	NONPARAMETRIC	33	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	12	NORMAL	100	WRS	1.57E-06	Yes
Barium	mg/kg	54	GAMMA	100	12	NORMAL	100	WRS	8.95E-06	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	12	NONPARAMETRIC	83	WRS	7.16E-05	Yes
Boron	mg/kg	N/A	N/A	N/A	8	NORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	12	NONPARAMETRIC	75	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	12	GAMMA	100	WRS	4.66E-07	Yes
Cesium	mg/kg	51	NONPARAMETRIC	14	4	NORMAL	100	N/A	N/A	N/A
Chromium	mg/kg	55	GAMMA	85	12	NORMAL	83	WRS	0.001	Yes
Cobalt	mg/kg	54	NORMAL	80	12	NONPARAMETRIC	100	WRS	8.57E-05	Yes
Copper	mg/kg	55	GAMMA	80	12	GAMMA	100	WRS	5.07E-04	Yes
Iron	mg/kg	55	GAMMA	100	12	NONPARAMETRIC	100	WRS	6.33E-06	Yes
Lead	mg/kg	55	LOGNORMAL	100	12	NORMAL	100	WRS	0.002	Yes
Lithium	mg/kg	52	GAMMA	79	12	NORMAL	75	WRS	0.012	Yes
Magnesium	mg/kg	55	GAMMA	95	12	NORMAL	100	WRS	5.44E-06	Yes
Manganese	mg/kg	55	GAMMA	100	12	NORMAL	100	WRS	0.002	Yes
Mercury	mg/kg	46	NONPARAMETRIC	4	12	GAMMA	67	N/A	N/A	N/A
Molybdenum	mg/kg	52	NONPARAMETRIC	29	12	GAMMA	50	WRS	0.993	No
Nickel	mg/kg	53	GAMMA	72	12	NORMAL	92	WRS	6.62E-07	Yes
Nitrate	mg/kg	49	LOGNORMAL	59	2	0	100	WRS	0.331	No
Potassium	mg/kg	54	GAMMA	80	12	NORMAL	75	WRS	2.40E-04	Yes
Selenium	mg/kg	54	NONPARAMETRIC	28	12	NONPARAMETRIC	25	WRS	3.68E-04	Yes
Silica	mg/kg	19	NONPARAMETRIC	100	8	NORMAL	100	WRS	0.001	Yes
Silver	mg/kg	48	NONPARAMETRIC	6	12	NONPARAMETRIC	0	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	12	NORMAL	67	WRS	0.335	No
Strontium	mg/kg	55	LOGNORMAL	87	12	NORMAL	100	WRS	6.33E-06	Yes
Thallium	mg/kg	47	NONPARAMETRIC	6	12	NORMAL	17	N/A	N/A	N/A
Tin	mg/kg	50	NONPARAMETRIC	28	12	NONPARAMETRIC	0	N/A	N/A	N/A
Titanium	mg/kg	N/A	N/A	N/A	8	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	8	NORMAL	0	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	12	NORMAL	100	WRS	1.04E-05	Yes
Zinc	mg/kg	55	NONPARAMETRIC	98	12	GAMMA	100	WRS	2.33E-04	Yes
Atrazine	ug/kg	N/A	N/A	N/A	1	0	100	N/A	N/A	N/A
Americium-241	pCi/g	42	NONPARAMETRIC	100	12	NORMAL	100	WRS	4.04E-04	Yes
Cesium-137	pCi/g	37	NONPARAMETRIC	100	4	NORMAL	100	WRS	0.022	Yes
Gross Alpha	pCi/g	45	GAMMA	100	4	NORMAL	100	WRS	0.886	No
Gross Beta	pCi/g	46	NORMAL	100	4	NORMAL	100	t-Test_N	0.952	No
Plutonium-239/240	pCi/g	46	NONPARAMETRIC	100	12	NORMAL	100	WRS	9.77E-05	Yes
Strontium-89/90	pCi/g	39	NORMAL	100	4	NORMAL	100	t-Test_N	1.76E-10	Yes
Uranium-233/234	pCi/g	47	GAMMA	100	12	NORMAL	100	WRS	0.905	No
Uranium-235	pCi/g	46	NONPARAMETRIC	100	12	NORMAL	100	WRS	0.012	Yes
Uranium-238	pCi/g	47	GAMMA	100	12	NORMAL	100	WRS	0.678	No

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
CRA Dataset ID: Ponds_08102005a.mdb

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Table 1.8
Statistical Concentrations in Sediments (including background samples)
Pond A-4

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]
Aluminum	mg/kg	12	95% Student's-t UCL	NORMAL	16,597	16,500	19,975	24,350	19,604	29,418	26,000
Antimony	mg/kg	12	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	9.77	0.290	20.8	33.8	52.3	41.4	41.4
Arsenic	mg/kg	12	95% Student's-t UCL	NORMAL	6.33	6.10	6.85	9.43	7.26	10.3	10.2
Barium	mg/kg	12	95% Student's-t UCL	NORMAL	166	157	200	203	182	235	206
Beryllium	mg/kg	12	95% Student's-t UCL	NONPARAMETRIC	0.927	0.925	1.02	1.15	1.03	1.20	1.20
Boron	mg/kg	8	95% Student's-t UCL	NORMAL	7.69	7.05	8.48	9.65	8.54	11.0	10.0
Cadmium	mg/kg	12	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.800	0.490	0.635	2.30	1.81	3.10	3.10
Calcium	mg/kg	12	95% Approximate Gamma UCL	GAMMA	13,051	8,740	16,250	31,235	19,770	38,000	38,000
Cesium	mg/kg	4	95% Student's-t UCL	NORMAL	3.85	3.90	5.05	5.41	5.75	10.6	5.50
Chromium	mg/kg	12	95% Student's-t UCL	NORMAL	16.6	17.5	21.7	25.9	20.4	33.1	27.0
Cobalt	mg/kg	12	95% Student's-t UCL	NONPARAMETRIC	9.53	8.95	9.88	13.5	10.7	13.9	13.9
Copper	mg/kg	12	95% Approximate Gamma UCL	GAMMA	18.2	17.0	19.3	27.9	21.4	33.4	33.4
Iron	mg/kg	12	95% Student's-t UCL	NONPARAMETRIC	21,392	17,850	20,500	37,345	26,996	55,000	55,000
Lead	mg/kg	12	95% Student's-t UCL	NORMAL	20.6	19.0	23.2	30.2	23.8	34.1	35.9
Lithium	mg/kg	12	95% Student's-t UCL	NORMAL	11.5	12.5	15.3	17.9	14.2	23.0	19.0
Magnesium	mg/kg	12	95% Student's-t UCL	NORMAL	3,780	3,600	4,750	5,044	4,302	6,004	5,220
Manganese	mg/kg	12	95% Student's-t UCL	NORMAL	349	324	410	537	408	603	630
Mercury	mg/kg	12	95% Approximate Gamma UCL	GAMMA	0.034	0.030	0.035	0.069	0.045	0.085	0.085
Molybdenum	mg/kg	12	95% Approximate Gamma UCL	GAMMA	1.63	0.555	2.60	5.13	3.15	6.50	6.50
Nickel	mg/kg	12	95% Student's-t UCL	NORMAL	18.2	17.0	20.3	24.2	20.0	26.1	25.5
Nitrate	mg/kg	2	Too Few Observations To Calculate UCLs	0	2.47	2.47	2.48	2.50	N/A	2.50	2.50
Potassium	mg/kg	12	95% Student's-t UCL	NORMAL	2,194	2,250	2,775	3,970	2,804	4,792	4,300
Selenium	mg/kg	12	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.790	0.550	0.850	1.79	1.52	1.90	1.90
Silica	mg/kg	8	95% Student's-t UCL	NORMAL	790	780	888	977	886	1,159	980
Silver	mg/kg	12	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.584	0.340	0.663	1.45	1.23	2.05	2.05
Sodium	mg/kg	12	95% Student's-t UCL	NORMAL	192	150	285	413	264	501	486
Strontium	mg/kg	12	95% Student's-t UCL	NORMAL	73.2	64.8	85.5	123	88.7	139	140
Thallium	mg/kg	12	95% Student's-t UCL	NORMAL	0.405	0.413	0.453	0.536	0.459	0.637	0.580
Tin	mg/kg	12	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	6.42	1.15	10.4	22.2	33.3	31.0	31.0
Titanium	mg/kg	8	95% Student's-t UCL	NORMAL	107	106	140	153	133	204	160
Uranium	mg/kg	8	95% Student's-t UCL	NORMAL	4.94	4.88	5.13	5.83	5.33	6.43	6.00
Vanadium	mg/kg	12	95% Student's-t UCL	NORMAL	42.8	44.0	47.3	58.3	48.2	65.9	59.0
Zinc	mg/kg	12	95% Approximate Gamma UCL	GAMMA	84.1	73.0	94.3	139	103	169	169
Atrazine	ug/kg	1	Too Few Observations To Calculate UCLs	0	120	120	120	120	N/A	N/A	120
Americium-241	pCi/g	12	95% Student's-t UCL	NORMAL	0.070	0.077	0.105	0.153	0.101	0.201	0.173
Cesium-137	pCi/g	4	95% Student's-t UCL	NORMAL	0.430	0.414	0.482	0.575	0.580	0.959	0.598
Gross Alpha	pCi/g	4	95% Student's-t UCL	NORMAL	13.3	12.5	14.1	16.4	16.4	24.1	17.0
Gross Beta	pCi/g	4	95% Student's-t UCL	NORMAL	27.6	28.1	28.8	28.9	29.6	34.6	29.0
Plutonium-239/240	pCi/g	12	95% Student's-t UCL	NORMAL	0.153	0.090	0.205	0.438	0.236	0.507	0.498
Strontium-89/90	pCi/g	4	95% Student's-t UCL	NORMAL	1.24	1.34	1.62	1.76	1.93	3.67	1.80
Uranium-233/234	pCi/g	12	95% Student's-t UCL	NORMAL	1.19	1.16	1.41	1.63	1.36	1.90	1.68
Uranium-235	pCi/g	12	95% Student's-t UCL	NORMAL	0.109	0.099	0.162	0.221	0.146	0.267	0.243
Uranium-238	pCi/g	12	95% Student's-t UCL	NORMAL	1.28	1.27	1.41	1.66	1.41	1.85	1.67

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be a detect.
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Table 1.9
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond A-5

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond A5 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Aluminum	mg/kg	55	GAMMA	100	9	NORMAL	100	WRS	0.001	Yes
Antimony	mg/kg	47	LOGNORMAL	11	9	NONPARAMETRIC	0	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	9	NORMAL	100	WRS	0.002	Yes
Barium	mg/kg	54	GAMMA	100	9	NORMAL	100	WRS	1.20E-04	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	9	NORMAL	44	WRS	0.015	Yes
Boron	mg/kg	N/A	N/A	N/A	4	NORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	9	NONPARAMETRIC	0	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	9	NORMAL	100	WRS	3.72E-06	Yes
Cesium	mg/kg	51	NONPARAMETRIC	14	5	NORMAL	0	N/A	N/A	N/A
Chromium	mg/kg	55	GAMMA	85	9	NORMAL	100	WRS	0.011	Yes
Cobalt	mg/kg	54	NORMAL	80	9	NORMAL	100	t-Test_N	6.25E-04	Yes
Copper	mg/kg	55	GAMMA	80	9	NORMAL	100	WRS	0.003	Yes
Iron	mg/kg	55	GAMMA	100	9	NORMAL	100	WRS	8.22E-04	Yes
Lead	mg/kg	55	LOGNORMAL	100	9	NORMAL	100	WRS	0.016	Yes
Lithium	mg/kg	52	GAMMA	79	9	LOGNORMAL	100	WRS	0.022	Yes
Magnesium	mg/kg	55	GAMMA	95	9	NORMAL	100	WRS	2.12E-04	Yes
Manganese	mg/kg	55	GAMMA	100	9	NORMAL	100	WRS	0.170	No
Mercury	mg/kg	46	NONPARAMETRIC	4	9	NORMAL	0	N/A	N/A	N/A
Molybdenum	mg/kg	52	NONPARAMETRIC	29	9	NORMAL	33	WRS	0.719	No
Nickel	mg/kg	53	GAMMA	72	9	NORMAL	89	WRS	6.49E-05	Yes
Nitrate	mg/kg	49	LOGNORMAL	59	5	NORMAL	0	N/A	N/A	N/A
Potassium	mg/kg	54	GAMMA	80	9	NORMAL	100	WRS	1.56E-04	Yes
Selenium	mg/kg	54	NONPARAMETRIC	28	9	NORMAL	0	N/A	N/A	N/A
Silica	mg/kg	19	NONPARAMETRIC	100	4	NORMAL	100	WRS	0.001	Yes
Silver	mg/kg	48	NONPARAMETRIC	6	9	NORMAL	33	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	9	GAMMA	89	WRS	0.024	Yes
Strontium	mg/kg	55	LOGNORMAL	87	9	GAMMA	100	WRS	4.25E-05	Yes
Thallium	mg/kg	47	NONPARAMETRIC	6	9	NORMAL	33	N/A	N/A	N/A
Tin	mg/kg	50	NONPARAMETRIC	28	9	NONPARAMETRIC	0	N/A	N/A	N/A
Titanium	mg/kg	N/A	N/A	N/A	4	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	4	NORMAL	0	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	9	NORMAL	100	WRS	8.95E-04	Yes
Zinc	mg/kg	55	NONPARAMETRIC	98	9	LOGNORMAL	100	WRS	0.002	Yes
Americium-241	pCi/g	42	NONPARAMETRIC	100	11	NORMAL	100	WRS	1.08E-06	Yes
Cesium-137	pCi/g	37	NONPARAMETRIC	100	5	NONPARAMETRIC	100	WRS	0.962	No
Gross Alpha	pCi/g	45	GAMMA	100	5	NORMAL	100	WRS	0.154	No
Gross Beta	pCi/g	46	NORMAL	100	5	NORMAL	100	t-Test_N	0.982	No
Plutonium-239/240	pCi/g	46	NONPARAMETRIC	100	12	GAMMA	100	WRS	7.96E-08	Yes
Uranium-233/234	pCi/g	47	GAMMA	100	12	NORMAL	100	WRS	0.978	No
Uranium-235	pCi/g	46	NONPARAMETRIC	100	12	GAMMA	100	WRS	0.194	No
Uranium-238	pCi/g	47	GAMMA	100	12	NONPARAMETRIC	100	WRS	0.947	No

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
CRA Dataset ID: Ponds_08102005a.mdb

Table 1.10
Statistical Concentrations in Sediments (including background samples)
Pond A-5

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]
Aluminum	mg/kg	9	95% Student's-t UCL	NORMAL	12,434	10,500	17,000	19,400	15,334	23,912	21,000
Antimony	mg/kg	9	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	5.65	9.00	9.75	10.9	22.5	11.5	11.5
Arsenic	mg/kg	9	95% Student's-t UCL	NORMAL	3.92	3.90	4.20	4.48	4.16	4.87	4.60
Barium	mg/kg	9	95% Student's-t UCL	NORMAL	159	161	170	204	178	233	220
Beryllium	mg/kg	9	95% Student's-t UCL	NORMAL	0.686	0.550	1.00	1.12	0.872	1.42	1.20
Boron	mg/kg	4	95% Student's-t UCL	NORMAL	7.68	7.25	8.83	10.6	10.6	18.1	11.0
Cadmium	mg/kg	9	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.416	0.650	0.700	0.810	1.66	0.850	0.850
Calcium	mg/kg	9	95% Student's-t UCL	NORMAL	10,861	10,800	12,000	15,400	12,702	18,147	17,000
Cesium	mg/kg	5	95% Student's-t UCL	NORMAL	0.584	0.500	0.650	0.890	0.800	1.36	0.950
Chromium	mg/kg	9	95% Student's-t UCL	NORMAL	13.3	12.9	17.0	19.8	16.1	24.2	21.0
Cobalt	mg/kg	9	95% Student's-t UCL	NORMAL	9.60	9.90	10.8	12.5	10.9	14.9	13.3
Copper	mg/kg	9	95% Student's-t UCL	NORMAL	17.2	18.0	18.0	20.6	19.0	24.4	22.0
Iron	mg/kg	9	95% Student's-t UCL	NORMAL	15,911	15,500	17,000	20,000	17,616	22,661	22,000
Lead	mg/kg	9	95% Student's-t UCL	NORMAL	17.2	16.3	18.0	21.0	18.8	23.6	21.0
Lithium	mg/kg	9	95% Student's-t UCL	LOGNORMAL	10.0	8.20	14.0	15.8	12.4	22.5	17.0
Magnesium	mg/kg	9	95% Student's-t UCL	NORMAL	3,068	3,030	3,400	3,920	3,449	4,578	4,200
Manganese	mg/kg	9	95% Student's-t UCL	NORMAL	230	229	268	308	268	380	330
Mercury	mg/kg	9	95% Student's-t UCL	NORMAL	0.029	0.040	0.045	0.048	0.040	0.073	0.050
Molybdenum	mg/kg	9	95% Student's-t UCL	NORMAL	2.18	3.10	3.40	3.78	3.12	5.91	4.00
Nickel	mg/kg	9	95% Student's-t UCL	NORMAL	15.4	16.1	17.0	18.6	17.4	23.6	19.0
Nitrate	mg/kg	5	95% Student's-t UCL	NORMAL	1.68	1.70	1.76	1.89	1.85	2.30	1.92
Potassium	mg/kg	9	95% Student's-t UCL	NORMAL	2,063	1,600	2,700	3,120	2,522	3,878	3,400
Selenium	mg/kg	9	95% Student's-t UCL	NORMAL	0.543	0.415	0.650	0.930	0.698	1.16	1.05
Silica	mg/kg	4	95% Student's-t UCL	NORMAL	1,600	1,550	1,775	1,955	1,972	2,916	2,000
Silver	mg/kg	9	95% Student's-t UCL	NORMAL	0.974	1.00	1.10	1.23	1.13	1.60	1.25
Sodium	mg/kg	9	95% Approximate Gamma UCL	GAMMA	285	221	340	614	455	790	790
Strontium	mg/kg	9	95% Approximate Gamma UCL	GAMMA	63.8	60.2	67.2	85.0	72.2	95.0	95.0
Thallium	mg/kg	9	95% Student's-t UCL	NORMAL	0.516	0.550	0.640	0.756	0.648	1.04	0.800
Tin	mg/kg	9	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	9.58	14.9	16.2	18.0	36.6	19.0	19.0
Titanium	mg/kg	4	95% Student's-t UCL	NORMAL	105	105	115	127	130	193	130
Uranium	mg/kg	4	95% Student's-t UCL	NORMAL	6.63	6.00	7.13	8.63	8.57	13.5	9.00
Vanadium	mg/kg	9	95% Student's-t UCL	NORMAL	33.9	32.7	38.0	43.2	38.0	49.8	46.0
Zinc	mg/kg	9	95% Student's-t UCL	LOGNORMAL	75.7	69.6	74.1	113	89.5	135	130
Americium-241	pCi/g	11	95% Student's-t UCL	NORMAL	0.061	0.051	0.075	0.105	0.076	0.124	0.121
Cesium-137	pCi/g	5	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.038	0.004	0.079	0.096	0.251	0.100	0.100
Gross Alpha	pCi/g	5	95% Student's-t UCL	NORMAL	24.3	23.8	26.7	28.0	27.3	34.9	28.3
Gross Beta	pCi/g	5	95% Student's-t UCL	NORMAL	26.5	26.0	27.5	30.1	29.4	36.9	30.7
Plutonium-239/240	pCi/g	12	95% Approximate Gamma UCL	GAMMA	0.138	0.124	0.141	0.271	0.182	0.332	0.332
Uranium-233/234	pCi/g	12	95% Student's-t UCL	NORMAL	1.03	1.03	1.08	1.32	1.12	1.40	1.33
Uranium-235	pCi/g	12	95% Approximate Gamma UCL	GAMMA	0.073	0.057	0.080	0.173	0.108	0.183	0.183
Uranium-238	pCi/g	12	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.975	1.05	1.08	1.26	1.40	1.44	1.44

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be a detect.
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Table 1.11
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond B-4

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond B4 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Aluminum	mg/kg	55	GAMMA	100	22	NORMAL	100	WRS	4.67E-07	Yes
Antimony	mg/kg	47	LOGNORMAL	11	18	NONPARAMETRIC	28	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	22	NORMAL	100	WRS	9.20E-10	Yes
Barium	mg/kg	54	GAMMA	100	22	NORMAL	100	WRS	1.74E-08	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	22	GAMMA	68	WRS	2.24E-05	Yes
Boron	mg/kg	N/A	N/A	N/A	14	LOGNORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	22	NONPARAMETRIC	86	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	22	GAMMA	100	WRS	7.80E-11	Yes
Cesium	mg/kg	51	NONPARAMETRIC	14	8	NORMAL	88	N/A	N/A	N/A
Chromium	mg/kg	55	GAMMA	85	22	NONPARAMETRIC	100	WRS	2.61E-06	Yes
Cobalt	mg/kg	54	NORMAL	80	22	NORMAL	100	t-Test_N	1.91E-04	Yes
Copper	mg/kg	55	GAMMA	80	22	NONPARAMETRIC	100	WRS	3.99E-08	Yes
Iron	mg/kg	55	GAMMA	100	22	NORMAL	100	WRS	7.78E-07	Yes
Lead	mg/kg	55	LOGNORMAL	100	22	GAMMA	100	WRS	3.20E-08	Yes
Lithium	mg/kg	52	GAMMA	79	22	NORMAL	86	WRS	0.009	Yes
Magnesium	mg/kg	55	GAMMA	95	22	NORMAL	100	WRS	2.12E-08	Yes
Manganese	mg/kg	55	GAMMA	100	22	NORMAL	100	WRS	0.044	Yes
Mercury	mg/kg	46	NONPARAMETRIC	4	22	NONPARAMETRIC	73	N/A	N/A	N/A
Molybdenum	mg/kg	52	NONPARAMETRIC	29	22	GAMMA	64	WRS	0.876	No
Nickel	mg/kg	53	GAMMA	72	22	NORMAL	95	WRS	1.28E-08	Yes
Nitrate	mg/kg	49	LOGNORMAL	59	4	NORMAL	0	N/A	N/A	N/A
Potassium	mg/kg	54	GAMMA	80	22	NORMAL	100	WRS	8.02E-08	Yes
Selenium	mg/kg	54	NONPARAMETRIC	28	22	NONPARAMETRIC	14	N/A	N/A	N/A
Silica	mg/kg	19	NONPARAMETRIC	100	14	NORMAL	100	WRS	4.36E-06	Yes
Silver	mg/kg	48	NONPARAMETRIC	6	22	NONPARAMETRIC	50	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	22	NONPARAMETRIC	95	WRS	1.37E-05	Yes
Strontium	mg/kg	55	LOGNORMAL	87	22	GAMMA	100	WRS	8.60E-09	Yes
Thallium	mg/kg	47	NONPARAMETRIC	6	22	NORMAL	18	N/A	N/A	N/A
Tin	mg/kg	50	NONPARAMETRIC	28	22	NONPARAMETRIC	23	WRS	0.949	No
Titanium	mg/kg	N/A	N/A	N/A	14	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	14	NORMAL	0	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	22	NORMAL	100	WRS	9.72E-07	Yes
Zinc	mg/kg	55	NONPARAMETRIC	98	22	GAMMA	100	WRS	4.75E-09	Yes
Acenaphthene	ug/kg	N/A	N/A	5	22	NONPARAMETRIC	5	N/A	N/A	N/A
Anthracene	ug/kg	N/A	N/A	9	22	GAMMA	45	N/A	N/A	N/A
Benzo(a)anthracene	ug/kg	N/A	N/A	12	22	NONPARAMETRIC	73	N/A	N/A	N/A
Benzo(a)pyrene	ug/kg	N/A	N/A	9	22	NONPARAMETRIC	77	N/A	N/A	N/A
Benzo(g,h,i)perylene	ug/kg	N/A	N/A	5	22	NONPARAMETRIC	45	N/A	N/A	N/A
Benzo(k)fluoranthene	ug/kg	N/A	N/A	7	22	GAMMA	55	N/A	N/A	N/A
bis(2-ethylhexyl)phthalate	ug/kg	N/A	N/A	43	22	GAMMA	82	WRS	N/A	N/A
Chrysene	ug/kg	N/A	N/A	12	22	NONPARAMETRIC	82	N/A	N/A	N/A
Dibenz(a,h)anthracene	ug/kg	N/A	N/A	2	22	GAMMA	14	N/A	N/A	N/A
Fluoranthene	ug/kg	N/A	N/A	14	22	NORMAL	82	N/A	N/A	N/A
Fluorene	ug/kg	N/A	N/A	5	22	GAMMA	5	N/A	N/A	N/A
gamma-BHC (Lindane)	ug/kg	N/A	N/A	N/A	7	NONPARAMETRIC	14	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	ug/kg	N/A	N/A	5	22	LOGNORMAL	45	N/A	N/A	N/A
PCB-1254	ug/kg	N/A	N/A	5	27	LOGNORMAL	56	N/A	N/A	N/A
Phenanthrene	ug/kg	N/A	N/A	9	22	GAMMA	82	N/A	N/A	N/A
Pyrene	ug/kg	N/A	N/A	14	22	NORMAL	73	N/A	N/A	N/A
Americium-241	pCi/g	42	NONPARAMETRIC	100	22	LOGNORMAL	100	WRS	4.76E-11	Yes
Cesium-137	pCi/g	37	NONPARAMETRIC	100	8	GAMMA	100	WRS	0.123	No
Gross Alpha	pCi/g	45	GAMMA	100	8	LOGNORMAL	100	WRS	0.127	No
Gross Beta	pCi/g	46	NORMAL	100	8	GAMMA	100	WRS	0.997	No
Plutonium-239/240	pCi/g	46	NONPARAMETRIC	100	21	NONPARAMETRIC	100	WRS	1.60E-09	Yes
Radium-226	pCi/g	19	NORMAL	100	4	NORMAL	100	t-Test_N	0.486	No

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Table 1.11
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond B-4

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond B4 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Radium-228	pCi/g	20	NORMAL	100	4	NORMAL	100	t-Test_N	0.659	No
Strontium-89/90	pCi/g	39	NORMAL	100	4	NORMAL	100	t-Test_N	0.582	No
Uranium-233/234	pCi/g	47	GAMMA	100	22	NONPARAMETRIC	100	WRS	0.641	No
Uranium-235	pCi/g	46	NONPARAMETRIC	100	22	NORMAL	100	WRS	0.007	Yes
Uranium-238	pCi/g	47	GAMMA	100	22	NONPARAMETRIC	100	WRS	0.260	No

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
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Table 1.12
Statistical Concentrations in Sediments (including background samples)
Pond B-4

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL*	UTL*	Maximum
Aluminum	mg/kg	22	95% Student's-t UCL	NORMAL	15,376	14,500	18,000	28,700	17,687	27,260	29,000
Antimony	mg/kg	18	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	4.24	0.418	2.14	24.8	23.3	25.6	25.6
Arsenic	mg/kg	22	95% Student's-t UCL	NORMAL	6.58	6.65	7.70	8.80	7.16	9.55	9.10
Barium	mg/kg	22	95% Student's-t UCL	NORMAL	171	170	190	220	182	231	230
Beryllium	mg/kg	22	95% Approximate Gamma UCL	GAMMA	0.955	0.960	1.08	2.17	1.18	2.20	2.20
Boron	mg/kg	14	95% H-UCL	LOGNORMAL	9.14	7.55	8.80	20.3	12.3	23.7	30.0
Cadmium	mg/kg	22	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	3.24	1.40	1.78	3.18	22.6	44.0	44.0
Calcium	mg/kg	22	95% Approximate Gamma UCL	GAMMA	17,036	15,500	19,925	34,620	21,722	51,000	51,000
Cesium	mg/kg	8	95% Student's-t UCL	NORMAL	2.26	2.25	3.05	3.40	2.89	4.70	3.50
Chromium	mg/kg	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	23.1	17.0	24.5	28.9	48.1	140	140
Cobalt	mg/kg	22	95% Student's-t UCL	NORMAL	8.46	8.40	9.58	11.1	9.22	12.4	12.0
Copper	mg/kg	22	95% Student's-t UCL	NONPARAMETRIC	29.2	23.4	30.8	39.0	37.0	120	120
Iron	mg/kg	22	95% Student's-t UCL	NORMAL	17,132	17,000	19,000	22,950	18,423	23,773	24,000
Lead	mg/kg	22	95% Approximate Gamma UCL	GAMMA	38.1	33.0	45.2	65.0	46.6	110	110
Lithium	mg/kg	22	95% Student's-t UCL	NORMAL	11.2	11.0	14.8	20.0	13.5	23.4	27.0
Magnesium	mg/kg	22	95% Student's-t UCL	NORMAL	3,637	3,745	4,193	5,085	4,005	5,530	5,800
Manganese	mg/kg	22	95% Student's-t UCL	NORMAL	244	242	283	340	269	371	350
Mercury	mg/kg	22	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.145	0.074	0.090	0.225	0.888	1.70	1.70
Molybdenum	mg/kg	22	95% Approximate Gamma UCL	GAMMA	1.96	1.30	3.16	3.99	2.55	4.10	4.10
Nickel	mg/kg	22	95% Student's-t UCL	NORMAL	16.9	17.9	18.8	23.0	18.9	26.8	31.0
Nitrate	mg/kg	4	95% Student's-t UCL	NORMAL	0.319	0.319	0.355	0.365	0.374	0.513	0.367
Potassium	mg/kg	22	95% Student's-t UCL	NORMAL	2,289	2,350	2,875	3,858	2,596	3,869	3,900
Selenium	mg/kg	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.780	0.600	0.775	1.79	1.46	3.60	3.60
Silica	mg/kg	14	95% Student's-t UCL	NORMAL	1,164	1,150	1,275	1,505	1,274	1,655	1,700
Silver	mg/kg	22	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	149	2.00	6.34	97.9	1,548	3,100	3,100
Sodium	mg/kg	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	322	272	338	631	497	990	990
Strontium	mg/kg	22	95% Approximate Gamma UCL	GAMMA	76.5	74.5	86.3	148	87.7	150	150
Thallium	mg/kg	22	95% Student's-t UCL	NORMAL	0.487	0.470	0.550	0.845	0.576	0.948	1.20
Tin	mg/kg	22	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	7.52	1.80	15.1	19.0	24.7	24.0	24.0
Titanium	mg/kg	14	95% Student's-t UCL	NORMAL	124	130	150	177	143	210	190
Uranium	mg/kg	14	95% Student's-t UCL	NORMAL	6.33	6.00	7.00	9.03	7.09	9.74	10.0
Vanadium	mg/kg	22	95% Student's-t UCL	NORMAL	38.7	37.5	44.0	55.0	42.7	59.2	63.0
Zinc	mg/kg	22	95% Approximate Gamma UCL	GAMMA	205	177	235	420	255	510	510
Acenaphthene	ug/kg	22	95% Student's-t UCL	NONPARAMETRIC	333	273	326	695	400	900	900
Anthracene	ug/kg	22	95% Approximate Gamma UCL	GAMMA	254	220	315	592	339	900	900
Benzo(a)anthracene	ug/kg	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	399	330	368	1,162	753	1,800	1,800
Benzo(a)pyrene	ug/kg	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	485	413	458	1,175	824	1,800	1,800
Benzo(g,h,i)perylene	ug/kg	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	449	300	383	1,390	859	1,800	1,800
Benzo(k)fluoranthene	ug/kg	22	95% Approximate Gamma UCL	GAMMA	546	380	550	1,390	702	1,800	1,800
bis(2-ethylhexyl)phthalate	ug/kg	22	95% Approximate Gamma UCL	GAMMA	2,916	1,040	2,475	7,925	4,783	25,000	25,000
Chrysene	ug/kg	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	510	470	515	1,173	847	1,800	1,800
Dibenz(a,h)anthracene	ug/kg	22	95% Approximate Gamma UCL	GAMMA	516	365	550	1,390	702	1,800	1,800
Fluoranthene	ug/kg	22	95% Student's-t UCL	NORMAL	889	975	1,100	1,390	1,037	1,649	1,800
Fluorene	ug/kg	22	95% Approximate Gamma UCL	GAMMA	560	428	588	1,390	726	1,800	1,800
gamma-BHC (Lindane)	ug/kg	7	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	9.00	6.00	7.50	19.8	20.7	25.0	25.0
Indeno(1,2,3-cd)pyrene	ug/kg	22	95% H-UCL	LOGNORMAL	435	270	383	1,390	628	1,379	1,800
PCB-1254	ug/kg	27	95% H-UCL	LOGNORMAL	322	160	225	1,016	696	1,479	3,100
Phenanthrene	ug/kg	22	95% Approximate Gamma UCL	GAMMA	537	440	588	1,178	684	1,800	1,800
Pyrene	ug/kg	22	95% Student's-t UCL	NORMAL	806	840	993	1,200	931	1,448	1,800
Americium-241	pCi/g	22	95% Chebyshev (MVUE) UCL	LOGNORMAL	5.00	0.581	2.57	16.8	14.3	31.9	56.5
Cesium-137	pCi/g	8	95% Approximate Gamma UCL	GAMMA	0.270	0.209	0.255	0.659	0.473	0.832	0.832
Gross Alpha	pCi/g	8	95% Student's-t UCL	LOGNORMAL	26.6	19.9	33.3	45.4	34.6	70.3	49.0
Gross Beta	pCi/g	8	95% Approximate Gamma UCL	GAMMA	26.8	26.7	27.1	29.5	28.1	30.8	30.8
Plutonium-239/240	pCi/g	21	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	17.6	1.34	9.58	47.1	62.7	217	217
Radium-226	pCi/g	4	95% Student's-t UCL	NORMAL	0.888	0.894	0.943	1.00	1.02	1.35	1.02
Radium-228	pCi/g	4	95% Student's-t UCL	NORMAL	1.65	1.69	1.75	1.77	1.83	2.27	1.78
Strontium-89/90	pCi/g	4	95% Student's-t UCL	NORMAL	0.174	0.161	0.177	0.209	0.208	0.295	0.217
Uranium-233/234	pCi/g	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	1.71	1.28	1.54	5.18	2.96	6.04	6.04
Uranium-235	pCi/g	22	95% Student's-t UCL	NORMAL	0.109	0.095	0.161	0.252	0.140	0.269	0.293
Uranium-238	pCi/g	22	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	1.97	1.26	1.58	5.63	3.65	8.51	8.51

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Table 1.12
Statistical Concentrations in Sediments (including background samples)
Pond B-4

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be a detect.
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Table 1.13
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond B-5

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond B5 (excluding background samples)					
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)	Test	1 - p	Retain as ECOPC?
Aluminum	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	4.09E-05	Yes
Antimony	mg/kg	47	LOGNORMAL	11	11	NON-PARAMETRIC	15	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	11	NORMAL	100	WRS	8.04E-06	Yes
Barium	mg/kg	54	GAMMA	100	11	NON-PARAMETRIC	100	WRS	1.58E-04	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	11	NORMAL	64	WRS	0.001	Yes
Boron	mg/kg	N/A	N/A	N/A	7	NORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	11	LOGNORMAL	64	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	1.32E-07	Yes
Cesium	mg/kg	51	NON-PARAMETRIC	14	4	NORMAL	100	N/A	N/A	N/A
Chromium	mg/kg	55	GAMMA	85	11	NORMAL	100	WRS	1.92E-04	Yes
Cobalt	mg/kg	54	NORMAL	80	11	NORMAL	100	t-Test_N	0.010	Yes
Copper	mg/kg	55	GAMMA	80	11	NORMAL	100	WRS	0.001	Yes
Iron	mg/kg	55	GAMMA	100	11	NON-PARAMETRIC	100	WRS	4.26E-04	Yes
Lead	mg/kg	55	LOGNORMAL	100	11	NORMAL	100	WRS	0.003	Yes
Lithium	mg/kg	52	GAMMA	79	11	LOGNORMAL	100	WRS	0.006	Yes
Magnesium	mg/kg	55	GAMMA	95	11	NORMAL	100	WRS	6.48E-05	Yes
Manganese	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	0.187	No
Mercury	mg/kg	46	NON-PARAMETRIC	4	11	NORMAL	50	N/A	N/A	N/A
Molybdenum	mg/kg	52	NON-PARAMETRIC	29	11	GAMMA	57	WRS	0.956	No
Nickel	mg/kg	53	GAMMA	72	11	GAMMA	100	WRS	2.89E-06	Yes
Potassium	mg/kg	54	GAMMA	80	11	NORMAL	100	WRS	3.89E-05	Yes
Selenium	mg/kg	54	NON-PARAMETRIC	28	11	NON-PARAMETRIC	23	WRS	3.45E-04	Yes
Silica	mg/kg	19	NON-PARAMETRIC	100	7	NORMAL	100	WRS	0.001	Yes
Silver	mg/kg	48	NON-PARAMETRIC	6	11	NORMAL	29	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	11	NORMAL	93	WRS	0.002	Yes
Strontium	mg/kg	55	LOGNORMAL	87	11	NORMAL	100	WRS	1.38E-05	Yes
Thallium	mg/kg	47	NON-PARAMETRIC	6	11	NON-PARAMETRIC	21	N/A	N/A	N/A
Tin	mg/kg	50	NON-PARAMETRIC	28	11	NON-PARAMETRIC	14	N/A	N/A	N/A
Titanium	mg/kg	N/A	N/A	N/A	7	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	7	NON-PARAMETRIC	0	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	11	NORMAL	100	WRS	1.62E-04	Yes
Zinc	mg/kg	55	NON-PARAMETRIC	98	11	NORMAL	100	WRS	1.21E-04	Yes
Americium-241	pCi/g	42	NON-PARAMETRIC	100	15	GAMMA	100	WRS	2.13E-07	Yes
Cesium-137	pCi/g	37	NON-PARAMETRIC	100	8	NORMAL	100	WRS	0.874	No
Gross Alpha	pCi/g	45	GAMMA	100	8	NORMAL	100	WRS	0.669	No
Gross Beta	pCi/g	46	NORMAL	100	8	NORMAL	100	t-Test_N	0.993	No
Plutonium-239/240	pCi/g	46	NON-PARAMETRIC	100	15	GAMMA	100	WRS	9.28E-06	Yes
Radium-226	pCi/g	19	NORMAL	100	4	NORMAL	100	t-Test_N	0.483	No
Radium-228	pCi/g	20	NORMAL	100	4	NORMAL	100	t-Test_N	0.704	No
Strontium-89/90	pCi/g	39	NORMAL	100	5	NORMAL	100	t-Test_N	0.031	Yes
Uranium-233/234	pCi/g	47	GAMMA	100	15	GAMMA	100	WRS	0.906	No
Uranium-235	pCi/g	46	NON-PARAMETRIC	100	15	GAMMA	100	WRS	0.042	Yes
Uranium-238	pCi/g	47	GAMMA	100	15	NORMAL	100	WRS	0.839	No

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
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Table 1.14
Statistical Concentrations in Sediments (including background samples)
Pond B-5

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]
Aluminum	mg/kg	11	95% Student's-t UCL	NORMAL	14,671	14,700	17,675	22,700	21,415	26,912	24,000
Antimony	mg/kg	11	99% Chebyshev (Mean, Sd) UCL	NON-PARAMETRIC	3.56	0.360	8.95	11.8	43.1	13.6	13.6
Arsenic	mg/kg	11	95% Student's-t UCL	NORMAL	5.38	4.80	6.28	8.41	7.70	9.08	8.60
Barium	mg/kg	11	95% Chebyshev (Mean, Sd) UCL	NON-PARAMETRIC	139	137	154	210	250	240	240
Beryllium	mg/kg	11	95% Student's-t UCL	NORMAL	0.775	0.775	0.930	1.24	1.21	1.37	1.30
Boron	mg/kg	7	95% Student's-t UCL	NORMAL	4.96	4.90	6.35	8.02	10.9	11.6	8.50
Cadmium	mg/kg	11	95% Chebyshev (MVUE) UCL	LOGNORMAL	0.513	0.570	0.643	0.870	4.21	2.72	1.00
Calcium	mg/kg	11	95% Student's-t UCL	NORMAL	8,871	8,020	9,995	15,015	18,339	15,871	16,900
Cesium	mg/kg	4	95% Student's-t UCL	NORMAL	3.04	3.10	3.40	3.48	5.32	4.57	3.50
Chromium	mg/kg	11	95% Student's-t UCL	NORMAL	16.3	15.5	18.8	26.4	23.1	29.0	27.0
Cobalt	mg/kg	11	95% Student's-t UCL	NORMAL	7.81	7.80	9.40	10.8	10.2	12.1	11.0
Copper	mg/kg	11	95% Student's-t UCL	NORMAL	17.9	18.1	21.5	28.7	30.4	32.9	29.9
Iron	mg/kg	11	95% Student's-t UCL	NON-PARAMETRIC	15,550	15,350	18,800	21,415	21,340	22,000	22,000
Lead	mg/kg	11	95% Student's-t UCL	NORMAL	19.9	18.4	25.7	33.0	32.6	38.0	36.8
Lithium	mg/kg	11	95% H-UCL	LOGNORMAL	10.9	11.1	12.9	17.7	21.0	29.0	19.0
Magnesium	mg/kg	11	95% Student's-t UCL	NORMAL	3,190	3,165	3,993	4,896	4,763	5,692	5,000
Manganese	mg/kg	11	95% Student's-t UCL	NORMAL	226	219	272	329	380	389	350
Mercury	mg/kg	11	95% Student's-t UCL	NORMAL	0.041	0.038	0.050	0.076	0.315	0.087	0.086
Molybdenum	mg/kg	11	95% Approximate Gamma UCL	GAMMA	1.78	1.20	3.04	4.05	3.22	4.70	4.70
Nickel	mg/kg	11	95% Approximate Gamma UCL	GAMMA	15.8	15.4	19.1	21.3	22.3	23.8	23.8
Potassium	mg/kg	11	95% Student's-t UCL	NORMAL	2,026	2,005	2,385	3,340	3,119	3,820	3,600
Selenium	mg/kg	11	95% Chebyshev (Mean, Sd) UCL	NON-PARAMETRIC	0.643	0.550	0.800	1.20	1.44	1.60	1.60
Silica	mg/kg	7	95% Student's-t UCL	NORMAL	867	810	1,015	1,240	1,383	1,619	1,300
Silver	mg/kg	11	95% Student's-t UCL	NORMAL	0.738	0.625	1.10	1.42	1.16	1.69	1.45
Sodium	mg/kg	11	95% Student's-t UCL	NORMAL	300	294	399	470	758	587	510
Strontium	mg/kg	11	95% Student's-t UCL	NORMAL	53.6	51.0	57.5	82.5	110	92.5	87.0
Thallium	mg/kg	11	95% Student's-t UCL	NON-PARAMETRIC	0.410	0.445	0.564	0.662	0.397	0.720	0.720
Tin	mg/kg	11	99% Chebyshev (Mean, Sd) UCL	NON-PARAMETRIC	8.39	0.975	15.8	28.4	32.6	39.5	39.5
Titanium	mg/kg	7	95% Student's-t UCL	NORMAL	108	120	145	157	149	236	160
Uranium	mg/kg	7	95% Chebyshev (Mean, Sd) UCL	NON-PARAMETRIC	5.37	5.00	5.75	6.85	7.18	7.00	7.00
Vanadium	mg/kg	11	95% Student's-t UCL	NORMAL	36.3	37.1	43.7	50.4	46.1	60.3	51.0
Zinc	mg/kg	11	95% Student's-t UCL	NORMAL	103	89.6	118	197	122	222	240
Americium-241	pCi/g	15	95% Approximate Gamma UCL	GAMMA	0.129	0.093	0.165	0.320	8.24	0.337	0.337
Cesium-137	pCi/g	8	95% Student's-t UCL	NORMAL	0.093	0.077	0.092	0.168	0.505	0.287	0.187
Gross Alpha	pCi/g	8	95% Student's-t UCL	NORMAL	18.7	15.7	15.9	30.4	53.8	48.1	34.0
Gross Beta	pCi/g	8	95% Student's-t UCL	NORMAL	24.8	25.5	26.4	28.1	30.0	35.3	28.6
Plutonium-239/240	pCi/g	15	95% Approximate Gamma UCL	GAMMA	0.315	0.284	0.388	0.748	22.0	0.895	0.895
Radium-226	pCi/g	4	95% Student's-t UCL	NORMAL	0.889	0.912	0.916	0.952	2.09	1.13	0.961
Radium-228	pCi/g	4	95% Student's-t UCL	NORMAL	1.62	1.59	1.66	1.80	1.83	2.09	1.84
Strontium-89/90	pCi/g	5	95% Student's-t UCL	NORMAL	0.369	0.392	0.534	0.570	0.806	1.05	0.579
Uranium-233/234	pCi/g	15	95% Approximate Gamma UCL	GAMMA	1.21	1.18	1.34	1.65	2.37	1.83	1.83
Uranium-235	pCi/g	15	95% Approximate Gamma UCL	GAMMA	0.098	0.092	0.136	0.214	0.153	0.243	0.243
Uranium-238	pCi/g	15	95% Student's-t UCL	NORMAL	1.15	1.13	1.28	1.52	3.08	1.68	1.53

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be a detect.
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Table 1.15
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond C-1

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond C1 (excluding background samples)			Test	1 - p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Aluminum	mg/kg	55	GAMMA	100	7	NORMAL	100	WRS	3.27E-05	Yes
Antimony	mg/kg	47	LOGNORMAL	11	6	NONPARAMETRIC	17	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	7	NORMAL	100	WRS	6.79E-05	Yes
Barium	mg/kg	54	GAMMA	100	7	NORMAL	100	WRS	1.28E-05	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	7	NONPARAMETRIC	100	WRS	1.39E-04	Yes
Boron	mg/kg	N/A	N/A	N/A	5	NORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	6	NORMAL	83	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	7	NORMAL	100	WRS	2.58E-05	Yes
Chromium	mg/kg	55	GAMMA	85	7	NORMAL	100	WRS	1.27E-04	Yes
Cobalt	mg/kg	54	NORMAL	80	7	NORMAL	100	t-Test_N	7.44E-06	Yes
Copper	mg/kg	55	GAMMA	80	7	NORMAL	100	WRS	5.68E-05	Yes
Iron	mg/kg	55	GAMMA	100	7	NORMAL	100	WRS	4.74E-05	Yes
Lead	mg/kg	55	LOGNORMAL	100	7	NORMAL	100	WRS	1.94E-04	Yes
Lithium	mg/kg	52	GAMMA	79	7	NORMAL	100	WRS	1.28E-04	Yes
Magnesium	mg/kg	55	GAMMA	95	7	NORMAL	100	WRS	4.52E-05	Yes
Manganese	mg/kg	55	GAMMA	100	7	LOGNORMAL	100	WRS	0.011	Yes
Mercury	mg/kg	46	NONPARAMETRIC	4	7	NONPARAMETRIC	100	N/A	N/A	N/A
Molybdenum	mg/kg	52	NONPARAMETRIC	29	6	NORMAL	50	WRS	0.971	No
Nickel	mg/kg	53	GAMMA	72	7	NORMAL	100	WRS	2.93E-05	Yes
Nitrate	mg/kg	49	LOGNORMAL	59	2	0	100	WRS	0.624	No
Potassium	mg/kg	54	GAMMA	80	7	NORMAL	100	WRS	3.75E-05	Yes
Selenium	mg/kg	54	NONPARAMETRIC	28	6	NORMAL	50	WRS	3.51E-04	Yes
Silica	mg/kg	19	NONPARAMETRIC	100	5	NORMAL	100	WRS	4.73E-04	Yes
Silver	mg/kg	48	NONPARAMETRIC	6	6	NORMAL	0	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	7	GAMMA	57	WRS	0.930	No
Strontium	mg/kg	55	LOGNORMAL	87	7	NORMAL	100	WRS	2.11E-04	Yes
Thallium	mg/kg	47	NONPARAMETRIC	6	6	GAMMA	33	N/A	N/A	N/A
Tin	mg/kg	50	NONPARAMETRIC	28	7	GAMMA	29	WRS	0.558	No
Titanium	mg/kg	N/A	N/A	N/A	5	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	5	NORMAL	0	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	7	NORMAL	100	WRS	2.68E-04	Yes
Zinc	mg/kg	55	NONPARAMETRIC	98	7	GAMMA	100	WRS	2.30E-04	Yes
Acenaphthene	ug/kg	N/A	N/A	5	6	NORMAL	50	N/A	N/A	N/A
Anthracene	ug/kg	N/A	N/A	9	6	NORMAL	83	N/A	N/A	N/A
Benzo(a)anthracene	ug/kg	N/A	N/A	12	6	NORMAL	67	N/A	N/A	N/A
Benzo(a)pyrene	ug/kg	N/A	N/A	9	6	NORMAL	50	N/A	N/A	N/A
Benzo(g,h,i)perylene	ug/kg	N/A	N/A	5	6	NORMAL	17	N/A	N/A	N/A
Chrysene	ug/kg	N/A	N/A	12	6	NORMAL	67	N/A	N/A	N/A
Dibenz(a,h)anthracene	ug/kg	N/A	N/A	2	5	NORMAL	20	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	ug/kg	N/A	N/A	5	6	NORMAL	50	N/A	N/A	N/A
PCB-1254	ug/kg	N/A	N/A	5	7	LOGNORMAL	14	N/A	N/A	N/A
Pentachlorophenol	ug/kg	N/A	N/A	N/A	6	NORMAL	17	N/A	N/A	N/A
Phenanthrene	ug/kg	N/A	N/A	9	6	NONPARAMETRIC	83	N/A	N/A	N/A
Pyrene	ug/kg	N/A	N/A	14	6	NORMAL	17	N/A	N/A	N/A
Americium-241	pCi/g	42	NONPARAMETRIC	100	9	GAMMA	100	WRS	1.91E-06	Yes
Gross Alpha	pCi/g	45	GAMMA	100	4	NORMAL	100	WRS	0.015	Yes
Gross Beta	pCi/g	46	NORMAL	100	4	NORMAL	100	t-Test_N	0.631	No
Plutonium-239/240	pCi/g	46	NONPARAMETRIC	100	9	NORMAL	100	WRS	1.23E-06	Yes
Uranium-233/234	pCi/g	47	GAMMA	100	9	LOGNORMAL	100	WRS	0.018	Yes
Uranium-235	pCi/g	46	NONPARAMETRIC	100	9	NORMAL	100	WRS	4.76E-05	Yes
Uranium-238	pCi/g	47	GAMMA	100	9	NORMAL	100	WRS	0.012	Yes

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
CRA Dataset ID: Ponds_08102005a.mdb

Table 1.16
Statistical Concentrations in Sediments (including background samples)
Pond C-1

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]
Aluminum	mg/kg	7	95% Student's-t UCL	NORMAL	23,643	23,000	29,500	31,700	29,035	43,871	32,000
Antimony	mg/kg	6	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	1.13	0.433	0.729	3.47	3.95	4.35	4.35
Arsenic	mg/kg	7	95% Student's-t UCL	NORMAL	6.44	6.40	6.85	8.30	7.40	10.0	8.90
Barium	mg/kg	7	95% Student's-t UCL	NORMAL	274	270	300	327	305	389	330
Beryllium	mg/kg	7	95% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	2.05	1.30	1.60	5.20	5.46	6.70	6.70
Boron	mg/kg	5	95% Student's-t UCL	NORMAL	9.16	8.60	10.0	10.8	10.4	13.6	11.0
Cadmium	mg/kg	6	95% Student's-t UCL	NORMAL	0.707	0.640	0.805	0.925	0.836	1.18	0.950
Calcium	mg/kg	7	95% Student's-t UCL	NORMAL	11,300	10,200	14,100	17,860	14,699	24,054	19,000
Chromium	mg/kg	7	95% Student's-t UCL	NORMAL	24.3	25.0	27.5	29.7	27.7	37.1	30.0
Cobalt	mg/kg	7	95% Student's-t UCL	NORMAL	11.9	12.0	12.7	13.0	12.6	14.5	13.0
Copper	mg/kg	7	95% Student's-t UCL	NORMAL	26.8	27.0	27.7	29.4	28.4	32.7	30.0
Iron	mg/kg	7	95% Student's-t UCL	NORMAL	26,086	27,000	28,500	30,400	28,990	36,981	31,000
Lead	mg/kg	7	95% Student's-t UCL	NORMAL	30.5	30.0	30.8	35.9	33.2	40.6	38.0
Lithium	mg/kg	7	95% Student's-t UCL	NORMAL	20.4	20.0	24.0	27.1	24.4	35.3	28.0
Magnesium	mg/kg	7	95% Student's-t UCL	NORMAL	4,607	4,500	4,850	5,560	5,115	6,512	5,800
Manganese	mg/kg	7	95% Student's-t UCL	LOGNORMAL	397	310	370	793	588	1,380	970
Mercury	mg/kg	7	99% Chebyshev (Mean, Sd) UCL	NONPARAMETRIC	0.483	0.094	0.720	1.51	2.99	1.60	1.60
Molybdenum	mg/kg	6	95% Student's-t UCL	NORMAL	1.06	0.845	1.72	2.11	1.74	3.56	2.15
Nickel	mg/kg	7	95% Student's-t UCL	NORMAL	20.5	21.0	21.5	23.4	22.2	27.1	24.0
Nitrate	mg/kg	2	Too Few Observations To Calculate UCLs	0	1.15	1.15	1.23	1.29	N/A	1.30	1.30
Potassium	mg/kg	7	95% Student's-t UCL	NORMAL	3,167	3,200	3,550	4,020	3,653	4,991	4,200
Selenium	mg/kg	6	95% Student's-t UCL	NORMAL	1.61	1.23	2.40	2.78	2.36	4.37	2.80
Silica	mg/kg	5	95% Student's-t UCL	NORMAL	1,420	1,500	1,500	1,580	1,603	2,075	1,600
Silver	mg/kg	6	95% Student's-t UCL	NORMAL	0.523	0.500	0.538	0.625	0.582	0.740	0.650
Sodium	mg/kg	7	95% Approximate Gamma UCL	GAMMA	124	70.0	180	284	259	290	290
Strontium	mg/kg	7	95% Student's-t UCL	NORMAL	68.5	68.0	74.7	84.8	77.3	101	89.0
Thallium	mg/kg	6	95% Approximate Gamma UCL	GAMMA	3.66	1.33	6.14	9.43	11.3	10.0	10.0
Tin	mg/kg	7	95% Approximate Gamma UCL	GAMMA	5.86	4.10	8.13	11.0	9.52	11.0	11.0
Titanium	mg/kg	5	95% Student's-t UCL	NORMAL	246	250	270	294	287	392	300
Uranium	mg/kg	5	95% Student's-t UCL	NORMAL	7.90	8.00	8.00	8.80	8.75	10.9	9.00
Vanadium	mg/kg	7	95% Student's-t UCL	NORMAL	44.4	46.0	47.0	53.3	50.1	65.8	56.0
Zinc	mg/kg	7	95% Approximate Gamma UCL	GAMMA	109	106	110	131	120	140	140
Acenaphthene	ug/kg	6	95% Student's-t UCL	NORMAL	335	360	386	474	451	761	500
Anthracene	ug/kg	6	95% Student's-t UCL	NORMAL	373	425	448	488	495	816	500
Benzo(a)anthracene	ug/kg	6	95% Student's-t UCL	NORMAL	297	165	423	725	538	1,177	800
Benzo(a)pyrene	ug/kg	6	95% Student's-t UCL	NORMAL	386	335	650	775	653	1,361	800
Benzo(g,h,i)perylene	ug/kg	6	95% Student's-t UCL	NORMAL	575	650	700	775	766	1,272	800
Chrysene	ug/kg	6	95% Student's-t UCL	NORMAL	294	160	423	725	537	1,180	800
Dibenz(a,h)anthracene	ug/kg	5	95% Student's-t UCL	NORMAL	666	700	700	780	765	1,020	800
Indeno(1,2,3-cd)pyrene	ug/kg	6	95% Student's-t UCL	NORMAL	540	500	650	775	685	1,071	800
PCB-1254	ug/kg	7	95% Chebyshev (MVUE) UCL	LOGNORMAL	142	38.0	180	430	377	1,825	500
Pentachlorophenol	ug/kg	6	95% Student's-t UCL	NORMAL	2,883	3,200	3,475	3,838	3,760	6,088	3,950
Phenanthrene	ug/kg	6	95% Student's-t UCL	NONPARAMETRIC	367	345	358	465	422	500	500
Pyrene	ug/kg	6	95% Student's-t UCL	NORMAL	602	650	700	775	746	1,129	800
Americium-241	pCi/g	9	95% Approximate Gamma UCL	GAMMA	0.169	0.098	0.220	0.375	0.269	0.442	0.442
Gross Alpha	pCi/g	4	95% Student's-t UCL	NORMAL	45.5	43.0	49.3	57.1	57.0	86.1	59.0
Gross Beta	pCi/g	4	95% Student's-t UCL	NORMAL	34.5	32.0	36.3	44.1	43.8	67.5	46.0
Plutonium-239/240	pCi/g	9	95% Student's-t UCL	NORMAL	0.971	0.850	1.19	1.88	1.33	2.39	2.20
Uranium-233/234	pCi/g	9	95% Student's-t UCL	LOGNORMAL	2.35	2.03	2.70	3.46	2.77	4.42	3.50
Uranium-235	pCi/g	9	95% Student's-t UCL	NORMAL	0.196	0.140	0.257	0.379	0.266	0.474	0.405
Uranium-238	pCi/g	9	95% Student's-t UCL	NORMAL	2.15	1.99	2.40	3.22	2.56	3.78	3.36

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be a detect.
CRA Dataset ID: Ponds_08102005a.mdb

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Table 1.17
Statistical Distribution and Comparison to Background for Sediments (excluding background samples)
Pond C-2

Analyte	Units	Statistical Distribution Testing Results						Background Comparison Test		
		Background			Pond C2 (excluding background samples)			Test	1.-p	Retain as ECOPC?
		Total Samples	Distribution Recommended by ProUCL	Detects (%)	Total Samples	Distribution Recommended by ProUCL	Detects (%)			
Aluminum	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	6.66E-04	Yes
Antimony	mg/kg	47	LOGNORMAL	11	10	NON-PARAMETRIC	0	N/A	N/A	N/A
Arsenic	mg/kg	55	GAMMA	89	11	NORMAL	100	WRS	1.68E-05	Yes
Barium	mg/kg	54	GAMMA	100	11	NORMAL	100	WRS	3.02E-04	Yes
Beryllium	mg/kg	52	LOGNORMAL	48	10	NORMAL	90	WRS	0.005	Yes
Boron	mg/kg	N/A	N/A	N/A	8	NORMAL	100	N/A	N/A	N/A
Cadmium	mg/kg	48	LOGNORMAL	10	10	NON-PARAMETRIC	10	N/A	N/A	N/A
Calcium	mg/kg	55	GAMMA	100	11	GAMMA	100	WRS	1.67E-04	Yes
Chromium	mg/kg	55	GAMMA	85	11	NORMAL	100	WRS	0.001	Yes
Cobalt	mg/kg	54	NORMAL	80	11	NORMAL	100	t-Test_N	4.07E-03	Yes
Copper	mg/kg	55	GAMMA	80	11	NORMAL	100	WRS	0.004	Yes
Iron	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	1.37E-04	Yes
Lead	mg/kg	55	LOGNORMAL	100	11	NORMAL	100	WRS	5.05E-03	Yes
Lithium	mg/kg	52	GAMMA	79	11	NORMAL	100	WRS	1.71E-02	Yes
Magnesium	mg/kg	55	GAMMA	95	11	NORMAL	100	WRS	0.001	Yes
Manganese	mg/kg	55	GAMMA	100	11	NORMAL	100	WRS	1.20E-04	Yes
Mercury	mg/kg	46	NON-PARAMETRIC	4	11	LOGNORMAL	91	N/A	N/A	N/A
Molybdenum	mg/kg	52	NON-PARAMETRIC	29	10	NORMAL	70	WRS	0.999	No
Nickel	mg/kg	53	GAMMA	72	11	NORMAL	100	WRS	0.000	Yes
Nitrate	mg/kg	49	LOGNORMAL	59	3	0	100	WRS	5.70E-01	No
Potassium	mg/kg	54	GAMMA	80	11	NORMAL	100	WRS	2.97E-05	Yes
Selenium	mg/kg	54	NON-PARAMETRIC	28	10	GAMMA	10	N/A	N/A	N/A
Silica	mg/kg	19	NON-PARAMETRIC	100	8	LOGNORMAL	100	WRS	1.04E-03	Yes
Silver	mg/kg	48	NON-PARAMETRIC	6	10	GAMMA	0	N/A	N/A	N/A
Sodium	mg/kg	55	GAMMA	85	11	NORMAL	82	WRS	4.08E-01	No
Strontium	mg/kg	55	LOGNORMAL	87	11	NORMAL	100	WRS	2.47E-04	Yes
Thallium	mg/kg	47	NON-PARAMETRIC	6	10	GAMMA	0	N/A	N/A	N/A
Tin	mg/kg	50	NON-PARAMETRIC	28	11	NON-PARAMETRIC	0	N/A	N/A	N/A
Titanium	mg/kg	N/A	N/A	N/A	8	NORMAL	100	N/A	N/A	N/A
Uranium	mg/kg	N/A	N/A	N/A	8	NORMAL	0	N/A	N/A	N/A
Vanadium	mg/kg	54	GAMMA	94	11	NORMAL	100	WRS	8.69E-04	Yes
Zinc	mg/kg	55	NON-PARAMETRIC	98	11	NORMAL	100	WRS	9.42E-03	Yes
Americium-241	pCi/g	42	NON-PARAMETRIC	100	11	NORMAL	100	WRS	3.19E-07	Yes
Gross Alpha	pCi/g	45	GAMMA	100	3	0	100	WRS	3.05E-02	Yes
Gross Beta	pCi/g	46	NORMAL	100	3	0	100	WRS	0.246	No
Plutonium-239/240	pCi/g	46	NON-PARAMETRIC	100	11	NORMAL	100	WRS	0.000	Yes
Uranium-233/234	pCi/g	47	GAMMA	100	8	NORMAL	100	WRS	0.921	No
Uranium-235	pCi/g	46	NON-PARAMETRIC	100	8	NORMAL	100	WRS	4.27E-03	Yes
Uranium-238	pCi/g	47	GAMMA	100	8	GAMMA	100	WRS	8.39E-01	No

Test: WRS = Wilcoxon Rank Sum, t-Test_N = Student's t-test using normal data, t-Test-LN = Student's t-test using log-transformed data, N/A = not applicable; site and/or background detection frequency less than 20%.
CRA Dataset ID: Ponds_08102005a.mdb

Table 1.18
Statistical Concentrations in Sediments (including background samples)
Pond C-2

Analyte	Units	Total Samples	UCL Recommended by ProUCL	Distribution Recommended by ProUCL	Mean	Median	75th percentile	95th percentile	UCL[a]	UTL[b]	Maximum[c]
Aluminum	mg/kg	11	95% Student's-t UCL	NORMAL	13,069	12,000	17,500	22,000	16,434	27,078	22,000
Antimony	mg/kg	10	99% Chebyshev (Mean, Sd) UCL	NON-PARAMETRIC	0.91	0.230	00.3	03.7	05.5	04.4	04.4
Arsenic	mg/kg	11	95% Student's-t UCL	NORMAL	5.75	5.40	6.65	8.75	6.81	10.2	9.80
Barium	mg/kg	11	95% Student's-t UCL	NORMAL	152	170	177	223	181	272	226
Beryllium	mg/kg	10	95% Student's-t UCL	NORMAL	0.803	0.80	1.06	1.20	0.99	1.57	1.20
Boron	mg/kg	8	95% Student's-t UCL	NORMAL	6.21	05.9	07.1	09.3	07.6	11.5	10.0
Cadmium	mg/kg	10	99% Chebyshev (Mean, Sd) UCL	NON-PARAMETRIC	0.18	0.015	0.10	0.79	1.21	01.0	0.95
Calcium	mg/kg	11	95% Approximate Gamma UCL	GAMMA	13,965	5,010	21,300	40,650	27,668	47,700	47,700
Chromium	mg/kg	11	95% Student's-t UCL	NORMAL	15.13	13.00	19.40	23.50	18.29	28.3	25.00
Cobalt	mg/kg	11	95% Student's-t UCL	NORMAL	08.5	09.5	10.0	11.5	09.9	14.3	12.0
Copper	mg/kg	11	95% Student's-t UCL	NORMAL	18.17	19.00	23.00	30.8	22.9	37.8	35.9
Iron	mg/kg	11	95% Student's-t UCL	NORMAL	18562.7	20000.0	21000.0	25500.0	21617.8	31282.8	29000.0
Lead	mg/kg	11	95% Student's-t UCL	NORMAL	0,020	0,020	0,025	0,031	0,024	0,037	0,035
Lithium	mg/kg	11	95% Student's-t UCL	NORMAL	10.9	09.7	14.0	18.0	13.5	21.9	19.0
Magnesium	mg/kg	11	95% Student's-t UCL	NORMAL	3221.8	3710.00	4245.0	5100.0	4022.2	6554.1	5400.0
Manganese	mg/kg	11	95% Student's-t UCL	NORMAL	0,431	0,435	0,524	0,596	0,498	0,710	0,602
Mercury	mg/kg	11	99% Chebyshev (MVUE) UCL	LOGNORMAL	0	0	0	1	1	3	1
Molybdenum	mg/kg	10	95% Student's-t UCL	NORMAL	0.880	0.665	1.075	1.840	1.217	2.248	2.200
Nickel	mg/kg	11	95% Student's-t UCL	NORMAL	15.33	18.00	18.55	20.50	18.12	26.97	21.00
Nitrate	mg/kg	3	Too Few Observations To Calculate UCLs	0	01.4	01.6	01.8	01.9	N/A	01.9	01.9
Potassium	mg/kg	11	95% Student's-t UCL	NORMAL	2,270	2,090	2,910	3,750	2,798	4,469	3,900
Selenium	mg/kg	10	95% Approximate Gamma UCL	GAMMA	0.584	0.525	0.600	0.90	0.70	1.10	1.10
Silica	mg/kg	8	95% Student's-t UCL	LOGNORMAL	0,858	0,725	0,930	1,330	1,049	1,775	1,400
Silver	mg/kg	10	95% Approximate Gamma UCL	GAMMA	0.343	0.290	0.36	0.54	0.41	0.65	0.65
Sodium	mg/kg	11	95% Student's-t UCL	NORMAL	175	157	205	385	243	0,457	0,460
Strontium	mg/kg	11	95% Student's-t UCL	NORMAL	72.2	43.0	106	159	101	193	167
Thallium	mg/kg	10	95% Approximate Gamma UCL	GAMMA	0.421	0.393	0.439	0.553	0.466	0.600	0.600
Tin	mg/kg	11	99% Chebyshev (Mean, Sd) UCL	NON-PARAMETRIC	2.52	0.90	03.7	07.4	11.3	08.2	08.2
Titanium	mg/kg	8	95% Student's-t UCL	NORMAL	104	98	125	153	127	194	160
Uranium	mg/kg	8	95% Student's-t UCL	NORMAL	4.52	4.40	4.66	5.33	4.86	5.82	5.50
Vanadium	mg/kg	11	95% Student's-t UCL	NORMAL	34.5	32.4	42.0	48.0	40.4	59.0	50.0
Zinc	mg/kg	11	95% Student's-t UCL	NORMAL	84	66	112	176	115	210	201
Americium-241	pCi/g	11	95% Student's-t UCL	NORMAL	0	0	0	1	0	1	1
Gross Alpha	pCi/g	3	Too Few Observations To Calculate UCLs	0	44	40	50	57	N/A	59	59
Gross Beta	pCi/g	3	Too Few Observations To Calculate UCLs	0	39	41	43	44	N/A	44	44
Plutonium-239/240	pCi/g	11	95% Student's-t UCL	NORMAL	2	2	2	3	2	3	3
Uranium-233/234	pCi/g	8	95% Student's-t UCL	NORMAL	1	1	1	1	1	2	1
Uranium-235	pCi/g	8	95% Student's-t UCL	NORMAL	0	0	0	0	0	0	0
Uranium-238	pCi/g	8	95% Approximate Gamma UCL	GAMMA	1	1	1	2	1	2	2

[a] UCL = 95% upper confidence limit on the mean; [b] UTL = 95% upper confidence limit on the 90th percentile value, [c] Maximum = maximum proxy result; may not be a detect.
CRA Dataset ID: Ponds_08102005a.mdb

K-H Review

Volume 15B2 – Work in progress items during K-H review.

There are a few items that are being worked on during the K-H review time period. We wanted to make you aware of these items so as to not create confusion during your review.

- The 'risk map' Figures for surface water which provide a color scheme depicting locations where the measured concentration by location is greater, or less than the ESL (or non detect) reflect the use of site-specific ESLs in most all cases. We found however, that a small set (WC AEU in particular) do not have this adjustment. The risk characterization results for these chemicals will not change as a result of this adjustment. All maps by the time of the agency review will have the site-specific ESL applied.

- The spreadsheets for the background statistical comparison may be updated by the time of the agency deliverable. It was found that down loading the spreadsheets can cause adjustments to certain values. This error has been caught and corrected. The risk characterization results provided in this document will not change.

- Two additional chemicals were identified for the WC AEU sediment ECOPC process as being eliminated as a result of the <5% screen. Due to multiple runs of the ECOPC process, these chemicals were not caught until yesterday. They include 2-methylnaphthalene and 4,4-DDT. The spatial extent of these chemicals is very limited and will not change the risk conclusions to the document. The document will be updated to include these chemicals for the agency DRAFT.

Those are the major items identified that require further work during the K-H review period. If you have any questions about these, or other document concerns do not hesitate to contact me.

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ECOLOGICAL SCREENING SUMMARY: ATTACHMENT 2

Alternative Toxicity Values and Site-Specific ESLs

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1.0 INTRODUCTION

The initial ecological contaminant of potential concern (ECOPC) screening of ecological contaminants of interest (ECOIs) for the ponds compared maximum detected concentrations (MDCs) to conservative ecological screening levels (ESLs) to identify ECOPCs. The second step of the risk evaluation considered more realistic exposure and effects characterization by calculating site-specific refinements to the ESLs and identifying alternative toxicity (AT) benchmark values. Concentrations of ECOPCs in sediment from each pond were compared to these refined ESLs and AT benchmarks to provide an upper and lower bound of the potential for adverse effects. While ESLs are typically concentrations at which adverse effects are rare, ATs represent an upper-bound concentration above which adverse effects are elevated. Concentrations between the ESL and AT values are within the range of uncertain toxicity, where adverse effects are occasionally observed. The use of lower- and upper-bound toxicity values for each ECOPC brackets the potential risk from each ECOPC and allows evaluation of the likelihood of potential risk.

Sediment ECOPCs for which ESLs and AT values were derived are presented within this Attachment. For many of these ECOPCs, ESLs had been previously identified in the Comprehensive Risk Assessment (CRA) Methodology. For others, however, ESLs and ATs were developed following the steps described in the CRA Methodology. Table 2-1 presents ESLs and AT values used within Appendix A of this document to evaluate sediment ECOPCs in the risk characterization process. Sources, endpoints, and toxicity information used for deriving sediment AT and site-specific ESLs are described below.

2.0 SEDIMENT ESLS AND ATS

Sediment ESLs provide a value below which adverse effects are unlikely to occur. Concentrations above which effects are likely to occur are referred to as AT values. Concentrations that occur between these upper- and lower-bound values are of uncertain, but potential, toxicity.

Table 2-1 shows the sediment ESLs used in the ECOPC identification process along with ATs based on literature. These two values can be used to bracket the estimated risk using the hazard quotient (HQ) approach. The hierarchy for identification and selection of ATs was as follows:

1. MacDonald et al., 2000a (organics and metals) and MacDonald et al., 2000b (PCBs) – consensus-based probable effects concentrations (CB-PECs);

2. EPA, 1997;

3. Ingersoll et al., 1996; and

4. Other literature sources.

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The endpoints for the sediment toxicity values vary. In general, the median observed toxicity value from available studies was selected as the AT (MacDonald et al., 1999). Compared to the ranges reported in Table 2-1, these values represent a central tendency measure, and were greater than the ESL. A description of the endpoints, as identified by the investigative study from which it was drawn, is provided below.

Bolton et al., 1985. The benchmark value for fluoride was derived from this study using an equilibrium partitioning approach. The AT benchmark represents the chronic equilibrium partition derived threshold concentration when organic carbon in sediment equals 1 percent.

CCME, 2002. The Canadian federal government has compiled a list of regularly updated screening environmental quality guidelines for surface water and sediments in Canada. The ESL and AT benchmark for total dioxins were identified in this document as follows:

- An interim sediment quality guideline (ISQG); and
- A probable effect level (PEL).

ISQGs provide a concentration below which effects are considered unlikely, whereas the PELs are concentrations above which adverse effects may occur. These benchmarks are generally good predictors of the likelihood of no-effects or adverse effects. These benchmarks are reported in sediment dry weight derived using an effects-range approach.

The ESL (0.00085 microgram per kilogram [μg/kg]) and the AT (0.0215 μg/kg) for dioxins (polychlorinated dibenzo-p-dioxins and dibenzo furans) were based on the consensus toxic equivalency factors (TEFs) developed by the World Health Organization (WHO) (WHO 1998). Dioxins and furans pose a potential for additive risk to sediment-dwelling organisms. A cumulative effect is expected due to a similar mode of toxic action from different congeners. However, all halogenated and aromatic hydrocarbons with dioxin-like properties (dioxins and furan congeners) do not excerpt the same degree of toxicity. Therefore, TEFs were used to normalize congener concentration to their dioxin equivalent (Table 2-2).

The dioxin and furans detected in pond sediment samples were evaluated as total dioxin equivalents. The concentration of each ECOPC was multiplied by its TEF to calculate the dioxin toxic equivalency quotient (TEQ). Congeners not detected in a specific sample were included in this calculation for the ECOPC selection with half the reporting limit used as a proxy concentration. These nondetected congeners were excluded from the refined risk characterization evaluation. All TEQs within a sample were summed, and the summed TEQ was compared to the ESL and AT for total dioxins (CCME 2002) presented in Table 2-2. Tier 2 statistical calculations (e.g., 95 percent upper tolerance limit [UTL] and 95 percent upper confidence limit [UCL]) were calculated using these summed TEQ concentrations derived from each sample if the summed TEQ concentrations were greater than the ESL.

Cubbage, et al., 1997. These Washington state sediment quality guidelines represent a probable apparent effects threshold sediment quality value derived using MICROTOX (for acenaphthylene and for carbazole) endpoints with dry weight values.

Ginn and Pastorak, 1992. The state of Washington has developed sediment quality standards for some polar and ionic organic compounds. These standards provide an indication that the potential for adverse effects may require additional evaluation. AT benchmarks for 4-methylphenol and pentachlorophenol were selected from this reference.

Ingersoll et al., 1996. Sediment-effect concentrations were developed for a suite of chemicals based on laboratory data on the toxicity of contaminants associated with field-collected sediment to the amphipod *Hyalella azteca* and the midge *Chironomus riparius*. The sediment-effect concentrations are defined as the concentrations of individual contaminants in sediment below which toxicity is rarely observed and above which toxicity is frequently observed. Two types of sediment-effect concentrations were calculated from the data:

- Effect range low (ERL); and
- Effect range median (ERM).

The ERL represents the chemical concentration below which adverse effects would rarely be observed. The ERL value represents the lower 10th-percentile concentration associated with observations of biological effects. According to this method, concentrations below the ERL should rarely be associated with adverse effects (EPA 1996). The ERL for total polynuclear aromatic hydrocarbons (PAHs) was used as a surrogate for the dibenzo(a,h)anthracene AT benchmark, for which no other AT value was available. The ERM represents the chemical concentration above which adverse effects would frequently occur. For the purposes of this evaluation, the reported ERL was selected as the AT benchmark for aluminum, iron, manganese, benzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene.

Jones et al., 1997. This reference provides a compilation of available sediment ATs and various approaches for their development. The AT benchmark for 2-butanone represents a secondary chronic value for sediment derived using the EqP approach. The guidance recommends these values be used cautiously given that they are site-specific and calculated using a 1-percent fraction of organic carbon.

MacDonald et al., 1999. Numeric standards for freshwater and marine, surface water, and sediment were gathered as part of a regional study contributing to the Georgia Basin Ecosystem Initiative, a federal-provincial partnership that provides a broad framework for action towards long-term sustainability in the Georgia Basin, British Columbia. Part of this effort was designed to determine applicable comparison standards for screening processes. Water quality, sediment quality, and tissue residue guidelines were reviewed for consideration as basic tools in evaluating environmental conditions for the development of water management strategies. This document provides a summary of all obtained, validated standards available in the literature at the time. Appendices are devoted to the summary of toxicity values by chemical and by media. The information

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for sediment ECOPCs was reviewed and the range of reported ATs was summarized for each chemical in Table 2-1. Consistent types of toxicity values were relied upon that represented median-level effects thresholds as compared to the range of values reported.

- The AT value for selenium represents a criterion in dry weight from Nagpal et al. (1995). This was the only value available for total selenium in sediment.
- The AT value for acenaphthene represents a PEL from Nagpal et al. (1995).
- The AT benchmark values for barium and silver were derived from this guidance and represent the Texas sediment quality guideline: 85th percentile level in reservoirs, dry weight (TNRCC 1996). The barium AT concentration represents the average of the observed toxicity values reviewed for this evaluation (reported range of 20 to 500 milligrams per kilogram [mg/kg]).

MacDonald et al., 2000a. Numeric sediment quality guidelines (SQGs) were compiled and evaluated for metals and organic compounds, and two SQGs were identified for each chemical.

- A consensus-based threshold effect concentration (TEC); and
- A consensus-based probable effect concentration (PEC).

The TECs were determined to provide a concentration below which effects are considered unlikely, whereas the PECs are concentrations above which adverse effects are likely. These benchmarks are generally good predictors of the likelihood of no-effects or adverse effects. Consensus-based TECs for sediment correctly predicated toxicity from 34.3 percent of samples for mercury (n=79) to 88.9 percent of samples for total polychlorinated biphenyls (PCBs) (n = 120), while PECs for sediment correctly predicted samples to be toxic in 77 percent of samples for arsenic (n=150) to 100 percent of samples for mercury (n = 100) for metals, PAHs, and PCBs. Thus, there is confidence that these severity of ill effects (SEVs) predict the potential for adverse effects except for the low SEV for mercury, where there is greater uncertainty.

MacDonald et al., 2000b. Numeric SQGs were compiled and evaluated for PCBs, and a set of comparable SQGs were identified for certain inorganic and organic chemicals. SSQGs were identified for each congener, and for total PCBs:

- A consensus-based TEC;
- A lowest effect level (LEL); and
- A toxic effect threshold (TET) concentration.

The TEC for total PCBs was determined to provide a concentration below which effects are considered unlikely. The LEL, an alternative SQG selected due to the lack of TECs for individual PCB congeners, is a numerical threshold concentration protective of 85 to 90 percent of sediment-dwelling organisms. The TET, an alternative SQG selected due to the lack of PECs for individual PCB congeners, represents concentrations above which adverse effects are likely. TETs were reported to represent concentrations above which adverse effects are expected on 90 percent of sediment-dwelling organisms. These benchmarks were designed for sediments with 1-percent organic carbon; higher

proportions would be protective of receptors and increase these toxicity value concentrations.

PCBs pose a potential for additive risk to sediment-dwelling organisms at RFETS. A cumulative effect from PCBs is expected due a similar mode of toxic action from different congeners. PCB congeners that were detected in sediment samples were evaluated both as individual PCBs and jointly as total PCBs. These concentrations were evaluated against their respective ESL and AT benchmarks (from MacDonald et al. 2000a and 2000b). Aroclor 1254 and aroclor 1260 were the only PCB congeners detected in at least 5 percent of the sediment samples. Concentrations of these PCBs in each sample were added to determine the total PCB concentration in the sample. Congeners not detected in a specific sample were included in this calculation with half the reporting limit used as a proxy concentration. Tier 1 and Tier 2 statistical calculations (e.g., 95 percent UTL and 95 percent UCL) were calculated using these total PCB concentrations derived from each sample.

MENVIQ/EC, 1992. The value for benzo(k)fluoranthene was derived from this study and represents the sediment quality TET where the fraction of organic carbon in sediment equals 1 percent.

NYSDEC, 1994. The value for antimony was derived from this study using a screening-level concentration approach and represents the LEL in dry weight.

EPA, 1997. These values represent a guideline value, or sediment quality advisory level at 1 percent organic carbon using an EqP approach. Equilibrium partitioning calculations were used to calculate AT benchmark concentrations (atrazine and bromomethane) in addition to ESLs for detected ECOIs where no previous ESL had been identified (2-butanone and atrazine). Chronic surface water AWQC were used as the basis for calculating sediment ESLs, while acute AWQC were used as the basis for calculating sediment AT benchmarks (Table 2-3) where:

$$EqP_{ESL} = ESL_{water} * Koc * foc$$

EqP = Equilibrium partitioning based sediment ESL
ESL_{water} = surface water ESL (chronic)
Koc = organic carbon portioning coefficient
foc = fraction organic carbon (assumed 1%)

$$Eq_{PTT} = AT_{water} * Koc * foc$$

EqP = Equilibrium partitioning based sediment AT
AT_{water} = surface water AT (acute)
Koc = organic carbon portioning coefficient
foc = fraction organic carbon (assumed 1%)

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Table 2.1
Toxicity Thresholds for Sediment ECOPCS

ECOPC [1]	Reported Range of Benchmarks [2]	(n)	ESL Value [3]	Reference	Type of Value	Alternative Toxicity Value	Reference	Type of Value
Inorganics (mg/kg)								
Aluminum	15,900 – 58,000	(3)	15,900	MacDonald et al., 1999	SQG	58,000	Ingersoll et al., 1996	ERM
Antimony (total)	2 – 500	(9)	2	MacDonald et al., 1999	SQG	3.2	NYSDEC, 1994	SLCA
Arsenic	3 – 150	(39)	9.79	MacDonald et al., 2000a	CB-TEC	33	MacDonald et al., 2000a	CB-PEC
Barium (total)	20 – 500	(6)	189	MacDonald et al., 1999	SQG	287	MacDonald et al., 1999	SQG
Cadmium	0.2 – 30	(34)	0.99	MacDonald et al., 2000a	CB-TEC	4.98	MacDonald et al., 2000a	CB-PEC
Chromium	6.25 – 600	(34)	43.4	MacDonald et al., 2000a	CB-TEC	111	MacDonald et al., 2000a	CB-PEC
Copper	8.4 – 840	(36)	31.6	MacDonald et al., 2000a	CB-TEC	149	MacDonald et al., 2000a	CB-PEC
Fluoride	0.01 – 96	(21)	0.01	MacDonald et al., 1999	ERL	7	Bolton et al., 1985	TET
Iron	20,000 – 290,000	(17)	20,000	MacDonald et al., 1999	LEL	280,000	Ingersoll et al., 1996	ERM
Lead	23 – 720	(42)	35.8	MacDonald et al., 2000a	CB-TEC	128	MacDonald et al., 2000a	CB-PEC
Manganese	300 – 1,800	(16)	630	MacDonald et al., 1999	TEL	1,700	Ingersoll et al., 1996	ERM
Mercury	0.1 – 15	(27)	0.18	MacDonald et al., 2000a	CB-TEC	1.06	MacDonald et al., 2000a	CB-PEC
Nickel	5 – 100	(31)	22.7	MacDonald et al., 2000a	CB-TEC	48.6	MacDonald et al., 2000a	CB-PEC
Selenium	0.95 – 5	(3)	0.95	MacDonald et al., 1999	SQG	1.73	MacDonald et al., 1999	SQG
Silver	0.5 - 4.5	(9)	1	Long et al., 1995	ERL	1.6	MacDonald et al., 1999	SQG
Zinc	50 – 3200	(42)	121	MacDonald et al., 2000a	CB-TEC	459	MacDonald et al., 2000a	CB-PEC
Organics (ug/kg)								
2-Butanone	270	(2)	84.2	EPA 1997b	EqP based	270	Jones et al., 1997	EqP based SCV
2-Methylnaphthalene	20 – 201	(8)	20.2	CCME 2002	ISQG	201	CCME 2002	PEL
4-methylphenol	12.3 - 670	(2)	12.3	EPA,1997b	EqP based	670	Ginn and Pastorak, 1992	WS-SQS
Acenaphthene	6.71 – 100,000	(17)	6.71	CCME 2002	ISQG	89	MacDonald et al., 1999	PEL
Acenaphthylene	5.87 – 6,000	(13)	5.87	CCME 2002	ISQG	1,900	Cubbage et al., 1997	WS-SQS
Anthracene	6.8 – 41,000	(21)	57.2	MacDonald et al., 2000a	CB-TEC	845	MacDonald et al., 2000a	CB-PEC
Aroclor 1254	7.3 – 604	(16)	60	MacDonald et al., 2000b	LEL	300	MacDonald et al., 2000b	TET
Aroclor 1260	5 – 240	(6)	5	MacDonald et al., 2000b	LEL	200	MacDonald et al., 2000b	TET
Atrazine	0.3 - 230.4	(3)	16.8	EPA 1997b	EqP based	230.4	EPA 1997b	EqP based
Benzo(a)anthracene	108-1050	(2)	108	MacDonald et al., 2000a	CB-TEC	1,050	MacDonald et al., 2000a	CB-PEC
Benzo(a)pyrene	9.6 – 450,000	(27)	150	MacDonald et al., 2000a	CB-TEC	1,450	MacDonald et al., 2000a	CB-PEC
Benzo(g,h,i)perylene	10.4 – 21,000	(19)	13	MacDonald et al., 1999	ERL	280	Ingersoll et al., 1996	ERM
Benzo(k)fluoranthene	2.6 – 1,250,000	(9)	240	MacDonald et al., 1999	LEL	750	MENVIQ/EC 1992	TET
Bromomethane	3.43	(1)	3.43	EPA 1997b	EqP based	62.72	EPA 1997b	EqP based
Carbazole	140 -1,800	(4)	25.2	EPA 1997b	EqP based.	1,600	Cubbage et al., 1997	WS-SQS
Chrysene	8.6 – 11,500	(25)	166	MacDonald et al., 2000a	CB-TEC	1,290	MacDonald et al., 2000a	CB-PEC
DDT	4.16 – 11,000	(5)	4.16	MacDonald et al., 2000a	CB-TEC	62.9	MacDonald et al., 2000a	CB-PEC
Dibenz(a,h)anthracene	5 – 3,500	(17)	33	MacDonald et al., 2000a	CB-TEC	240	Ingersoll et al., 1996	(surrogate)
Fluoranthene	20 – 130,000	(28)	423	MacDonald et al., 2000a	CB-TEC	2,230	MacDonald et al., 2000a	CB-PEC
Fluorene	77.4 - 536	(21)	77.4	MacDonald et al., 2000a	CB-TEC	536	MacDonald et al., 2000a	CB-PEC
Heptachlor	0.132 - 50	(11)	0.132	EPA,1997b	EqP based	16	MacDonald et al., 2000a	CB-PEC
Indeno(1,2,3-cd)pyrene	10.4 – 6,000,000	(20)	17	MacDonald et al., 1999	TEL	250	Ingersoll et al., 1996	ERM
Naphthalene	10 – 140,000	(21)	176	MacDonald et al., 2000a	CB-TEC	561	MacDonald et al., 2000a	CB-PEC
Pentachlorophenol	255 - 360	(2)	255	EPA 1997b	EqP based	360	Ginn and Pastorak, 1992	WS-SQS
Phenanthrene	6.8 – 210,000	(27)	204	MacDonald et al., 2000a	CB-TEC	1,170	MacDonald et al., 2000a	CB-PEC
Pyrene	7.6 – 85,000	(25)	195	MacDonald et al., 2000a	CB-TEC	1,520	MacDonald et al., 2000a	CB-PEC
Total DDTs	1.19 - 4,450	(24)	5.28	MacDonald et al., 2000a	CB-TEC	572	MacDonald et al., 2000a	CB-PEC
Total PCBs	2.9 – 40,000	(24)	40.0	MacDonald et al., 2000b	CB-TEC	676	MacDonald et al., 2000a	CB-PEC
TEQ - Dioxins	0.001 - 100	(8)	0.00085	CCME 2002	ISQG	0.0215	CCME 2002	PEL

[1] Metals as dissolved unless otherwise stated.

[2] Range of benchmarks is derrived from McDonald et al. 1999 and presented values.

[3] ESL values derrived from Table B-4 of CRA Methodology; or, from cited reference if not listed in Table B-4.

The hierarch of use of the alternative ESLs was as follows: MacDonald et al., 2000a,b as a preference: others (EPA, 1997b; Ingersoll et al., 1996 etc) have no preference as compared to each other. The best available, most appropriate value is reported as the Toxicity Threshold value.

CB-PEC = concensus-based probable effect concentration.

CB-TEC = concensus-based threshold effect concentration.

EqP = SW ESL * Koc * foc ; foc estimated at 1%.

ERL = Effects Range Low.

ERM = Effects Range Moderate.

ISQG = Interim Sediment Quality Guideline.

LEL = Lowest Effect Level.

MENVIQ/EC = Ministere de l'Environnement du Quebec / Environment Canada.

PEL = Probable Effect Level.

SCV = secondary chronic value.

SQAL = Sediment Quality Advisory Level (based on 1% foc).

SQG = Sediment Quality Guideline.

TEL = Threshold Effects Level.

TET = Toxic Effect Threshold at 1% OC.

Table 2.1
Toxicity Thresholds for Sediment ECOPCS

ECOPC [1]	Reported Range of Benchmarks [2]	(n)	ESL Value [3]	Reference	Type of Value	Alternative Toxicity Value	Reference	Type of Value

WS-SQS = Washington State Sediment Quality Standard.

Table 2.2
Unique Dioxins and Furans that are Evaluated within the ECOPC Process

Dioxin Congener	Aquatic TEF[b]
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.001
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01
Heptachlorodibenzofuran[a]	0.01
Heptachlorodibenzo-p-dioxin [a]	0.001
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.5
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.01
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.01
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1
Hexachlorodibenzofuran [a]	0.1
Hexachlorodibenzo-p-dioxin [a]	0.5
1,2,3,7,8-Pentachlorodibenzofuran	0.05
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1
2,3,4,7,8-Pentachlorodibenzofuran	0.5
Pentachlorodibenzofuran [a]	0.5
Pentachlorodibenzo-p-dioxin [a]	1
2,3,7,8-Tetrachlorodibenzodioxin	1
2,3,7,8-Tetrachlorodibenzofuran	0.05
Tetrachlorodibenzo-p-dioxin [a]	1
Octachlorodibenzofuran	0.0001
Octachlorodibenzo-p-dioxin	0.0001

[a] The highest TEF within the series was assigned for results listed as generic dioxin/furan.
Sources: WHO 1997; Van den Berg et al. (1998).

Table 2.3
Equilibrium Partitioning Calculations for Deriving Sediment ESL and AT Values

Chemical	SW ESLs (µg/L)	SW AT (µg/L)	SW ESL (µg/L)	Koc	foc	EqP based Sediment Benchmark	Type
Atrazine	7.3	-	7.30	230.40	0.01	16.82	ESL
Atrazine	-	100	100	230.40	0.01	230	AT
2-butanone	2,200	-	2,200	3.827	0.01	84.19	ESL
Bromomethane	-	640	640.00	9.80	0.01	62.7	AT

EqP = ESL_{water} * Koc * foc.
- = Not available.

ECOLOGICAL SCREENING SUMMARY: ATTACHMENT 3

Chemical Risk Characterization Lines of Evidence in Support of the Risk Characterization

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1.0 CHEMICAL RISK CHARACTERIZATION LINE OF EVIDENCE METHODS

The identified pond sediment ecological contaminants of potential concern (ECOPCs) were carried into the risk characterization process, and several data sets were generated in order to better understand current exposure conditions. Surface sediment (0 to 6 inches), and pond-series data sets were queried to develop additional lines of evidence in the chemical risk characterization. In addition, the spatial distribution of each ECOPC in all sediments (all depth fractions) was mapped in order to understand the depth at which the ECOPC occurs.

1.1 Surface Sediment

The pond sediment ECOPC selection process relied upon the comprehensive data sets that included sediment samples collected from all depth fractions. Certain samples were collected from depths of over 8 feet below ground surface (bgs), which is not a relevant exposure media for aquatic life receptors. The surface sediment is more representative of the exposure media for aquatic species. As an additional line of evidence in risk characterization, all samples gathered from "surface" sediment (0 to 6 inches) were compiled to develop a surface sediment data set for each pond. Those sediment ECOPCs identified using the comprehensive data set were further evaluated by comparing the results of the surface sediment data set to the ecological screening levels (ESLs). This strategy is a line of evidence that more accurately describes the ongoing exposure conditions within a pond. The results of the surface sediment data set were statistically summarized and results are presented in Tables 3-1 through 3-9.

1.2 Pond-Series Summary Statistics

Each pond was evaluated independently as part of the ECOPC and risk characterization process. However, certain ponds (A-1, B-4, and C-1) provide very limited habitat for an aquatic population, therefore in order to better determine population exposure conditions, summary statistics for a 'pond-series' were developed. The results were used to determine realistic exposure point concentrations for the individual pond ECOPCs. Tables 3-10 through 3-12 provide the summary statistics for the A-, B- and C- series ponds.

1.3 Spatial Extent of ECOPCs

The spatial extent of each identified ECOPC was mapped. All sample results were shown by location. The location was highlighted as gray in color if the concentration was at non-detect levels, green if the detected concentration was less than the ESL, and yellow if greater than the ESL. The results were used to determine the depth fraction, and location where the ECOPCs occurred. A figure for each ECOPC was developed. The spatial extent within the 'pond-series' was shown even though the chemical may not be an ECOPC in each pond. The pond-series provides a better understanding of the magnitude

of ECOPC extent within the entire pond habitat area. Figures 3-1 through 3-29 provide the spatial extent of the A-series ECOPCs, Figures 3-30 through 3-56 for the B-series, and 3-57 through 3-79 for the C-series.

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Table 3.1
Summary of Surface Sediment ECOI Data for Pond A-1

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	4	4	100	6 - 7.7	11,000	25,000	21,000	6,730
Arsenic	4	4	100	0.81 - 1	5.30	9.30	7.85	1.80
Barium	4	4	100	0.15 - 0.19	64.0	220	176	74.8
Beryllium	4	4	100	0.18 - 0.24	0.730	1.40	1.21	0.322
Boron	4	4	100	1.2 - 1.5	6.60	12.0	9.90	2.35
Cadmium	4	4	100	0.031 - 0.039	0.140	1.30	0.740	0.474
Calcium	4	4	100	7.6 - 9.7	12,000	27,000	19,500	7,140
Chromium	4	4	100	0.33 - 0.42	11.0	25.0	20.5	6.45
Cobalt	4	4	100	0.12 - 0.16	4.90	9.30	8.15	2.17
Copper	4	4	100	0.69 - 0.88	18.0	27.0	23.2	3.86
Iron	4	4	100	1.8 - 2.4	8,400	24,000	19,100	7,200
Lead	4	4	100	0.33 - 0.42	21.0	29.0	25.2	3.30
Lithium	4	4	100	0.37 - 0.47	8.90	20.0	17.0	5.40
Magnesium	4	4	100	4.5 - 5.8	3,000	5,300	4,650	1,100
Manganese	4	4	100	0.096 - 0.12	200	500	358	128
Mercury	4	4	100	0.0058 - 0.0074	0.071	0.180	0.102	0.052
Molybdenum	4	4	100	0.32 - 0.41	0.950	1.20	1.11	0.118
Nickel	4	4	100	0.29 - 0.38	8.80	22.0	18.0	6.15
Potassium	4	4	100	50 - 64	1,100	3,400	2,650	1,050
Selenium	2	4	50	1.1 - 1.4	1.20	1.80	1.04	0.588
Silica	4	4	100	5.4 - 6.9	1,100	1,500	1,300	183
Silver	1	4	25	0.59 - 0.75	0.810	0.810	0.435	0.250
Sodium	4	4	100	72 - 93	400	1,200	722	339
Strontium	4	4	100	0.079 - 0.1	110	140	125	17.3
Tin	4	4	100	1.1 - 1.4	1.20	1.70	1.55	0.238
Titanium	4	4	100	0.17 - 0.22	36.0	140	106	47.7
Vanadium	4	4	100	0.76 - 0.97	26.0	52.0	44.0	12.1
Zinc	4	4	100	0.43 - 0.55	55.0	140	111	38.4
Organics (ug/kg)								
Benzo(a)anthracene	4	4	100	25 - 31	73.0	120	90.0	21.7
Benzo(a)pyrene	3	4	75	25 - 31	83.0	150	207	187
Benzo(b)fluoranthene	4	4	100	66 - 81	83.0	180	128	40.0
Benzo(g,h,i)perylene	3	4	75	20 - 25	60.0	100	180	204
Benzo(k)fluoranthene	3	4	75	50 - 61	63.0	100	180	204
Chrysene	4	4	100	34 - 41	82.0	150	107	31.0
Fluoranthene	4	4	100	45 - 55	170	300	215	58.0
Indeno(1,2,3-cd)pyrene	3	4	75	28 - 34	50.0	90.0	172	210
PCB-1254	4	8	50	8.3 - 530	73.0	88.0	52.8	32.9
Phenanthrene	4	4	100	21 - 26	87.0	140	106	24.9
Radionuclides (pCi/g)								
Americium-241	8	8	100	0.00666 - 0.115	0.623	6.89	1.85	2.14
Cesium-134	4	4	100	0.03 - 0.04	0.040	0.050	0.045	0.006

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Table 3.1
Summary of Surface Sediment ECOI Data for Pond A-1

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Cesium-137	4	4	100	0.05 - 0.05	0.210	0.270	0.242	0.028
Gross Alpha	4	4	100	2.61 - 4.36	19.8	28.9	24.2	3.73
Gross Beta	4	4	100	3.53 - 4.03	29.3	31.5	30.3	1.02
Plutonium-239/240	8	8	100	0.005 - 0.129	1.84	22.4	5.88	6.93
Radium-226	4	4	100	0.25 - 0.29	1.84	2.10	1.94	0.120
Radium-228	4	4	100	0.149 - 0.247	1.59	1.83	1.72	0.098
Strontium-89/90	4	4	100	0.0503 - 0.3504	0.270	0.827	0.601	0.248
Uranium-233/234	8	8	100	0.0499 - 0.289	1.33	2.80	1.96	0.482
Uranium-235	8	8	100	0.0314 - 0.33	0.056	0.193	0.118	0.052
Uranium-238	8	8	100	0.0278 - 0.344	2.03	5.35	3.04	1.18

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Table 3.2
Summary of Surface Sediment ECOI Data for Pond A-2

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganic (mg/kg)								
Aluminum	6	6	100	4.3 - 40	5,790	26,000	14,000	8,130
Arsenic	6	6	100	0.56 - 3.5	2.40	11.0	6.18	3.52
Barium	6	6	100	0.13 - 40	73.0	260	165	75.8
Beryllium	4	6	67	0.025 - 1	0.440	1.50	0.838	0.487
Boron	4	4	100	1.1 - 5.2	5.90	16.0	10.8	4.53
Cadmium	4	6	67	0.027 - 1	0.340	0.950	0.705	0.261
Calcium	6	6	100	6.6 - 1000	8,350	43,000	18,100	13,300
Chromium	6	6	100	0.058 - 2	4.70	26.0	14.4	8.75
Cobalt	6	6	100	0.11 - 10	3.00	10.6	7.85	2.79
Copper	6	6	100	0.072 - 5	9.10	30.0	18.9	8.96
Iron	6	6	100	1.2 - 20	7,700	28,000	18,000	7,170
Lead	6	6	100	0.29 - 1.4	8.00	33.0	21.1	8.95
Lithium	6	6	100	0.28 - 20	4.90	24.0	13.0	8.12
Magnesium	6	6	100	4 - 1000	2,100	6,200	4,060	1,800
Manganese	6	6	100	0.084 - 3	310	1,100	524	309
Mercury	4	6	67	0.005 - 0.1	0.024	0.072	0.048	0.018
Molybdenum	3	6	50	0.19 - 40	0.650	1.70	1.85	1.74
Nickel	5	6	83	0.19 - 8	6.10	22.0	14.2	6.22
Potassium	6	6	100	35 - 1000	1,200	4,000	2,500	1,180
Silica	4	4	100	1.5 - 23	720	3,300	1,720	1,170
Silver	1	6	17	0.071 - 2.6	0.098	0.098	0.775	0.561
Sodium	6	6	100	63 - 1000	378	2,100	874	632
Strontium	6	6	100	0.069 - 40	48.5	220	104	67.3
Titanium	4	4	100	0.15 - 0.75	66.0	180	121	53.2
Uranium	1	4	25	1 - 39	4.30	4.30	9.31	7.25
Vanadium	6	6	100	0.34 - 10	16.0	58.0	35.2	17.5
Zinc	6	6	100	0.38 - 4	33.0	110	74.6	33.3
Organics (ug/kg)								
1234678-HpCDF	1	1	100	0.00286 - 0.00286	0.003	0.003	0.003	N/A
123478-HxCDF	1	1	100	0.00286 - 0.00286	5.66E-04	5.66E-04	5.66E-04	N/A
123678-HxCDD	1	1	100	0.00286 - 0.00286	0.001	0.001	0.001	N/A
123789-HxCDD	1	1	100	0.00286 - 0.00286	0.001	0.001	0.001	N/A
2-Butanone	1	3	33	10 - 20	34.0	34.0	534	880
Acenaphthene	1	6	17	18 - 330	180	180	459	283
Acetone	1	3	33	10 - 20	230	230	633	887
Anthracene	1	6	17	18 - 330	210	210	464	277
Benzo(a)anthracene	1	6	17	21 - 330	52.0	52.0	777	697
Benzo(a)pyrene	1	6	17	21 - 330	51.0	51.0	777	697
Benzo(b)fluoranthene	1	6	17	56 - 330	64.0	64.0	779	694
Benzoic Acid	1	6	17	300 - 1600	330	330	3,900	3,480

Table 3.2
Summary of Surface Sediment ECOI Data for Pond A-2

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
bis(2-ethylhexyl)phthalate	5	6	83	33 - 330	110	4,200	1,070	1,560
Chrysene	1	6	17	28 - 330	60.0	60.0	778	695
Fluoranthene	1	6	17	38 - 330	89.0	89.0	783	689
Heptachlorodibenzo-p-dioxin	1	1	100	0.00286 - 0.00286	0.020	0.020	0.020	N/A
Indeno(1,2,3-cd)pyrene	1	6	17	23 - 330	210	210	803	666
Methylene Chloride	1	3	33	3.5 - 5	9.30	9.30	1,390	2,390
OCDD	1	1	100	0.00571 - 0.00571	0.161	0.161	0.161	N/A
OCDF	1	1	100	0.00571 - 0.00571	0.009	0.009	0.009	N/A
PCB-1254	2	8	25	7.1 - 690	89.0	130	88.5	45.4
Phenanthrene	1	6	17	18 - 330	190	190	800	670
Pyrene	1	6	17	140 - 690	71.0	71.0	785	689
Toluene	2	3	67	3.4 - 5	650	860	507	442
Radionuclides (pCi/g)								
Americium-241	9	9	100	0.00377 - 0.225	0.154	1.99	1.26	0.519
Cesium-134	3	3	100	0.05 - 0.05	0.050	0.100	0.077	0.025
Cesium-137	5	5	100	0.07 - 0.1	0.130	0.610	0.444	0.196
Gross Alpha	5	5	100	2.2 - 3.77	21.7	33.5	28.9	4.50
Gross Beta	5	5	100	3.6 - 5.4	27.8	32.7	29.8	2.07
Plutonium-239/240	9	9	100	0 - 0.123	0.587	7.43	3.92	2.00
Radium-226	3	3	100	0.37 - 0.42	2.75	3.08	2.92	0.165
Radium-228	3	3	100	0.17 - 0.18	1.70	1.89	1.81	0.101
Strontium-89/90	3	3	100	0.0536 - 0.0581	0.357	0.779	0.542	0.215
Uranium-233/234	9	9	100	0 - 0.316	1.11	3.70	2.56	0.999
Uranium-235	9	9	100	0.017 - 0.274	0.016	0.285	0.144	0.082
Uranium-238	9	9	100	0.017 - 0.245	1.21	6.10	4.09	1.81

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Table 3.3
Summary of Surface Sediment ECOI Data for Pond A-3

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	5	5	100	6.7 - 40	13,100	25,000	20,000	4,540
Antimony	1	5	20	0.52 - 12	26.0	26.0	5.45	11.5
Arsenic	5	5	100	0.9 - 2	5.60	7.60	6.90	0.800
Barium	5	5	100	0.16 - 40	160	200	176	15.3
Beryllium	4	5	80	0.2 - 1	1.10	1.30	1.08	0.228
Boron	4	4	100	1.3 - 2.1	5.50	9.90	7.30	2.06
Cadmium	4	5	80	0.034 - 1	0.350	0.490	0.480	0.136
Calcium	5	5	100	8.4 - 1000	7,200	51,000	20,700	18,100
Cesium	1	1	100	200 - 200	3.30	3.30	3.30	N/A
Chromium	5	5	100	0.37 - 2	12.9	25.0	20.2	4.64
Cobalt	5	5	100	0.14 - 10	8.50	13.9	10.0	2.21
Copper	5	5	100	0.76 - 5	19.0	24.0	21.3	2.09
Iron	5	5	100	2 - 20	18,000	22,000	20,400	1,540
Lead	5	5	100	0.37 - 1	20.0	29.3	25.1	4.14
Lithium	5	5	100	0.41 - 20	7.70	18.0	14.1	3.89
Magnesium	5	5	100	5 - 1000	3,930	5,400	4,390	608
Manganese	5	5	100	0.11 - 3	340	520	420	70.3
Mercury	4	5	80	0.0064 - 0.1	0.040	0.068	0.048	0.011
Molybdenum	4	5	80	0.35 - 40	0.680	1.10	1.33	1.11
Nickel	5	5	100	0.33 - 8	15.4	21.0	18.7	2.15
Potassium	5	5	100	56 - 1000	1,690	3,300	2,540	598
Selenium	1	5	20	1 - 1.9	1.80	1.80	0.858	0.569
Silica	4	4	100	6 - 9.6	1,300	2,000	1,720	310
Sodium	5	5	100	80 - 1000	240	850	400	255
Strontium	5	5	100	0.087 - 40	53.0	140	85.2	35.0
Titanium	4	4	100	0.19 - 0.31	140	170	150	14.1
Vanadium	5	5	100	0.84 - 10	39.6	53.0	45.9	5.36
Zinc	5	5	100	0.48 - 4	120	540	222	179
Organics (ug/kg)								
2-Butanone	1	1	100	10 - 10	4.00	4.00	4.00	N/A
Benzo(a)pyrene	1	1	100	330 - 330	170	170	170	N/A
Benzo(b)fluoranthene	1	1	100	330 - 330	240	240	240	N/A
bis(2-ethylhexyl)phthalate	1	1	100	330 - 330	570	570	570	N/A
Chrysene	1	1	100	330 - 330	170	170	170	N/A
Fluoranthene	1	1	100	330 - 330	390	390	390	N/A
PCB-1254	1	5	20	160 - 450	45.0	45.0	158	75.1
Phenanthrene	1	1	100	330 - 330	200	200	200	N/A

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Table 3.3
Summary of Surface Sediment ECOI Data for Pond A-3

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Pyrene	1	1	100	330 - 330	340	340	340	N/A
Toluene	1	1	100	5 - 5	17.0	17.0	17.0	N/A
Radionuclides (pCi/g)								
Americium-241	5	5	100	0 - 0.201	0.155	0.477	0.337	0.128
Cesium-137	1	1	100	0.05 - 0.05	0.219	0.219	0.219	N/A
Gross Alpha	1	1	100	2.44 - 2.44	22.4	22.4	22.4	N/A
Gross Beta	1	1	100	2.27 - 2.27	29.5	29.5	29.5	N/A
Plutonium-239/240	5	5	100	0.026 - 0.415	0.323	1.30	0.781	0.369
Strontium-89/90	1	1	100	0.05 - 0.05	0.162	0.162	0.162	N/A
Uranium-233/234	5	5	100	0.032 - 0.779	0.527	1.59	1.19	0.448
Uranium-235	5	5	100	0 - 0.993	-0.052	0.149	0.040	0.072
Uranium-238	5	5	100	0.039 - 0.709	1.04	1.63	1.23	0.236

Table 3.4
Summary of Surface Sediment ECOI Data for Pond A-4

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	9	9	100	6.3 - 40	8,360	26,000	17,200	5,190
Antimony	4	9	44	0.49 - 12	0.740	41.4	12.9	16.0
Arsenic	9	9	100	0.85 - 2	3.80	10.2	6.50	1.97
Barium	9	9	100	0.16 - 40	130	206	165	29.3
Beryllium	7	9	78	0.19 - 1	0.880	1.20	0.915	0.215
Boron	5	5	100	1.3 - 1.6	6.70	10.0	7.82	1.36
Cadmium	6	9	67	0.032 - 1	0.370	3.10	0.912	0.909
Calcium	9	9	100	8 - 1000	4,900	38,000	15,300	11,100
Cesium	4	4	100	200 - 200	2.10	5.50	3.85	1.61
Chromium	7	9	78	0.35 - 2	4.70	27.0	16.5	7.67
Cobalt	9	9	100	0.13 - 10	7.40	13.9	9.86	2.51
Copper	9	9	100	0.72 - 5	14.4	33.4	19.2	6.02
Iron	9	9	100	1.9 - 20	16,500	22,900	18,400	2,370
Lead	9	9	100	0.35 - 1	18.0	35.9	22.6	5.61
Lithium	6	9	67	0.39 - 20	12.0	19.0	11.5	5.36
Magnesium	9	9	100	4.8 - 1000	2,940	5,220	3,940	841
Manganese	9	9	100	0.1 - 3	240	460	338	75.2
Mercury	5	9	56	0.0061 - 0.1	0.016	0.035	0.039	0.020
Molybdenum	4	9	44	0.34 - 40	0.390	0.610	2.00	2.16
Nickel	8	9	89	0.31 - 8	15.0	25.5	18.5	4.10
Nitrate / Nitrite	2	2	100	0.2 - 0.2	2.43	2.50	2.46	0.050
Potassium	6	9	67	53 - 1000	2,150	4,300	2,120	1,180
Selenium	3	9	33	1 - 1.4	1.60	1.90	0.883	0.652
Silica	5	5	100	5.7 - 7	750	980	874	100
Sodium	6	9	67	76 - 1000	150	486	226	144
Strontium	9	9	100	0.083 - 40	43.5	140	80.6	30.1
Thallium	2	9	22	0.84 - 2	0.350	0.580	0.411	0.122
Titanium	5	5	100	0.18 - 0.22	81.0	160	118	33.0
Vanadium	9	9	100	0.8 - 10	25.7	59.0	43.7	10.3
Zinc	9	9	100	0.45 - 4	61.2	169	92.4	34.6
Organics (ug/kg)								
Benzene	1	4	25	5 - 5	3.00	3.00	4.62	2.59
bis(2-ethylhexyl)phthalate	2	4	50	330 - 330	170	950	399	369
Toluene	2	4	50	5 - 5	5.00	8.00	5.00	2.12
Radionuclides (pCi/g)								
Americium-241	9	9	100	0 - 0.128	-0.015	0.173	0.070	0.067
Cesium-137	4	4	100	0.05 - 0.07	0.297	0.598	0.430	0.127
Gross Alpha	4	4	100	2.07 - 2.91	11.3	17.0	13.3	2.59

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Table 3.4
Summary of Surface Sediment ECOI Data for Pond A-4

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Gross Beta	4	4	100	2.27 - 2.45	25.4	29.0	27.6	1.66
Plutonium-239/240	9	9	100	0 - 0.113	0.039	0.498	0.160	0.150
Strontium-89/90	4	4	100	0.04 - 0.06	0.468	1.80	1.24	0.585
Uranium-233/234	9	9	100	0.025 - 0.263	0.913	1.68	1.25	0.271
Uranium-235	9	9	100	0 - 0.296	0.023	0.243	0.092	0.071
Uranium-238	9	9	100	0 - 0.27	1.02	1.67	1.37	0.221

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Table 3.5
Summary of Surface Sediment ECOI Data for Pond A-5

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	7	7	100	7.5 - 40	7,710	21,000	12,100	4,960
Arsenic	7	7	100	1 - 2	3.40	4.30	3.86	0.331
Barium	7	7	100	0.18 - 40	120	220	158	34.2
Beryllium	3	7	43	0.23 - 1	0.630	1.20	0.668	0.312
Boron	3	3	100	1.5 - 2.4	5.20	11.0	8.10	2.90
Calcium	7	7	100	9.5 - 1000	7,740	17,000	11,600	3,000
Chromium	7	7	100	0.42 - 2	8.30	21.0	13.1	4.59
Cobalt	7	7	100	0.15 - 10	6.20	13.3	9.76	2.37
Copper	7	7	100	0.86 - 5	11.0	22.0	17.1	3.35
Iron	7	7	100	2.3 - 20	13,000	22,000	15,800	3,140
Lead	7	7	100	0.42 - 1	13.0	21.0	17.3	2.94
Lithium	7	7	100	0.46 - 20	6.50	17.0	9.74	4.06
Magnesium	7	7	100	5.7 - 1000	2,000	4,200	3,010	685
Manganese	7	7	100	0.12 - 3	130	330	239	65.5
Molybdenum	3	7	43	0.4 - 40	0.400	0.990	2.33	1.50
Nickel	6	7	86	0.37 - 8	12.0	19.0	14.9	3.75
Potassium	7	7	100	63 - 1000	1,360	3,400	2,040	787
Silica	3	3	100	6.8 - 11	1,300	2,000	1,570	379
Silver	2	7	29	0.74 - 2	0.880	1.20	0.979	0.295
Sodium	6	7	86	91 - 1000	166	790	303	236
Strontium	7	7	100	0.098 - 40	51.5	95.0	65.0	14.8
Thallium	2	7	29	1 - 2	0.610	0.690	0.501	0.241
Titanium	3	3	100	0.22 - 0.35	79.0	130	103	25.6
Vanadium	7	7	100	0.95 - 10	26.0	46.0	33.6	7.08
Zinc	7	7	100	0.54 - 4	55.0	130	78.2	25.0
Organics (ug/kg)								
2-Butanone	3	4	75	10 - 10	25.0	51.0	30.8	18.0
Acetone	2	4	50	10 - 10	130	210	126	61.8
Benzoic Acid	3	4	75	1600 - 1600	240	500	618	438
bis(2-ethylhexyl)phthalate	3	4	75	330 - 330	90.0	130	142	77.1
Methylene Chloride	1	4	25	5 - 5	18.0	18.0	9.62	6.10
Phenol	1	4	25	330 - 330	110	110	232	83.9
Toluene	4	4	100	5 - 5	3.00	18.0	13.0	7.07
Radionuclides (pCi/g)								
Americium-241	9	9	100	0 - 0.117	0.038	0.121	0.066	0.027
Cesium-137	4	4	100	0.086 - 0.103	0.003	0.100	0.028	0.048

Table 3.5
Summary of Surface Sediment ECOI Data for Pond A-5

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Gross Alpha	4	4	100	2.1 - 2.6	21.0	28.3	23.8	3.25
Gross Beta	4	4	100	5.3 - 5.6	22.2	27.5	25.4	2.26
Plutonium-239/240	10	10	100	0 - 0.13	0.045	0.332	0.142	0.081
Uranium-233/234	10	10	100	0.019 - 0.306	0.780	1.33	1.03	0.183
Uranium-235	10	10	100	0 - 0.328	0.019	0.183	0.076	0.057
Uranium-238	10	10	100	0 - 0.279	0	1.44	0.960	0.370

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Table 3.6
Summary of Surface Sediment ECOI Data for Pond B-4

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	6	6	100	6.7 - 11	7,800	29,000	17,000	7,690
Antimony	1	6	17	0.52 - 0.86	2.60	2.60	0.727	0.920
Arsenic	6	6	100	0.9 - 1.5	4.50	8.70	6.45	1.85
Barium	6	6	100	0.16 - 0.27	110	220	175	42.3
Beryllium	6	6	100	0.2 - 0.34	0.550	1.50	0.955	0.338
Boron	6	6	100	1.3 - 2.2	4.10	30.0	11.3	9.40
Cadmium	6	6	100	0.034 - 0.057	0.610	1.80	1.16	0.516
Calcium	6	6	100	8.4 - 14	5,100	35,000	15,400	10,300
Chromium	6	6	100	0.37 - 0.61	14.0	29.0	21.2	6.37
Cobalt	6	6	100	0.14 - 0.23	3.50	9.40	6.77	2.21
Copper	6	6	100	0.76 - 1.3	13.0	32.0	24.3	7.03
Iron	6	6	100	2 - 3.4	13,000	24,000	18,500	4,510
Lead	6	6	100	0.37 - 0.61	15.0	39.0	26.8	8.57
Lithium	6	6	100	0.41 - 0.68	6.60	20.0	13.7	5.22
Magnesium	6	6	100	5 - 8.4	1,600	5,100	3,720	1,310
Manganese	6	6	100	0.11 - 0.18	110	340	232	76.8
Mercury	6	6	100	0.0064 - 0.011	0.068	0.091	0.082	0.009
Molybdenum	6	6	100	0.35 - 0.59	0.980	1.50	1.21	0.208
Nickel	6	6	100	0.33 - 0.54	8.70	23.0	15.8	5.31
Potassium	6	6	100	56 - 93	930	3,900	2,360	1,030
Selenium	2	6	33	1.2 - 1.9	1.50	1.80	1.08	0.469
Silica	6	6	100	6 - 10	860	1,400	1,140	200
Silver	3	6	50	0.65 - 1.1	1.60	3.10	2.27	0.956
Sodium	5	6	83	80 - 130	260	990	446	327
Strontium	6	6	100	0.087 - 0.14	40.0	150	77.8	39.2
Thallium	1	6	17	0.88 - 1.5	1.20	1.20	0.707	0.265
Tin	1	6	17	1.2 - 1.9	2.20	2.20	1.12	0.581
Titanium	6	6	100	0.19 - 0.32	70.0	190	140	41.5
Vanadium	6	6	100	0.84 - 1.4	22.0	63.0	41.3	15.0
Zinc	6	6	100	0.48 - 0.79	130	510	277	153
Organics (ug/kg)								
Acenaphthene	1	6	17	28 - 92	110	110	424	282
Anthracene	2	6	33	28 - 92	73.0	140	390	310
Benzo(a)anthracene	4	6	67	33 - 110	80.0	300	620	712
Benzo(a)pyrene	3	6	50	33 - 110	100	320	735	652
Benzo(b)fluoranthene	3	6	50	88 - 290	180	270	730	653

Table 3.6
Summary of Surface Sediment ECOI Data for Pond B-4

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Benzo(g,h,i)perylene	3	6	50	26 - 87	90.0	270	710	673
Benzo(k)fluoranthene	2	6	33	66 - 220	270	310	805	592
bis(2-ethylhexyl)phthalate	5	6	83	51 - 170	310	710	668	572
Chrysene	4	6	67	45 - 150	74.0	350	644	699
Dibenz(a,h)anthracene	2	6	33	31 - 100	65.0	92.0	734	671
Fluoranthene	4	6	67	60 - 200	170	750	788	622
Fluorene	1	6	17	30 - 98	94.0	94.0	824	595
Indeno(1,2,3-cd)pyrene	3	6	50	36 - 120	74.0	200	687	693
PCB-1254	6	11	55	9 - 370	120	220	114	84.0
Phenanthrene	4	6	67	28 - 92	110	630	703	674
Pyrene	2	6	33	220 - 710	580	700	922	490
Radionuclides (pCi/g)								
Americium-241	6	6	100	0.0649 - 0.131	0.144	1.19	0.564	0.377
Plutonium-239/240	6	6	100	0.046 - 0.111	0.472	2.92	1.36	0.945
Uranium-233/234	6	6	100	0.155 - 0.241	0.903	1.40	1.12	0.210
Uranium-235	6	6	100	0.168 - 0.241	0.030	0.193	0.125	0.072
Uranium-238	6	6	100	0.164 - 0.241	1.10	1.45	1.26	0.150

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Table 3.7
Summary of Surface Sediment ECOI Data for Pond B-5

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	12	12	100	3.2 - 40	6,500	24,000	16,100	4,740
Antimony	2	11	18	0.17 - 12	0.580	0.580	4.16	5.38
Arsenic	12	12	100	0.27 - 2	3.90	8.60	5.72	1.61
Barium	12	12	100	0.05 - 40	73.0	240	146	42.7
Beryllium	7	12	58	0.04 - 1	0.520	1.30	0.833	0.247
Boron	5	5	100	1.2 - 1.9	3.10	8.50	5.84	2.04
Cadmium	7	12	58	0.031 - 1	0.036	0.620	0.570	0.257
Calcium	12	12	100	0.98 - 1000	5,000	16,900	9,450	3,180
Cesium	5	5	100	200 - 200	2.40	3.50	3.04	0.451
Chromium	12	12	100	0.08 - 2	8.10	27.0	17.6	5.30
Cobalt	12	12	100	0.1 - 10	5.20	11.0	8.15	1.93
Copper	12	12	100	0.17 - 5	7.80	29.9	19.6	5.99
Iron	12	12	100	1.5 - 20	11,000	22,000	16,800	3,320
Lead	12	12	100	0.17 - 1	10.0	36.8	21.5	8.14
Lithium	12	12	100	0.32 - 20	5.30	19.0	11.8	3.71
Magnesium	12	12	100	1.2 - 1000	1,500	5,000	3,480	955
Manganese	12	12	100	0.05 - 3	150	350	245	62.3
Mercury	6	12	50	0.0059 - 0.1	0.017	0.086	0.046	0.019
Molybdenum	6	12	50	0.08 - 40	0.440	1.40	1.96	1.52
Nickel	12	12	100	0.08 - 8	9.90	23.8	16.7	3.88
Potassium	12	12	100	3.1 - 1000	970	3,600	2,200	748
Selenium	3	12	25	0.26 - 1.6	0.720	1.60	0.655	0.363
Silica	5	5	100	5.5 - 8.3	640	1,300	954	257
Silver	4	12	33	0.09 - 2	0.340	1.40	0.809	0.449
Sodium	12	12	100	24.5 - 1000	84.0	510	332	114
Strontium	12	12	100	0.05 - 40	34.0	87.0	57.2	16.0
Thallium	3	12	25	0.25 - 2	0.450	0.720	0.409	0.213
Tin	2	12	17	0.31 - 40	1.90	39.5	9.70	12.5
Titanium	5	5	100	0.18 - 0.26	57.0	160	125	41.0
Vanadium	12	12	100	0.25 - 10	20.0	51.0	39.3	8.67
Zinc	12	12	100	0.12 - 4	43.0	240	112	54.5
Organics (ug/kg)								
2-Butanone	3	7	43	10 - 1300	2.00	21.0	192	313
Acetone	1	7	14	10 - 1300	87.0	87.0	205	305
bis(2-ethylhexyl)phthalate	2	5	40	330 - 330	180	270	306	142
Carbon Tetrachloride	2	7	29	5 - 1300	390	440	122	201

Table 3.7
Summary of Surface Sediment ECOI Data for Pond B-5

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Di-n-octylphthalate	1	5	20	330 - 330	240	240	253	20.2
Fluoranthene	2	5	40	330 - 330	84.0	190	203	71.4
Methylene Chloride	2	7	29	5 - 1300	410	420	122	200
Pyrene	1	5	20	330 - 330	160	160	237	47.0
Toluene	5	6	83	5 - 1300	12.0	47.0	129	256
Radionuclides (pci/g)								
Americium-241	10	10	100	0 - 0.119	0.024	0.337	0.138	0.111
Cesium-137	5	5	100	0.05 - 0.06	0.032	0.187	0.093	0.057
Gross Alpha	5	5	100	2.15 - 3.56	13.0	34.0	18.7	8.63
Gross Beta	5	5	100	2.27 - 2.46	20.7	28.6	24.8	3.08
Plutonium-239/240	10	10	100	0 - 0.121	0.027	0.895	0.345	0.257
Radium-226	5	5	100	0.5 - 0.5	0.773	0.961	0.889	0.071
Radium-228	5	5	100	0.5 - 0.5	1.47	1.84	1.62	0.139
Strontium-89/90	5	5	100	0.01 - 0.06	0.111	0.579	0.369	0.199
Uranium-233/234	10	10	100	0 - 0.272	0.889	1.83	1.19	0.300
Uranium-235	10	10	100	0 - 0.31	-0.006	0.190	0.086	0.064
Uranium-238	10	10	100	0 - 0.339	0.759	1.53	1.12	0.230

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Table 3.8
Summary of Surface Sediment ECOI Data for Pond C-1

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	6	6	100	8.9 - 40	13,000	31,000	22,200	6,960
Antimony	1	5	20	0.69 - 12	0.820	0.820	1.28	1.73
Arsenic	6	6	100	1.2 - 2	4.90	8.90	6.37	1.41
Barium	6	6	100	0.22 - 40	208	330	275	45.5
Beryllium	6	6	100	0.27 - 1	0.860	6.70	2.14	2.25
Boron	4	4	100	1.8 - 2.3	8.30	11.0	9.48	1.26
Cadmium	4	5	80	0.045 - 1	0.600	0.850	0.736	0.156
Calcium	6	6	100	11 - 1000	7,000	19,000	12,000	4,630
Chromium	6	6	100	0.49 - 2	17.4	30.0	24.0	5.02
Cobalt	6	6	100	0.18 - 10	10.9	13.0	12.0	0.927
Copper	6	6	100	1 - 5	23.0	30.0	26.9	2.33
Iron	6	6	100	2.7 - 20	19,100	31,000	25,900	4,310
Lead	6	6	100	0.49 - 0.65	26.0	38.0	30.5	4.01
Lithium	6	6	100	0.55 - 20	12.4	28.0	19.7	5.47
Magnesium	6	6	100	6.7 - 1000	3,540	5,800	4,540	733
Manganese	6	6	100	0.14 - 3	200	970	403	284
Mercury	6	6	100	0.0085 - 0.1	0.075	1.60	0.540	0.711
Molybdenum	2	5	40	0.47 - 40	0.860	2.00	1.10	0.921
Nickel	6	6	100	0.44 - 8	16.4	24.0	20.2	2.51
Nitrate / Nitrite	2	2	100	0.2 - 0.2	1.00	1.30	1.15	0.212
Potassium	6	6	100	75 - 1000	2,320	4,200	3,100	694
Selenium	3	5	60	1 - 2.1	1.50	2.80	1.74	0.961
Silica	4	4	100	8 - 11	1,100	1,600	1,400	216
Sodium	4	6	67	110 - 1000	23.3	290	134	115
Strontium	6	6	100	0.12 - 40	54.5	89.0	70.0	12.4
Thallium	2	5	40	1.2 - 2	7.70	10.0	4.10	4.42
Tin	2	6	33	1.6 - 40	11.0	11.0	6.15	3.85
Titanium	4	4	100	0.25 - 0.33	190	300	240	46.9
Vanadium	6	6	100	1.1 - 10	32.4	56.0	44.0	8.42
Zinc	6	6	100	0.64 - 4	95.2	140	109	16.3
Organics (ug/kg)								
1234678-HpCDF	1	1	100	0.00271 - 0.0027	8.07E-04	8.07E-04	8.07E-04	N/A
2,4-Dinitrophenol	1	5	20	220 - 1600	890	890	2,770	1,180
4,6-Dinitro-2-methylphenol	1	5	20	290 - 1600	750	750	2,740	1,240
Acenaphthene	2	5	40	31 - 330	74.0	320	330	158
Anthracene	4	5	80	31 - 330	90.0	450	366	163
Benzo(a)anthracene	3	5	60	36 - 330	69.0	190	340	305

Table 3.8
Summary of Surface Sediment ECOI Data for Pond C-1

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Benzo(a)pyrene	2	5	40	36 - 330	66.0	170	447	321
Benzo(b)fluoranthene	2	5	40	97 - 330	170	180	450	273
Benzo(g,h,i)perylene	1	5	20	29 - 330	150	150	550	250
Benzo(k)fluoranthene	1	5	20	73 - 330	150	150	550	250
Benzoic Acid	2	6	33	510 - 1600	190	410	2,440	1,690
Chrysene	3	5	60	49 - 330	65.0	190	337	308
Dibenz(a,h)anthracene	1	4	25	35 - 45	530	530	658	118
Di-n-butylphthalate	1	5	20	53 - 330	110	110	582	273
Fluoranthene	3	5	60	66 - 330	120	330	374	286
Heptachlorodibenzo-p-dioxin	1	1	100	0.00271 - 0.0027	0.005	0.005	0.005	N/A
Indeno(1,2,3-cd)pyrene	2	5	40	40 - 330	340	500	568	182
OCDD	1	1	100	0.00542 - 0.0054	0.031	0.031	0.031	N/A
OCDF	1	1	100	0.00542 - 0.0054	0.001	0.001	0.001	N/A
PCB-1254	1	6	17	12 - 160	94.0	94.0	160	189
Pentachlorophenol	1	5	20	200 - 1600	950	950	2,780	1,160
Phenanthrene	4	5	80	31 - 330	310	360	370	74.8
Pyrene	1	5	20	240 - 330	310	310	582	189
Toluene	2	2	100	5 - 5	380	520	450	99.0
Radionuclides (pCi/g)								
Americium-241	8	8	100	0.005 - 0.0891	0.059	0.442	0.156	0.127
Gross Alpha	4	4	100	2.2 - 3.5	37.0	59.0	45.5	9.75
Gross Beta	4	4	100	4.4 - 5.6	28.0	46.0	34.5	7.94
Plutonium-239/240	8	8	100	0.003 - 0.135	0.320	2.20	0.943	0.614
Uranium-233/234	8	8	100	0.012 - 0.203	1.70	3.50	2.22	0.601
Uranium-235	8	8	100	0.012 - 0.242	0.071	0.405	0.178	0.106
Uranium-238	8	8	100	0.012 - 0.23	1.30	3.00	2.00	0.520

Table 3.9
Summary of Surface Sediment ECOI Data for Pond C-2

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Inorganics (mg/kg)								
Aluminum	9	9	100	5.5 - 40	4,460	22,000	13,000	5,750
Arsenic	9	9	100	0.74 - 2	2.50	9.80	5.90	2.13
Barium	9	9	100	0.13 - 40	73.8	226	159	50.6
Beryllium	7	8	88	0.17 - 1	0.660	1.20	0.807	0.328
Boron	6	6	100	1.1 - 1.5	4.60	10.0	6.63	2.08
Cadmium	1	8	12	0.028 - 1	0.130	0.130	0.219	0.358
Calcium	9	9	100	6.9 - 1000	2,800	47,700	16,400	17,000
Chromium	9	9	100	0.3 - 2	7.00	25.0	15.3	5.58
Cobalt	9	9	100	0.11 - 10	4.00	12.0	8.62	2.40
Copper	9	9	100	0.63 - 5	9.00	35.9	19.4	8.59
Iron	9	9	100	1.7 - 20	8,090	29,000	18,900	5,860
Lead	9	9	100	0.3 - 0.6	11.4	34.6	21.5	7.39
Lithium	9	9	100	0.34 - 20	3.60	19.0	11.0	4.66
Magnesium	9	9	100	4.1 - 1000	1,340	5,400	3,390	1,430
Manganese	9	9	100	0.087 - 3	260	602	452	119
Mercury	9	9	100	0.0053 - 0.1	0.015	0.680	0.242	0.314
Molybdenum	5	8	62	0.29 - 40	0.570	1.10	0.970	0.619
Nickel	9	9	100	0.27 - 8	5.30	21.0	15.5	5.01
Nitrate / Nitrite	3	3	100	0.2 - 0.2	0.700	1.90	1.40	0.624
Potassium	9	9	100	46 - 1000	1,160	3,900	2,250	880
Selenium	1	8	12	0.96 - 1.3	1.10	1.10	0.609	0.213
Silica	6	6	100	4.9 - 6.7	660	1,400	925	303
Sodium	9	9	100	66 - 1000	76.3	460	206	115
Strontium	9	9	100	0.072 - 40	29.0	167	81.7	54.0
Titanium	6	6	100	0.16 - 0.21	53.0	140	99.5	29.5
Vanadium	9	9	100	0.69 - 10	14.3	50.0	35.1	11.1
Zinc	9	9	100	0.39 - 4	39.0	201	93.4	57.0
Organics (ug/kg)								
Benzoic Acid	1	2	50	1600 - 1600	240	240	2,620	3,370
Fluoranthene	1	2	50	330 - 330	140	140	595	643
Phenol	1	2	50	330 - 330	150	150	600	636
Toluene	3	3	100	5 - 5	340	410	373	35.1
Radionuclides (pCi/g)								
Americium-241	9	9	100	0.002 - 0.13	0.048	0.727	0.321	0.184
Gross Alpha	3	3	100	2.4 - 3.1	33.0	59.0	44.0	13.5
Gross Beta	3	3	100	4.9 - 5.2	32.0	44.0	39.0	6.24
Plutonium-239/240	9	9	100	0.002 - 0.102	0.792	2.96	1.74	0.678

Table 3.9
Summary of Surface Sediment ECOI Data for Pond C-2

Analyte	Number of Detects	Number of Samples	Detection Frequency (%)	Range of Reported Detection Limits	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation
Uranium-233/234	6	6	100	0.195 - 0.272	0.819	1.40	1.14	0.197
Uranium-235	6	6	100	0.198 - 0.272	0.037	0.247	0.129	0.088
Uranium-238	6	6	100	0.18 - 0.289	0.805	1.79	1.05	0.370

Table 3.10
A-Series Pond Summary Statistics

ECOI	A-Series Pond Statistics				Pond-Specific MDCs				
	Min.	Max.	Mean	Std. Dev.	A-1	A-2	A-3	A-4	A-5
Aluminum	5,790	49,000	18,588	8,501	29,000	49,000	27,400	26,000	21,000
Antimony	0.740	41.4	26.1	12.3	30.4		26.0	41.4	
Arsenic	2.40	12.0	6.93	2.14	9.30	12.0	7.80	10.2	04.6
Barium	53.0	390	180	61.2	230	390	200	206	220
Beryllium	0.440	2.50	1.14	0.414	1.50	2.50	1.30	1.20	1.20
Boron	3.50	26.0	9.63	4.56	12.0	26.0	9.90	10.0	11.0
Cadmium	0.140	8.30	1.22	1.65	8.30	3.20	0.490	3.10	
Calcium	4,300	51,000	16,309	10,688	27,000	43,000	51,000	38,000	1,700
Cesium	1.80	5.80	3.70	1.47	5.80		4.90	5.50	
Chromium	4.70	44.0	19.8	8.77	30.0	44.0	29.9	27.0	
Cobalt	3.00	15.5	9.60	2.69	13.0	15.0	15.5	13.9	13.3
Copper	9.10	56.0	23.3	9.75	43.0	56.0	24.1	33.4	22.0
Iron	5,400	55,000	20,573	7,947	24,000	39,000	25,000	55,000	22,000
Lead	8.00	45.0	25.5	8.05	39.0	45.0	29.3	35.9	21.0
Lithium	4.90	37.0	15.3	6.66	22.0	37.0	18.0	19.0	17.0
Magnesium	1,800	11,000	4,367	1,557	5,300	11,000	5,400	5,220	4,200
Manganese	72.0	1,100	399	184	500	1,100	520	630	330
Mercury	0.016	0.470	0.116	0.131	0.470	0.150	0.068	0.035	
Molybdenum	0.390	5.40	1.30	1.26	2.30	5.40	1.10	0.930	0.990
Nickel	6.10	34.0	19.4	5.66	26.4	34.0	25.6	25.5	19.0
Nitrate / Nitrite	2.43	2.50	2.47	0.049				2.50	
Potassium	800	6,500	2,763	1,090	3,700	6,500	3,440	4,300	3,400
Selenium	1.20	1.90	1.66	0.230	1.80		1.80	1.90	
Silica	590	4,900	1,462	947	1,500	4,900	2,000	980	2000
Silver	0.098	3.90	1.26	1.30	2.00	3.90			1.2
Sodium	79.0	2,100	573	401	1,200	2,100	850	486	790
Strontium	31.0	220	91.2	42.4	140	220	140	140	95
Thallium	0.350	0.580	0.465	0.163				0.580	0.690
Tin	1.20	3.90	2.13	0.760	1.80	2.70	3.90		
Titanium	36.0	310	130	55.1	170	310	170	160	130
Uranium	4.30	20.0	13.4	8.16		20.0			
Vanadium	16.0	96.0	44.0	14.6	57.0	96.0	62.7	59.0	46.0
Zinc	33.0	540	115	77.9	140	170	540	169	130
1234678-HpCDF	0.003	0.030	0.012	0.016	0.030	0.003			
123478-HxCDD	0.001	0.001	0.001		0.001				
123478-HxCDF	5.50E-04	0.004	0.002	0.002	0.004	5.66E-04			
1234789-HpCDF	7.40E-04	0.002	0.001	9.67E-04	0.002	7.70E-04			
123678-HxCDD	0.001	0.005	0.003	0.002	0.005	0.001			
123678-HxCDF	0.003	0.003	0.003		0.003				
12378-PeCDF	0.002	0.002	0.002		0.002				
123789-HxCDD	0.001	0.003	0.002	0.002	0.003	0.001			
123789-HxCDF	5.53E-04	5.53E-04	5.53E-04			5.53E-04			
2-Butanone	2.00	71.0	18.8	21.2	19.0	71.0	4.00		51
234678-HxCDF	0.002	0.002	0.002		0.002				
23478-PeCDF	0.004	0.004	0.004		0.004				
2378-TCDD	0.003	0.003	0.003		0.003				
2378-TCDF	0.006	0.006	0.006		0.006				
4-Methyl-2-pentanone	6.00	6.00	6.00		6.00				
Acenaphthene	89.0	180	135	64.3	89.0	180			
Acetone	11.0	400	196	154	11.0	400			210
Anthracene	52.0	210	105	71.9	88.0	210			
Atrazine	120	120	120					120	
Benzene	3.00	3.00	3.00					3.00	
Benzo(a)anthracene	52.0	270	145	73.1	270	52.0			
Benzo(a)pyrene	51.0	310	165	77.1	310	80.0	240		
Benzo(b)fluoranthene	64.0	420	222	111	420	64.0	370		
Benzo(g,h,i)perylene	60.0	210	126	57.0	210				
Benzo(k)fluoranthene	63.0	200	118	48.5	200				
Benzoic Acid	290	2,700	1,107	1,380		2,700			500
bis(2-ethylhexyl)phthalate	110	47,000	4,037	11,633	360	47,000	570	950	130

Table 3.10
A-Series Pond Summary Statistics

ECOI	A-Series Pond Statistics				Pond-Specific MDCs				
	Min.	Max.	Mean	Std. Dev.	A-1	A-2	A-3	A-4	A-5
Chrysene	60.0	350	174	85.0	350	81.0	250		
Di-n-octylphthalate	66.0	130	98.0	45.3	130				
Fluoranthene	89.0	790	385	204	790	140	540		
Heptachlorodibenzo-p-dioxin	0.020	0.095	0.045	0.043	0.095	0.020			
Indeno(1,2,3-cd)pyrene	50.0	210	139	61.4	210	210			
Methylene Chloride	3.70	9.30	6.58	2.44	3.70	9.30			18
OCDD	0.018	0.539	0.208	0.229	0.539	0.161			
OCDF	0.006	0.041	0.019	0.019	0.041	0.009			
PCB-1254	34.0	5,200	510	1,309	5,200	130	45.0		
PCB-1260	150	150	150		150				
Phenanthrene	87.0	520	237	143	520	190	260		
Phenol	54.0	54.0	54.0		54.0				110
Pyrene	71.0	710	368	195	710	83.0	460		
Toluene	4.00	860	181	271	280	860	62.0	8.00	18.00
Americium-241	0.013	13.2	2.15	3.36	13.2	3.47	0.666	0.173	0.121
Cesium-134	0.040	0.100	0.060	0.024	0.050	0.100			
Cesium-137	0.083	0.685	0.370	0.171	0.685	0.610	0.288	0.598	0.100
Gross Alpha	11.3	70.7	29.1	16.5	70.7	45.6	22.4	17.0	28.3
Gross Beta	25.4	32.7	29.0	1.73	31.5	32.7	30.2	29.0	30.7
Plutonium-239/240	0.040	36.2	5.75	8.85	36.2	10.5	2.05	0.498	0.332
Radium-226	1.84	3.08	2.36	0.535	2.10	3.08			
Radium-228	1.59	1.89	1.76	0.104	1.83	1.89			
Strontium-89/90	0.124	1.80	0.634	0.501	0.827	0.779	0.162	1.80	
Uranium-233/234	0.500	3.87	1.82	0.776	3.87	3.70	1.59	1.68	1.33
Uranium-235	0.016	0.352	0.102	0.084	0.352	0.285	0.060	0.084	0.070
Uranium-238	0.802	6.10	2.33	1.48	5.35	6.10	1.63	1.67	1.44

Table 3.11
B-Series Pond Summary Statistics

ECOI	B-Series Pond Statistics				Pond-Specific MDCs	
	Min.	Max.	Mean	Std. Dev.	B-4	B-5
Aluminum	5,890	29,000	15,376	6,300	29,000	24,000.00
Antimony	0.730	25.6	10.9	13.1	25.6	0.58
Arsenic	4.40	9.10	6.58	1.57	9.10	8.60
Barium	110	230	171	32.0	230	240.00
Beryllium	0.550	2.20	1.20	0.512	2.20	1.30
Boron	4.10	30.0	9.14	6.64	30.0	8.50
Cadmium	0.130	44.0	3.77	10.1	44.0	0.62
Calcium	3,900	51,000	17,133	11,038	51,000	16,900.00
Cesium	1.40	3.50	2.44	0.846	3.50	3.50
Chromium	4.50	140	23.0	27.6	140	27.00
Cobalt	3.50	12.0	8.46	2.07	12.0	11.00
Copper	13.0	120	29.2	21.5	120	29.90
Iron	11,600	24,000	17,043	3,582	24,000	22,000.00
Lead	14.0	110	38.1	21.9	110	36.80
Lithium	3.40	27.0	12.5	6.05	27.0	19.00
Magnesium	1,600	5,800	3,637	1,003	5,800	5,000.00
Manganese	110	350	244	67.3	350	350.00
Mercury	0.013	1.70	0.186	0.406	1.70	0.09
Molybdenum	0.430	4.10	1.19	0.890	4.10	1.40
Nickel	8.70	31.0	17.4	4.91	31.0	23.80
Potassium	930	3,900	2,289	838	3,900	3,600.00
Selenium	1.50	3.60	2.30	1.14	3.60	1.60
Silica	860	1,700	1,164	233	1,700	1,300.00
Silver	0.780	3,100	296	930	3,100	1.40
Sodium	190	990	334	185	990	510.00
Strontium	40.0	150	76.5	29.3	150	87.00
Sulfide	37.0	37.0	37.0			
Thallium	0.380	1.20	0.640	0.377	1.20	0.07
Tin	1.20	24.0	6.40	9.87	24.0	39.50
Titanium	53.0	190	124	40.6	190	160.00
Vanadium	20.9	63.0	38.7	10.8	63.0	51.00
Zinc	63.0	510	205	120	510	240.00
2-Butanone	3.00	11.0	6.67	4.04	11.0	21.00
Acenaphthene	110	110	110		110	
Acetone	7.60	61.0	34.3	37.8	61.0	87.00
Anthracene	60.0	420	122	107	420	
Benzo(a)anthracene	80.0	430	266	109	430	
Benzo(a)pyrene	100	570	359	124	570	
Benzo(b)fluoranthene	180	1,500	621	338	1,500	
Benzo(g,h,i)perylene	90.0	320	228	82.2	320	
Benzo(k)fluoranthene	200	540	302	101	540	
bis(2-ethylhexyl)phthalate	300	25,000	3,341	5,860	25,000	270.00
Butylbenzylphthalate	66.0	110	88.0	31.1	110	
Chrysene	74.0	650	407	161	650	
cis-1,2-Dichloroethene	48.0	48.0	48.0			
Di-n-octylphthalate	74.0	250	158	88.3	250	240.00
Dibenz(a,h)anthracene	65.0	110	89.0	22.6	110	190.00
Fluoranthene	170	1,400	830	361	1,400	
Fluorene	94.0	94.0	94.0		94.0	

Table 3.11
B-Series Pond Summary Statistics

ECOI	B-Series Pond Statistics				Pond-Specific MDCs	
	Min.	Max.	Mean	Std. Dev.	B-4	B-5
gamma-BHC (Lindane)	25.0	25.0	25.0		25.0	
Indeno(1,2,3-cd)pyrene	74.0	300	199	77.8	300	
Methylene Chloride	2.80	2.80	2.80			420.00
PCB-1254	120	3,100	539	760	3,100	
Phenanthrene	110	760	437	192	760	
Pyrene	310	1,200	779	244	1,200	160.00
Toluene	0.420	360	79.5	157	360	47.00
trans-1,2-Dichloroethene	2.00	2.00	2.00			
Trichloroethene	1.10	1.10	1.10			
Vinyl Chloride	16.8	16.8	16.8			
Americium-241	0.081	56.5	5.50	12.8	56.5	0.34
Cesium-137	0.090	0.832	0.270	0.240	0.832	0.19
Gross Alpha	16.9	49.0	26.6	12.0	49.0	33.96
Gross Beta	25.0	30.8	26.8	1.81	30.8	28.56
Plutonium-239/240	0.313	217	19.5	49.5	217	0.90
Radium-226	0.749	1.02	0.888	0.111	1.02	0.96
Radium-228	1.45	1.78	1.65	0.147	1.78	1.84
Strontium-89/90	0.155	0.217	0.174	0.029	0.217	0.59
Uranium-233/234	0.857	6.04	1.71	1.35	6.04	1.83
Uranium-235	-0.005	0.143	0.066	0.048	0.143	0.24
Uranium-238	0.939	8.51	1.97	1.81	8.51	1.53

Table 3.12
C-Series Pond Summary Statistics

ECOI	C-Series Pond Statistics				Pond-Specific MDCs	
	Min.	Max.	Mean	Std. Dev.	C-1	C-2
Aluminum	4,460	32,000	17,181	8,334	32,000	22,000
Antimony	0.820	0.820	0.820		0.820	
Arsenic	2.50	9.80	6.02	1.72	8.90	9.80
Barium	70.0	330	201	79.6	330	226
Beryllium	0.470	6.70	1.39	1.45	6.70	1.20
Boron	3.60	11.0	7.35	2.29	11.0	10.0
Cadmium	0.130	0.850	0.570	0.239	0.850	0.130
Calcium	1,400	47,700	12,928	12,743	19,000	47,700
Chromium	7.00	30.0	18.7	6.96	30.0	25.0
Cobalt	4.00	13.0	9.83	2.62	13.0	12.0
Copper	6.40	35.9	21.5	7.99	30.0	35.9
Iron	8,090	31,000	21,488	6,176	31,000	29,000
Lead	9.70	38.0	23.9	8.33	38.0	34.6
Lithium	3.60	28.0	14.6	6.88	28.0	19.0
Magnesium	1,100	5,800	3,761	1,383	5,800	5,400
Manganese	200	970	418	181	970	602
Mercury	0.014	1.60	0.308	0.495	1.60	0.680
Molybdenum	0.400	2.00	0.869	0.449	2.00	1.10
Nickel	5.30	24.0	17.3	4.91	24.0	21.0
Nitrate / Nitrite	0.700	1.90	1.30	0.474	1.30	1.90
Potassium	1,100	4,200	2,619	952	4,200	3,900
Selenium	1.10	2.80	2.03	0.854	2.80	1.10
Silica	610	1,600	1,074	376	1,600	1,400
Sodium	23.3	460	195	116	290	460
Strontium	16.0	167	72.4	42.0	89.0	167
Thallium	7.70	10.0	8.85	1.63	10.0	
Tin	11.0	11.0	11.0	0	11.0	
Titanium	53.0	300	158	80.7	300	160
Vanadium	14.3	56.0	38.4	10.7	56.0	50.0
Zinc	27.0	201	93.8	45.0	140	201
1234678-HpCDF	8.07E-04	0.002	0.001	5.47E-04	0.002	
123478-HxCDF	0.001	0.001	0.001		0.001	
123678-HxCDF	5.62E-04	5.62E-04	5.62E-04		5.62E-04	
2,4-Dinitrophenol	890	890	890		890	
234678-HxCDF	7.81E-04	7.81E-04	7.81E-04		7.81E-04	
23478-PeCDF	0.001	0.001	0.001		0.001	
4,6-Dinitro-2-methylphenol	750	750	750		750	
Acenaphthene	74.0	360	251	155	360	
Anthracene	90.0	450	348	149	450	
Benzo(a)anthracene	69.0	190	121	55.6	190	
Benzo(a)pyrene	66.0	170	105	56.7	170	
Benzo(b)fluoranthene	170	180	175	7.07	180	
Benzo(g,h,i)perylene	150	150	150		150	
Benzo(k)fluoranthene	150	150	150		150	
Benzoic Acid	190	410	280	115	410	240
Chrysene	65.0	190	117	56.3	190	
Di-n-butylphthalate	110	110	110		110	
Dibenz(a,h)anthracene	530	530	530		530	
Fluoranthene	120	330	168	90.9	330	140

Table 3.12
C-Series Pond Summary Statistics

ECOI	C-Series Pond Statistics				Pond-Specific MDCs	
	Min.	Max.	Mean	Std. Dev.	C-1	C-2
Heptachlorodibenzo-p-dioxin	0.003	0.005	0.004	0.002	0.005	
Indeno(1,2,3-cd)pyrene	340	500	413	80.8	500	
OCDD	0.013	0.031	0.022	0.012	0.031	
OCDF	0.001	0.002	0.002	3.39E-04	0.002	
PCB-1254	94.0	94.0	94.0		94.0	
Pentachlorodibenzo-p-dioxin	3.72E-04	3.72E-04	3.72E-04		3.72E-04	
Pentachlorophenol	950	950	950		950	
Phenanthrene	310	360	340	18.7	360	
Phenol	150	150	150			150
Pyrene	310	310	310		310	
Toluene	340	520	404	69.5	520	410
Americium-241	0.059	0.727	0.259	0.164	0.442	0.727
Gross Alpha	33.0	59.0	44.9	10.4	59.0	59.0
Gross Beta	28.0	46.0	36.4	7.09	46.0	44.0
Plutonium-239/240	0.320	2.96	1.37	0.712	2.20	2.96
Uranium-233/234	0.801	3.50	1.76	0.820	3.50	1.40
Uranium-235	0.071	0.405	0.212	0.116	0.405	0.219
Uranium-238	0.805	3.36	1.65	0.751	3.36	1.79

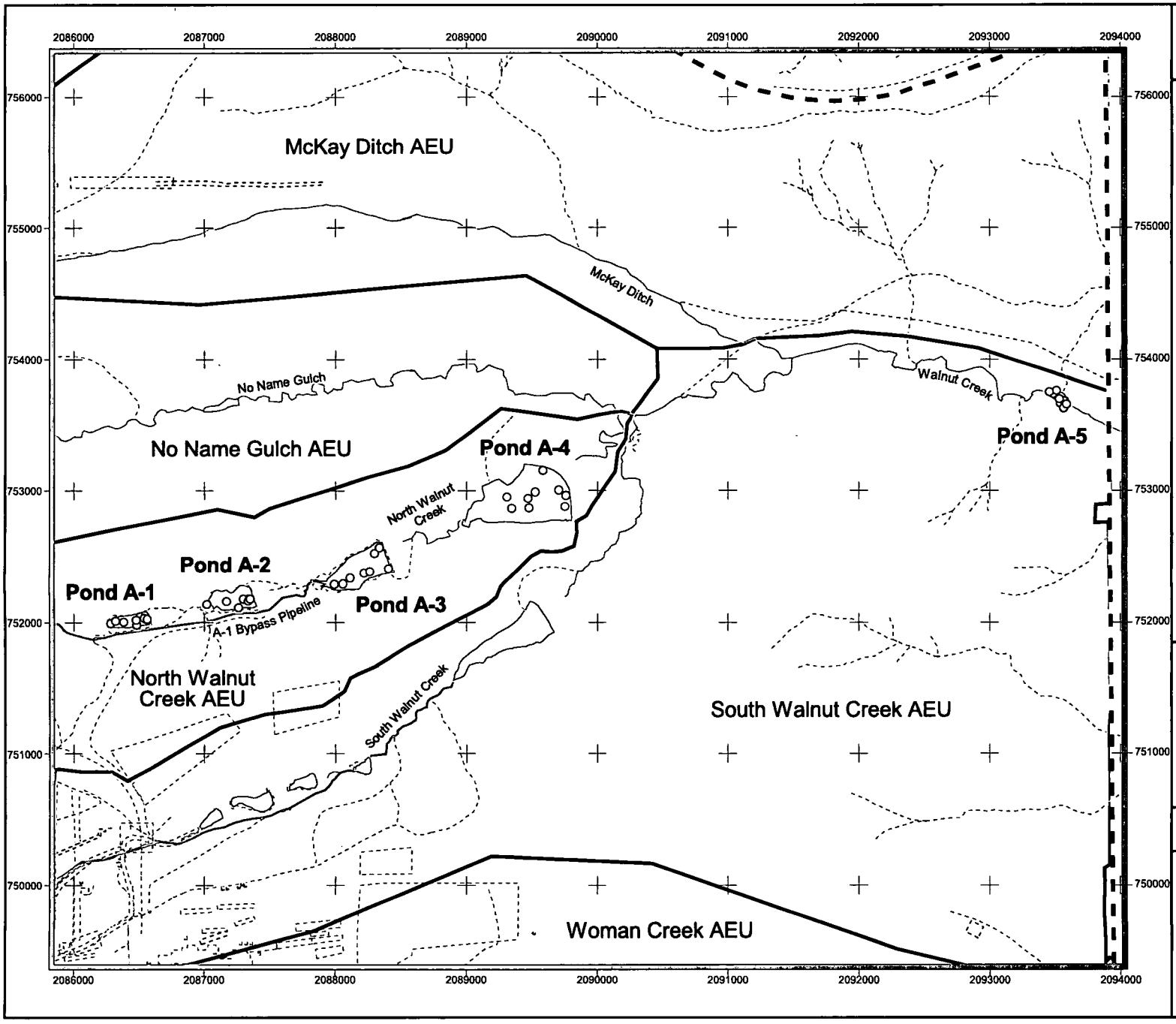

Figure 3.1
A Ponds
Sediment Sampling Locations
for Aluminum

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 15900 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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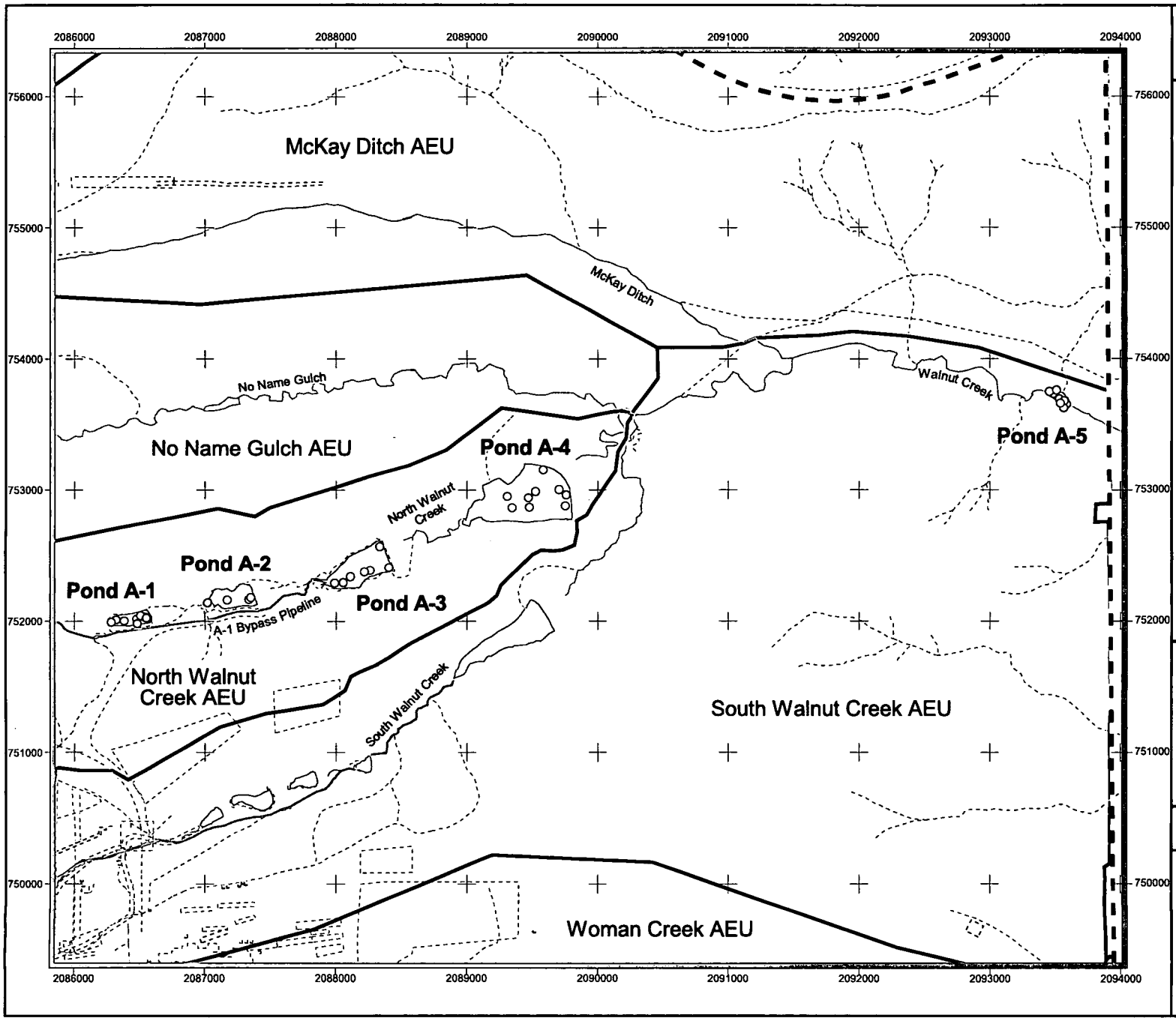

Figure 3.2
A Ponds
Sediment Sampling Locations
for Antimony

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 2 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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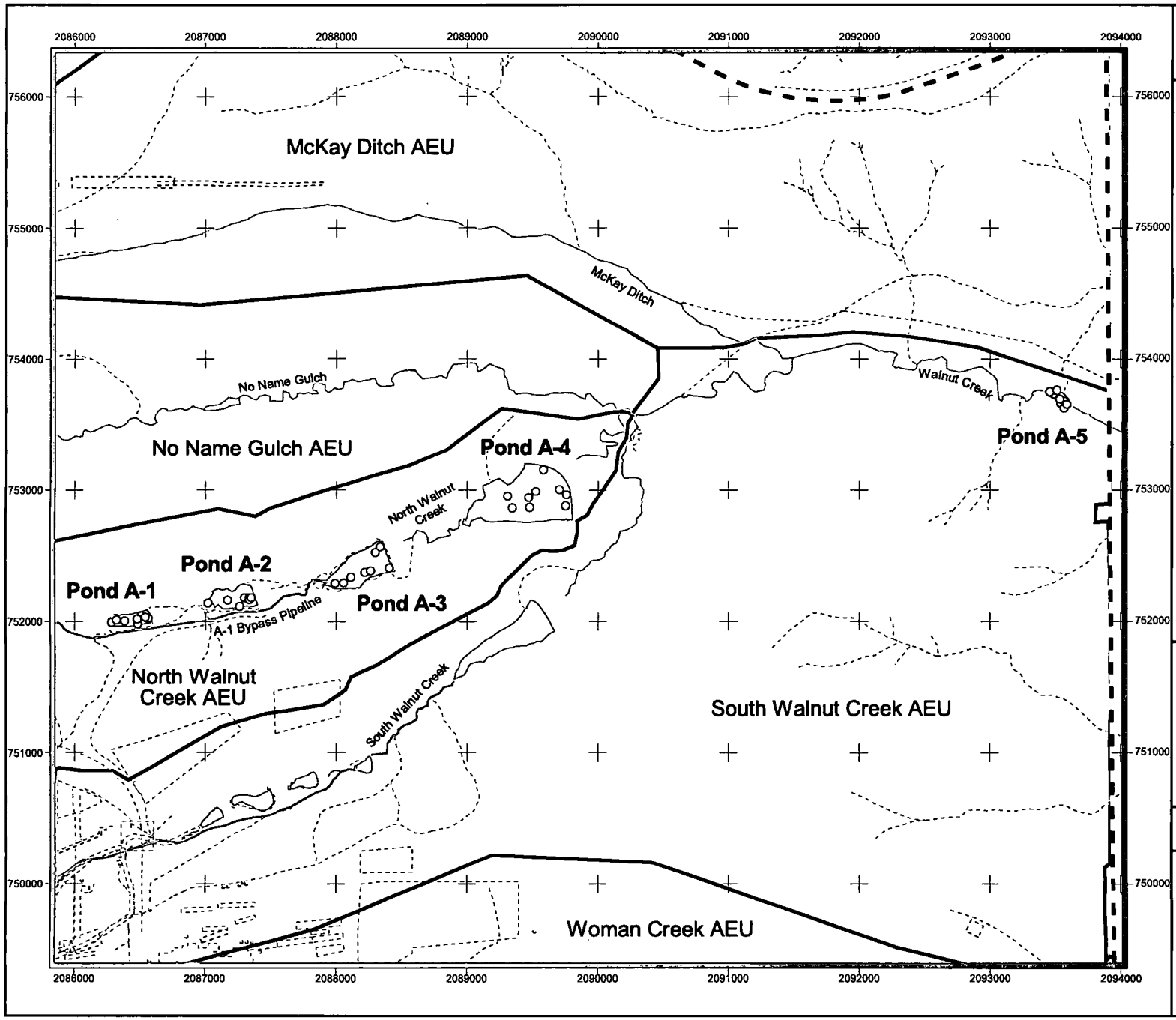

Figure 3.3
A Ponds
Sediment Sampling Locations
for Arsenic

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 9.79 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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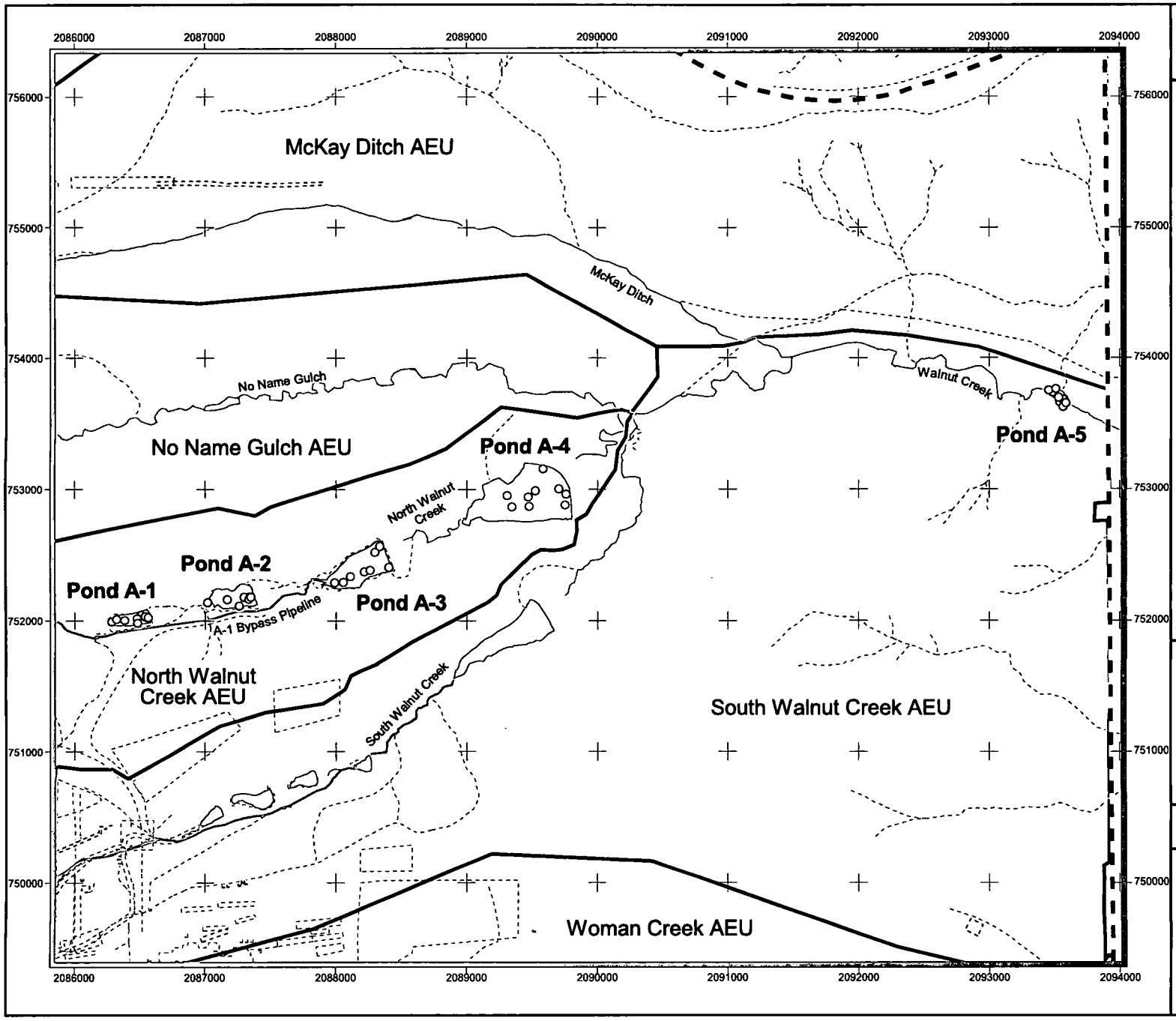

Figure 3.4
A Ponds
Sediment Sampling Locations
for Barium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 189 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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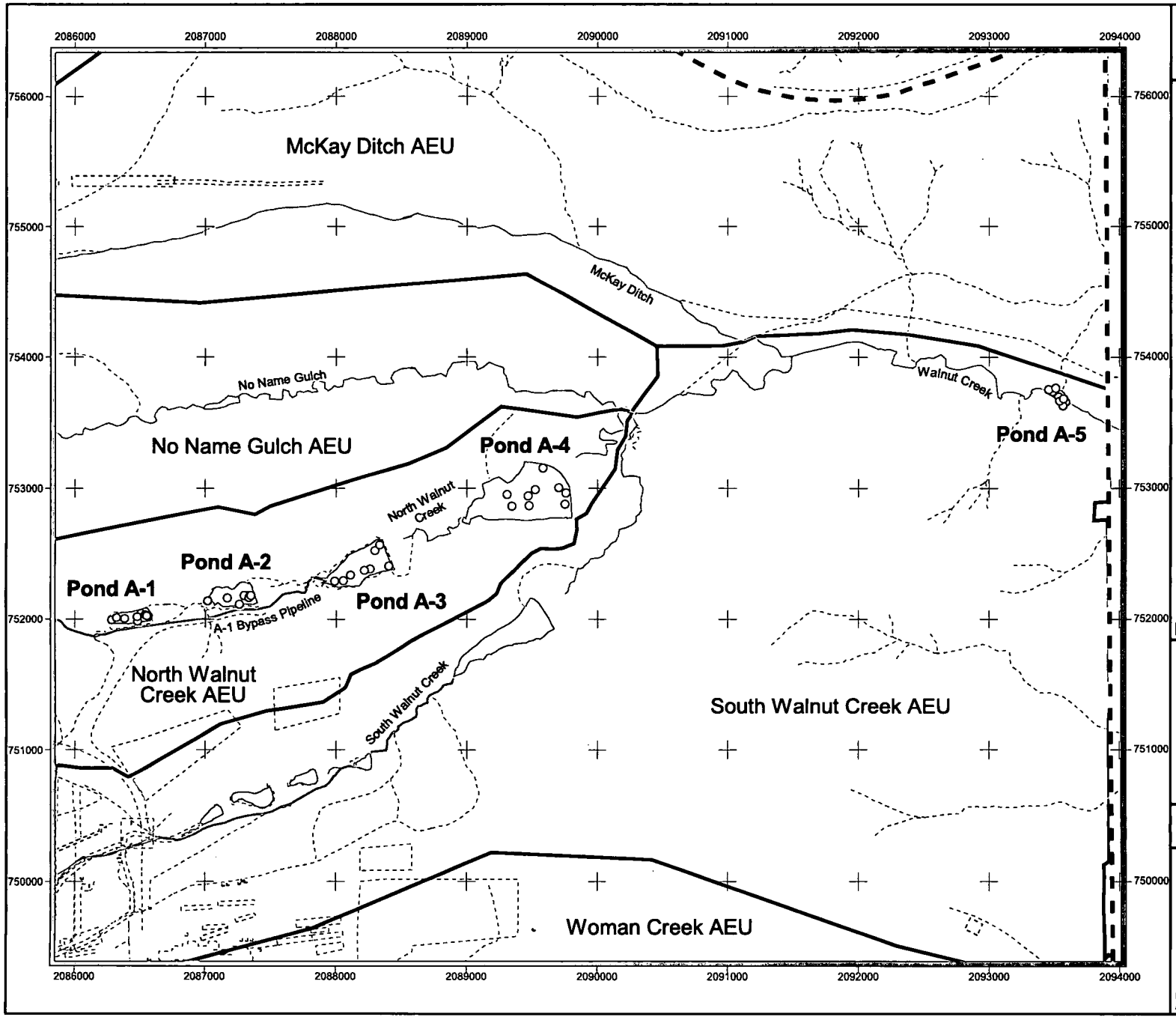

Figure 3.5
A Ponds
Sediment Sampling Locations
for Cadmium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.99 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
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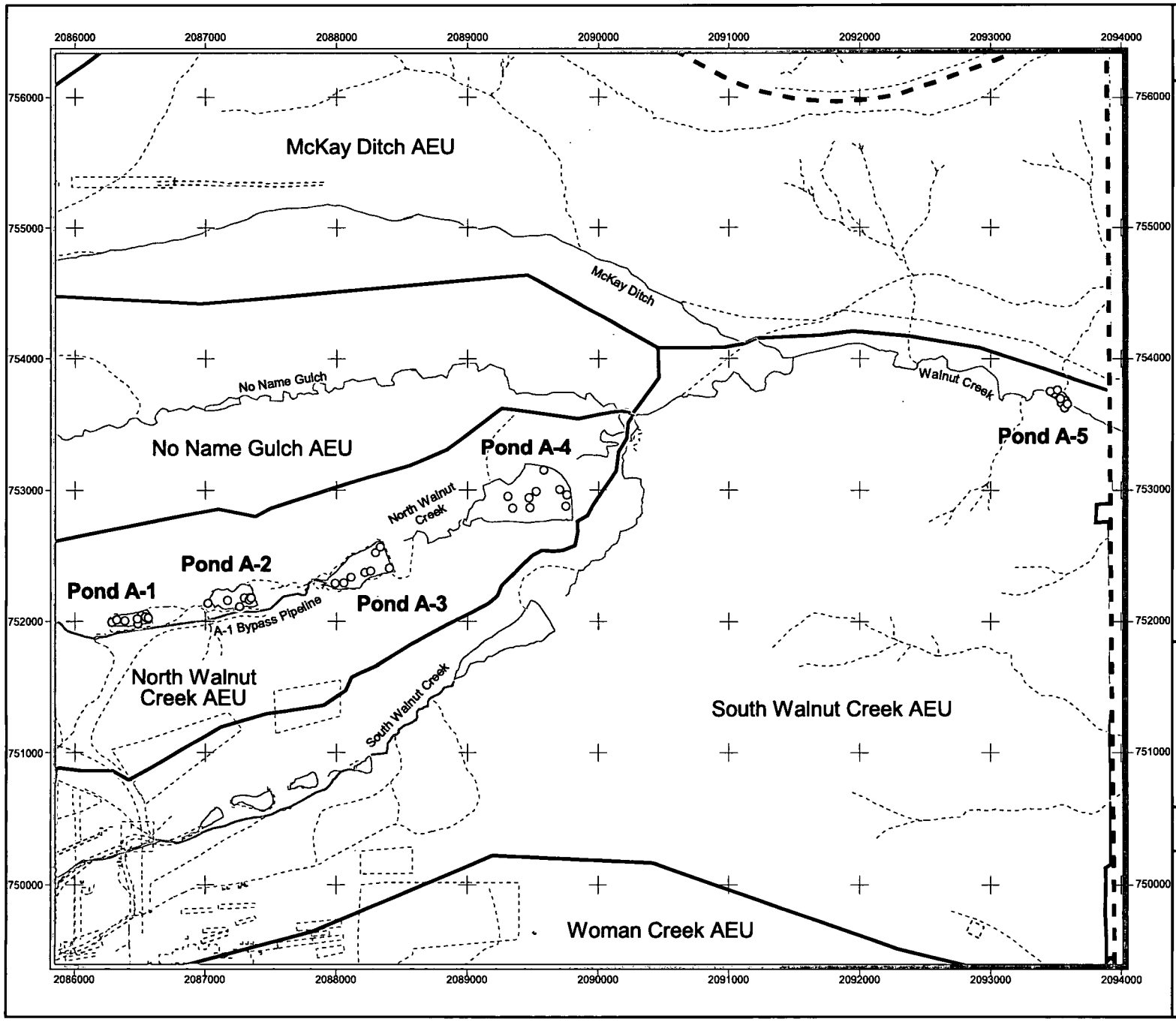

Figure 3.6
A Ponds
Sediment Sampling Locations
for Chromium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 43.4 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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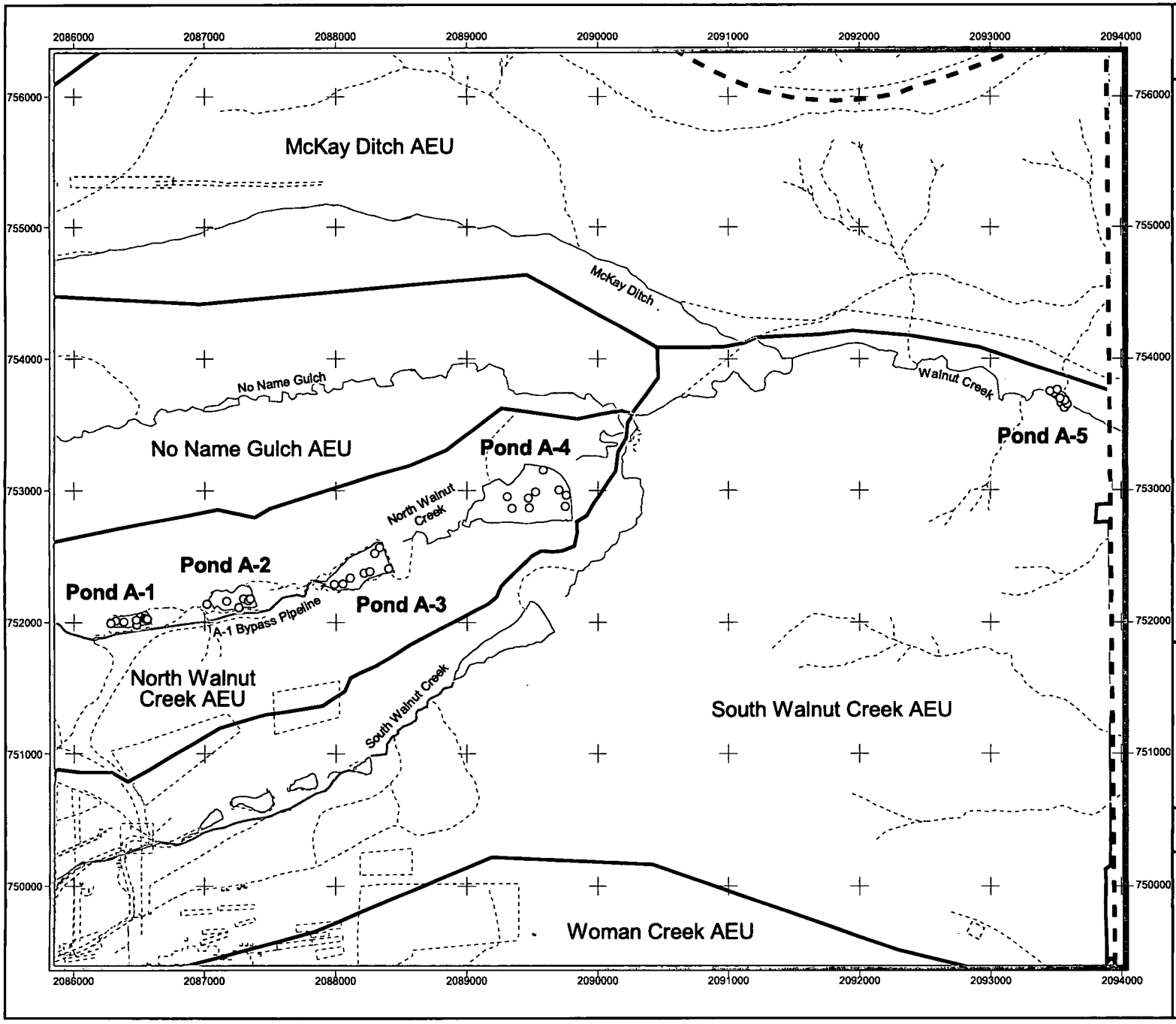

Figure 3.7
A Ponds
Sediment Sampling Locations
for Copper

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 31.6 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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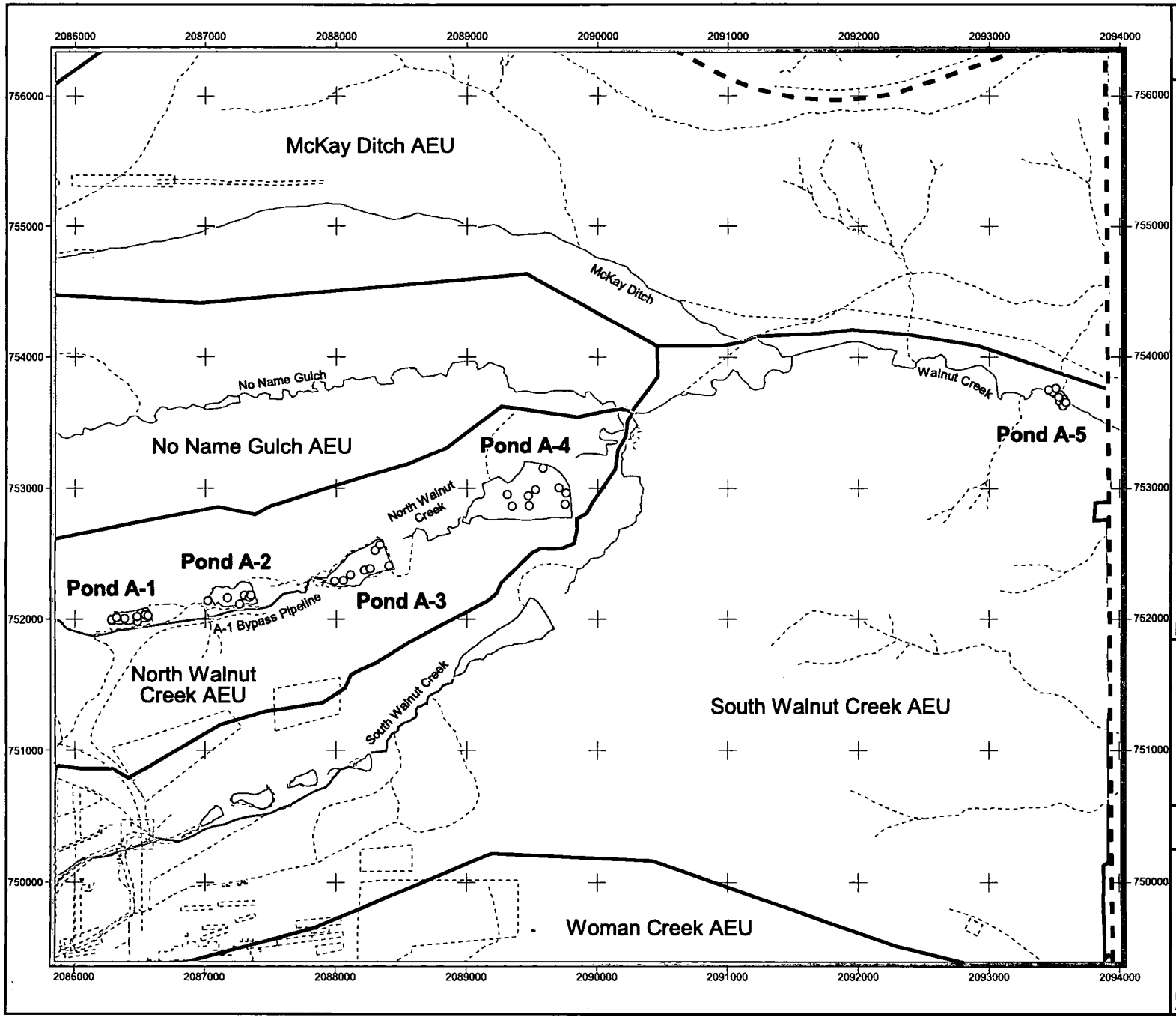

Figure 3.8
A Ponds
Sediment Sampling Locations
for Iron

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 20000 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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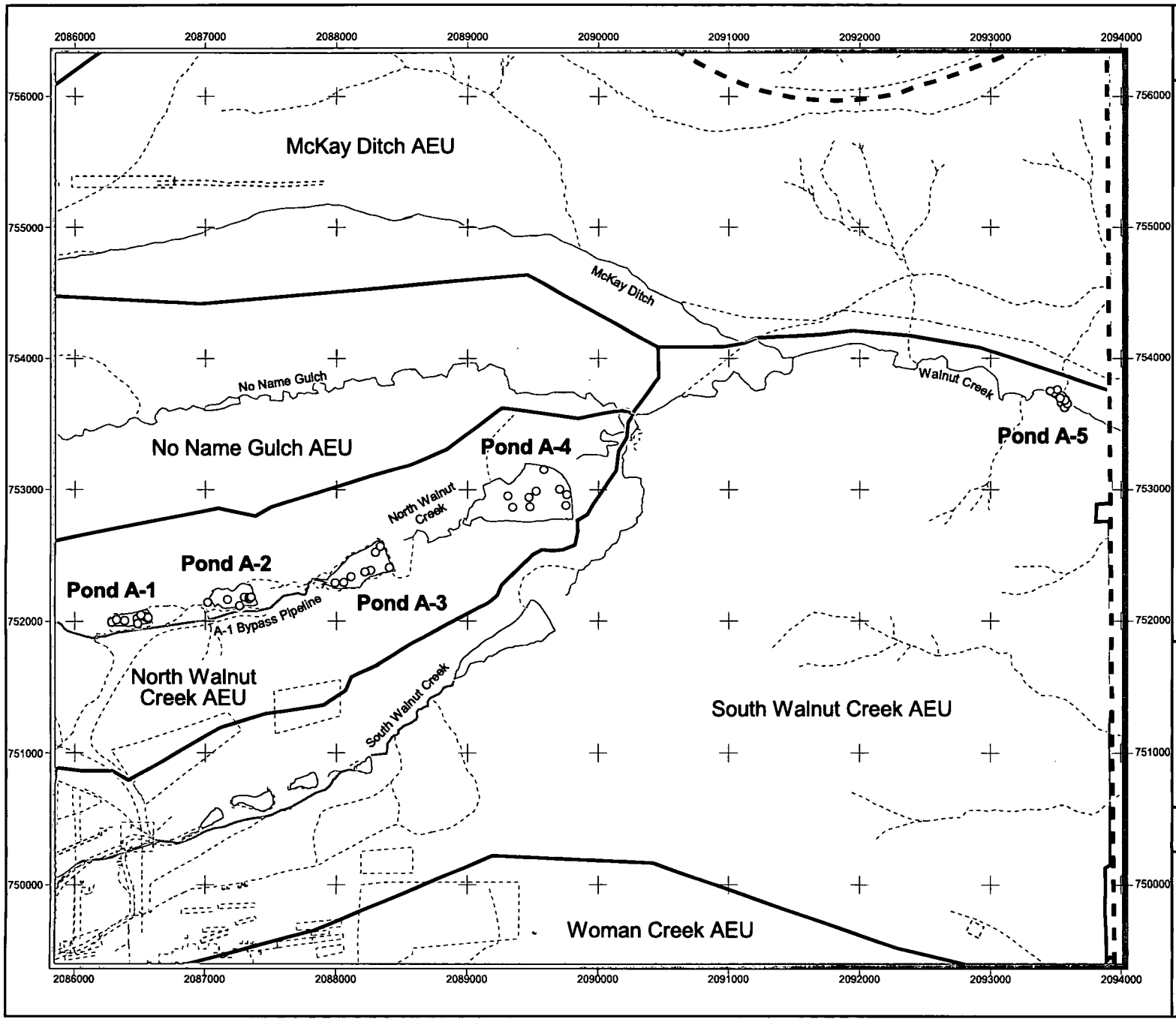

Figure 3.9
A Ponds
Sediment Sampling Locations
for Lead

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 35.8 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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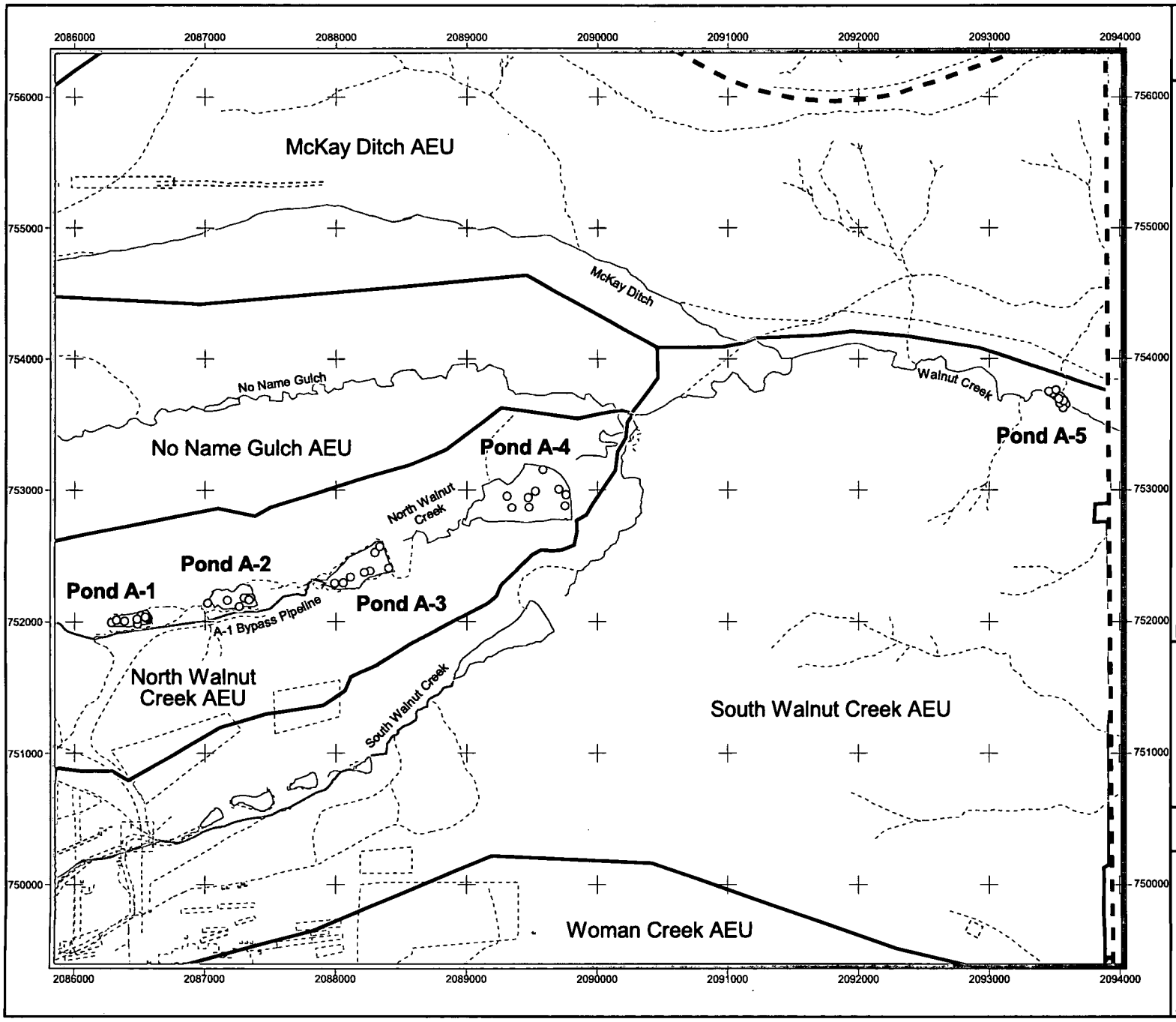

Figure 3.10
A Ponds
Sediment Sampling Locations
for Manganese

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 630 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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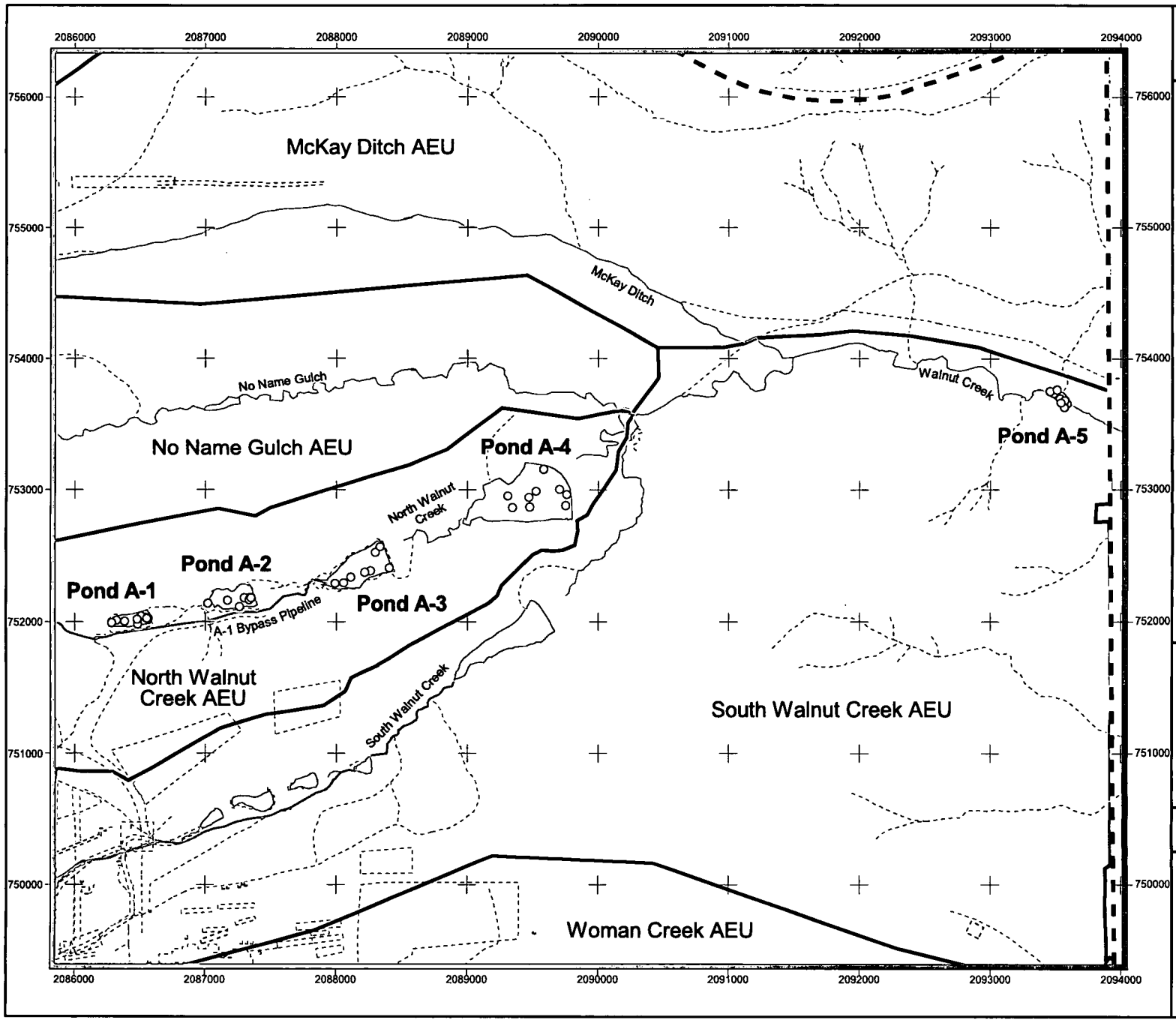

Figure 3.11
A Ponds
Sediment Sampling Locations
for Mercury

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.18 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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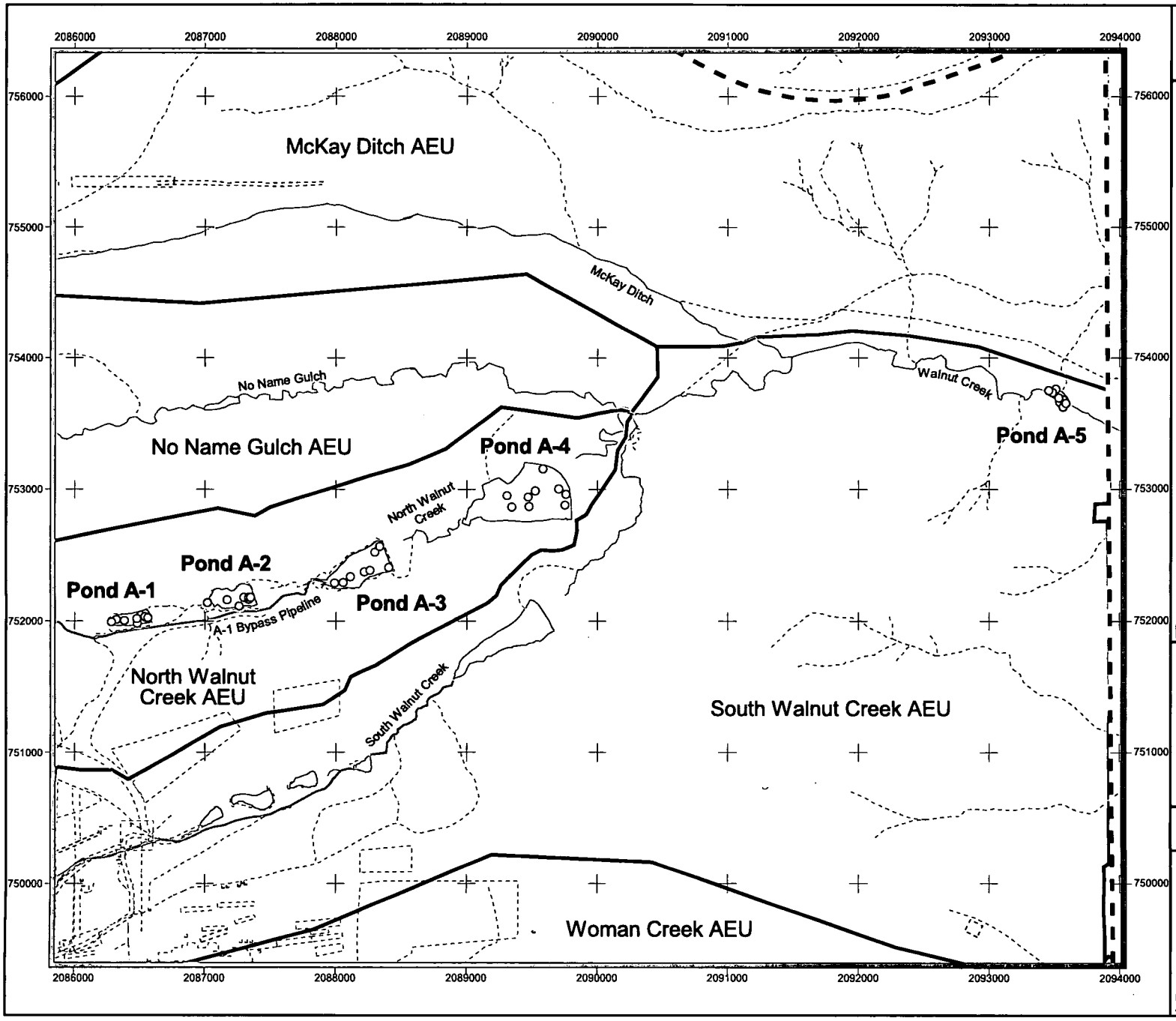

Figure 3.12
A Ponds
Sediment Sampling Locations
for Nickel

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 22.7 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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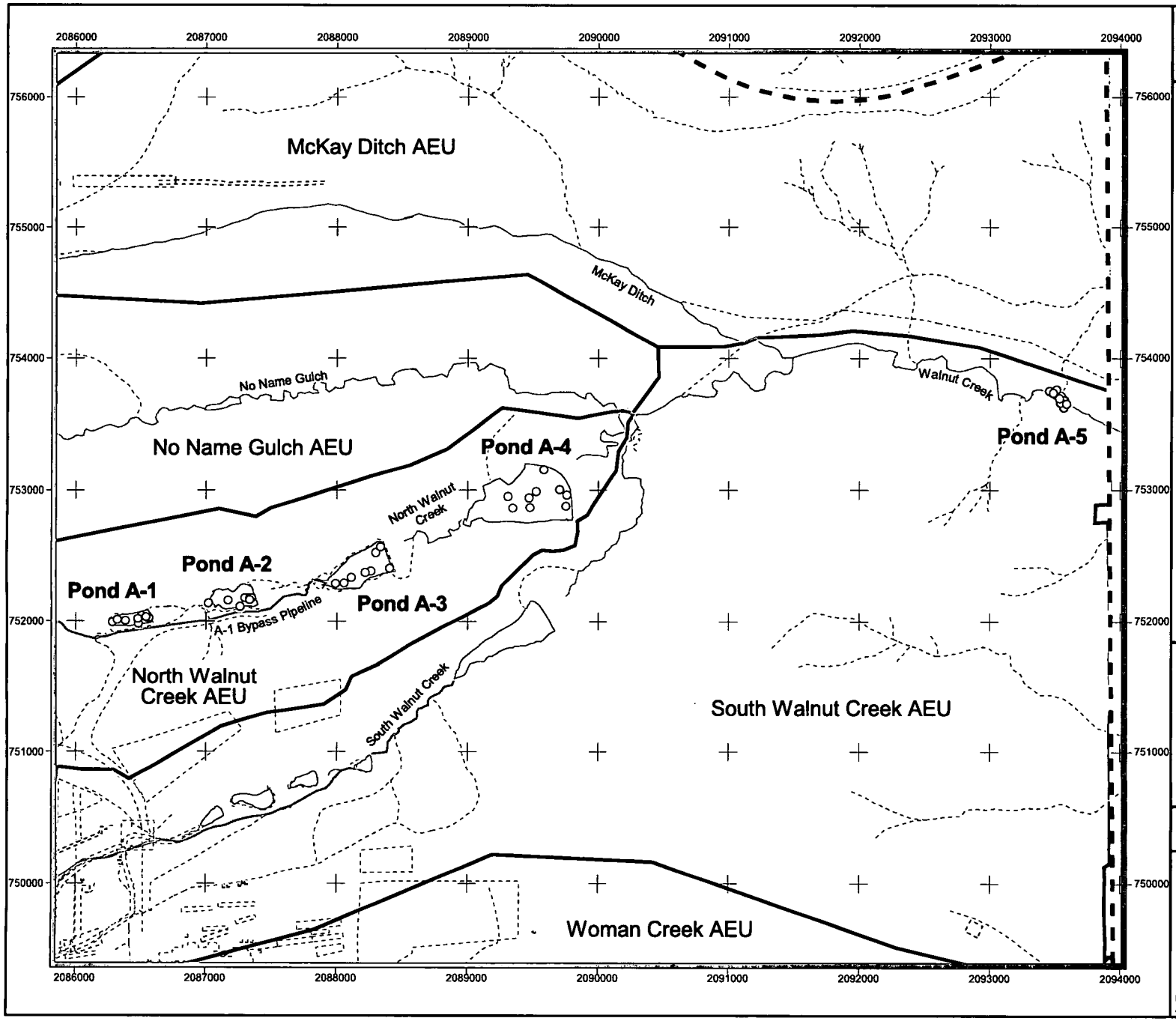

Figure 3.13
A Ponds
Sediment Sampling Locations
for Selenium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.95 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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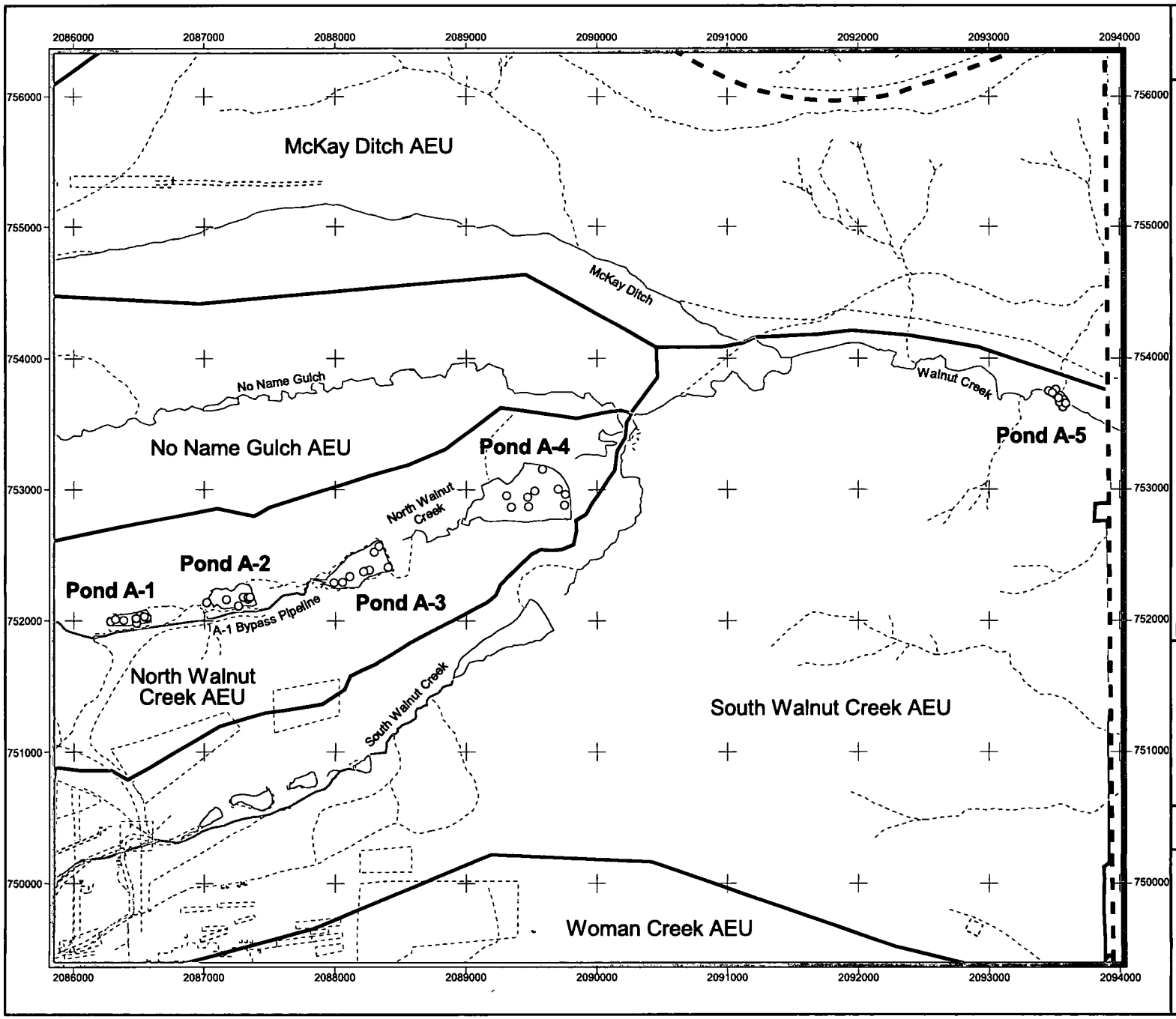

Figure 3.14
A Ponds
Sediment Sampling Locations
for Silver

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 1 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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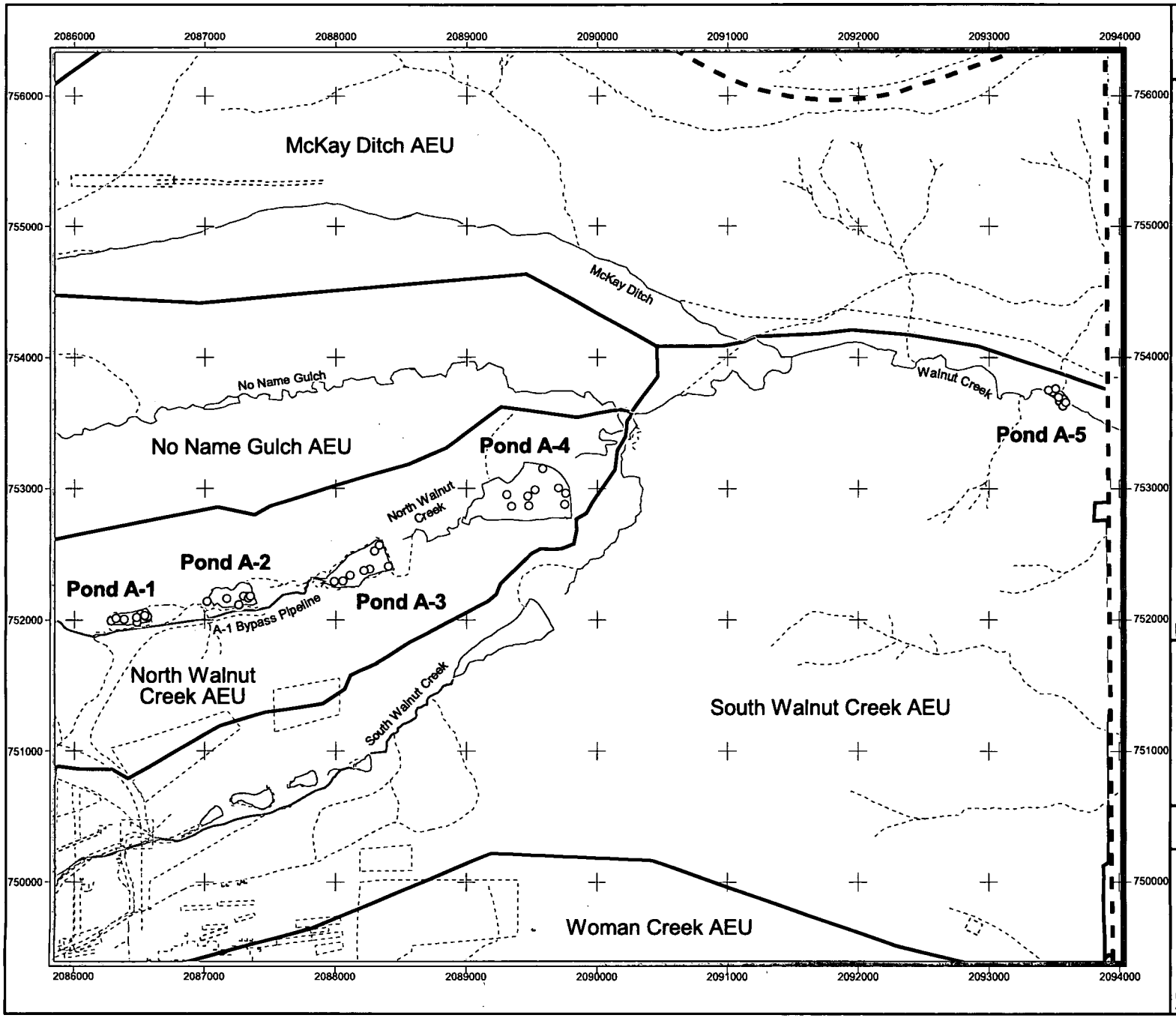

Figure 3.15
A Ponds
Sediment Sampling Locations
for Zinc

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 121 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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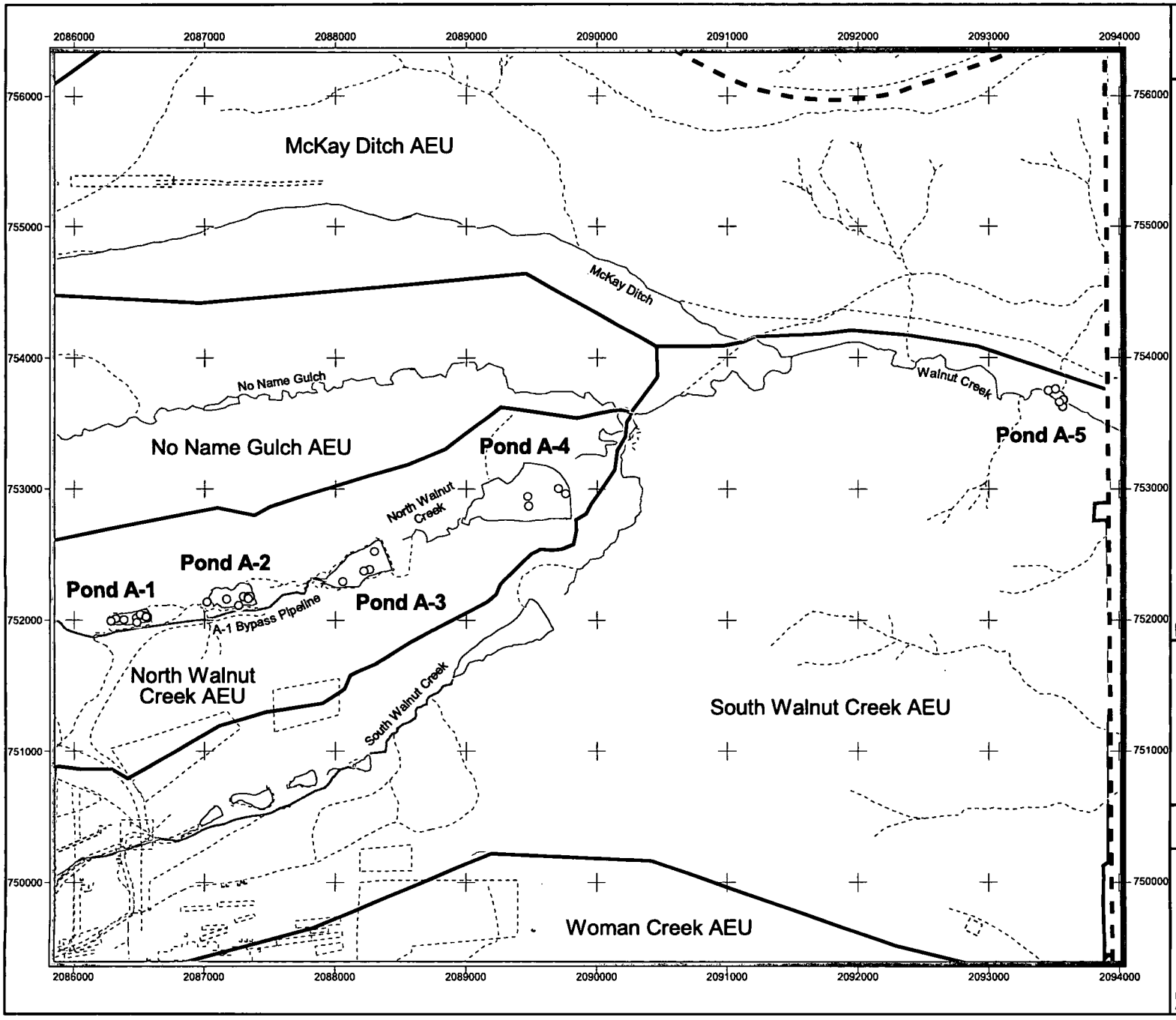

Figure 3.16
A Ponds
Sediment Sampling Locations
for Acenaphthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 6.71 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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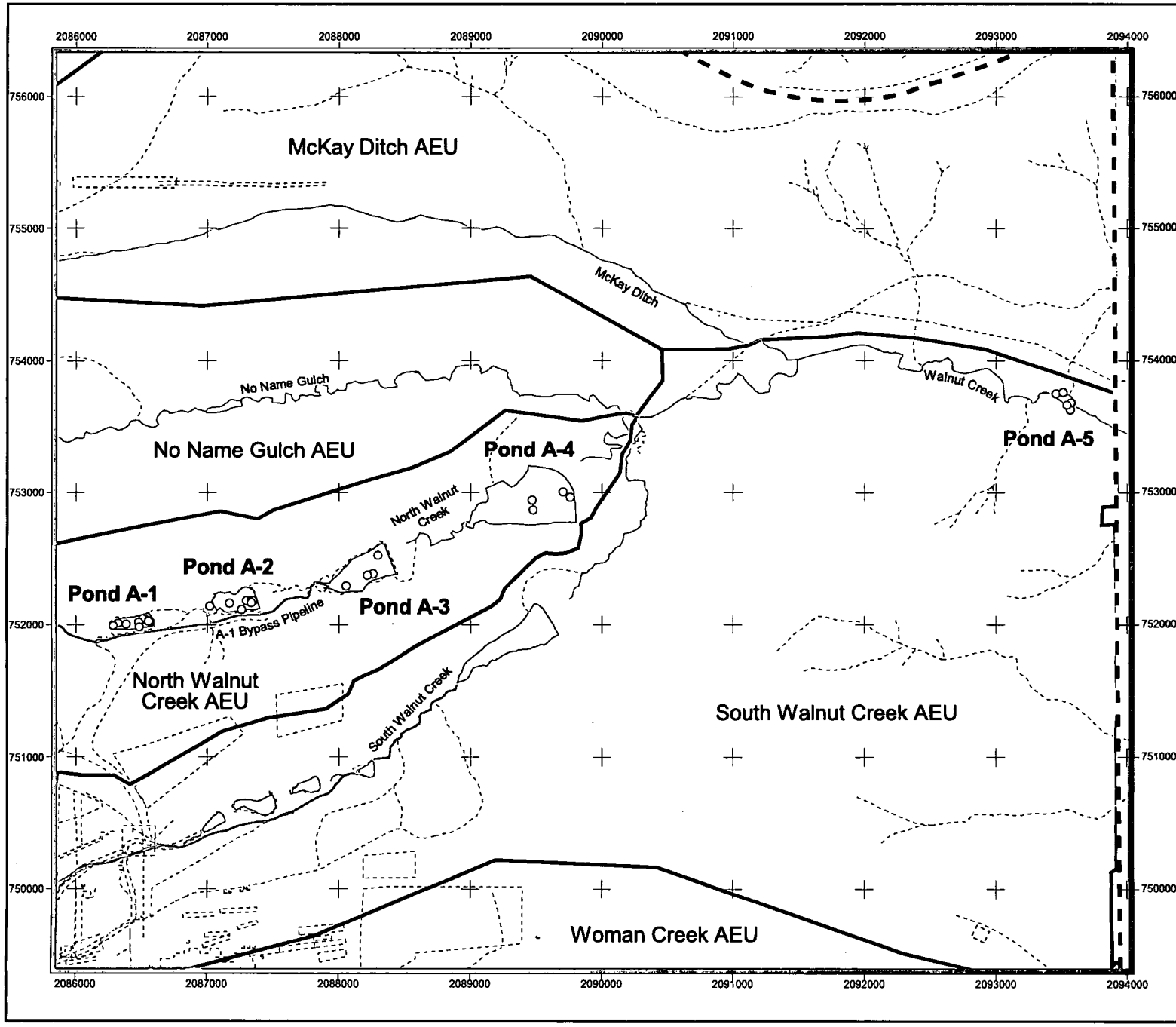

Figure 3.17
A Ponds
Sediment Sampling Locations
for Anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 57.2 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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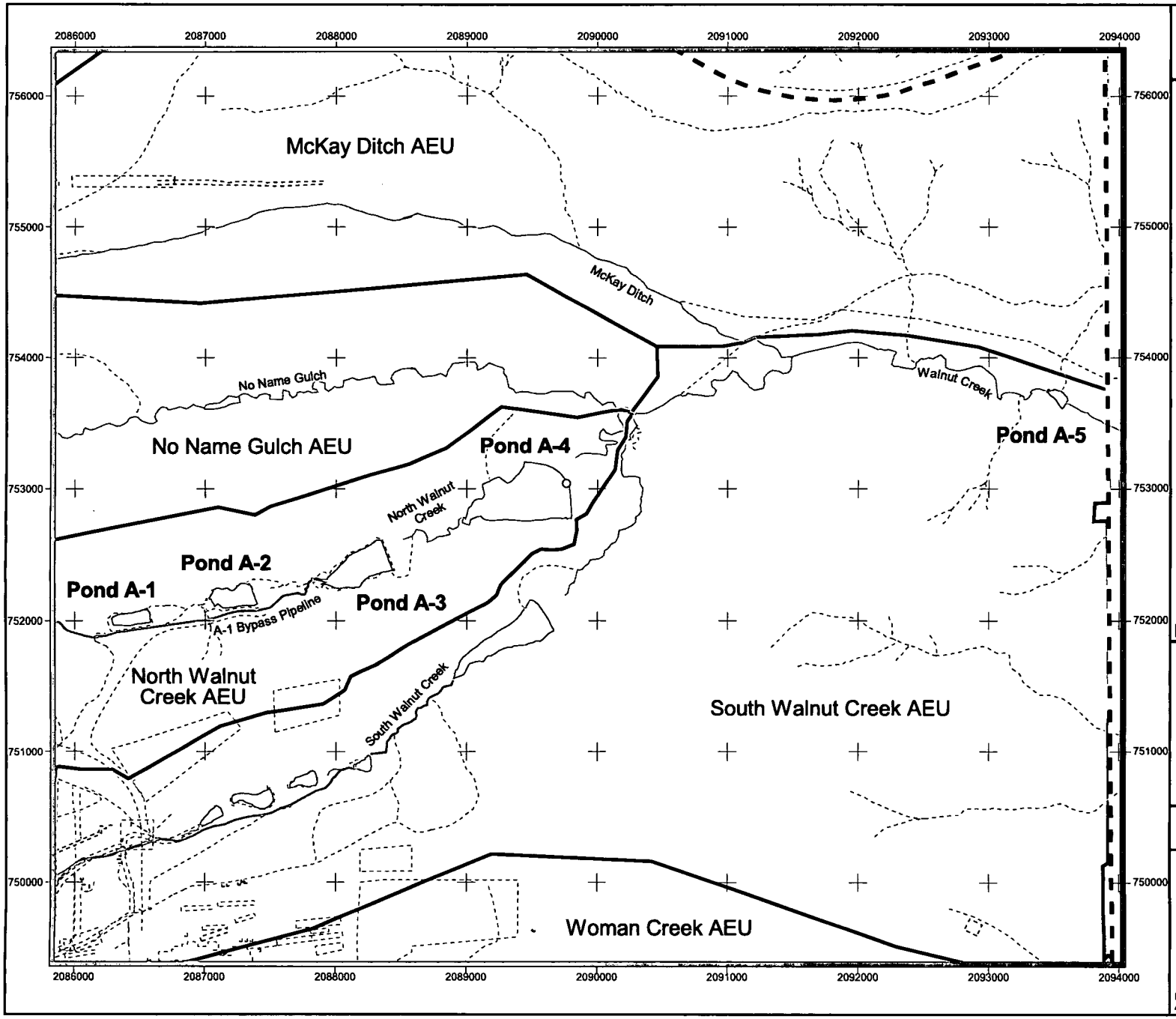

Figure 3.18
A Ponds
Sediment Sampling Locations
for Atrazine

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 16.8192 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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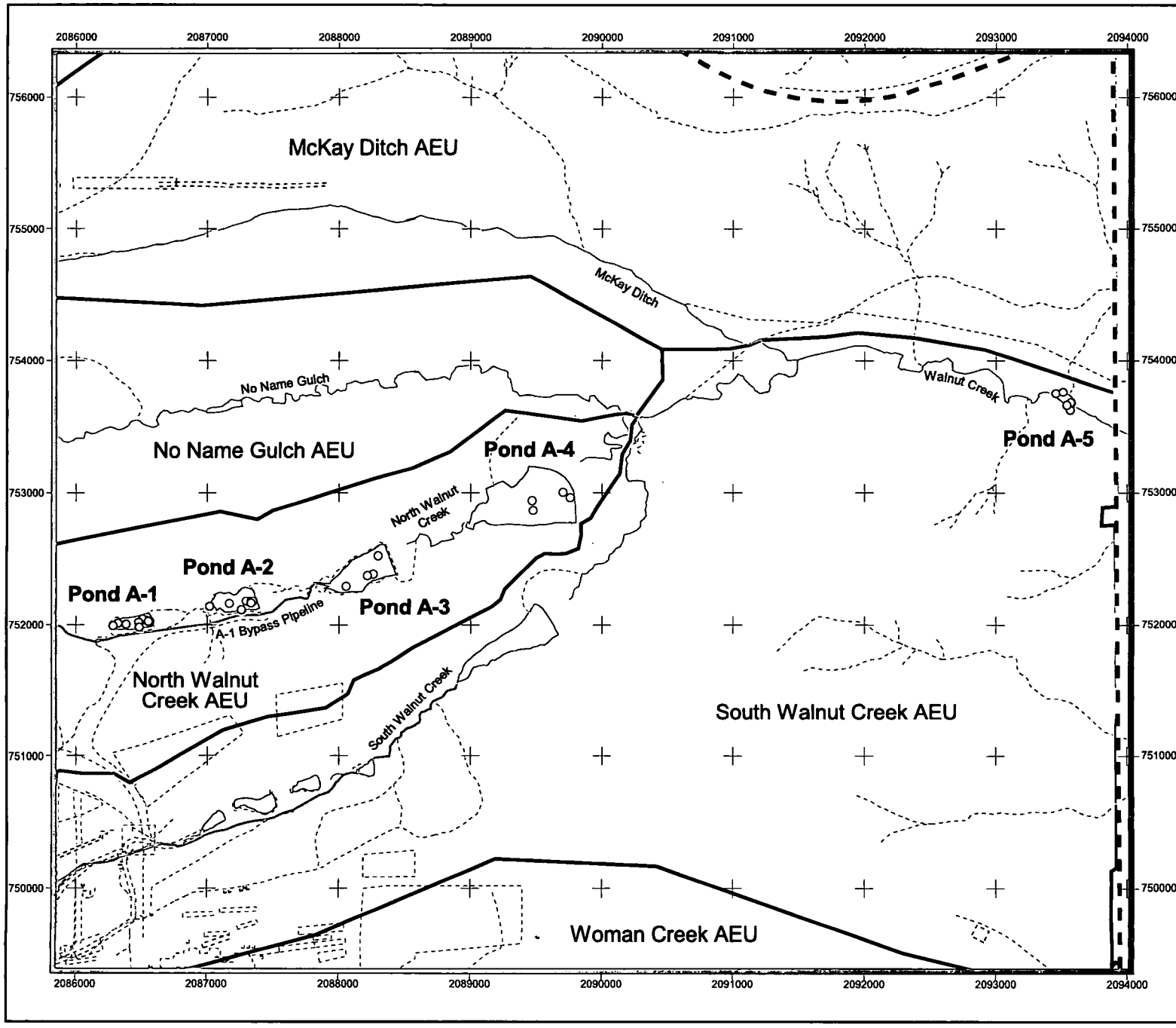

Figure 3.19
A Ponds
Sediment Sampling Locations
for Benzo(a)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 108 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

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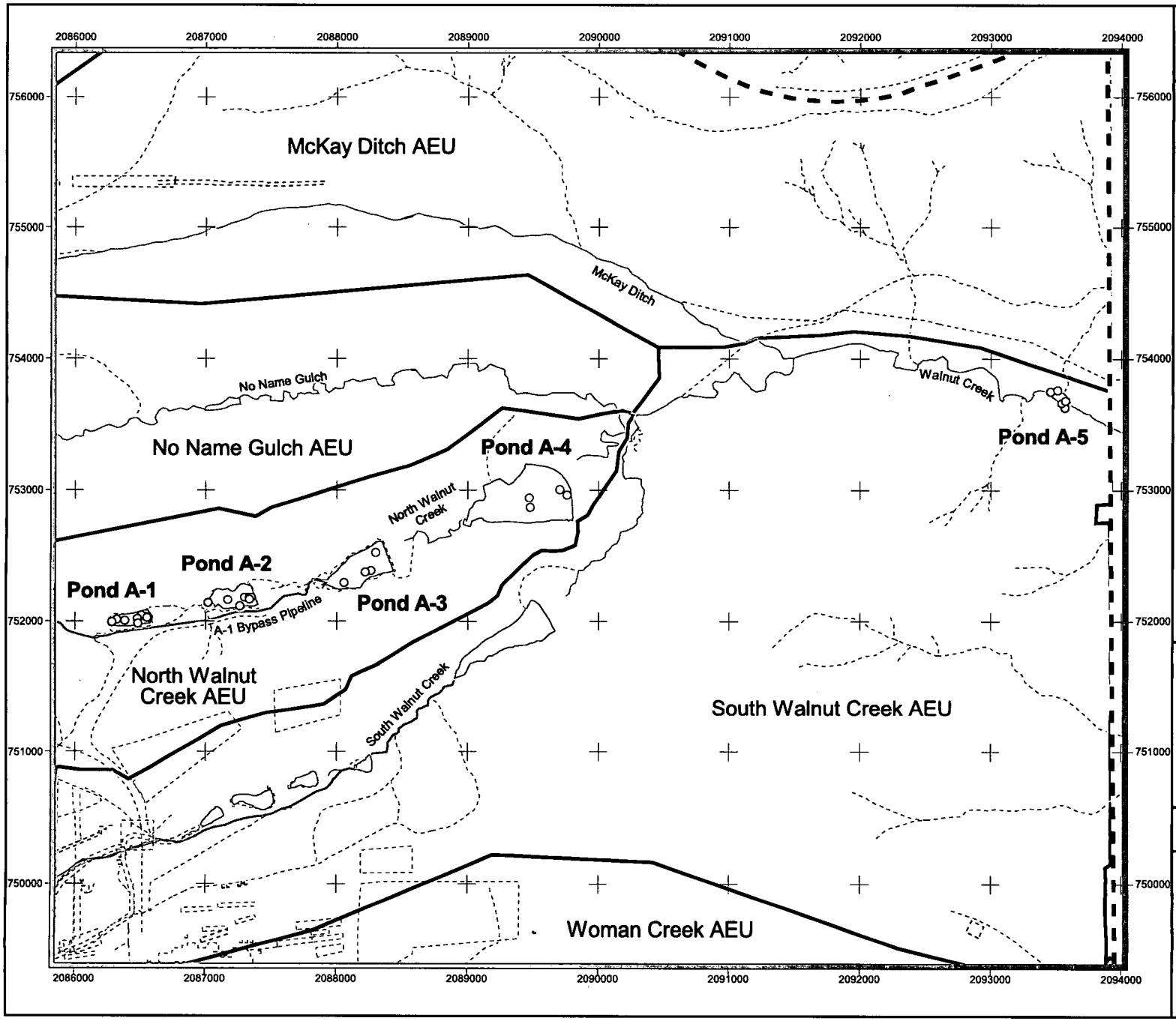

Figure 3.20
A Ponds
Sediment Sampling Locations
for Benzo(a)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 150 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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447

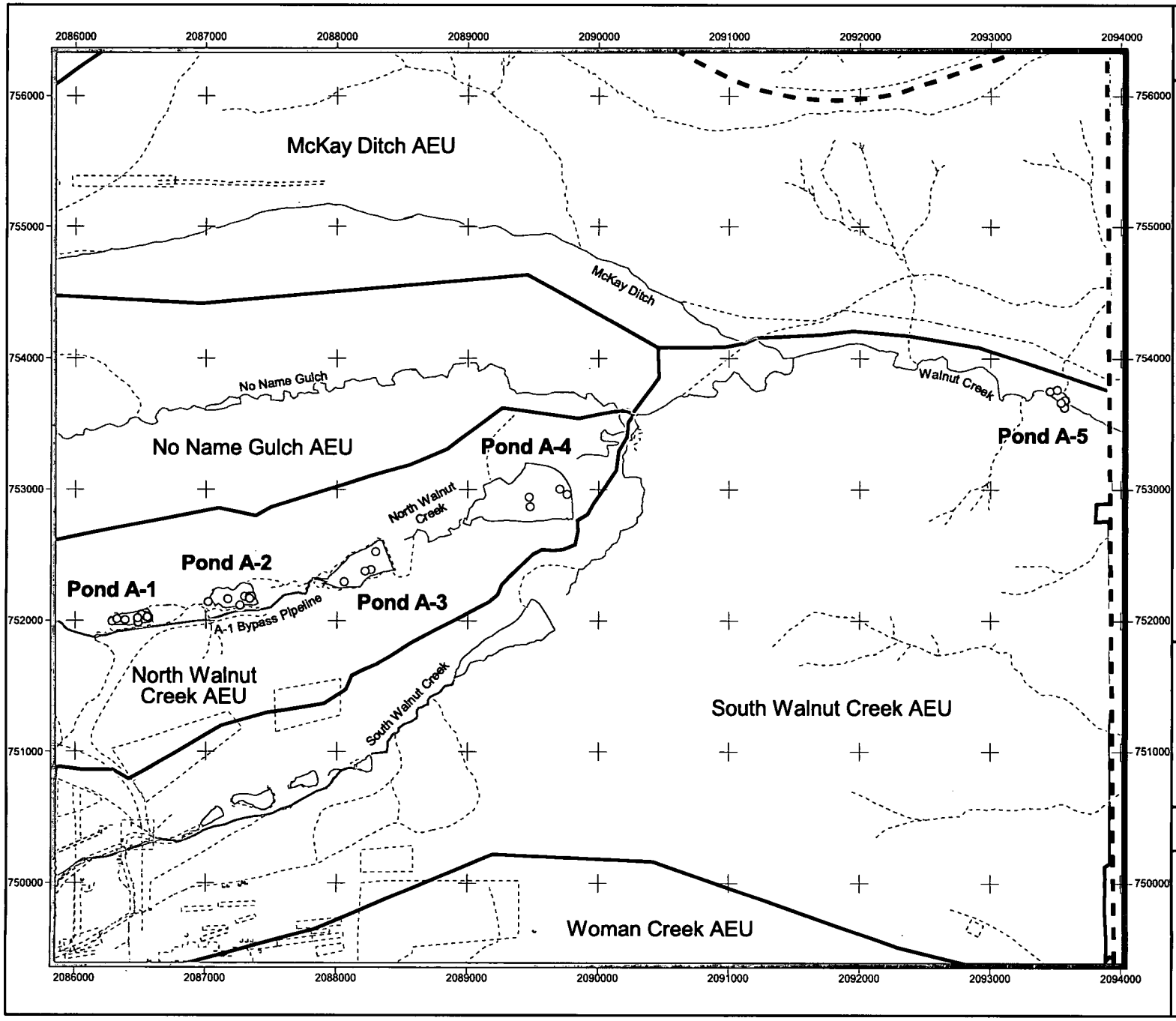

Figure 3.21
A Ponds
Sediment Sampling Locations
for Benzo(g,h,i)perylene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 13 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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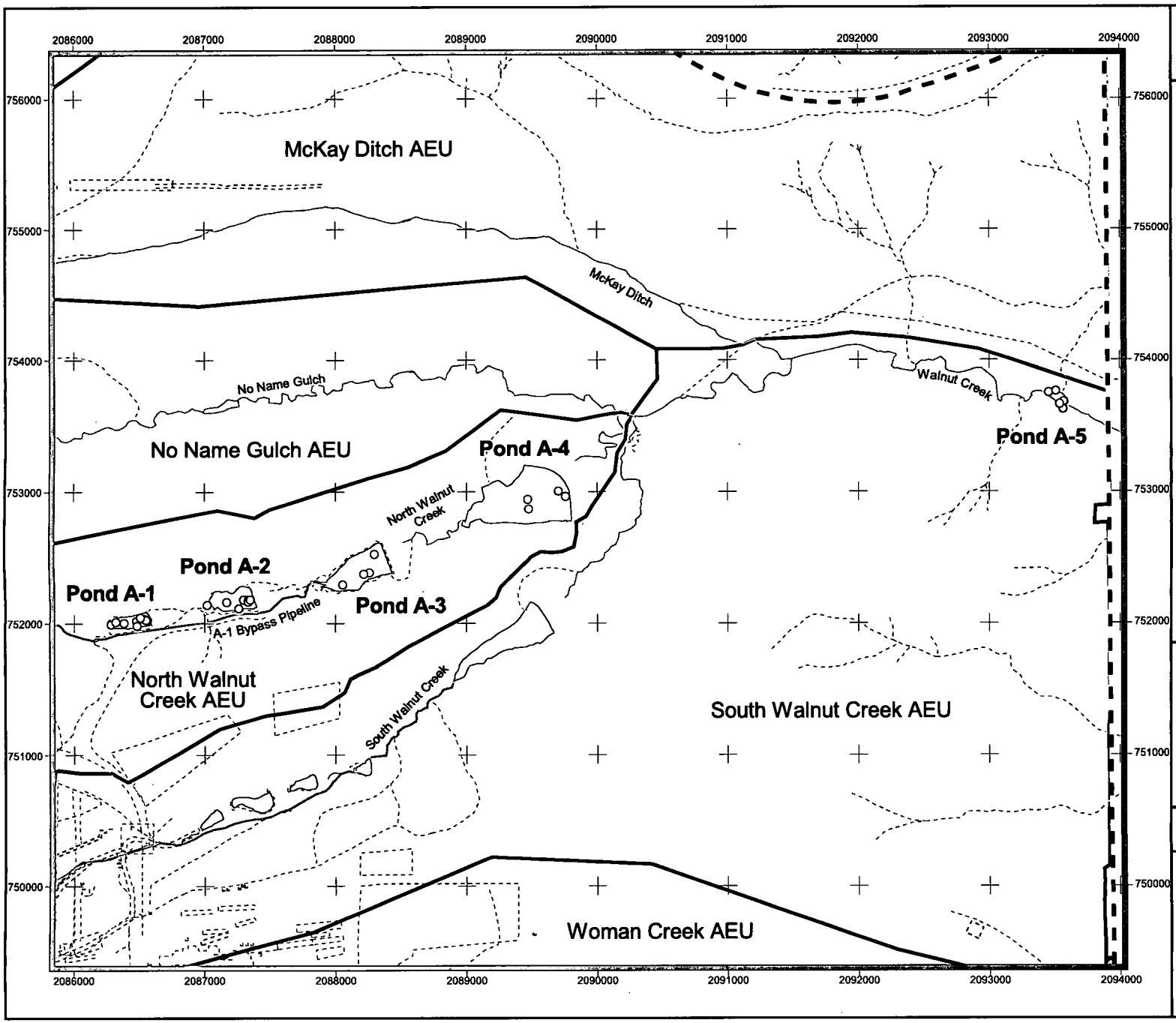

Figure 3.22
A Ponds
Sediment Sampling Locations
for bis(2-ethylhexyl)phthalate

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 24900 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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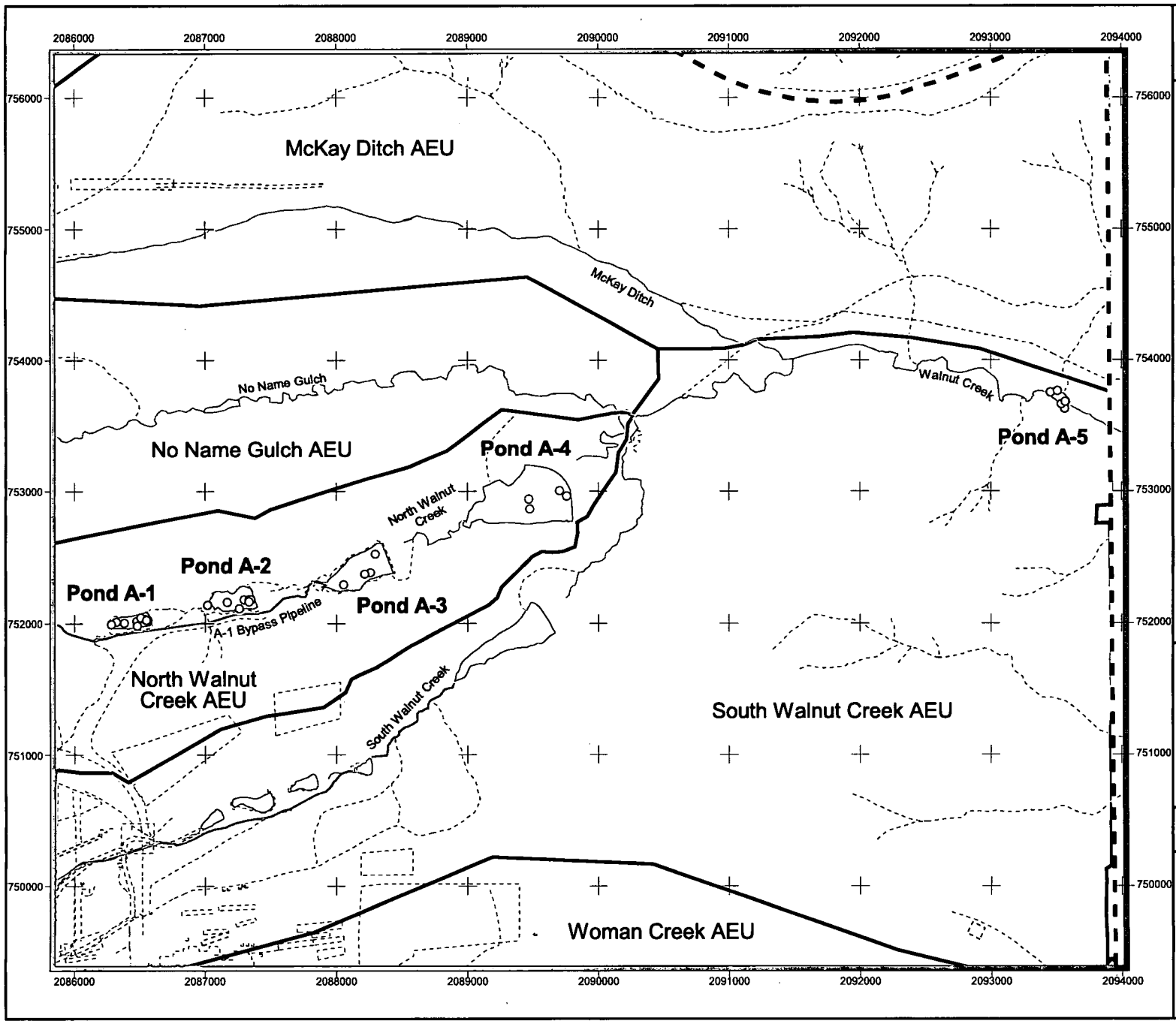

Figure 3.23
A Ponds
Sediment Sampling Locations
for Chrysene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 166 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

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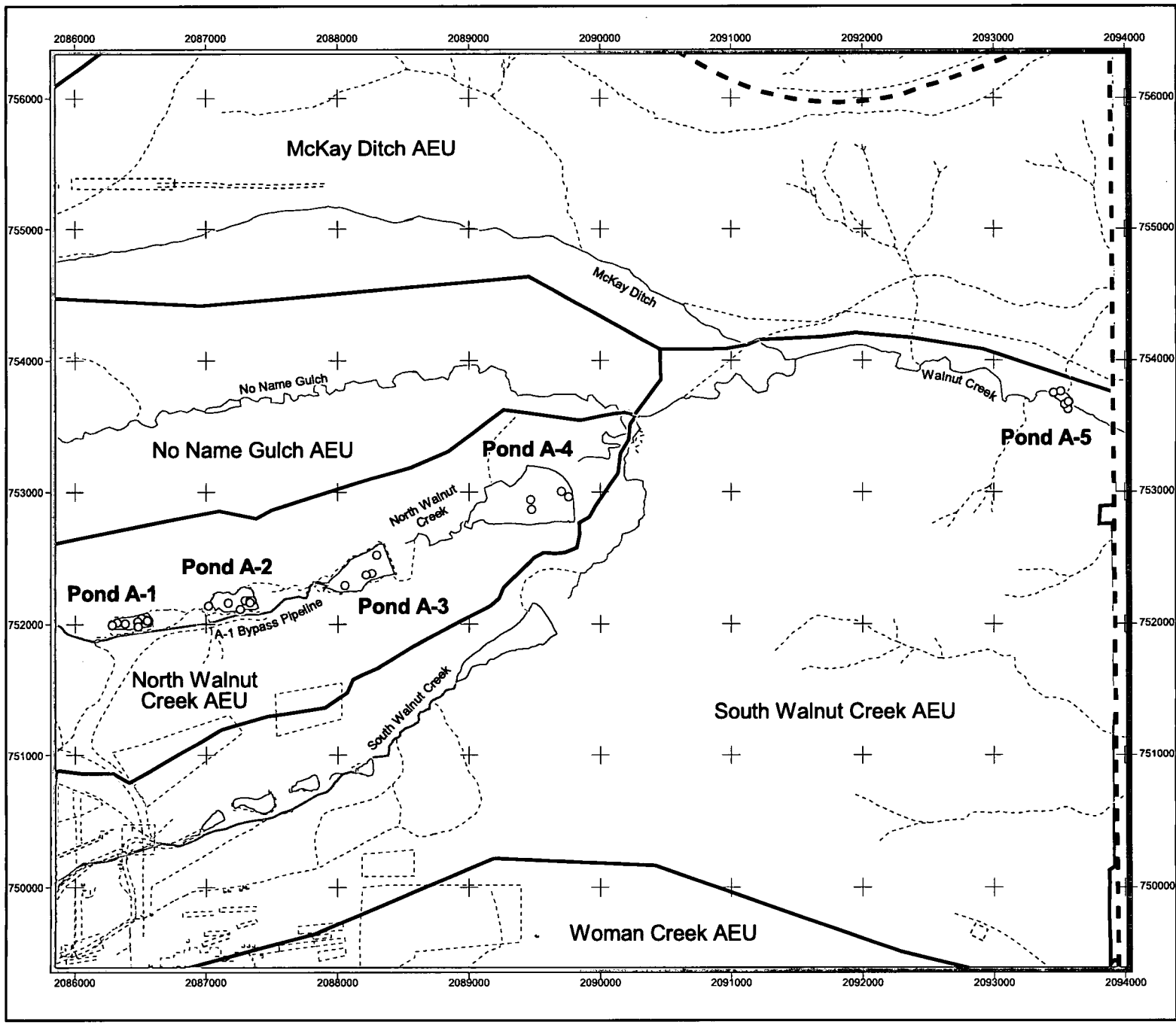

Figure 3.24
A Ponds
Sediment Sampling Locations
for Fluoranthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 423 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

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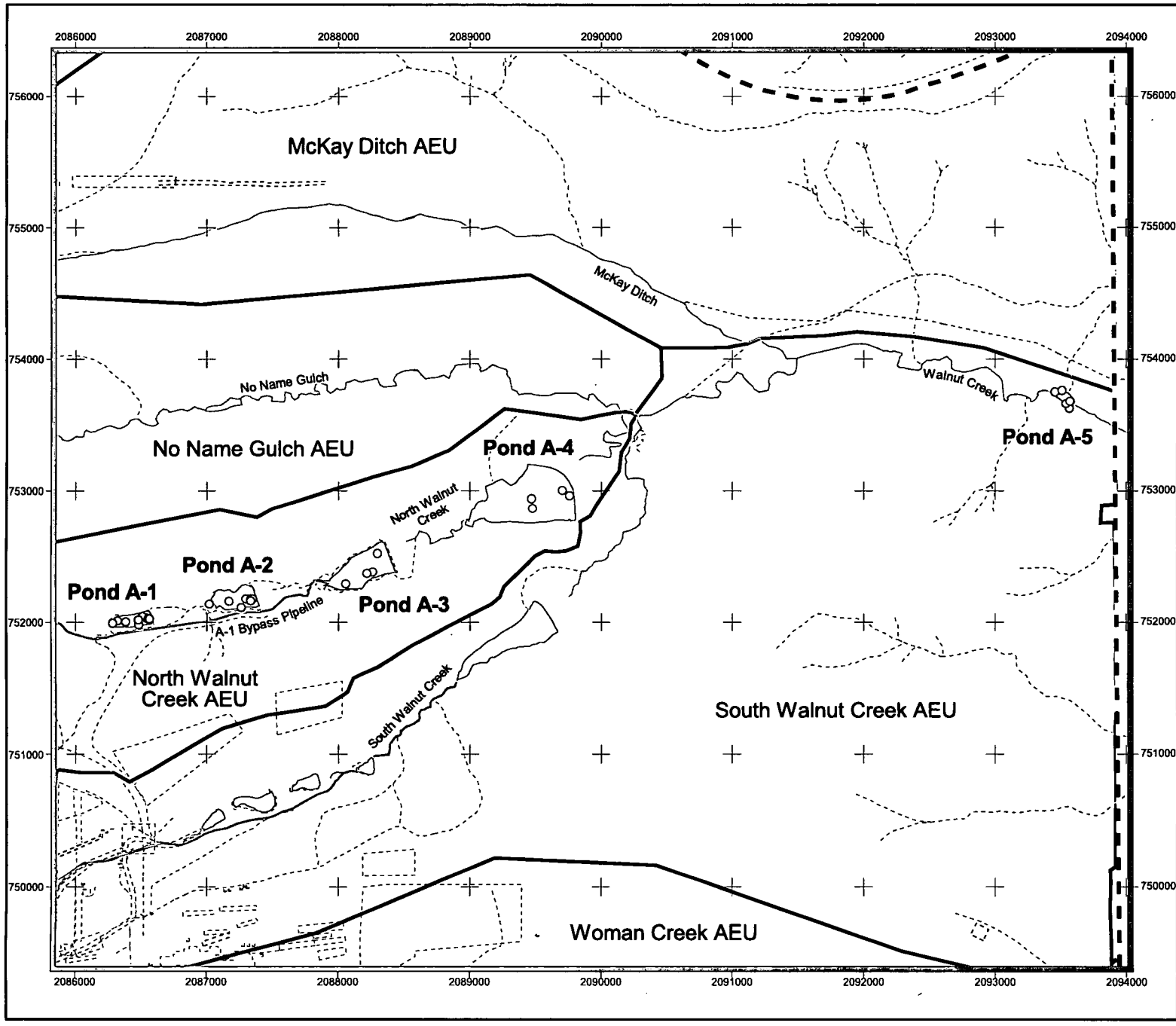

Figure 3.25
A Ponds
Sediment Sampling Locations
for Indeno(1,2,3-cd)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 17 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

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Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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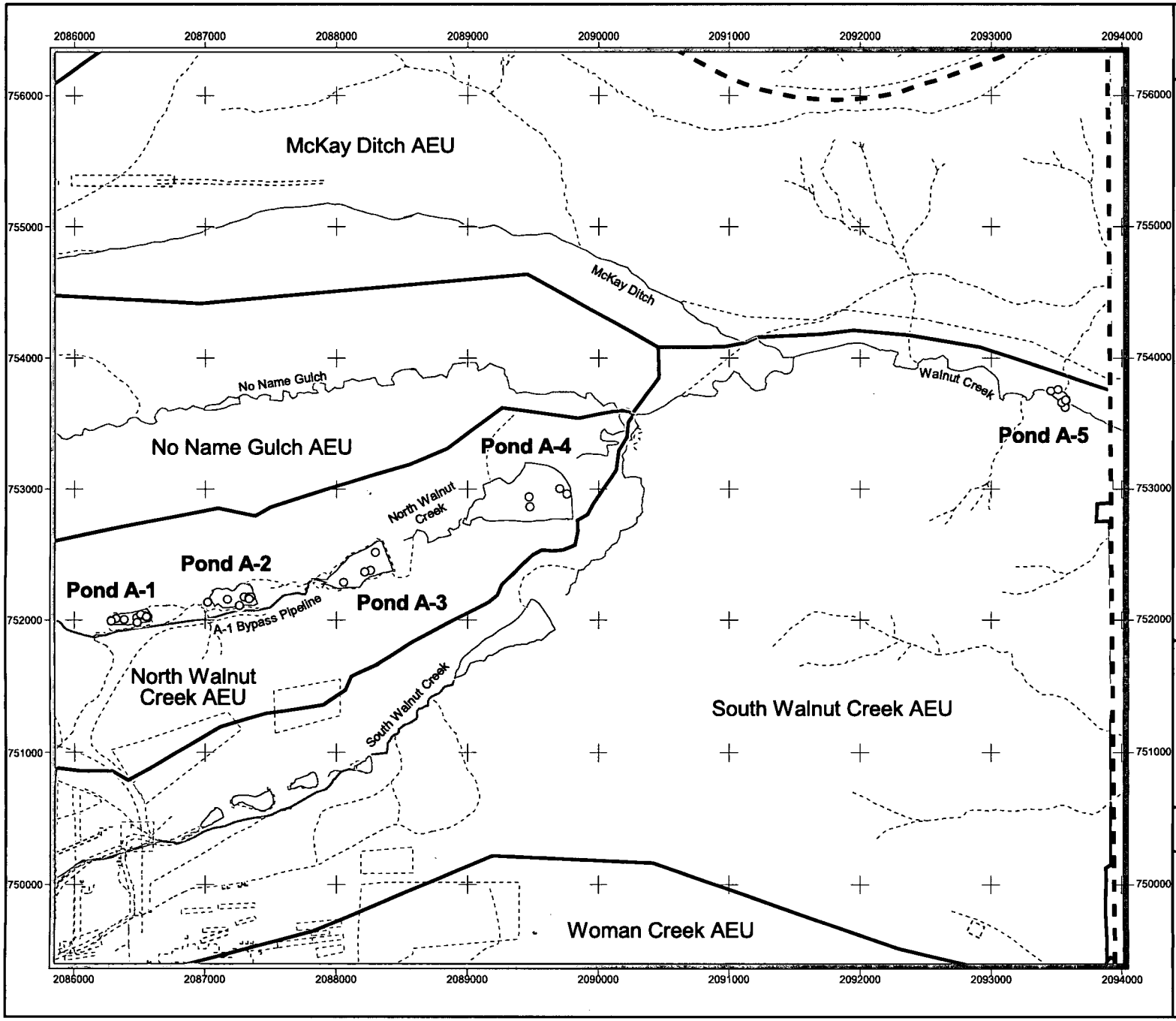

Figure 3.26
A Ponds
Sediment Sampling Locations
for Phenanthrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 204 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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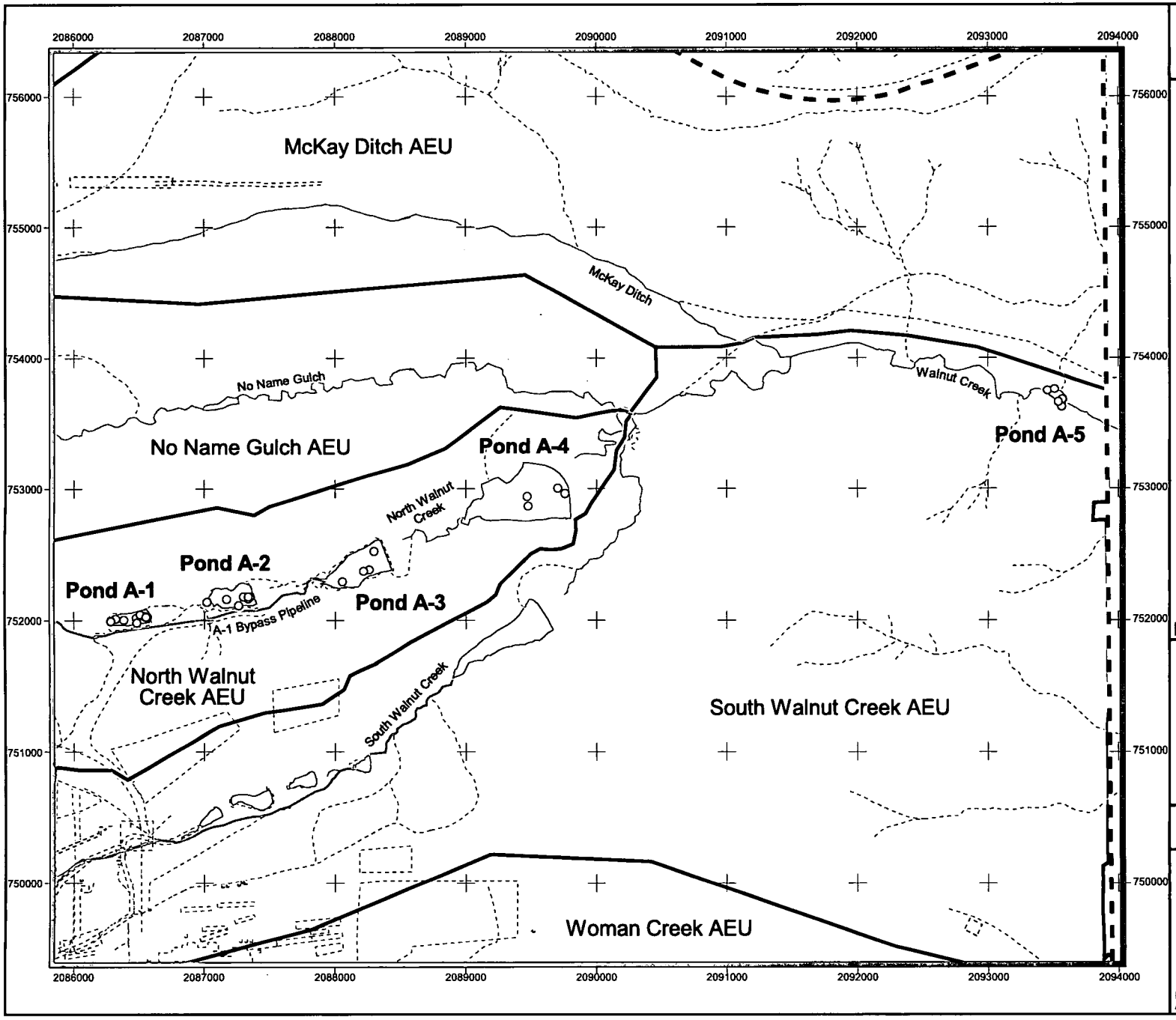

Figure 3.27
A Ponds
Sediment Sampling Locations
for Pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 195 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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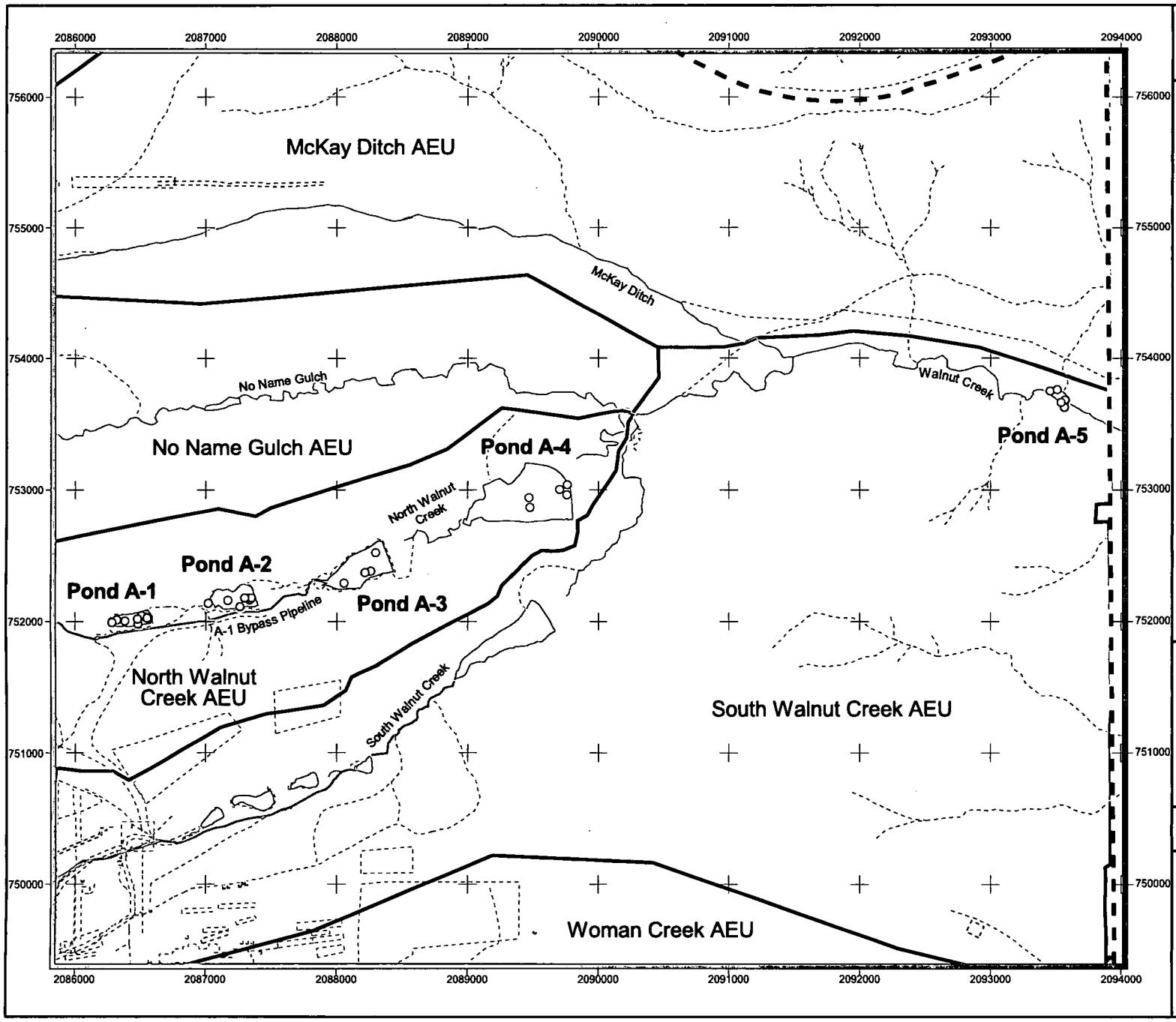

Figure 3.28
A Ponds
Sediment Sampling Locations
for PCB-1254

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 40 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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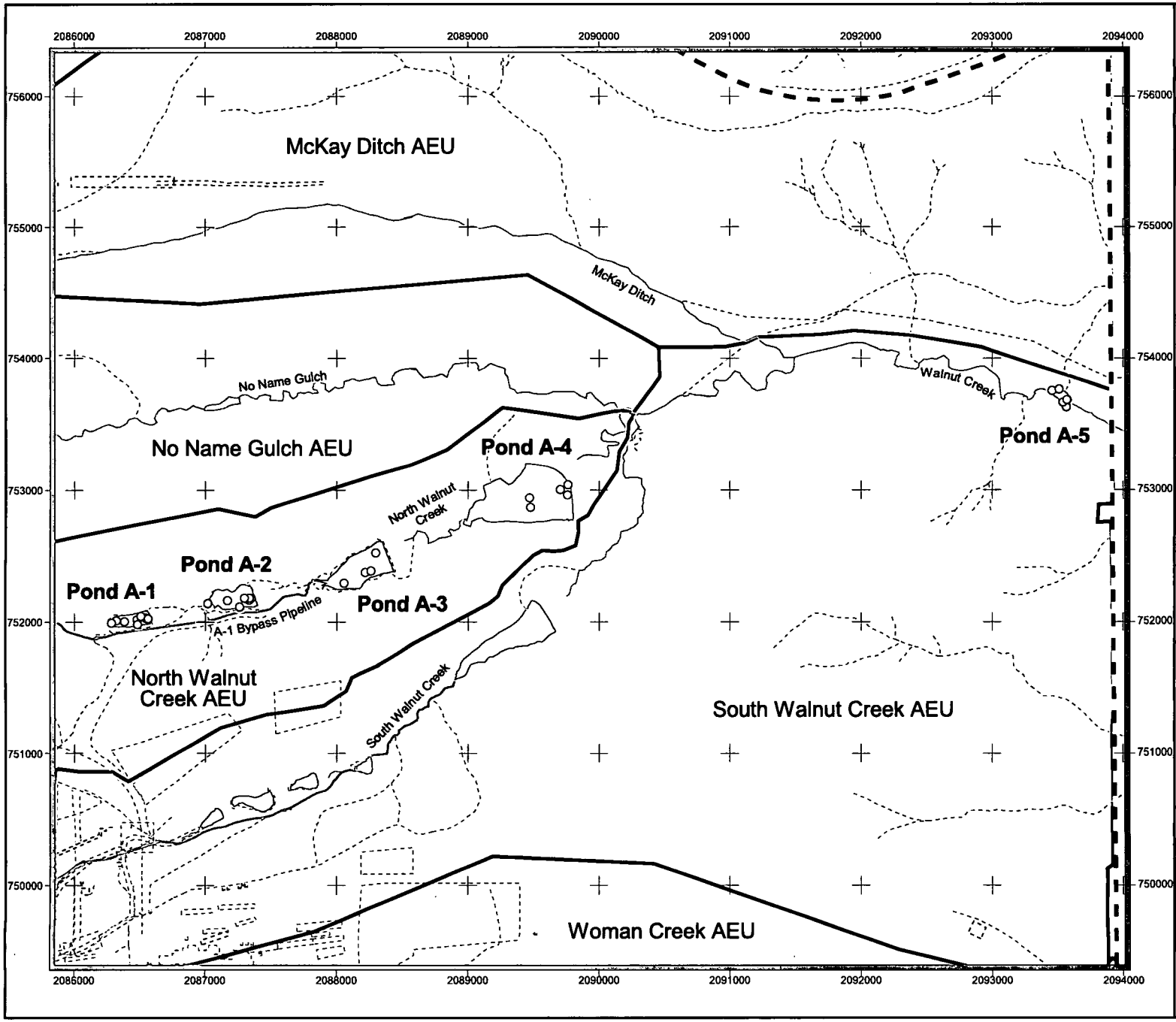

Figure 3.29
A Ponds
Sediment Sampling Locations
for PCB-1260

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 40 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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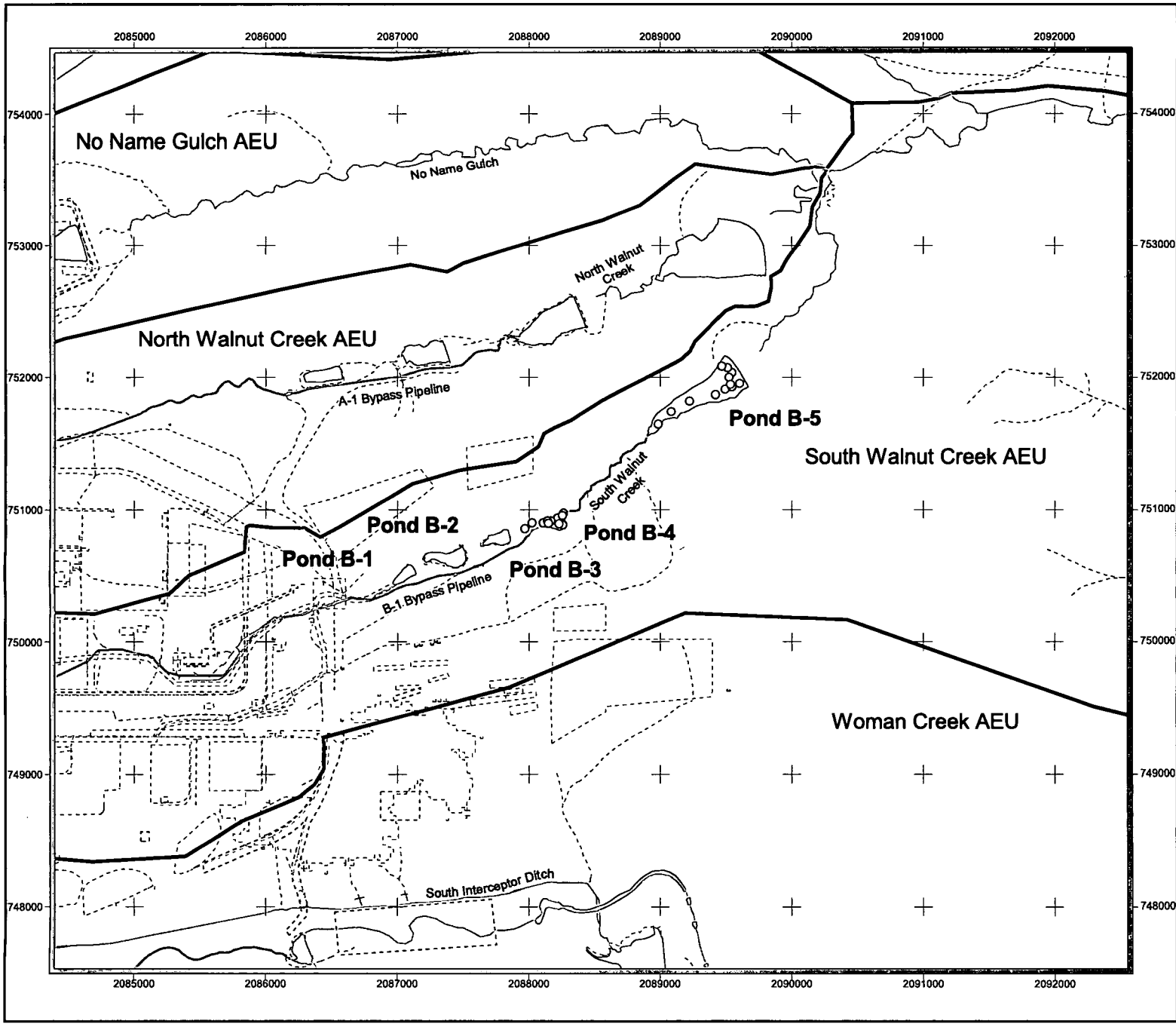

Figure 3.30
B Ponds
Sediment Sampling Locations
for Aluminum

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 15900 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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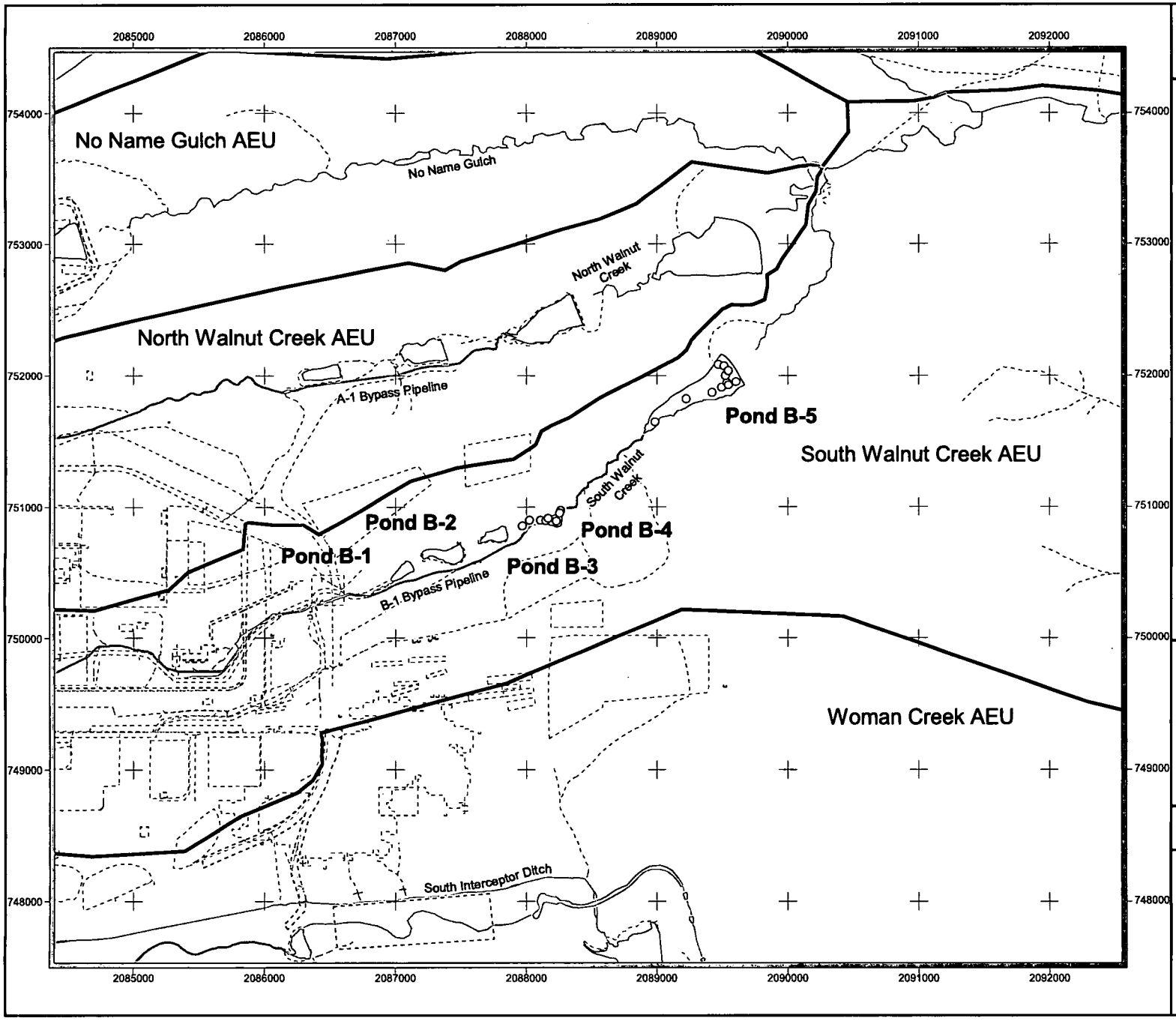

Figure 3.31
B Ponds
Sediment Sampling Locations
for Antimony

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 2 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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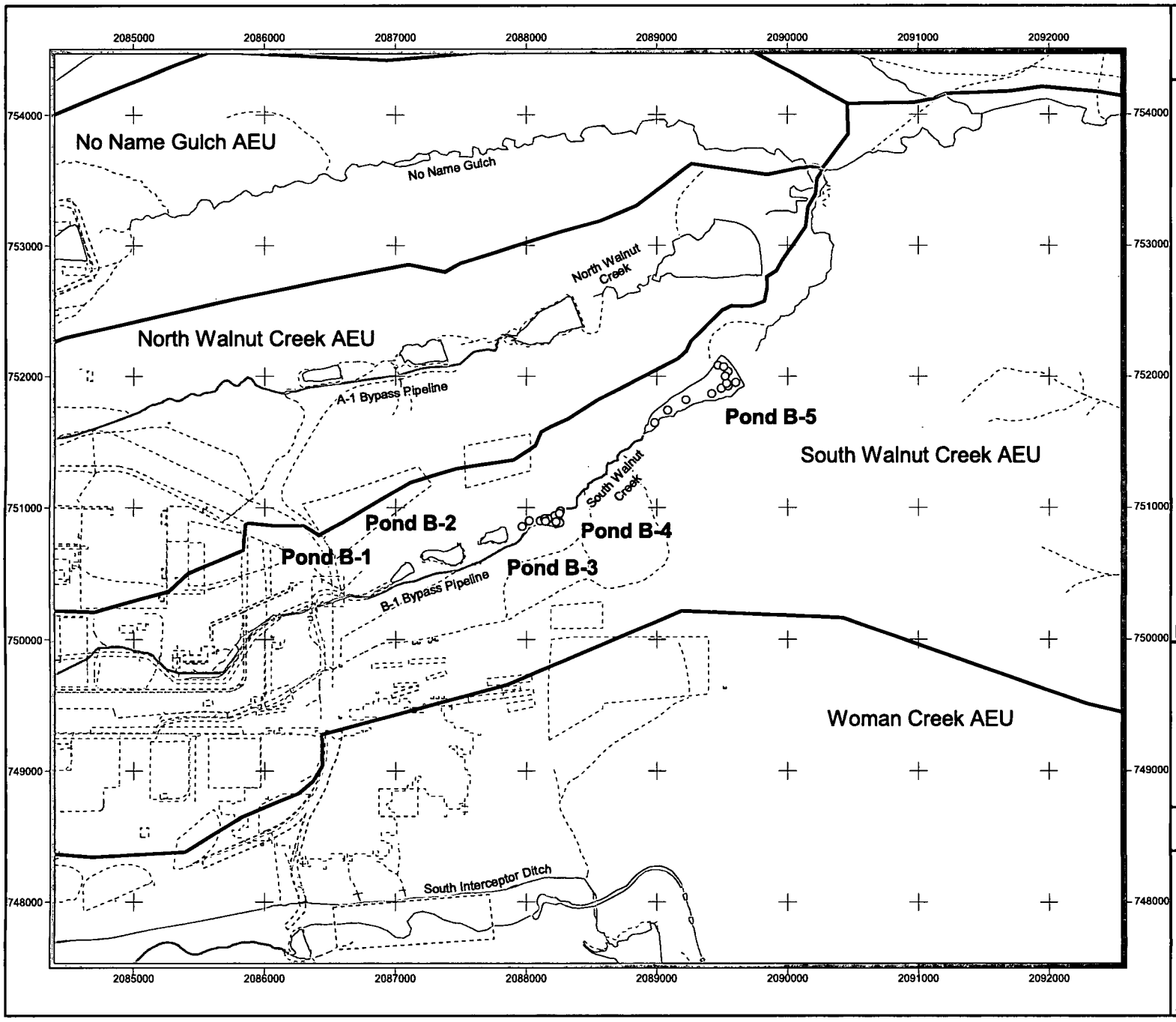

Figure 3.32
B Ponds
Sediment Sampling Locations
for Barium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 189 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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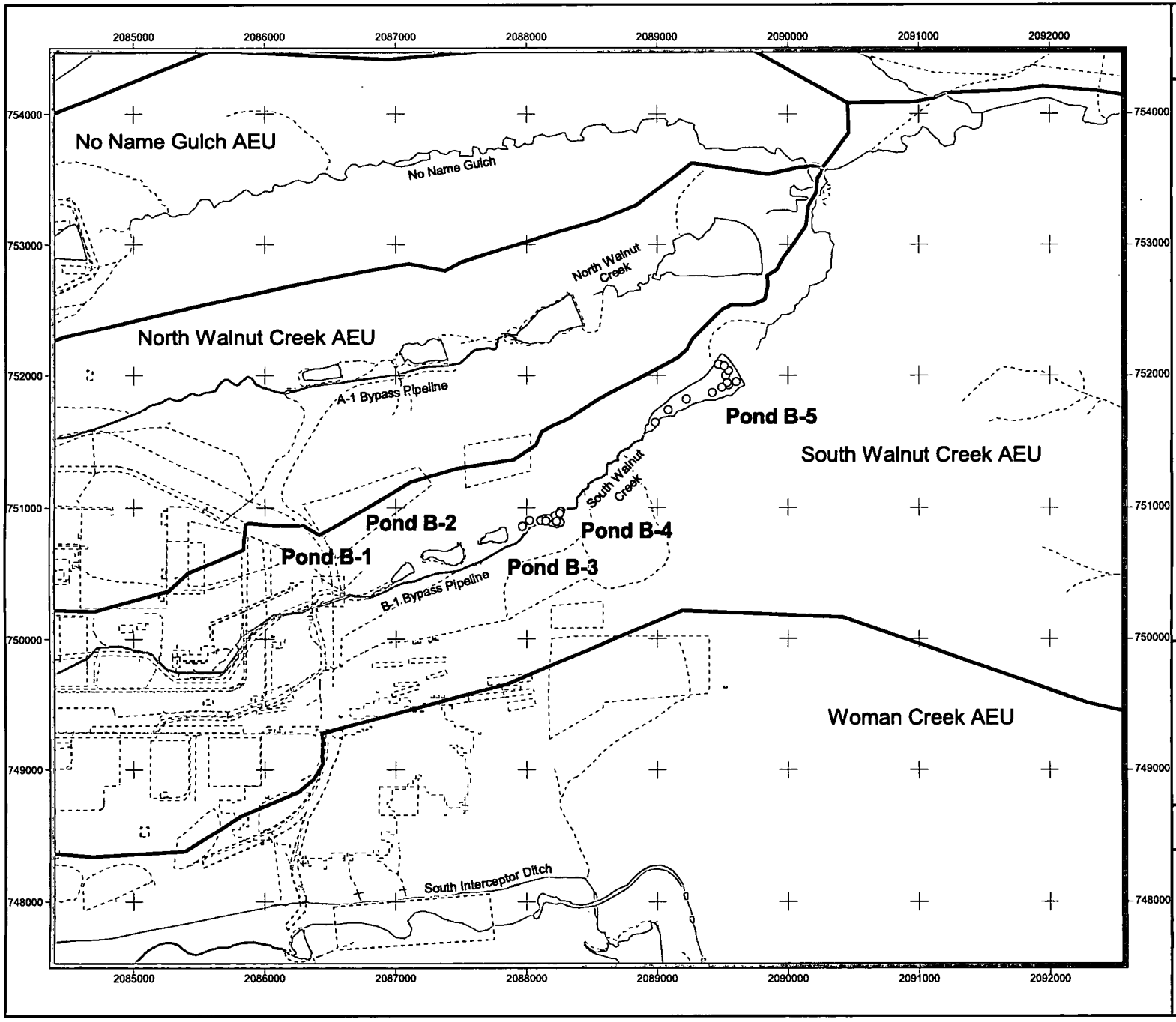

Figure 3.33
B Ponds
Sediment Sampling Locations
for Cadmium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.99 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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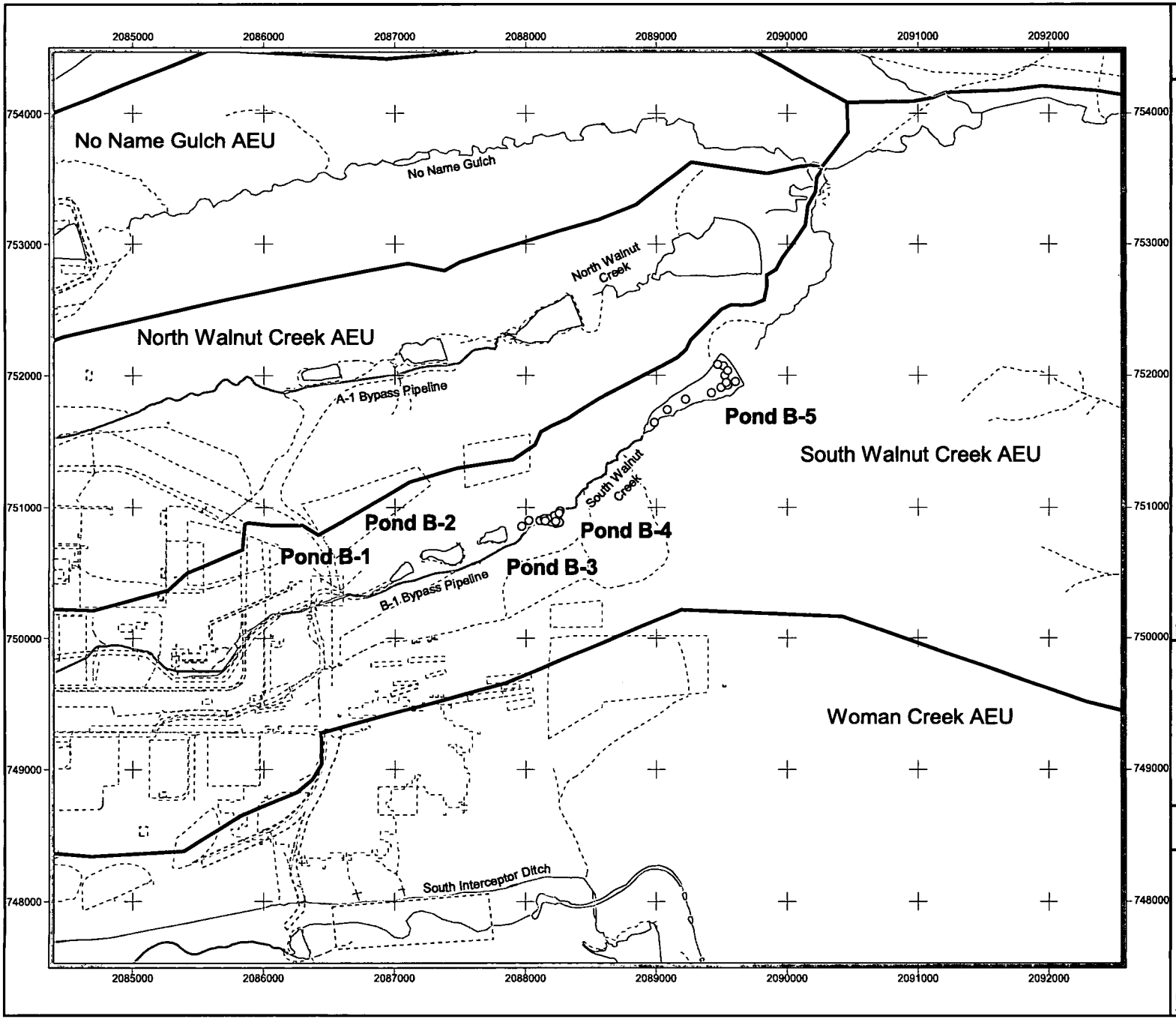

Figure 3.34
B Ponds
Sediment Sampling Locations
for Chromium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 43.4 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
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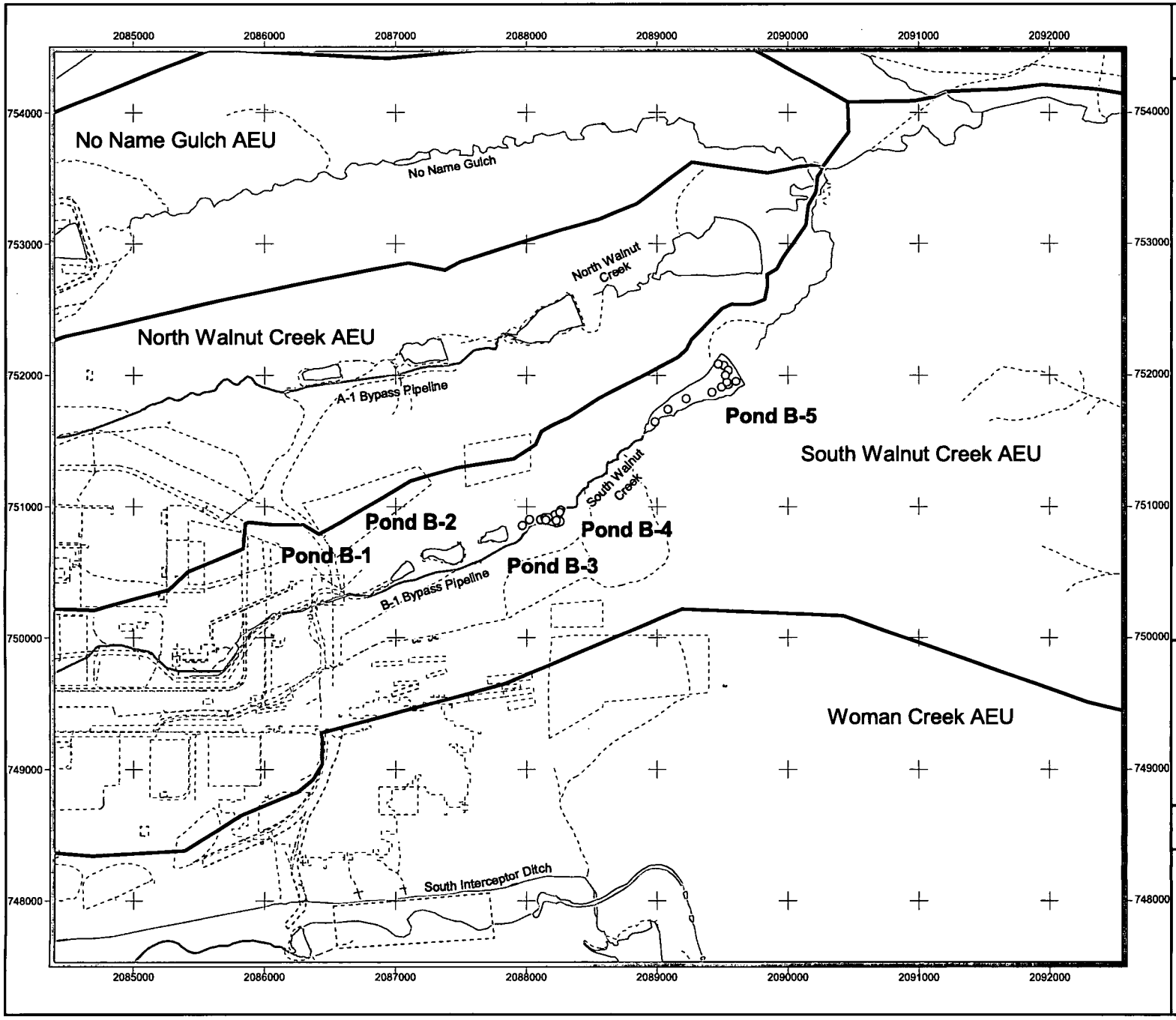

Figure 3.35
B Ponds
Sediment Sampling Locations
for Copper

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 31.6 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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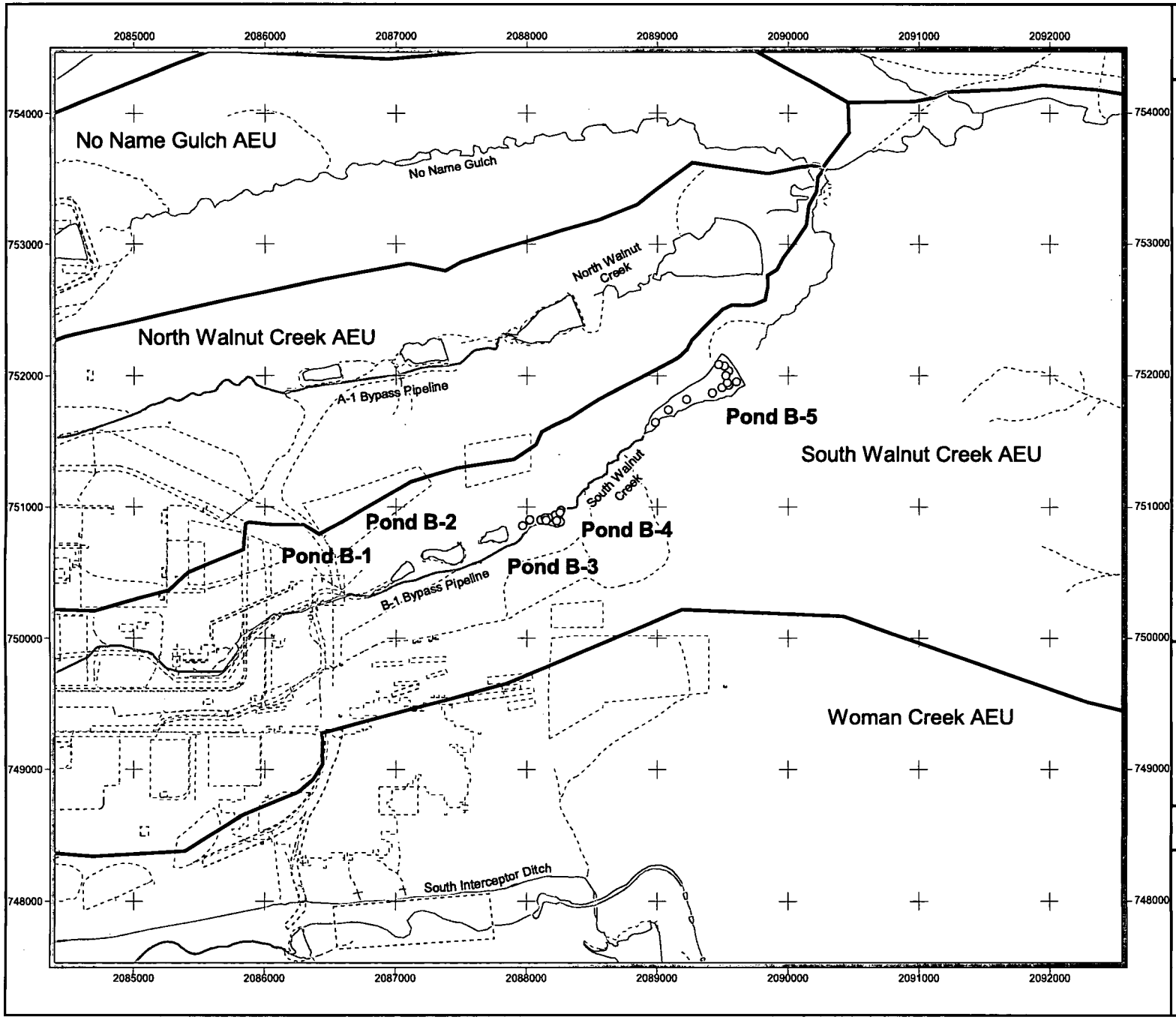

Figure 3.36
B Ponds
Sediment Sampling Locations
for Iron

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 20000 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

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Scale 1:13,200
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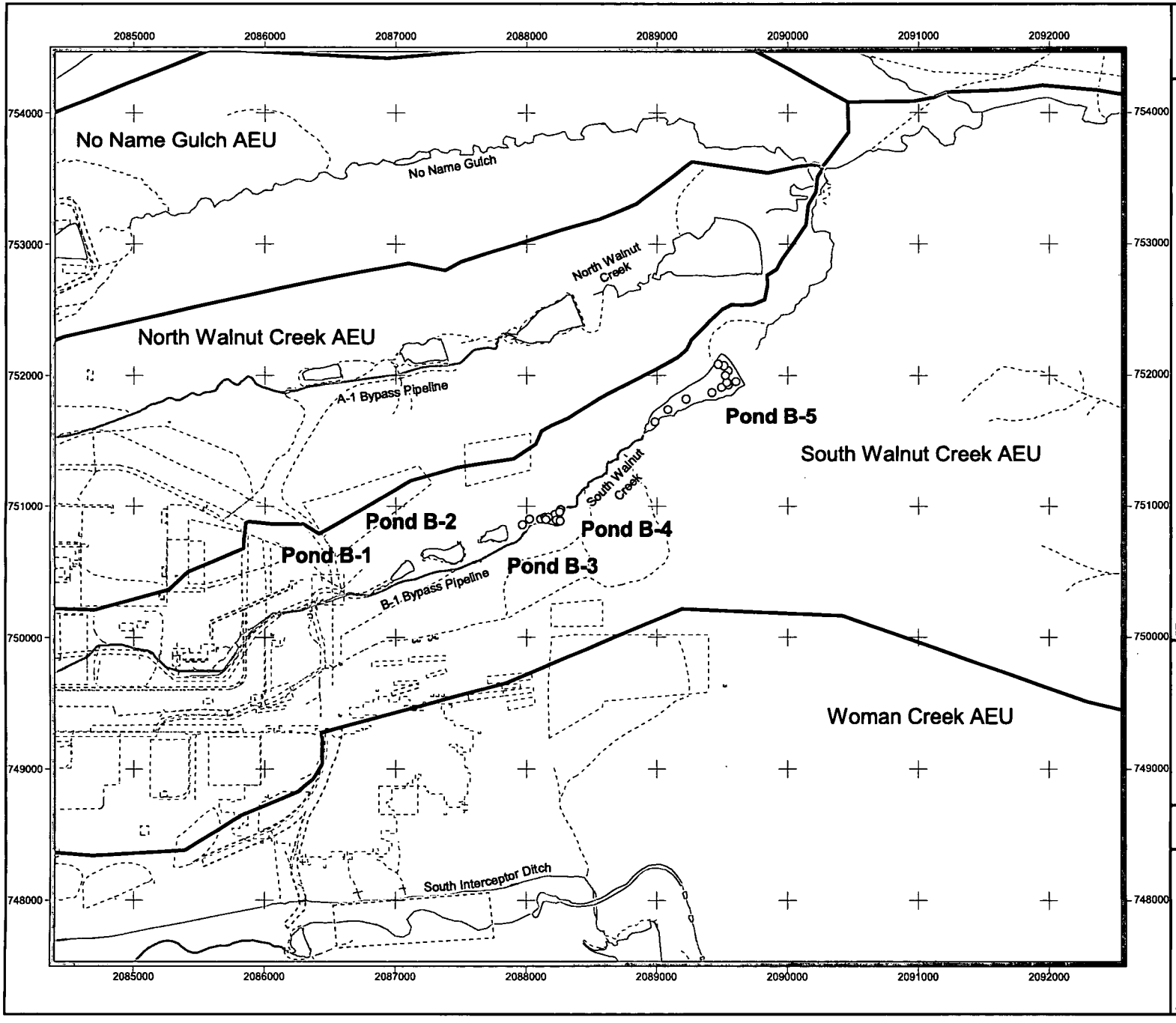

Figure 3.37
B Ponds
Sediment Sampling Locations
for Lead

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 35.8 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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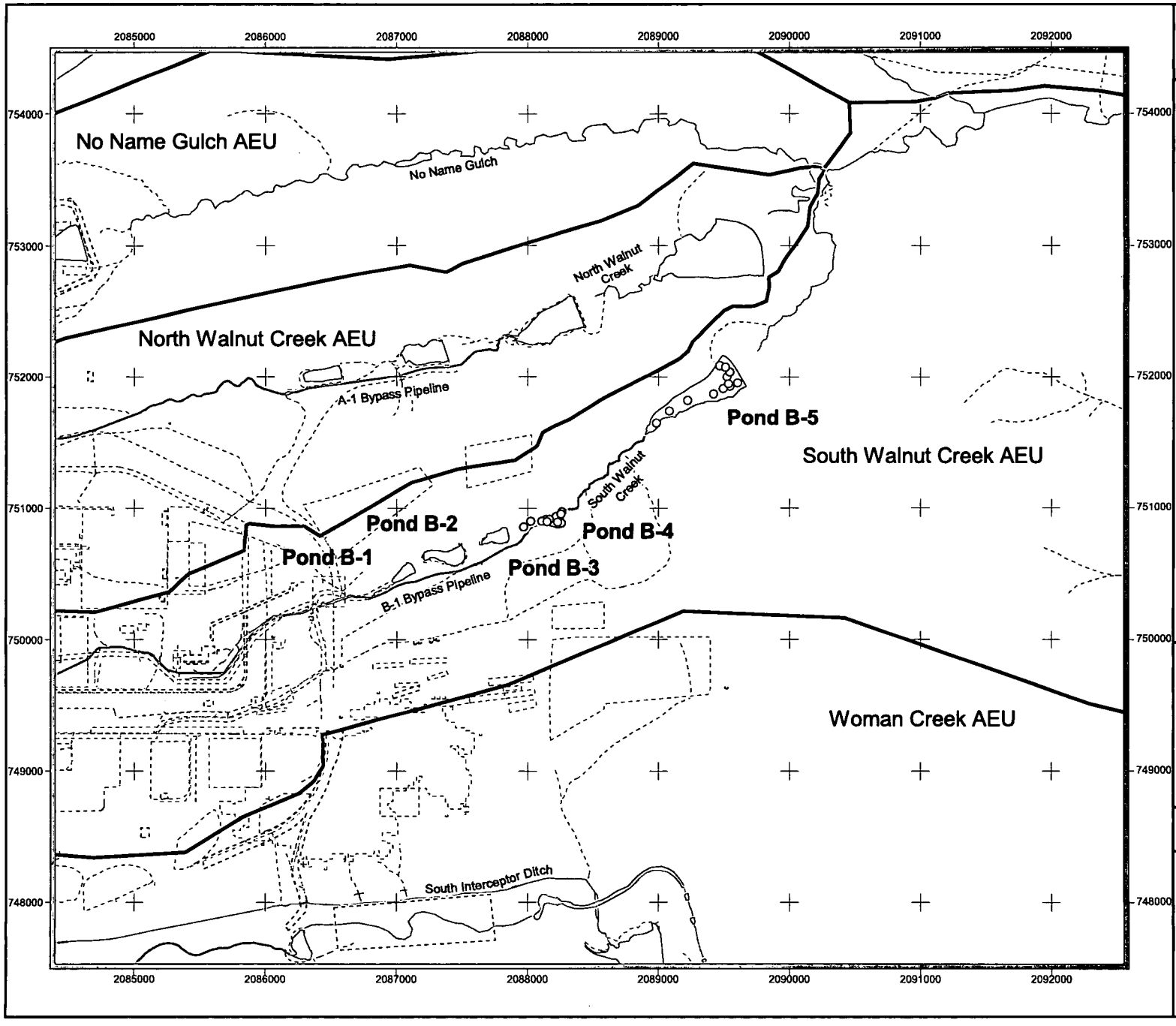

Figure 3.38
B Ponds
Sediment Sampling Locations
for Mercury

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.18 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

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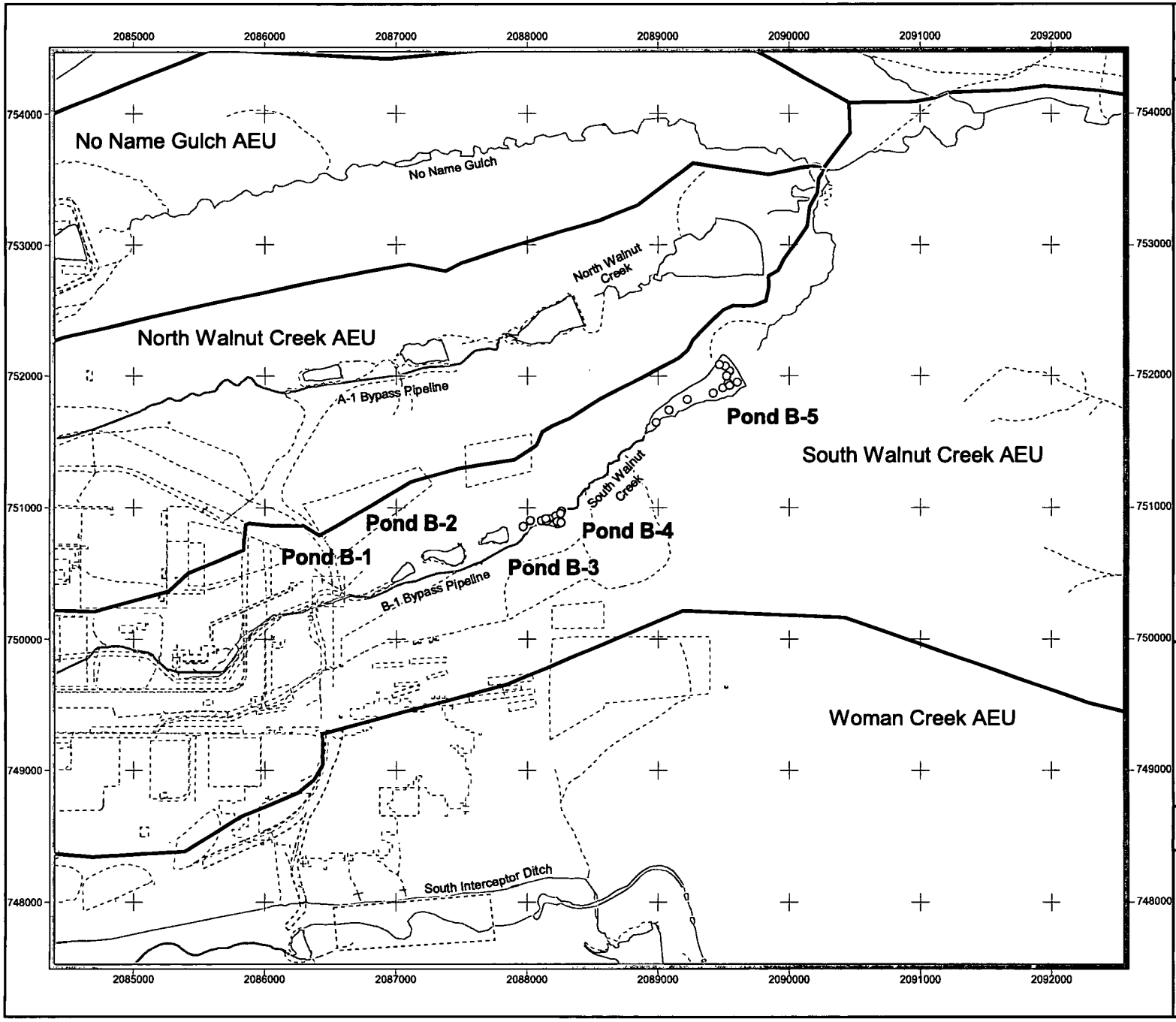

Figure 3.39
B Ponds
Sediment Sampling Locations
for Nickel

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 22.7 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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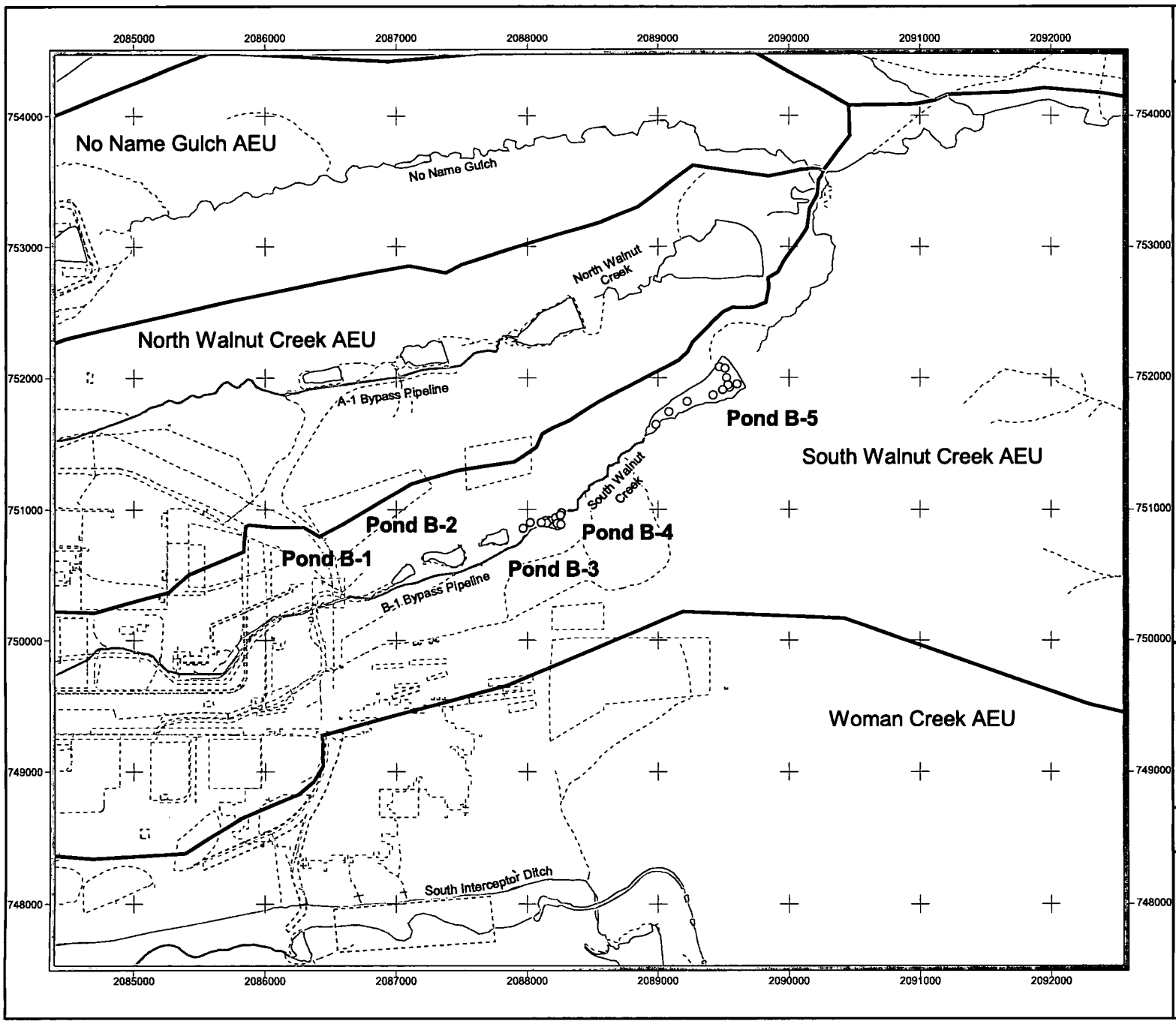

Figure 3.40
B Ponds
Sediment Sampling Locations
for Selenium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.95 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

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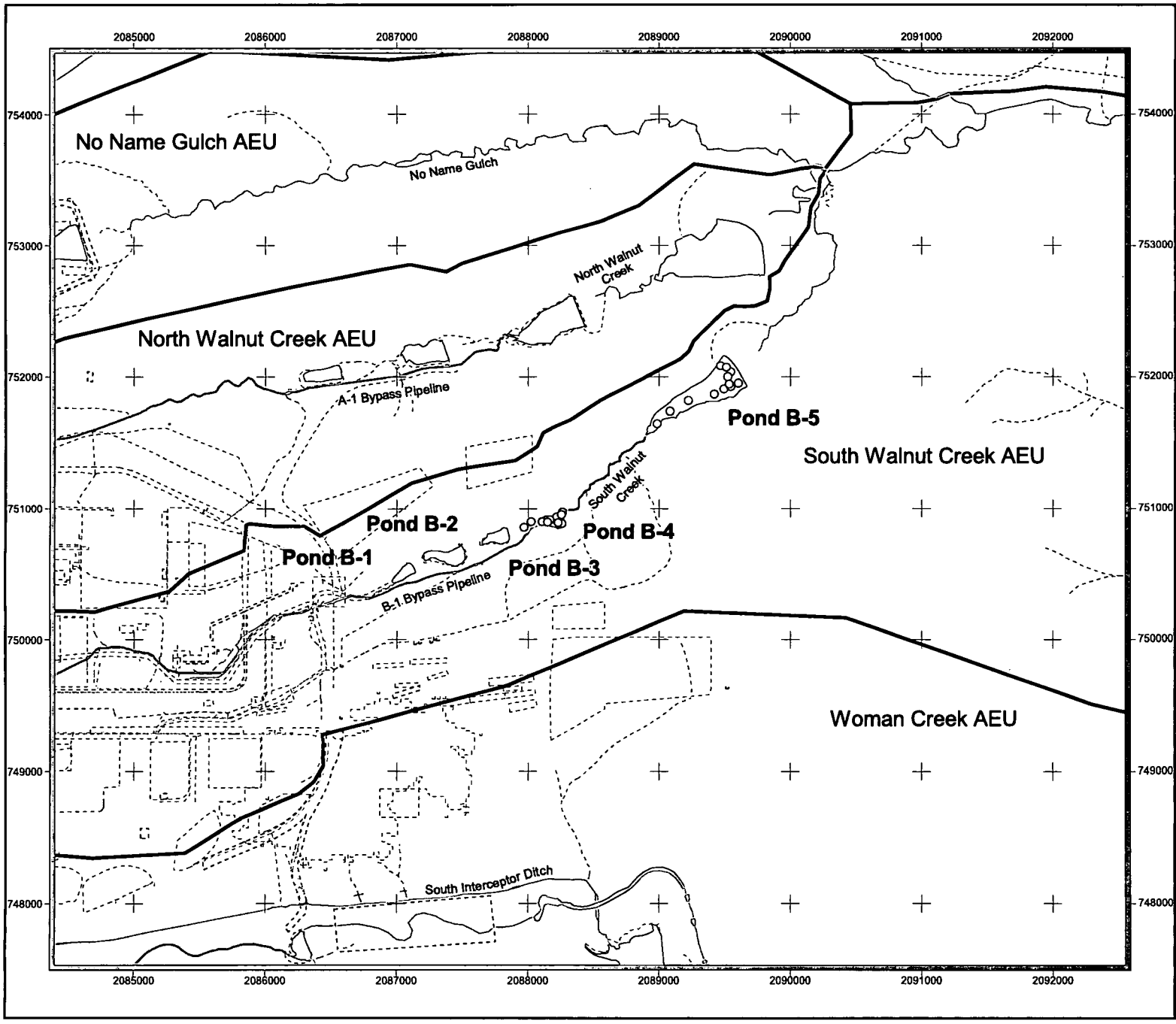

Figure 3.41
B Ponds
Sediment Sampling Locations
for Silver

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 1 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 08/11/05

Prepared for:

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

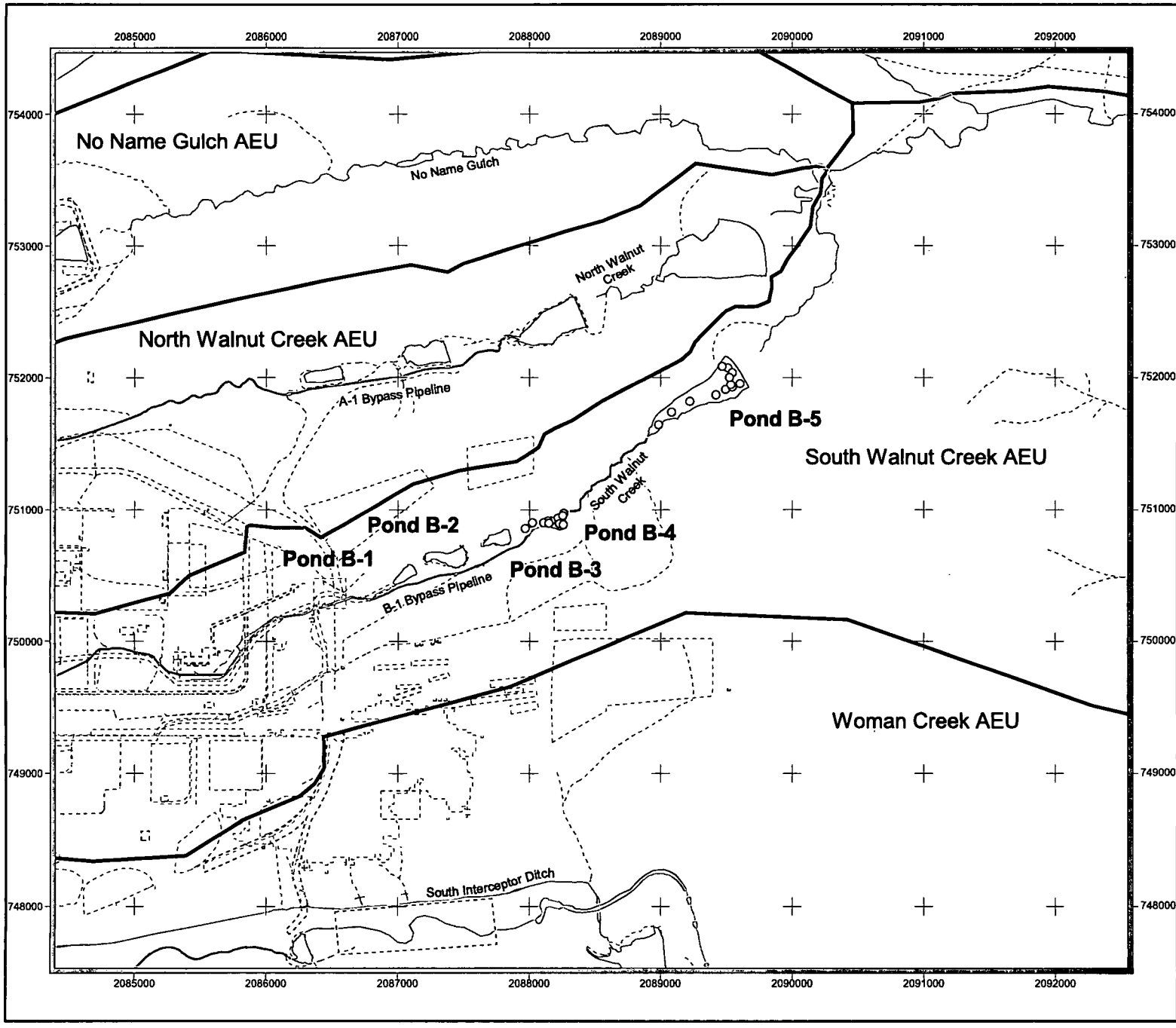

Figure 3.42
B Ponds
Sediment Sampling Locations
for Zinc

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 121 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr

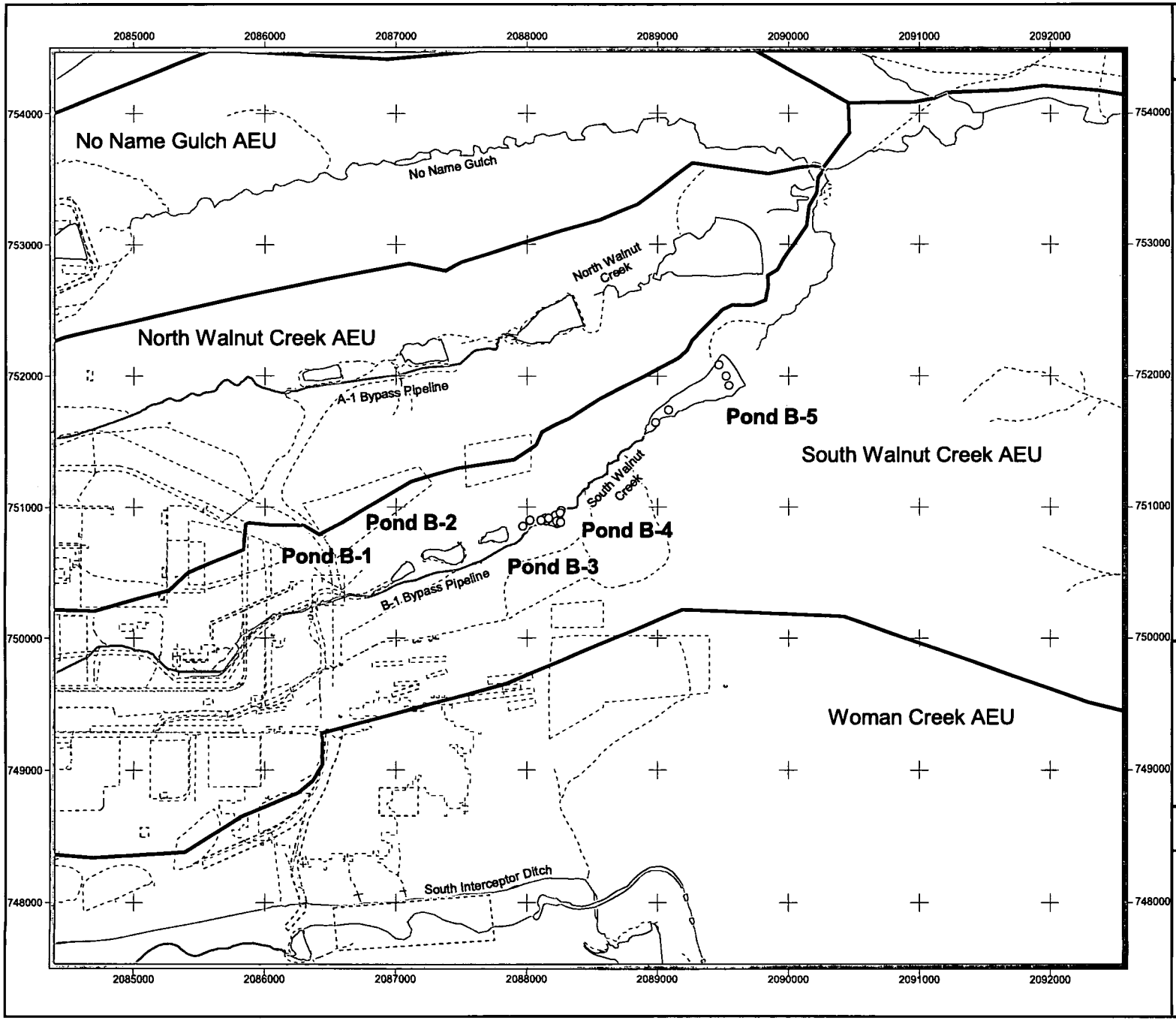

Figure 3.43
B Ponds
Sediment Sampling Locations
for Anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 57.2 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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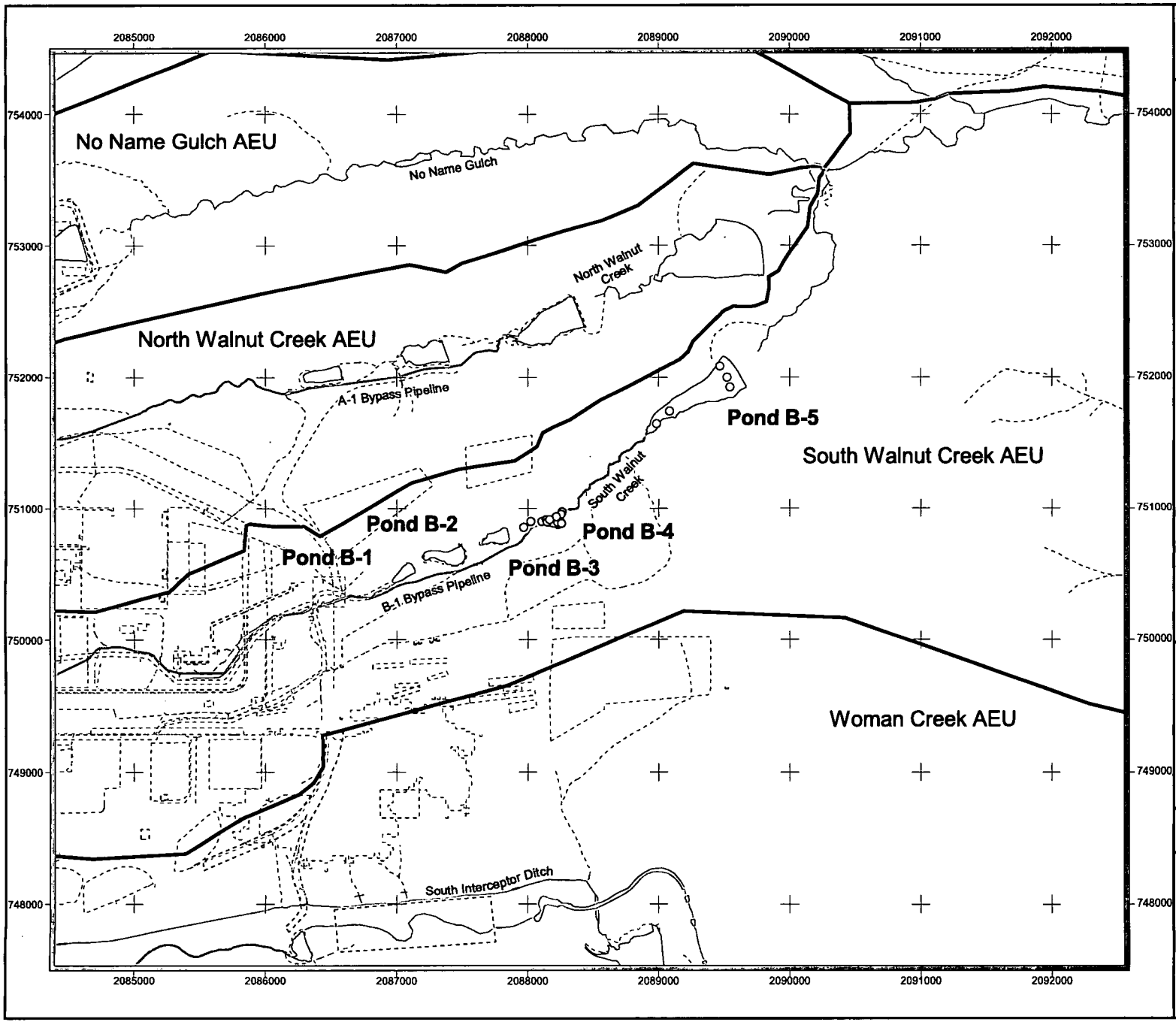

Figure 3.44
B Ponds
Sediment Sampling Locations
for Benzo(a)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 108 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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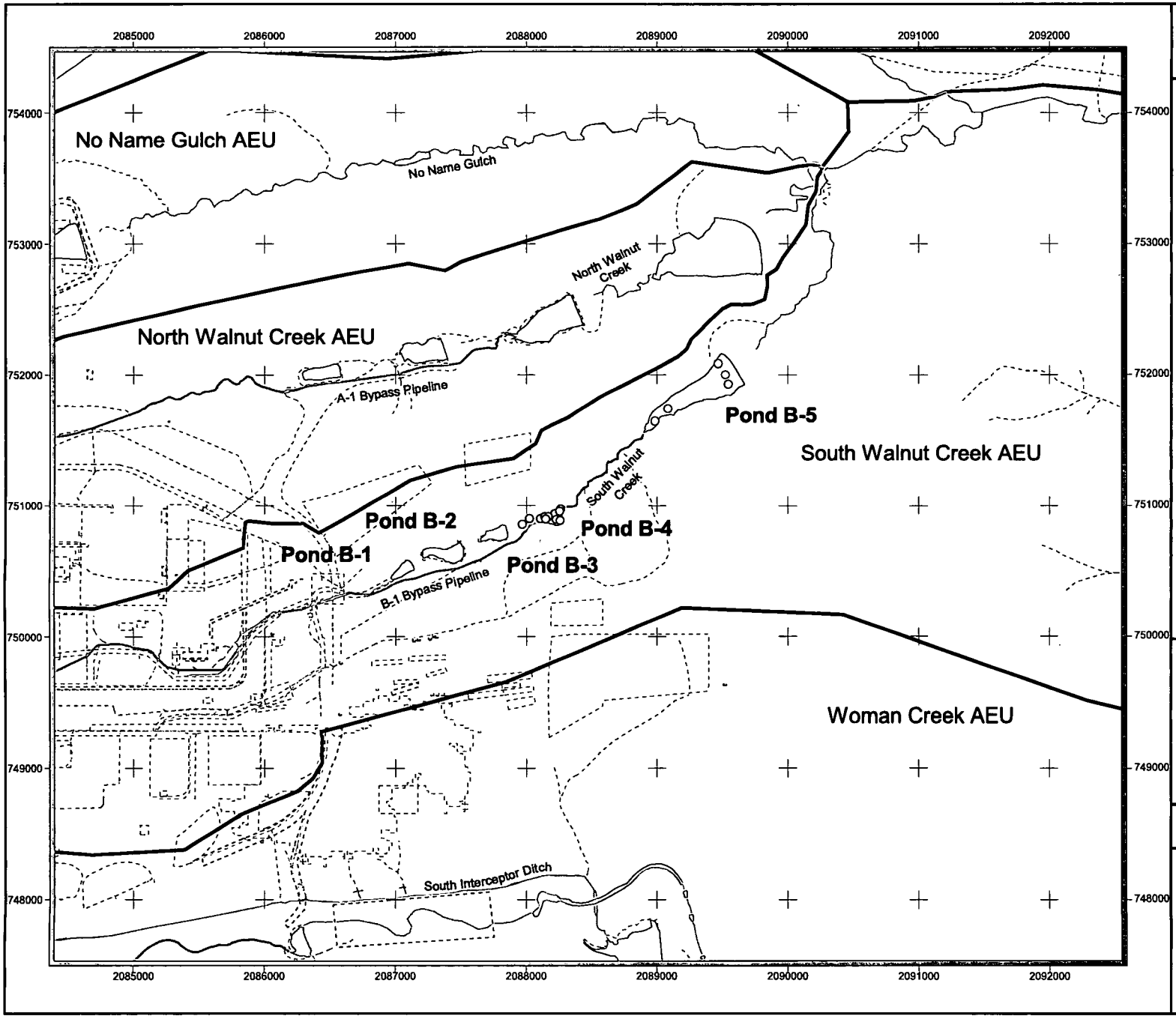

Figure 3.45
B Ponds
Sediment Sampling Locations
for Benzo(a)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 150 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 08/11/05

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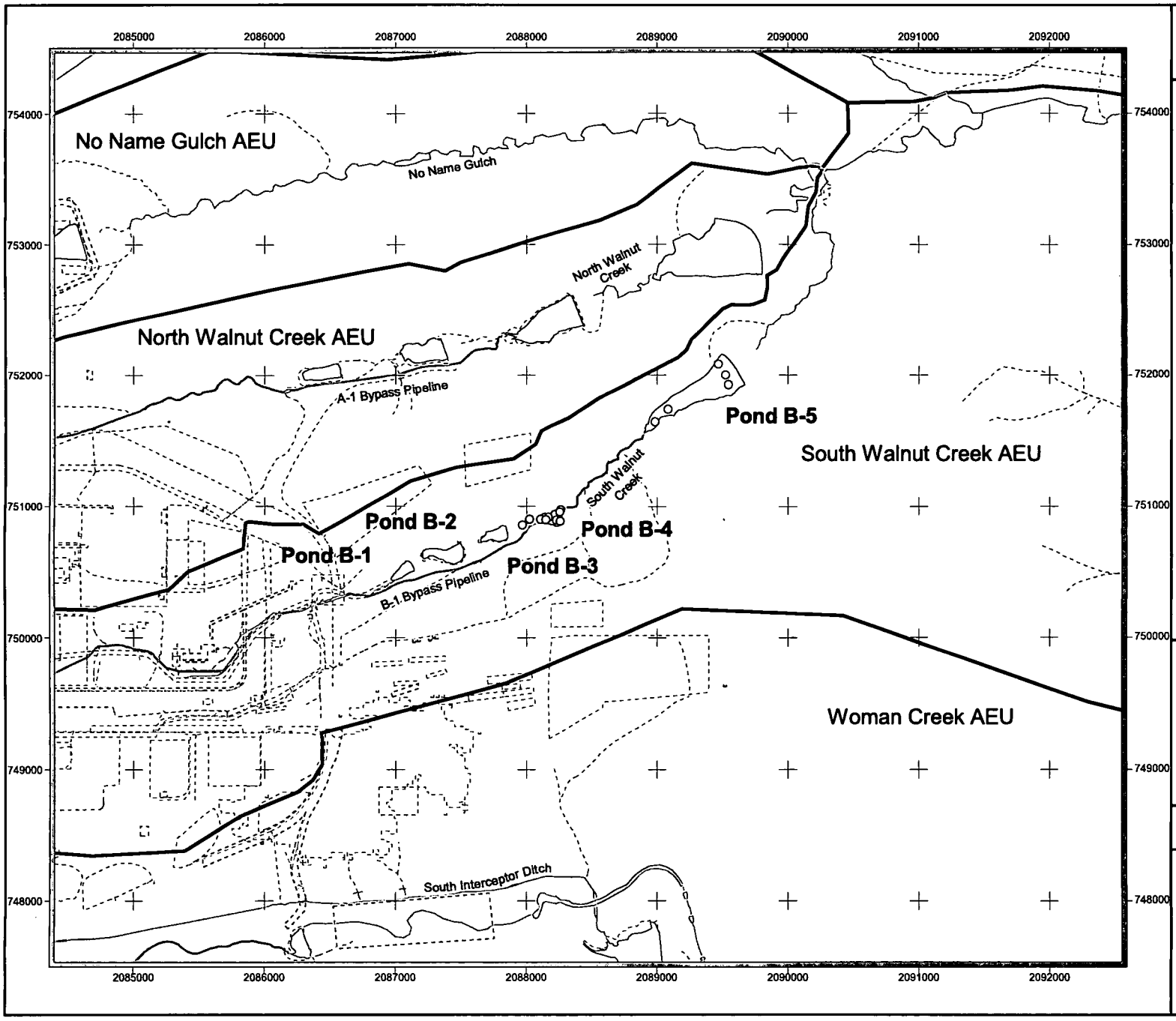

Figure 3.46
B Ponds
Sediment Sampling Locations
for Benzo(g,h,i)perylene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 13 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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473

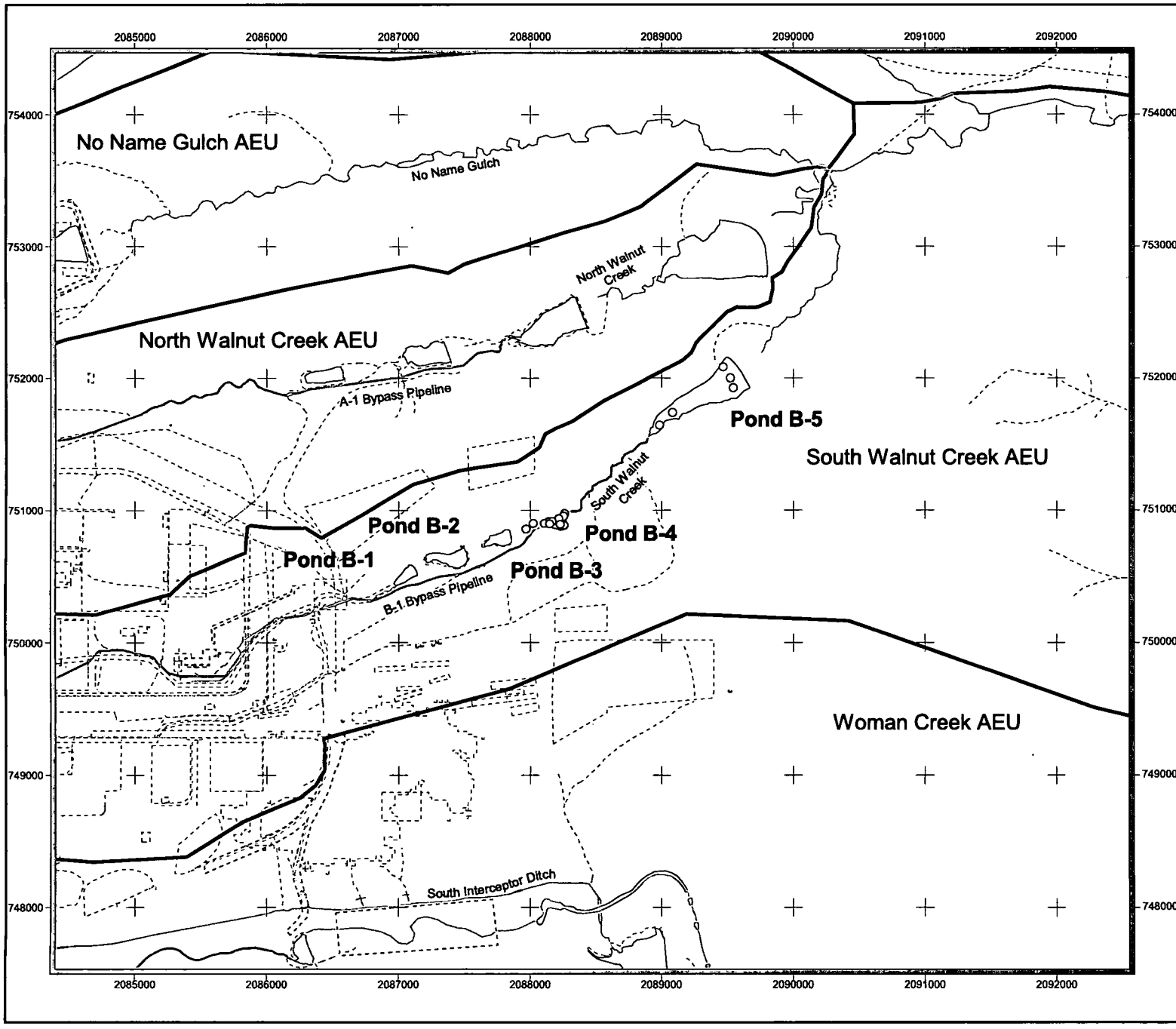

Figure 3.47
B Ponds
Sediment Sampling Locations
for Benzo(k)fluoranthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 240 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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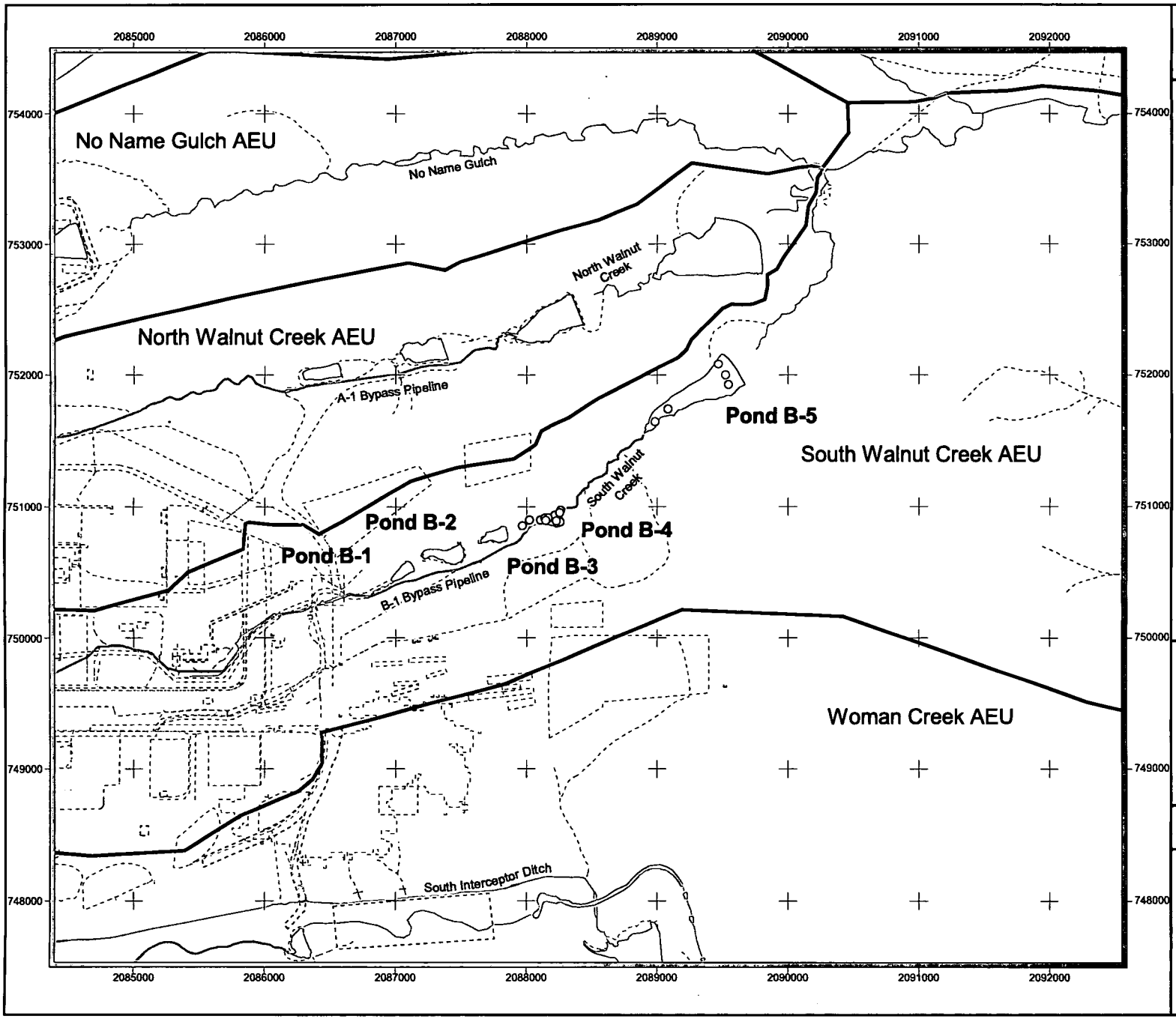

Figure 3.48
B Ponds
Sediment Sampling Locations
for bis(2-ethylhexyl)phthalate

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 24900 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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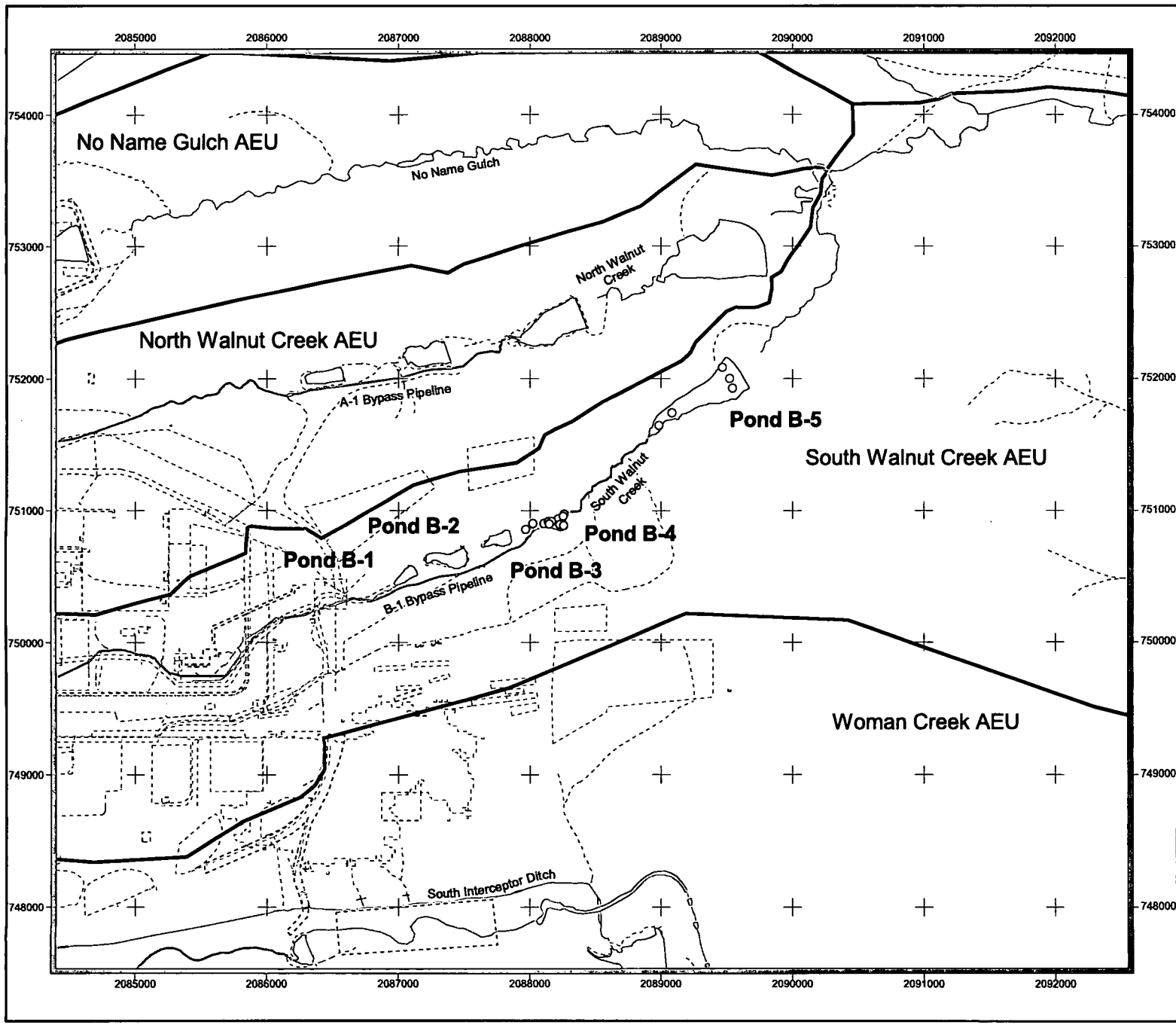

Figure 3.49
B Ponds
Sediment Sampling Locations
for Chrysene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 166 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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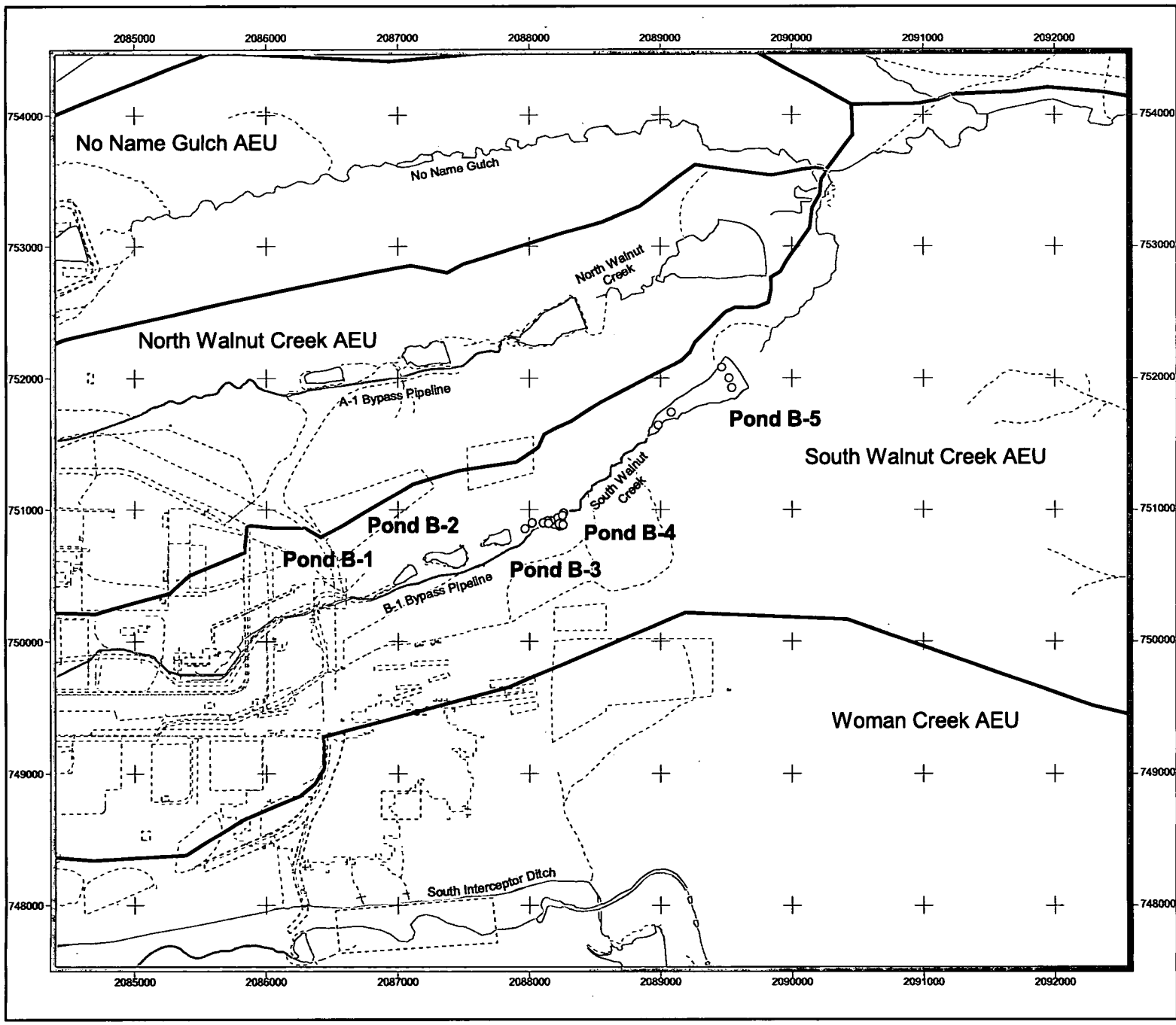

Figure 3.50
B Ponds
Sediment Sampling Locations
for Dibenz(a,h)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 33 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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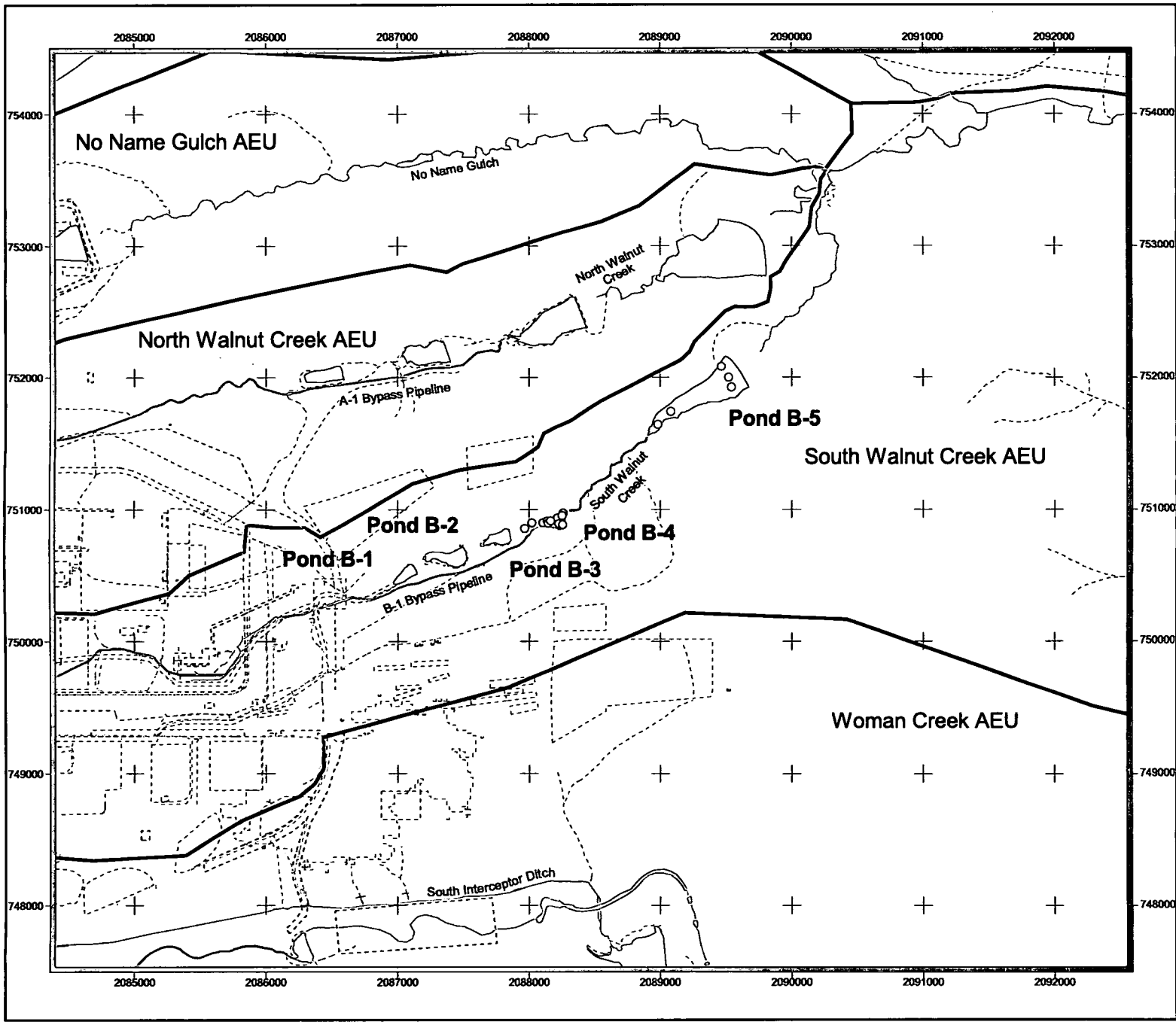

Figure 3.51
B Ponds
Sediment Sampling Locations
for Fluoranthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 423 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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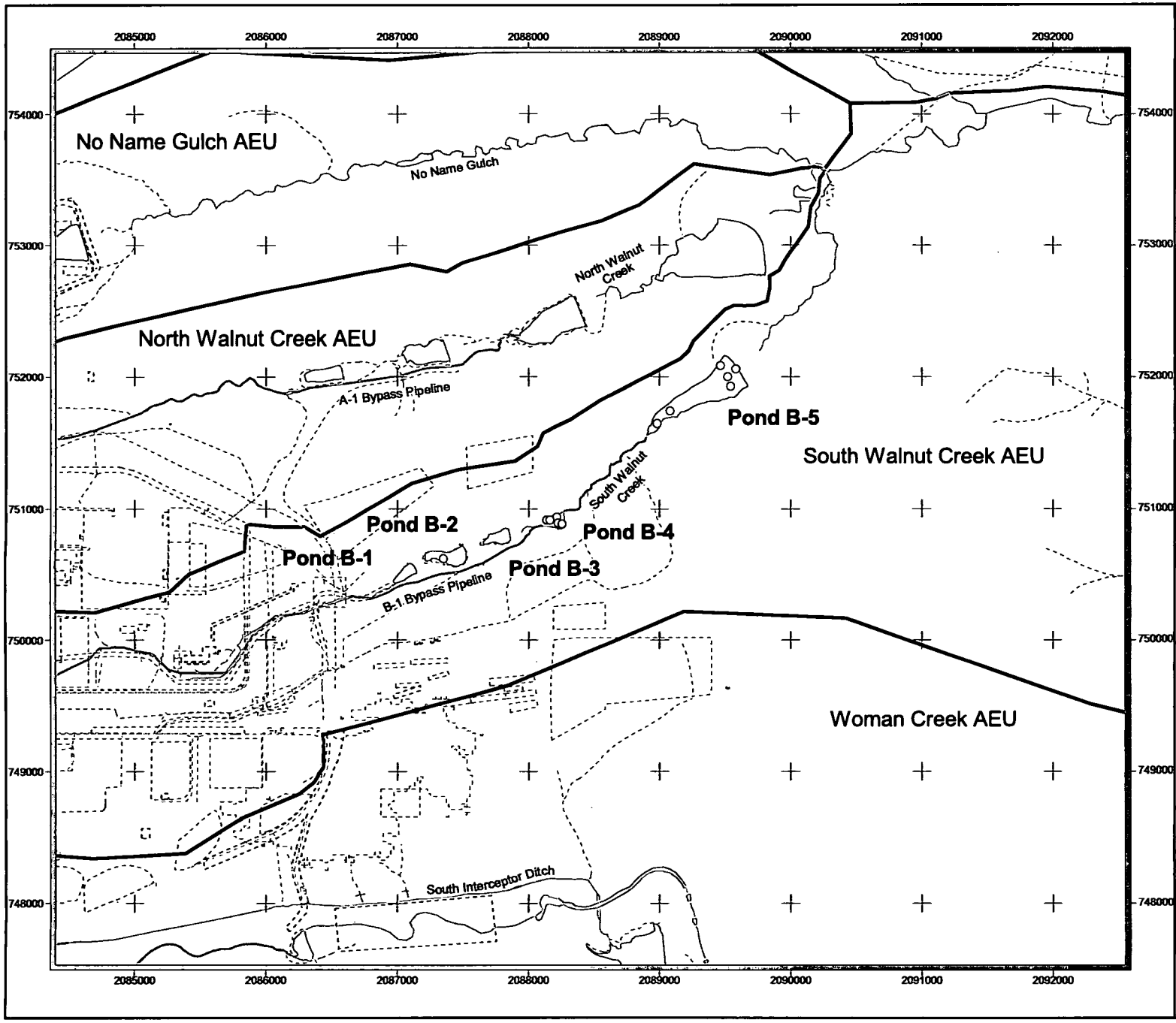

Figure 3.52
B Ponds
Sediment Sampling Locations
for gamma-BHC (Lindane)

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 2.37 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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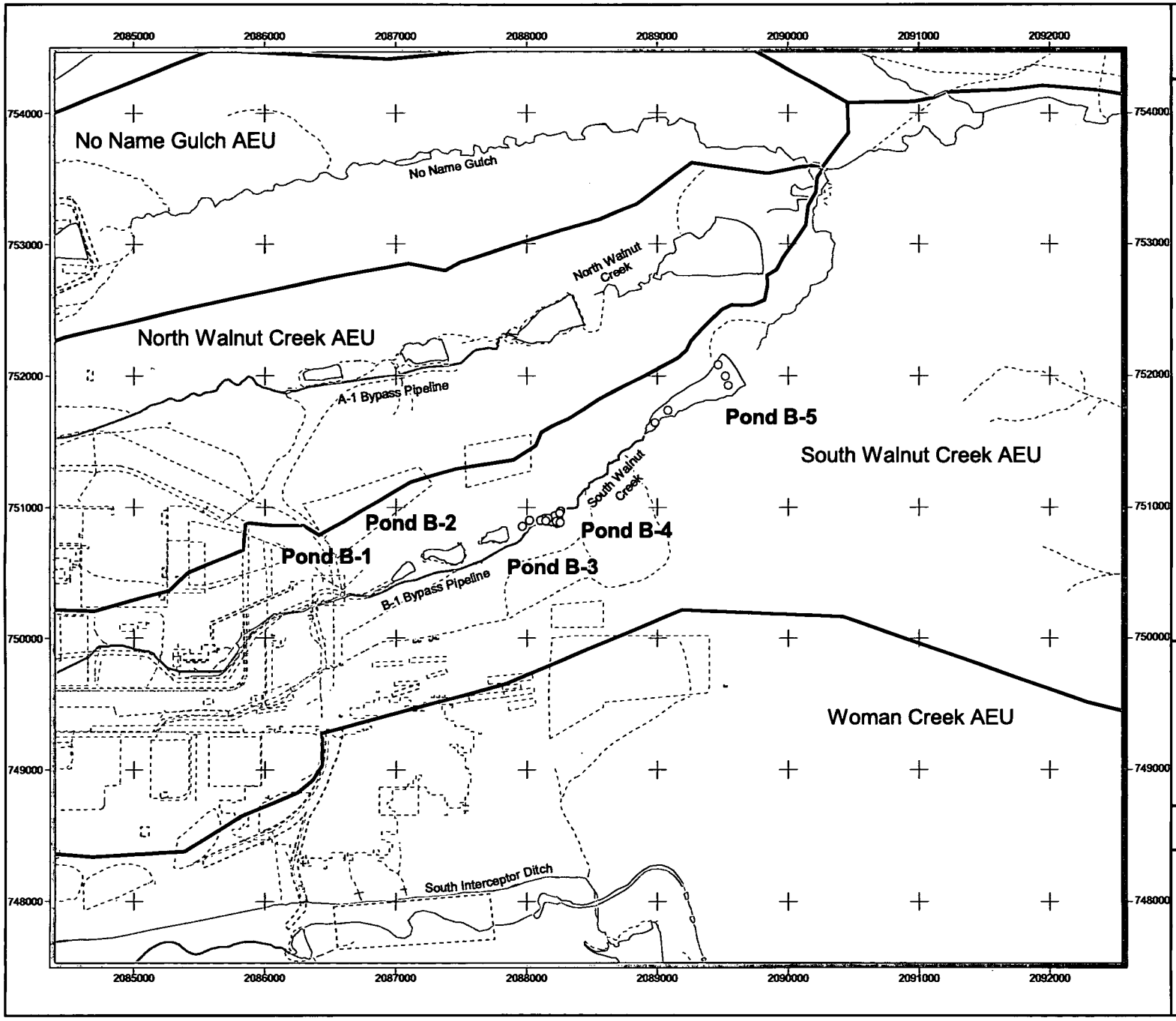

Figure 3.53
B Ponds
Sediment Sampling Locations
for Indeno(1,2,3-cd)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 17 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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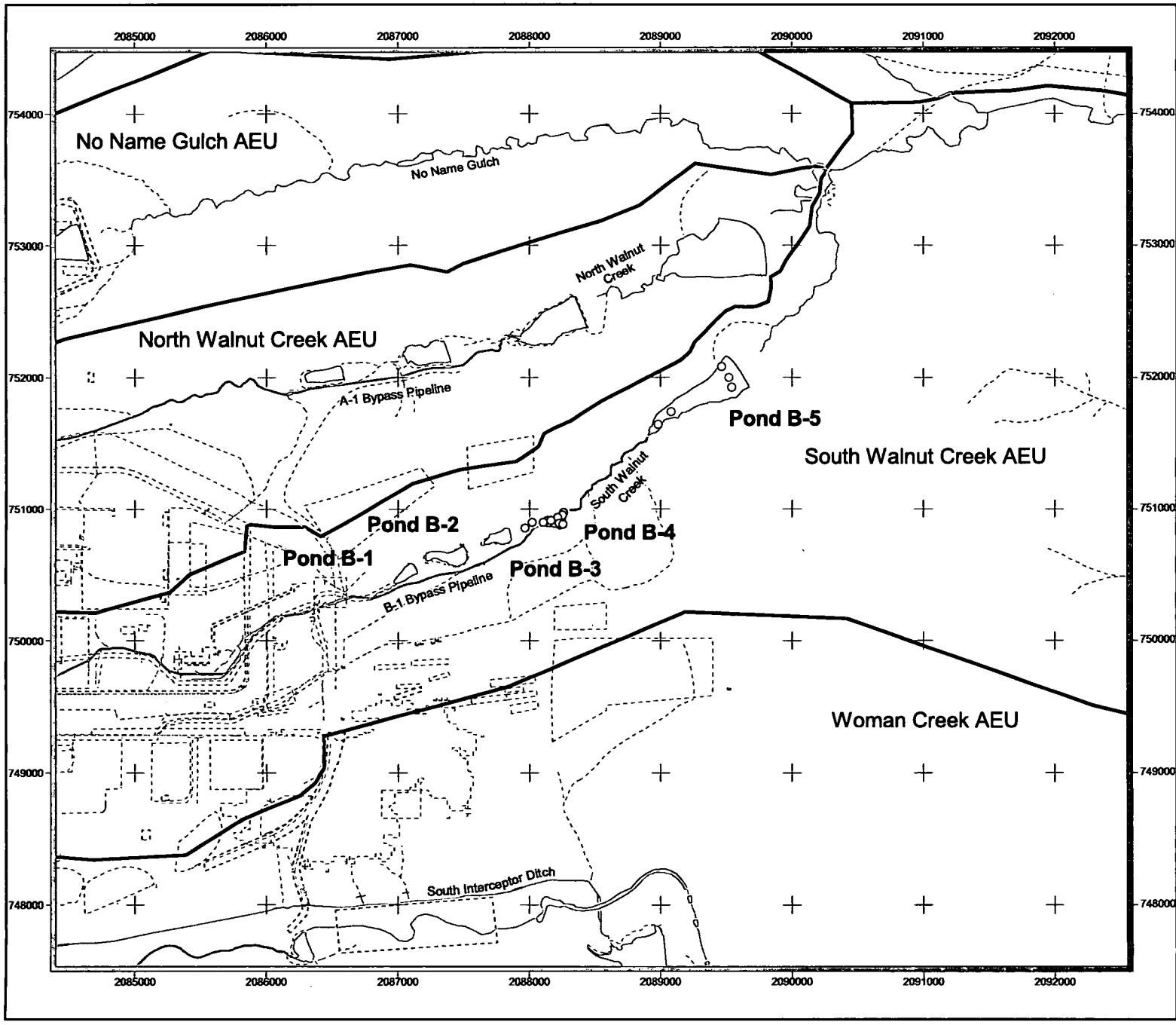

Figure 3.54
B Ponds
Sediment Sampling Locations
for Phenanthrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 204 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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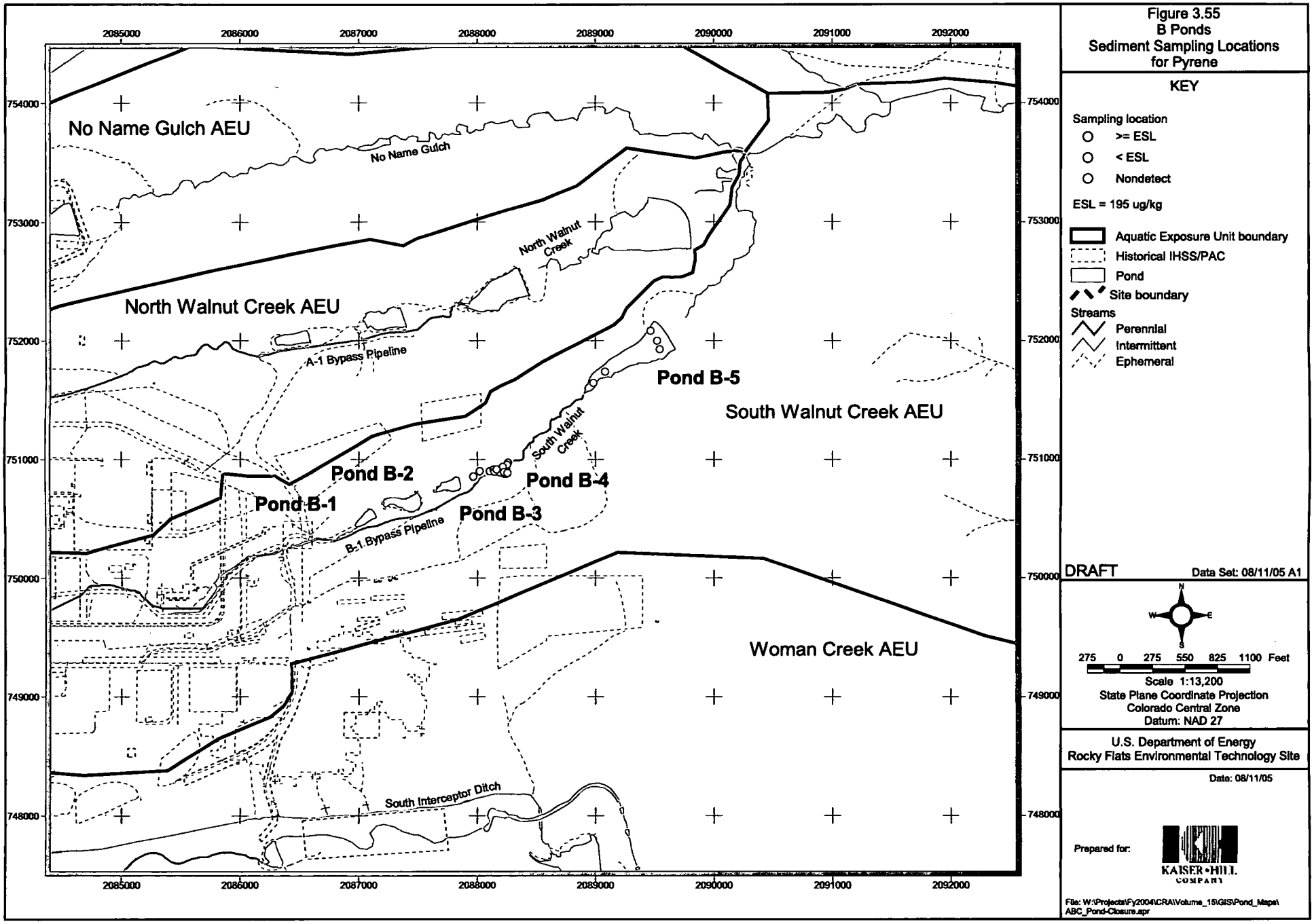
Figure 3.55
B Ponds
Sediment Sampling Locations
for Pyrene
KEY
Sampling location
>= ESL
< ESL
Nondetect
ESL = 195 ug/kg
Aquatic Exposure Unit boundary
Historical IHSS/PAC
Pond
Site boundary
Streams
Perennial
Intermittent
Ephemeral
DRAFT
Data Set: 08/11/05 A1
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Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27
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Date: 08/11/05
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KAISER-HILL COMPANY
File: W:\Projects\Fy2004\CRA\Volume_15\GIS\Pond_Maps\ABC_Pond-Closure.apr
No Name Gulch AEU
No Name Gulch
North Walnut Creek
North Walnut Creek AEU
A-1 Bypass Pipeline
Pond B-5
South Walnut Creek AEU
South Walnut Creek
Pond B-2
Pond B-4
Pond B-1
Pond B-3
B-1 Bypass Pipeline
Woman Creek AEU
South Interceptor Ditch
2085000
2086000
2087000
2088000
2089000
2090000
2091000
2092000
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752000
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748000

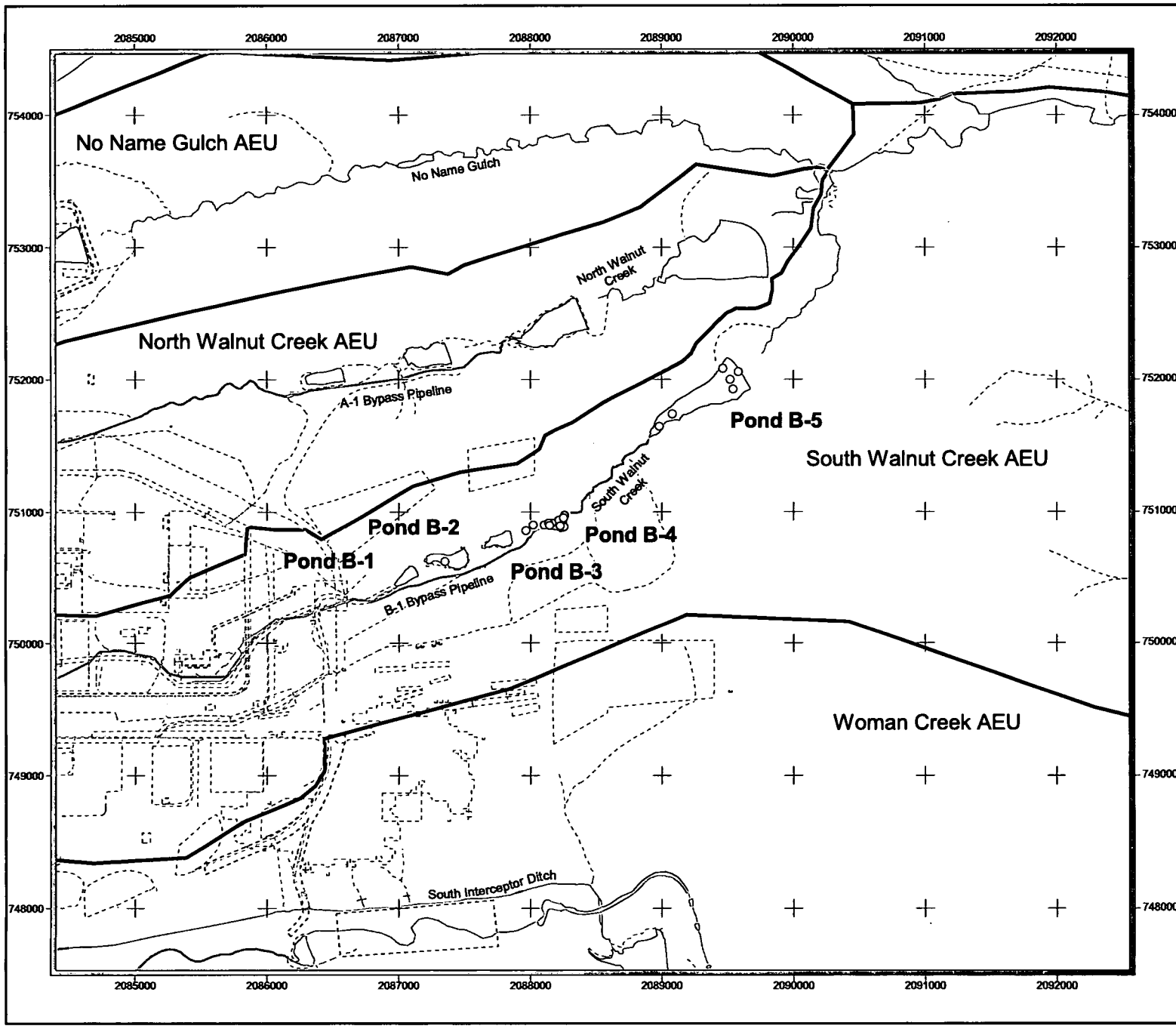

Figure 3.56
B Ponds
Sediment Sampling Locations
for PCB-1254

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 40 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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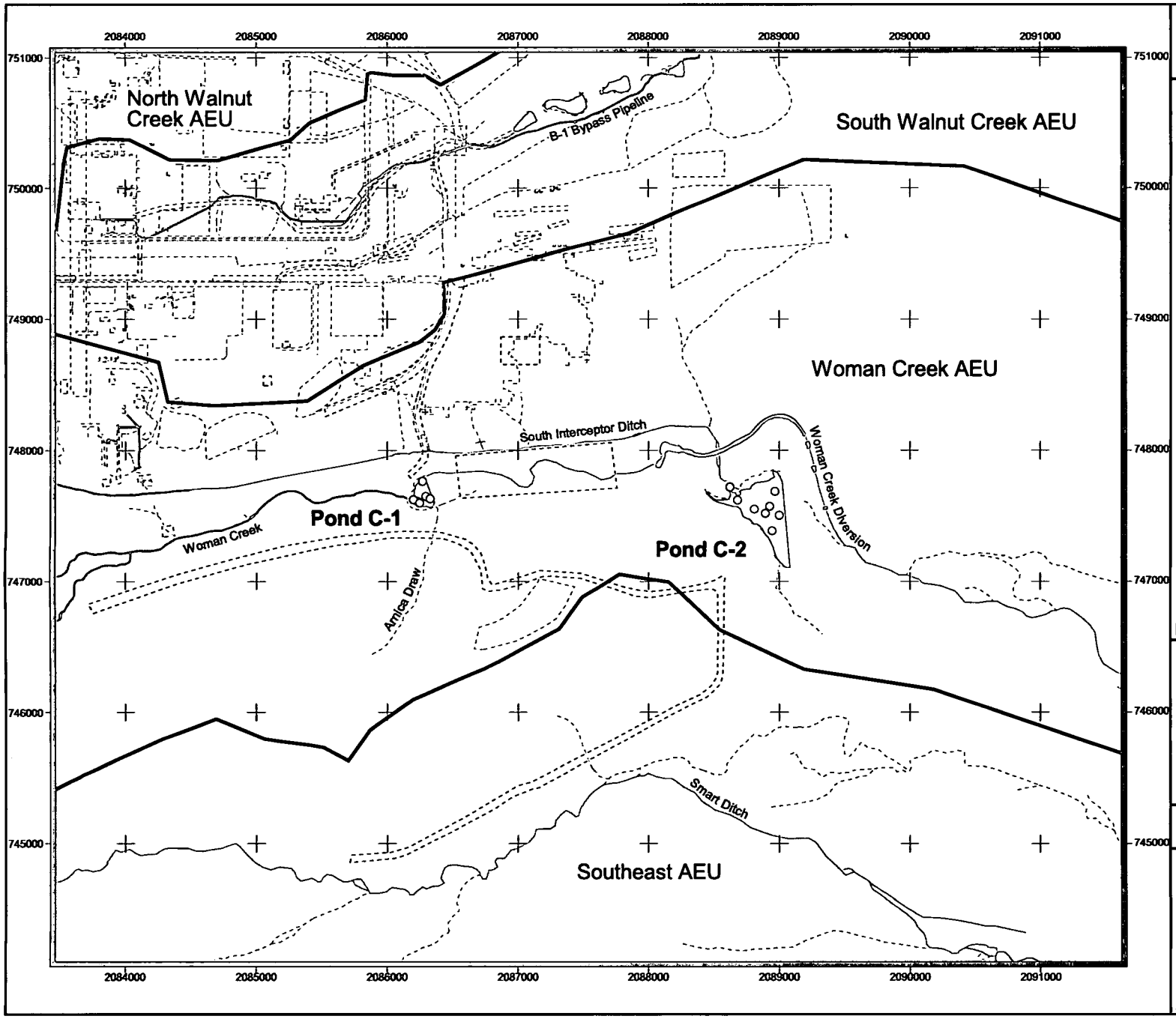

Figure 3.57
C Ponds
Sediment Sampling Locations
for Aluminum

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 15900 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
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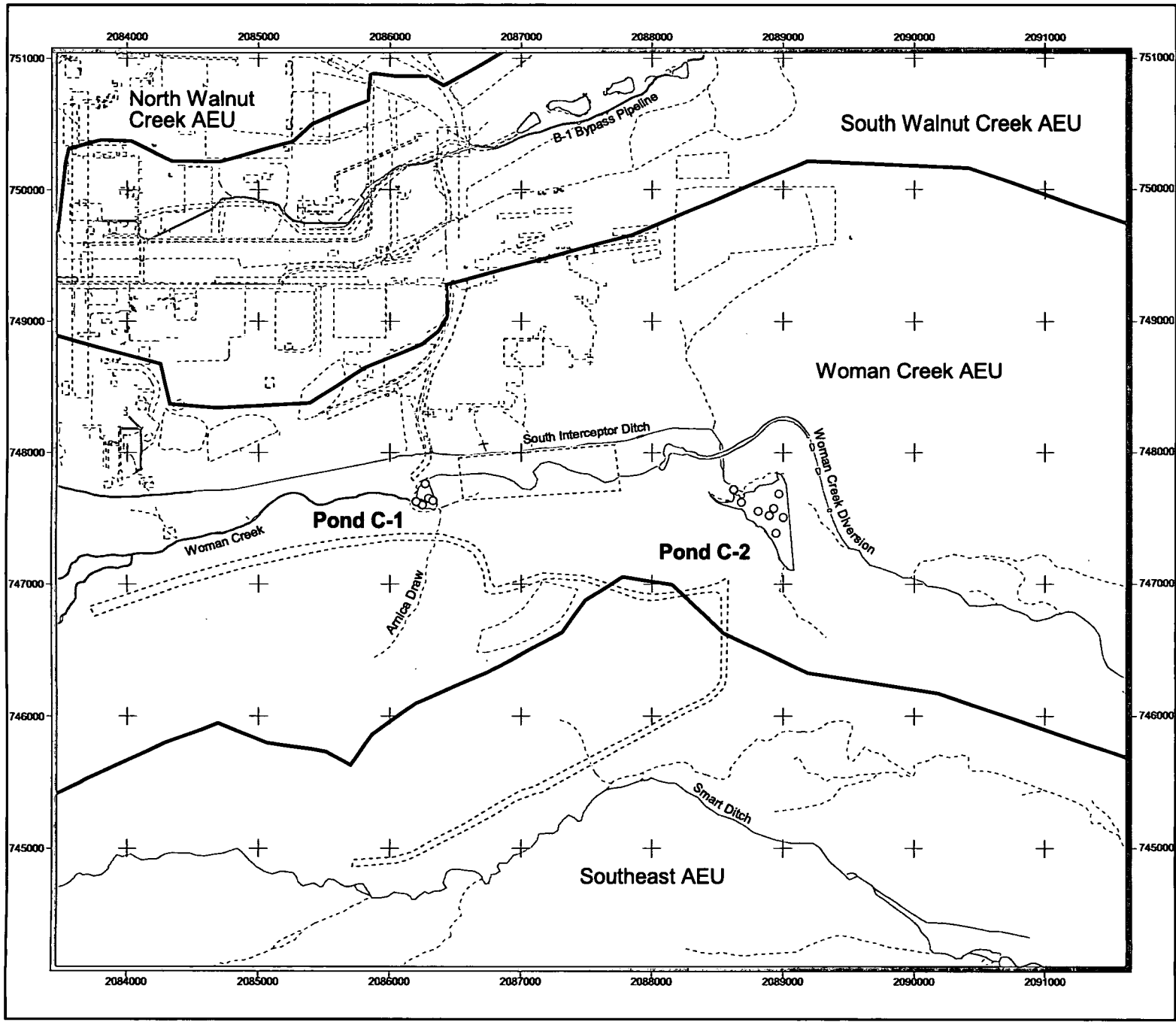

Figure 3.58
C Ponds
Sediment Sampling Locations
for Arsenic

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 9.79 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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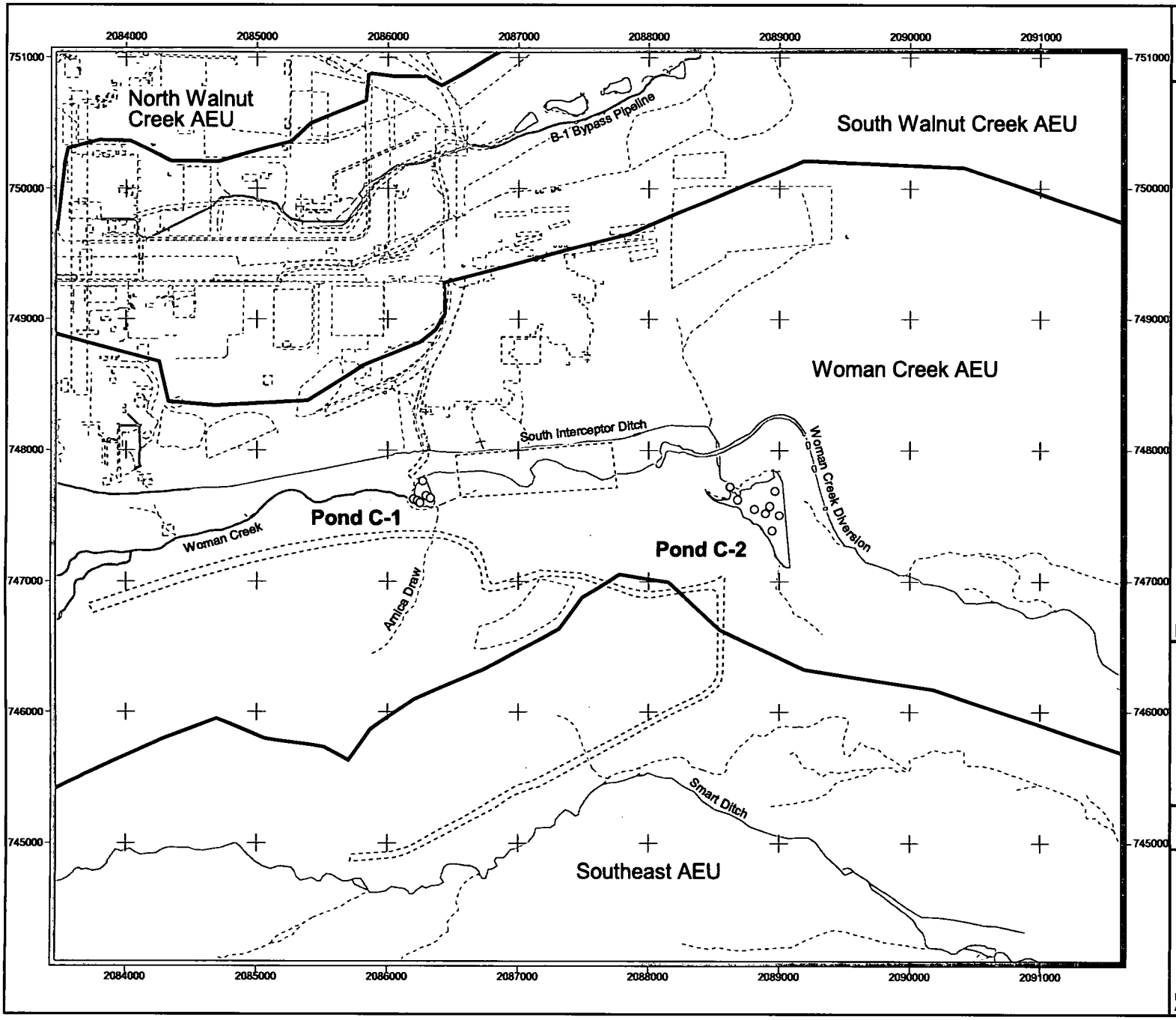

Figure 3.59
C Ponds
Sediment Sampling Locations
for Barium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 189 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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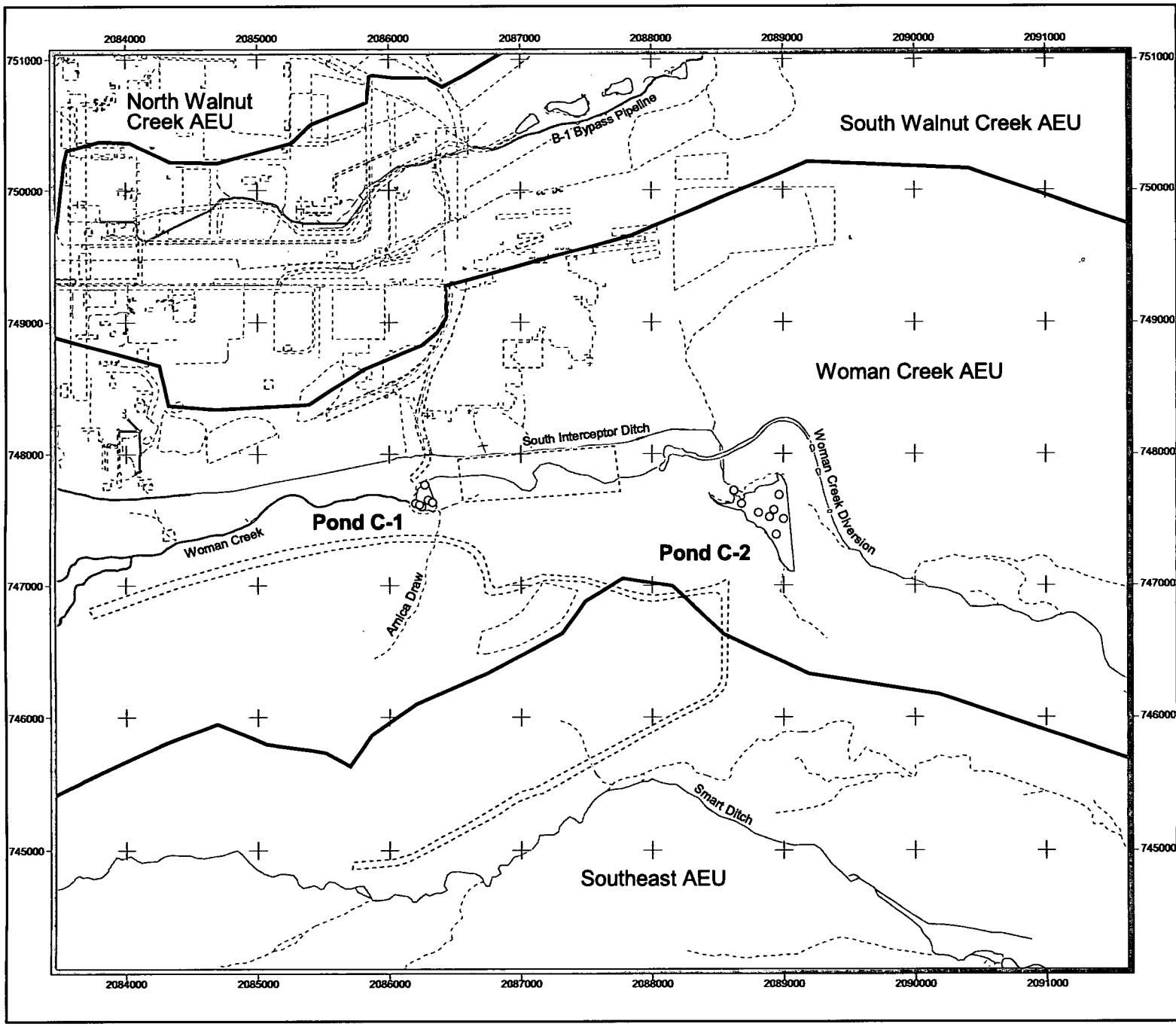

Figure 3.60
C Ponds
Sediment Sampling Locations
for Copper

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 31.6 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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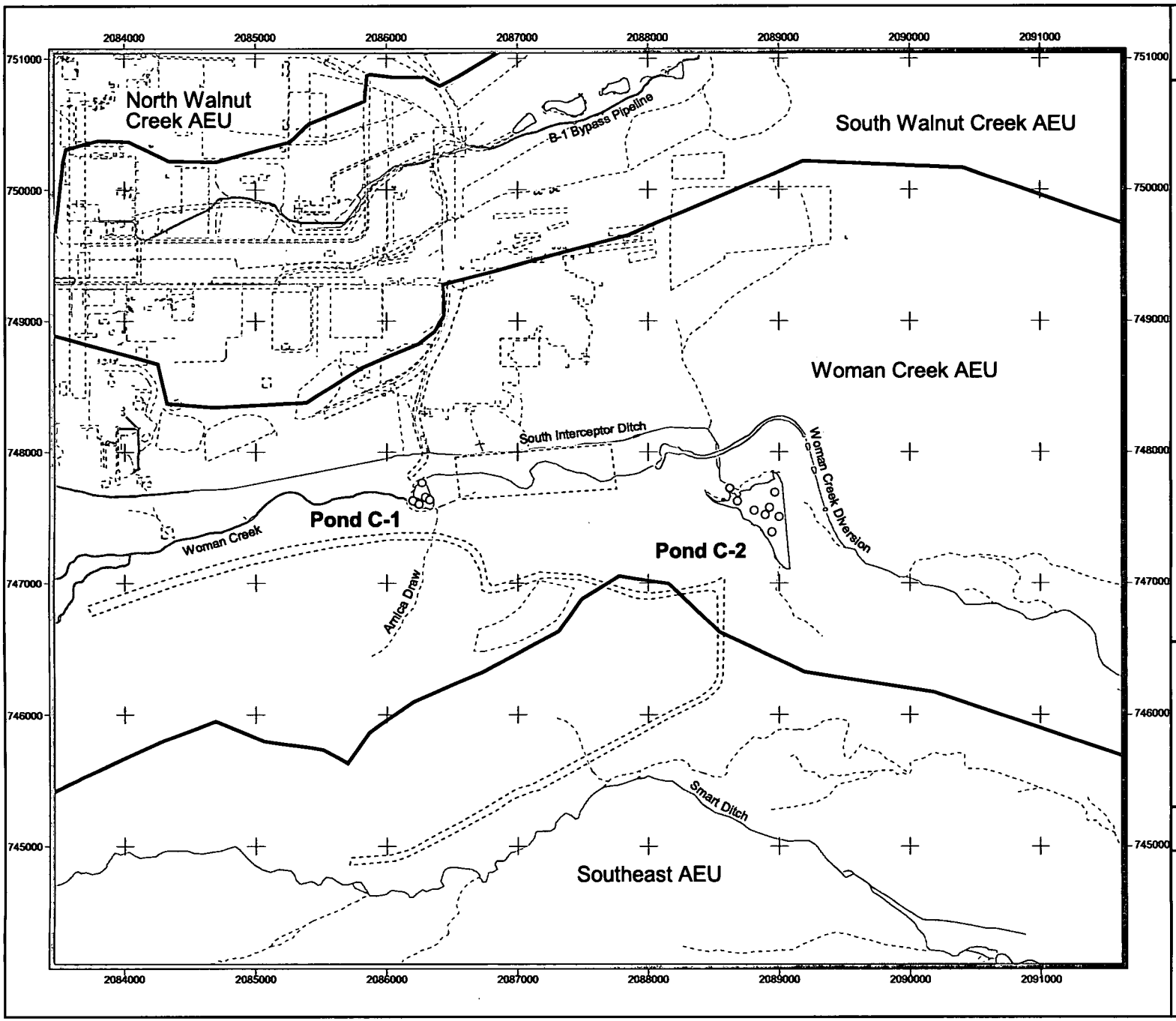

Figure 3.61
C Ponds
Sediment Sampling Locations
for Iron

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 20000 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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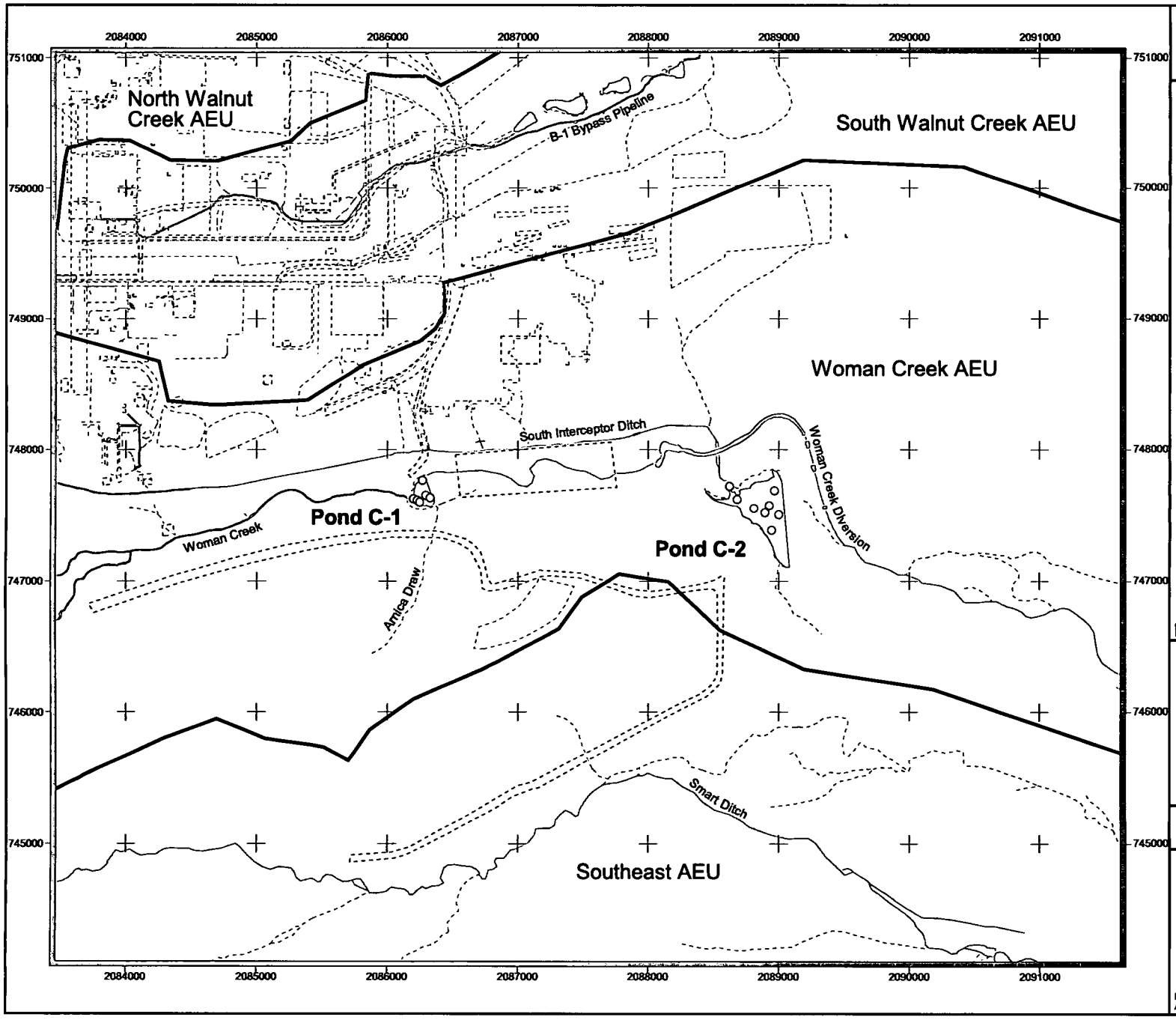

Figure 3.62
C Ponds
Sediment Sampling Locations
for Lead

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 35.8 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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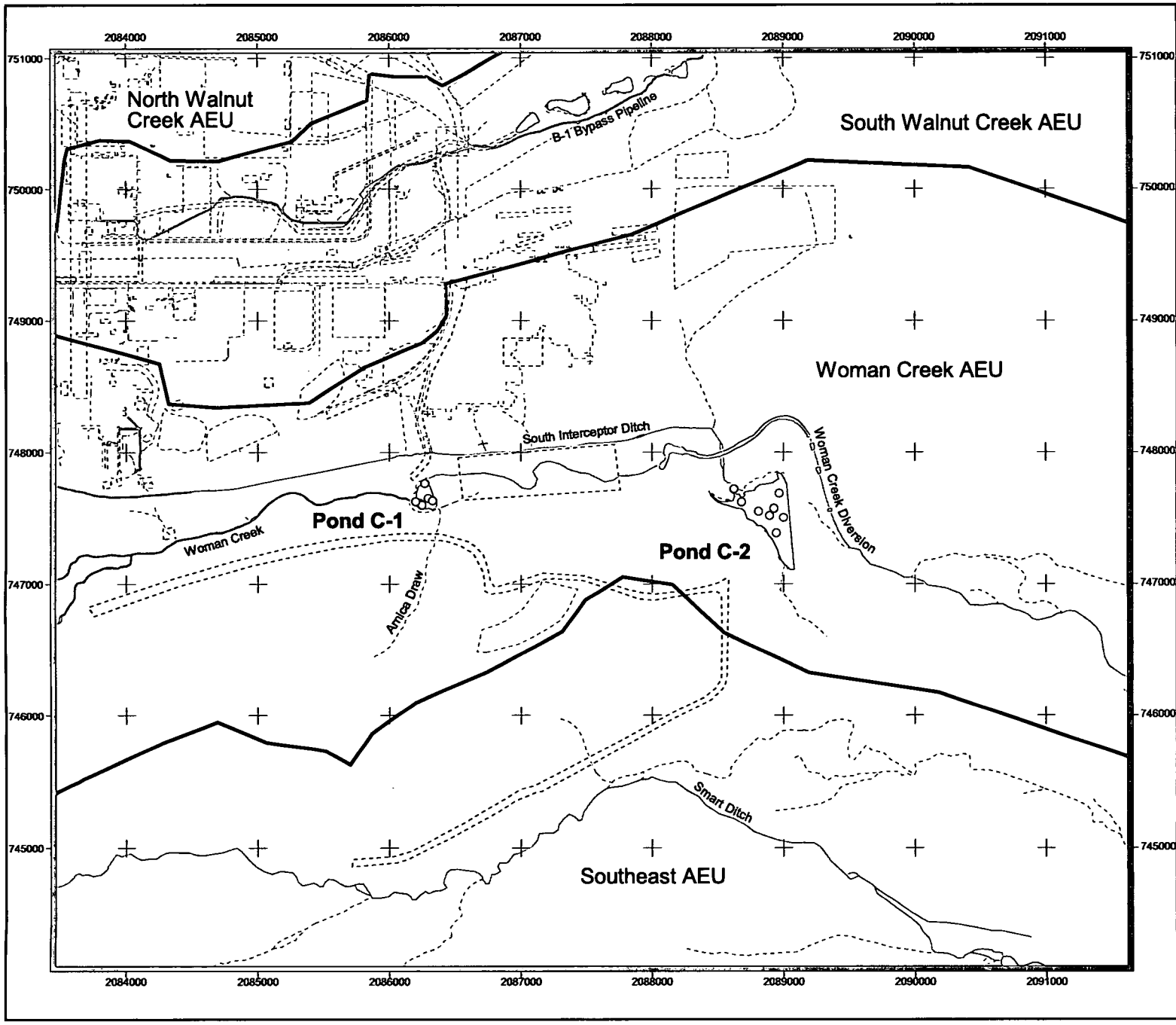

Figure 3.63
C Ponds
Sediment Sampling Locations
for Manganese

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 630 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

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Scale 1:13,200
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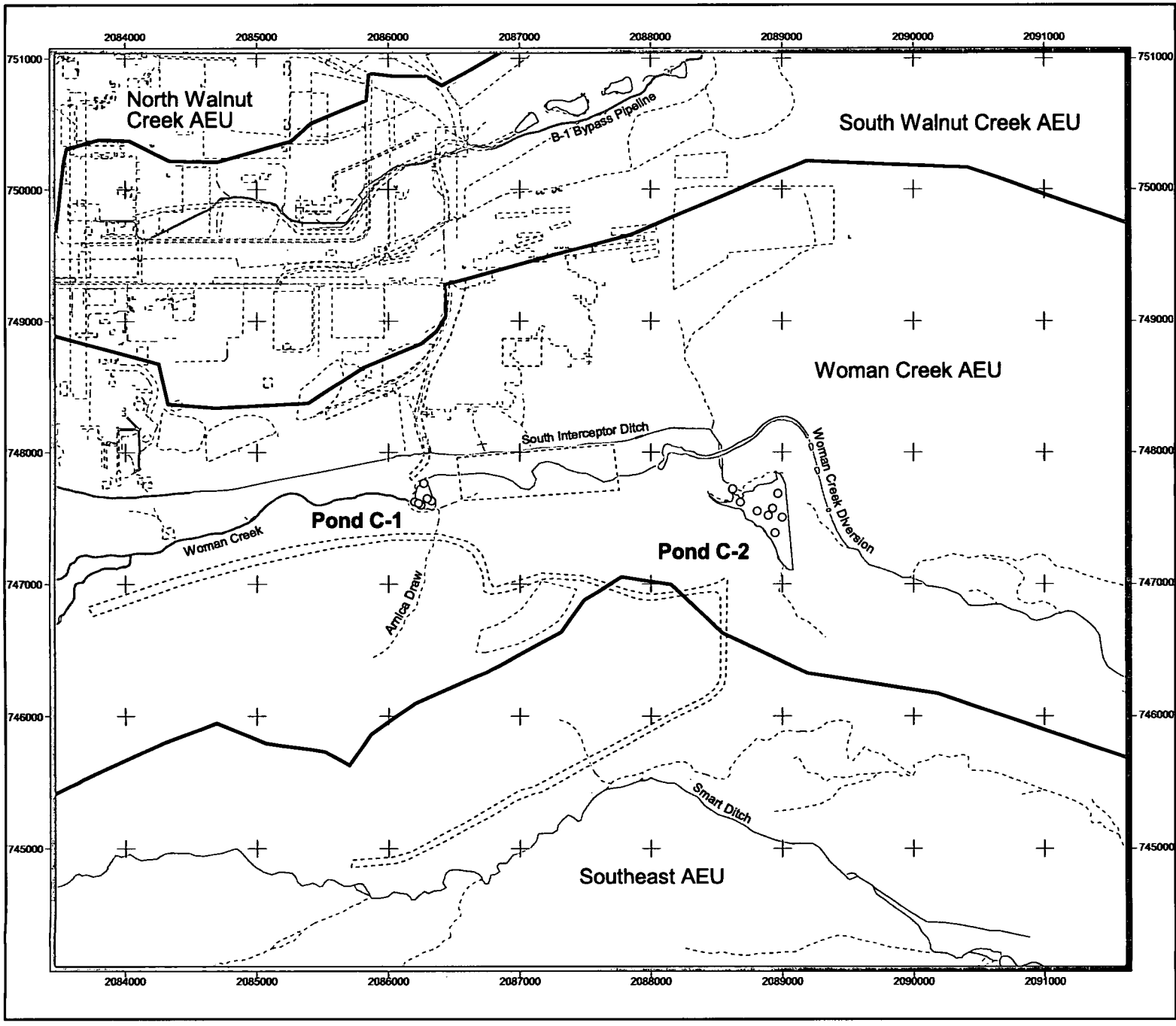

Figure 3.64
C Ponds
Sediment Sampling Locations
for Mercury

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.18 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

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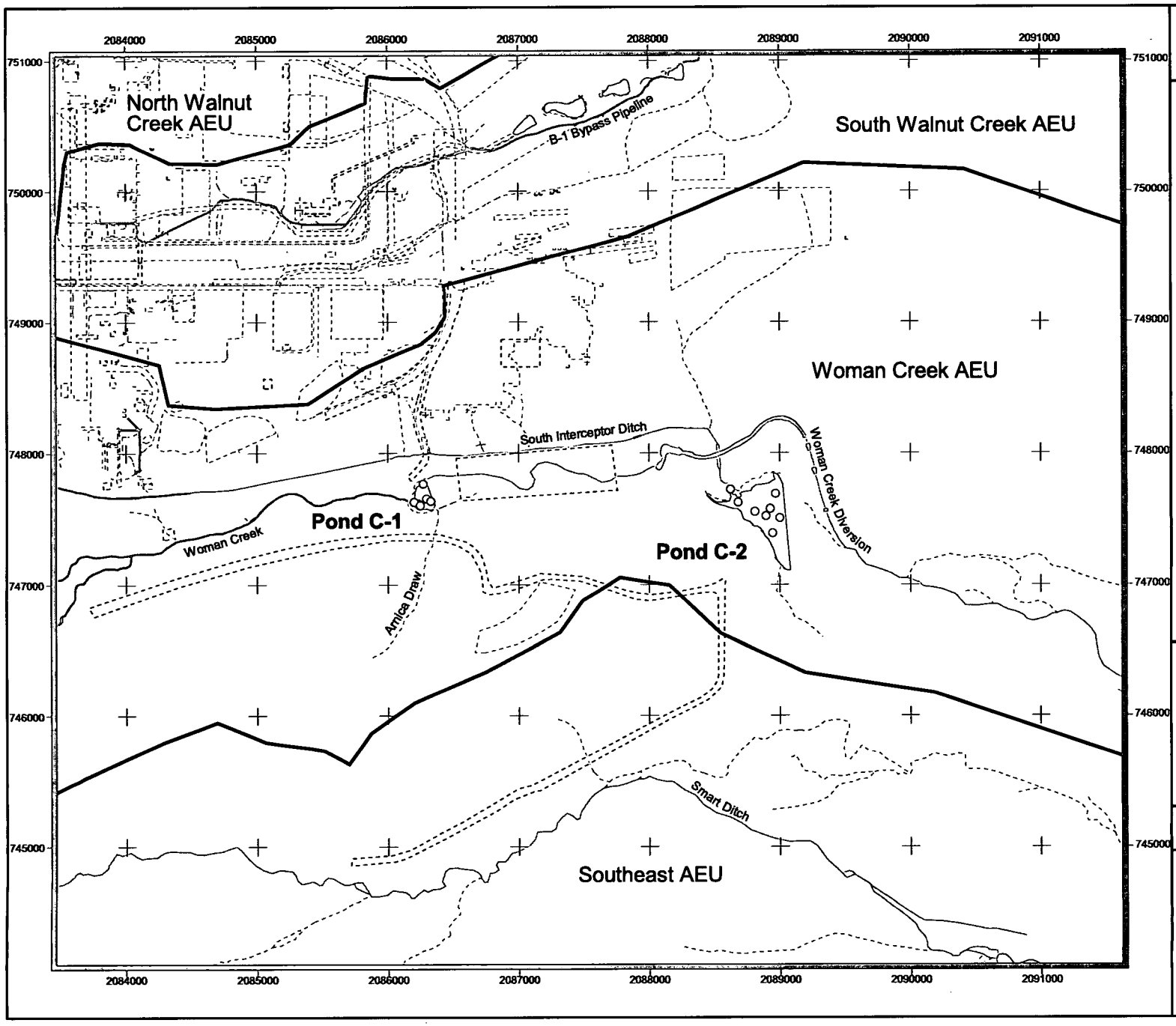

Figure 3.65
C Ponds
Sediment Sampling Locations
for Nickel

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 22.7 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
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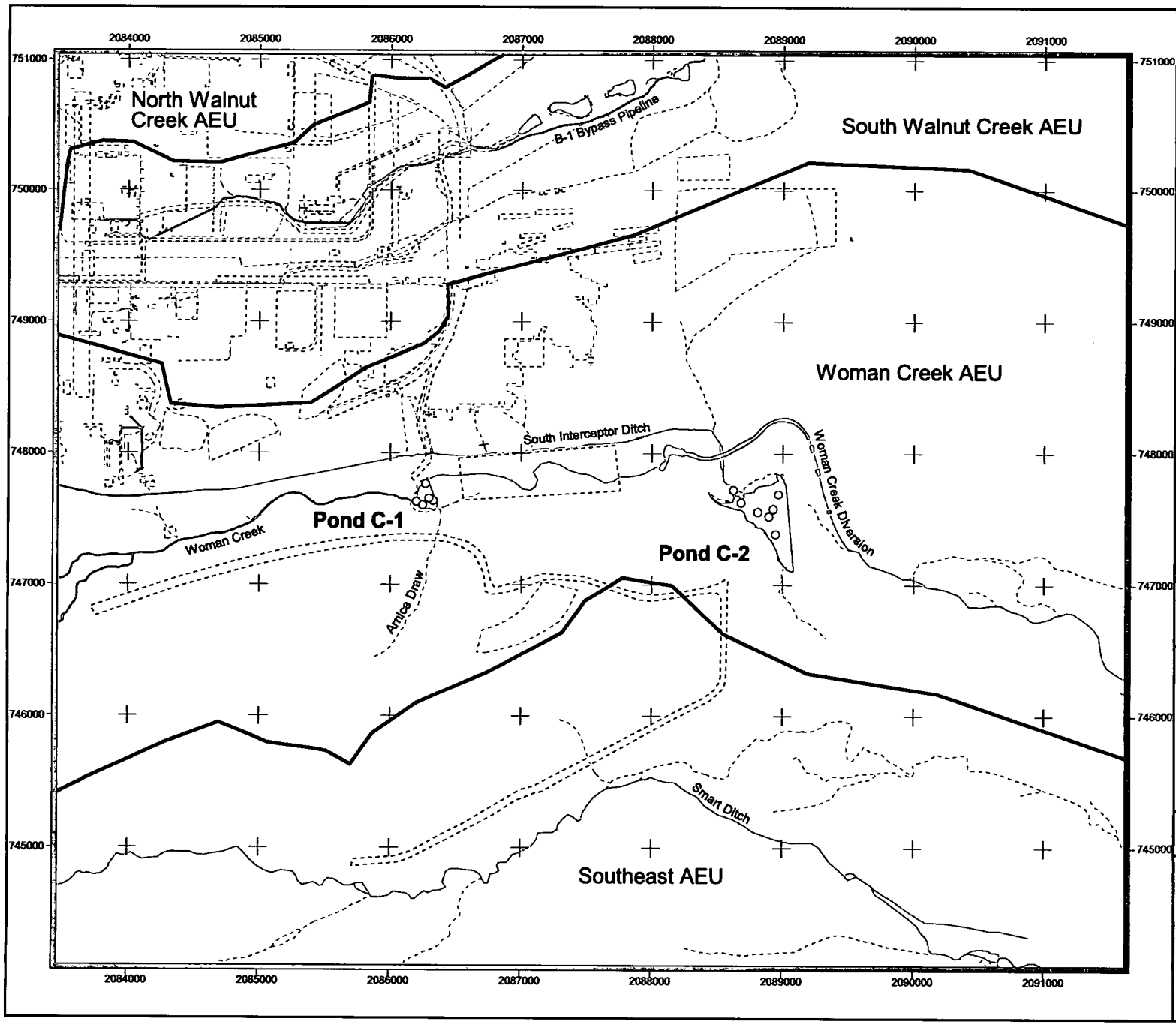

Figure 3.66
C Ponds
Sediment Sampling Locations
for Selenium

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 0.95 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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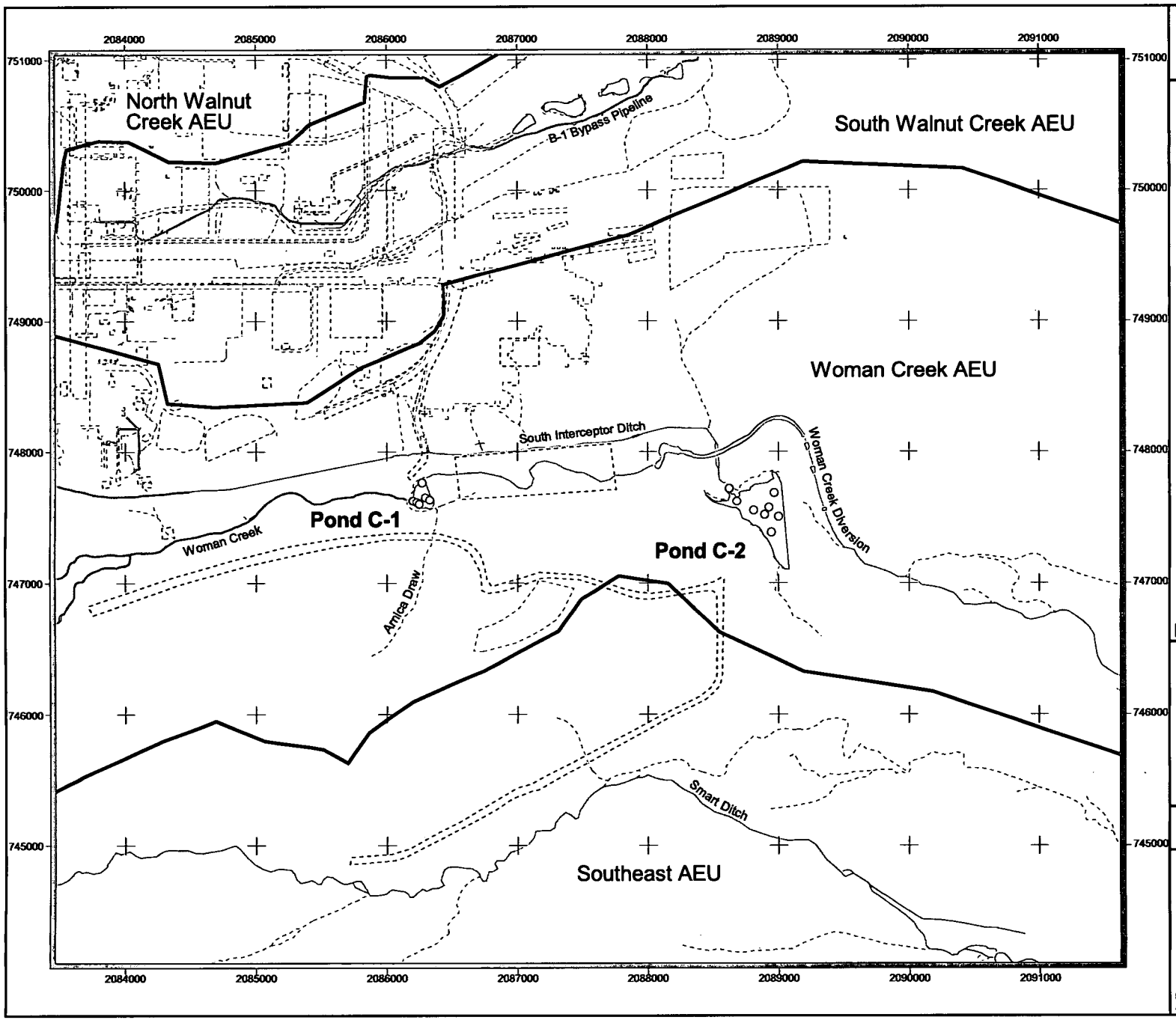

Figure 3.67
C Ponds
Sediment Sampling Locations
for Zinc

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 121 mg/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 08/11/05

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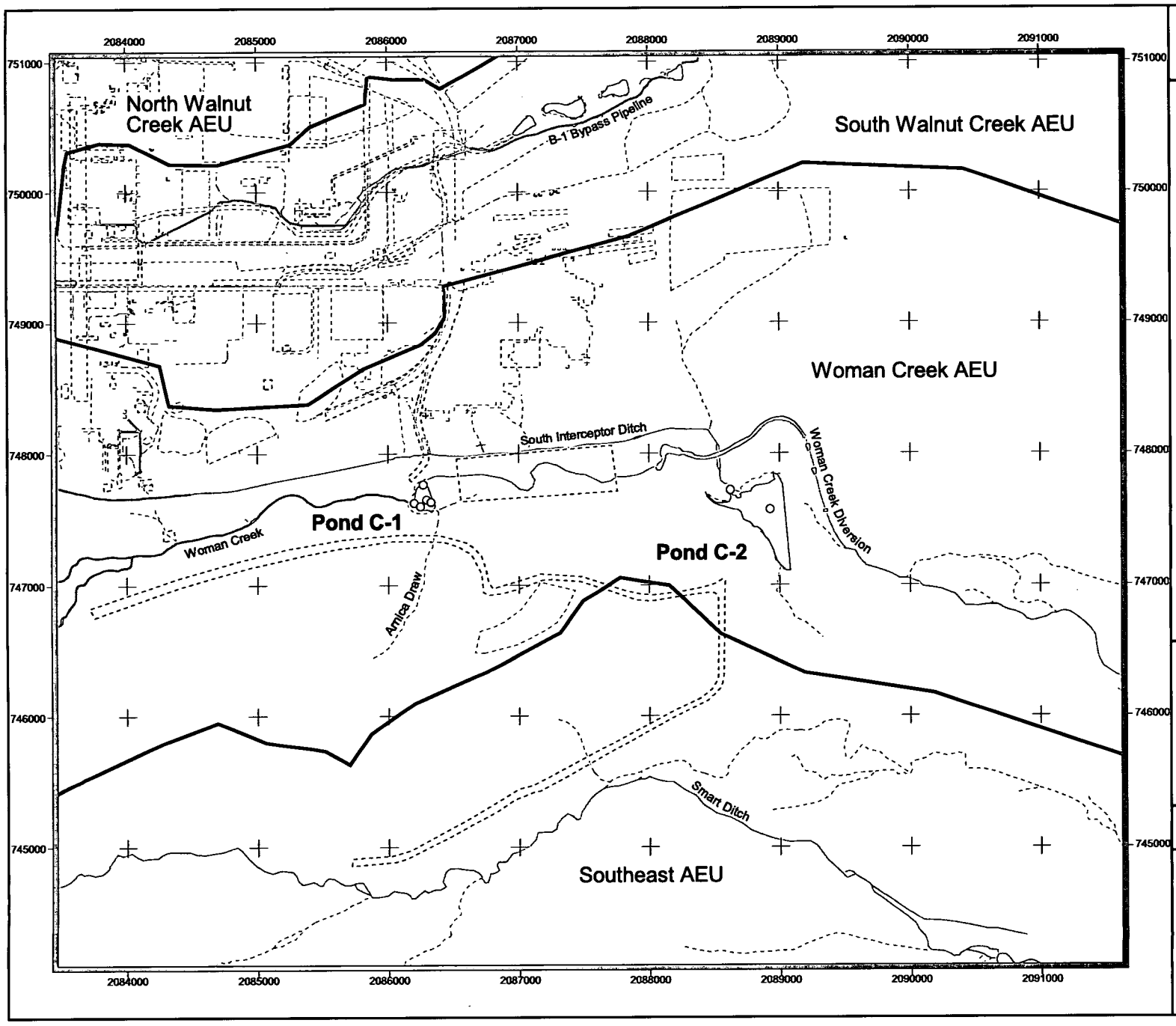

Figure 3.68
C Ponds
Sediment Sampling Locations
for Acenaphthene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 6.71 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

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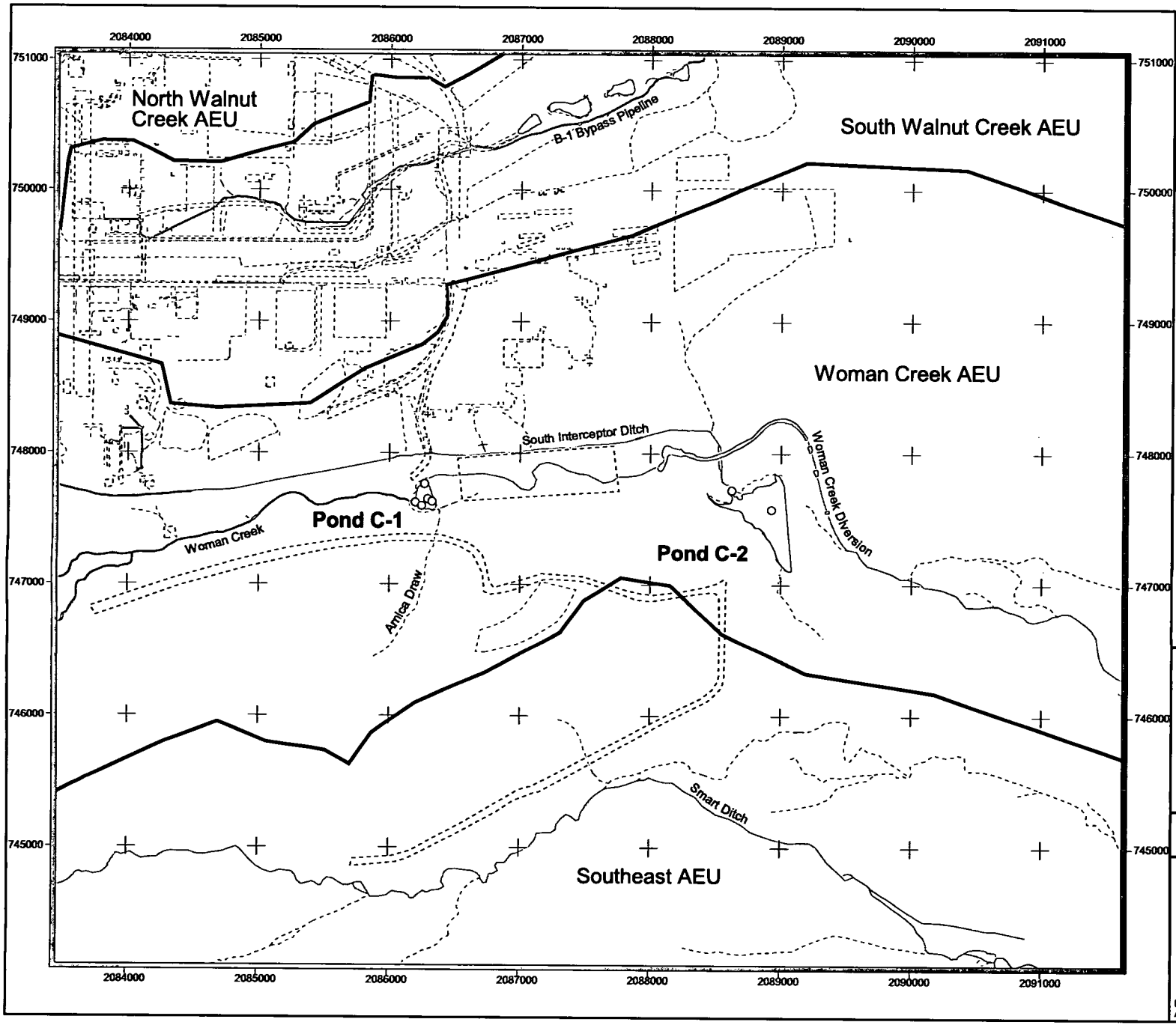

Figure 3.69
C Ponds
Sediment Sampling Locations
for Anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 57.2 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
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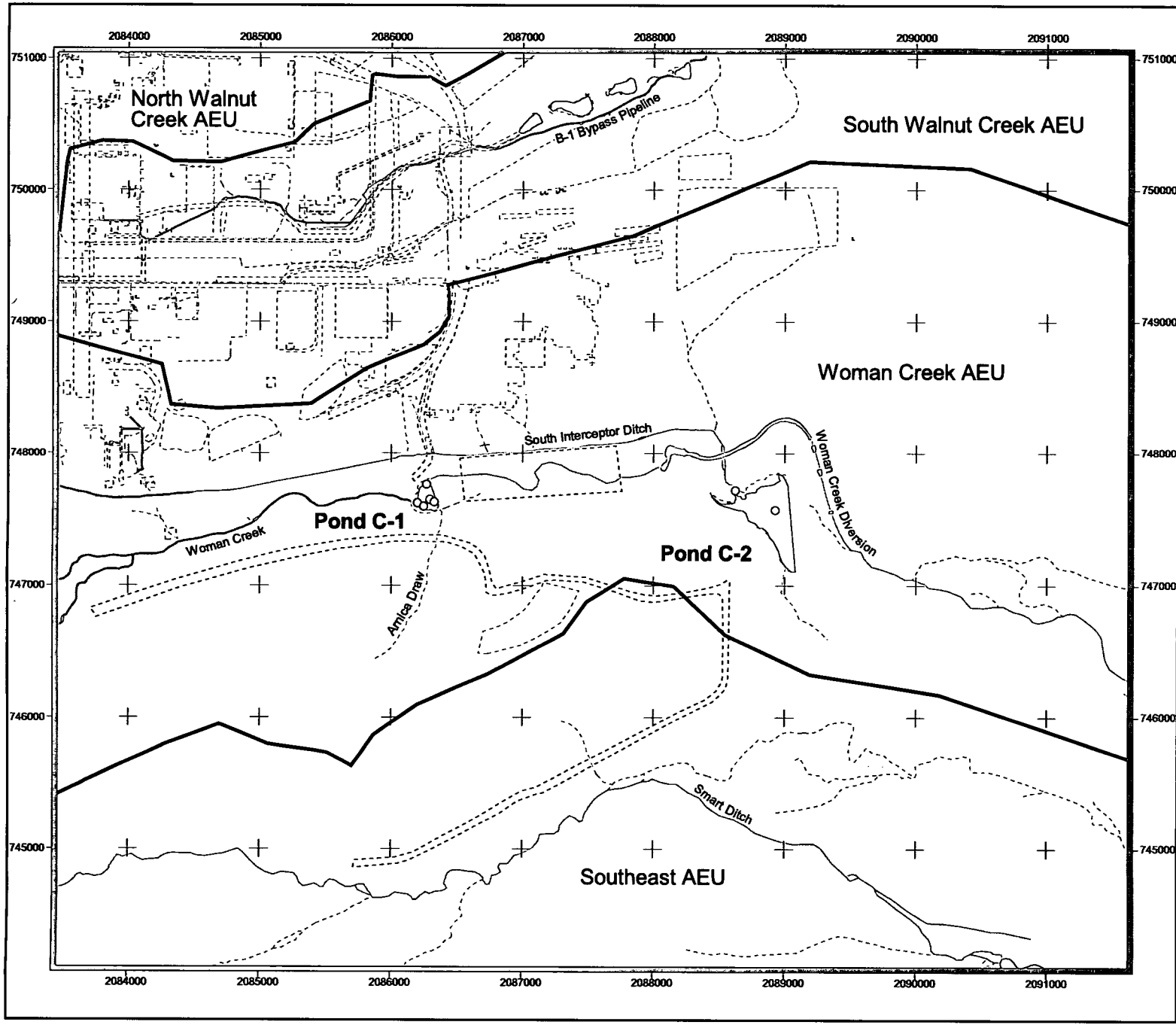

Figure 3.70
C Ponds
Sediment Sampling Locations
for Benzo(a)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 108 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

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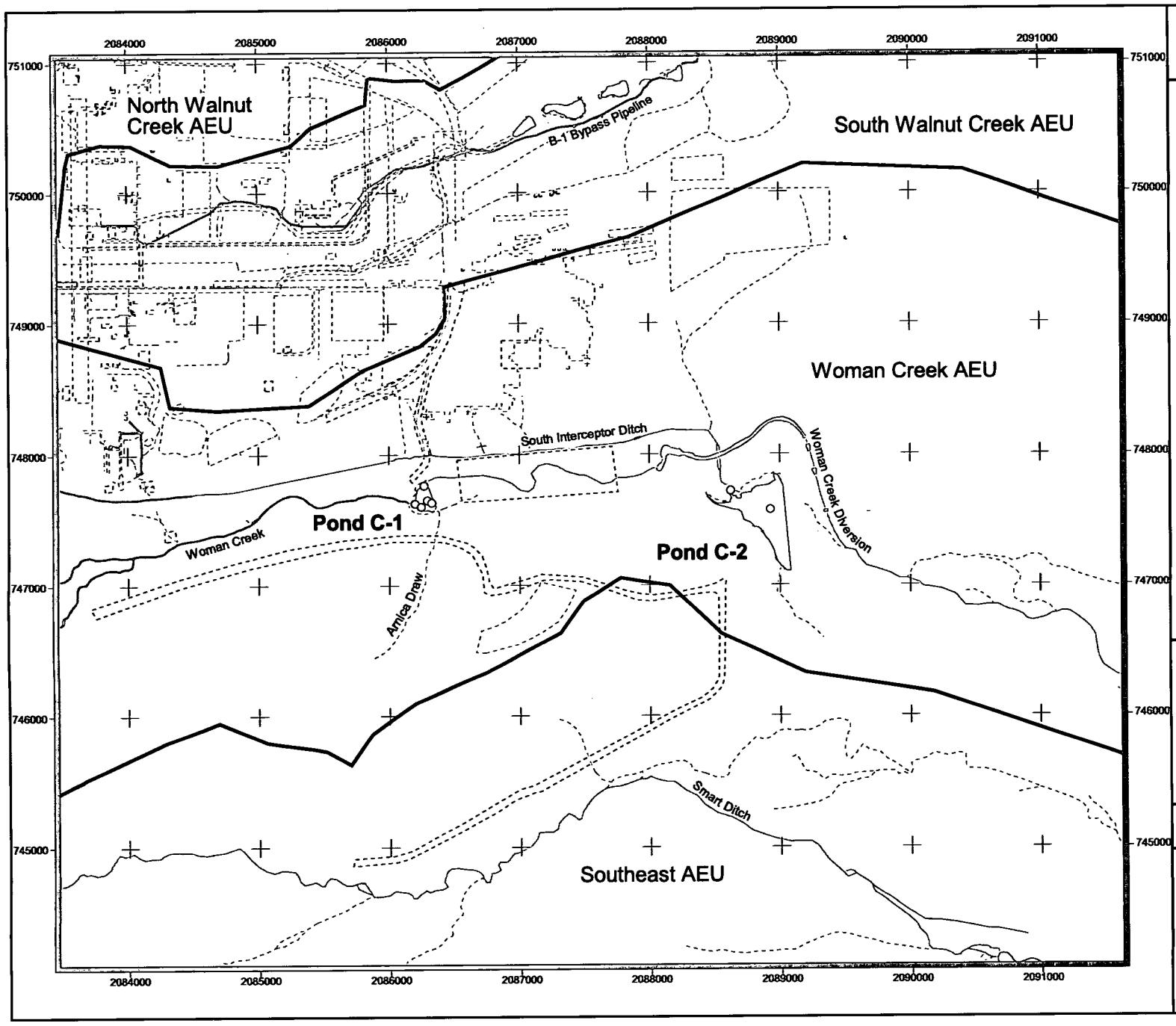

Figure 3.71
C Ponds
Sediment Sampling Locations
for Benzo(a)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 150 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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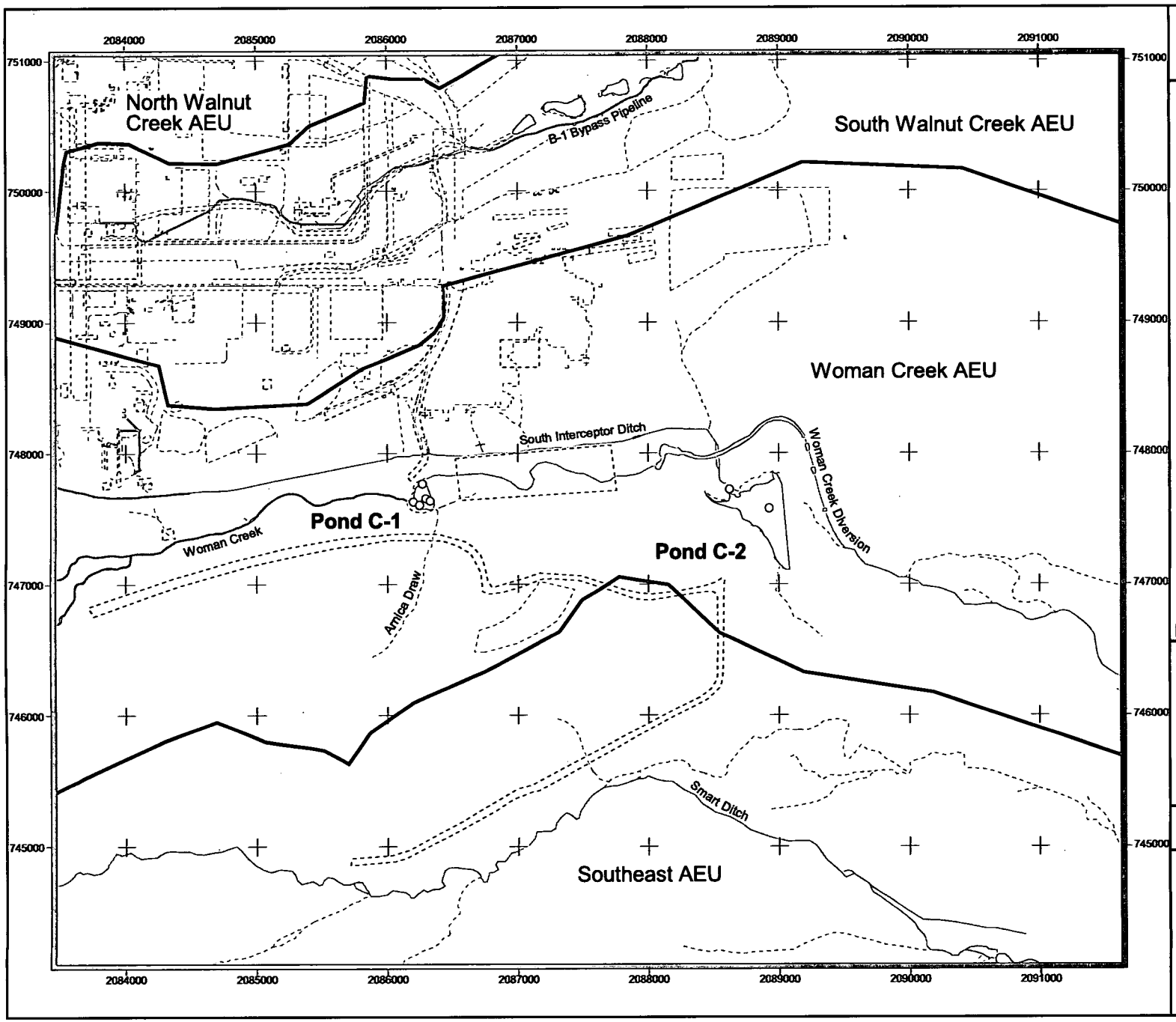

Figure 3.72
C Ponds
Sediment Sampling Locations
for Benzo(g,h,i)perylene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 13 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
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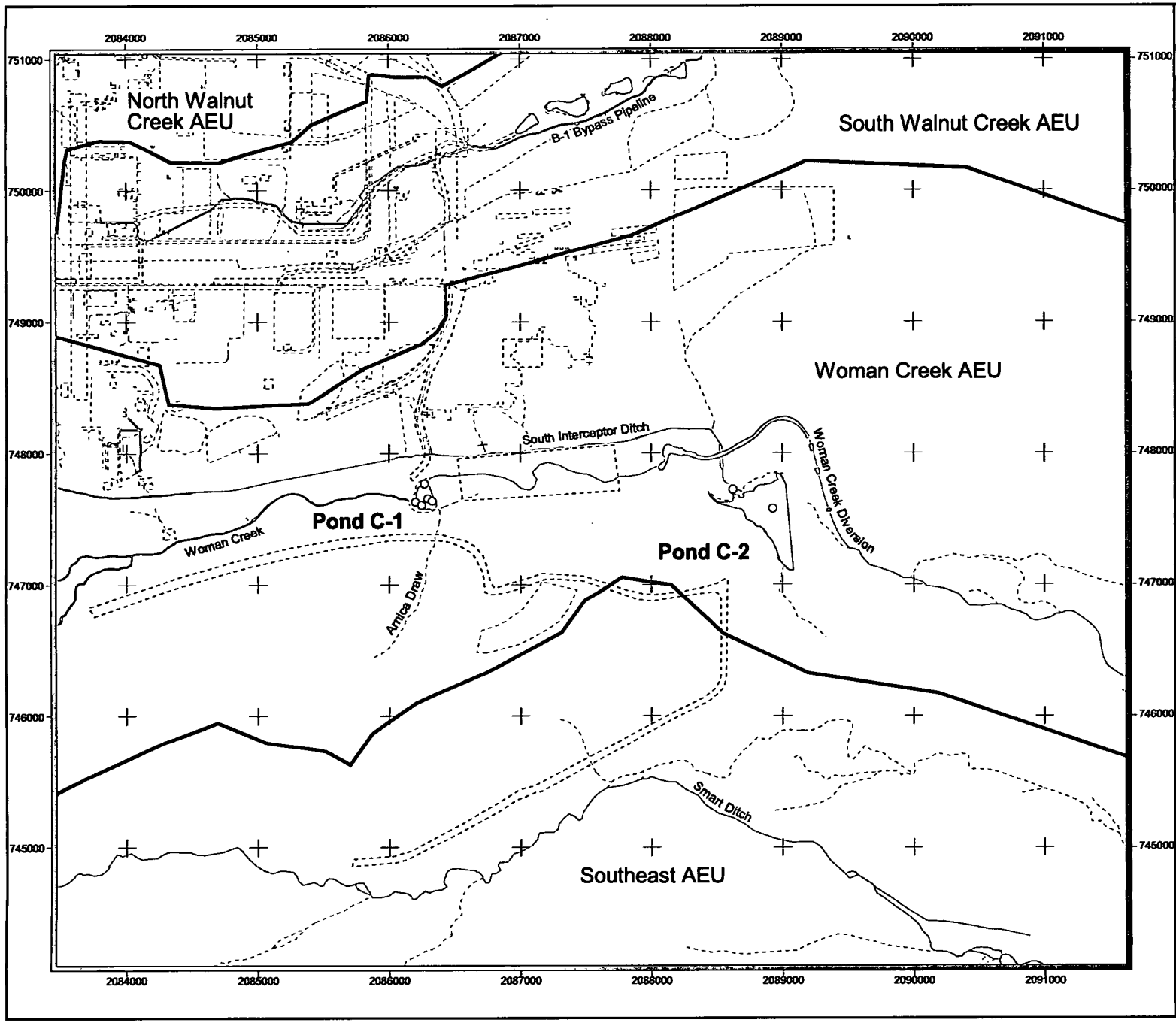

Figure 3.73
C Ponds
Sediment Sampling Locations
for Chrysene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 166 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
State Plane Coordinate Projection
Colorado Central Zone
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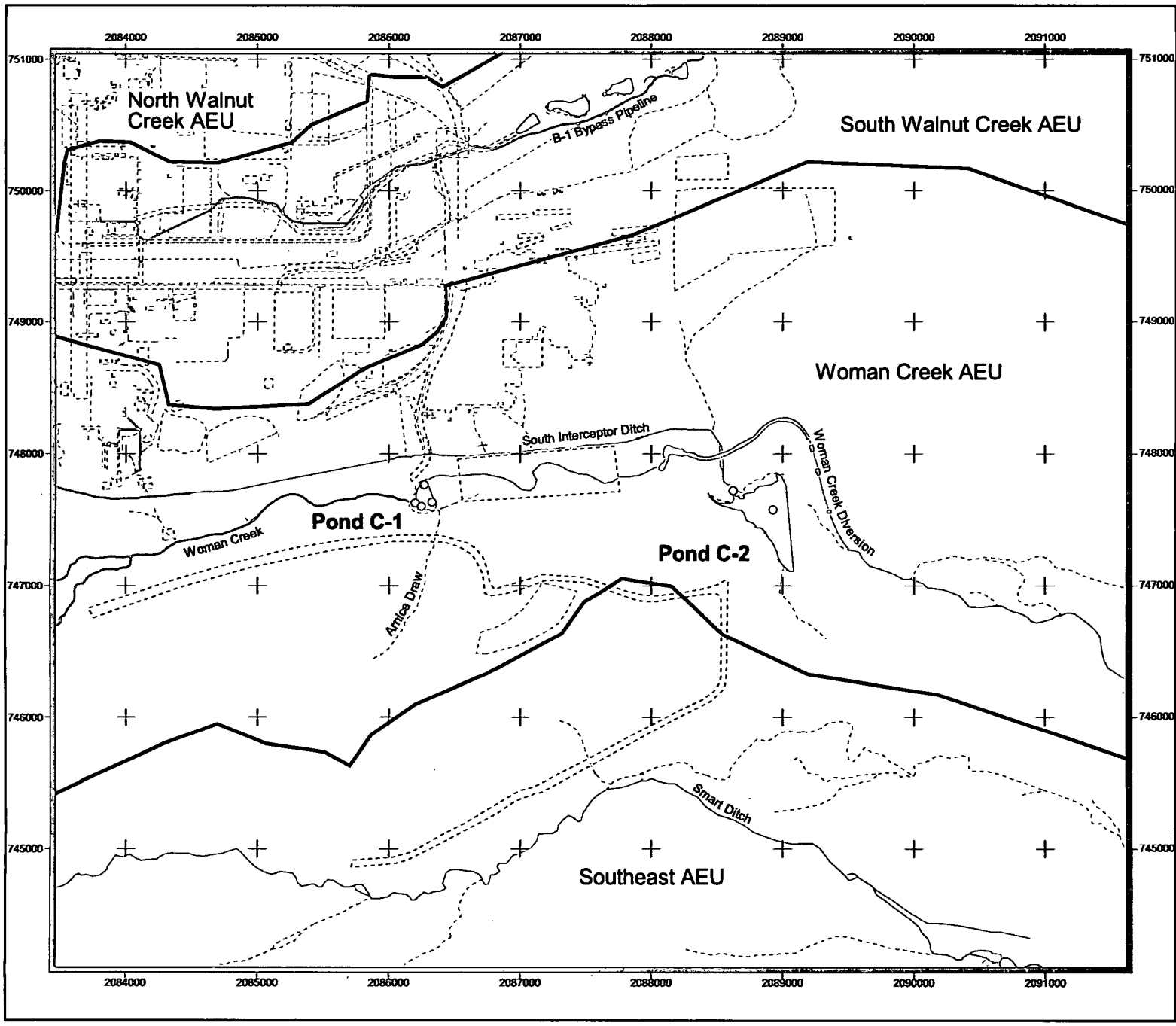

Figure 3.74
C Ponds
Sediment Sampling Locations
for Dibenz(a,h)anthracene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 33 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
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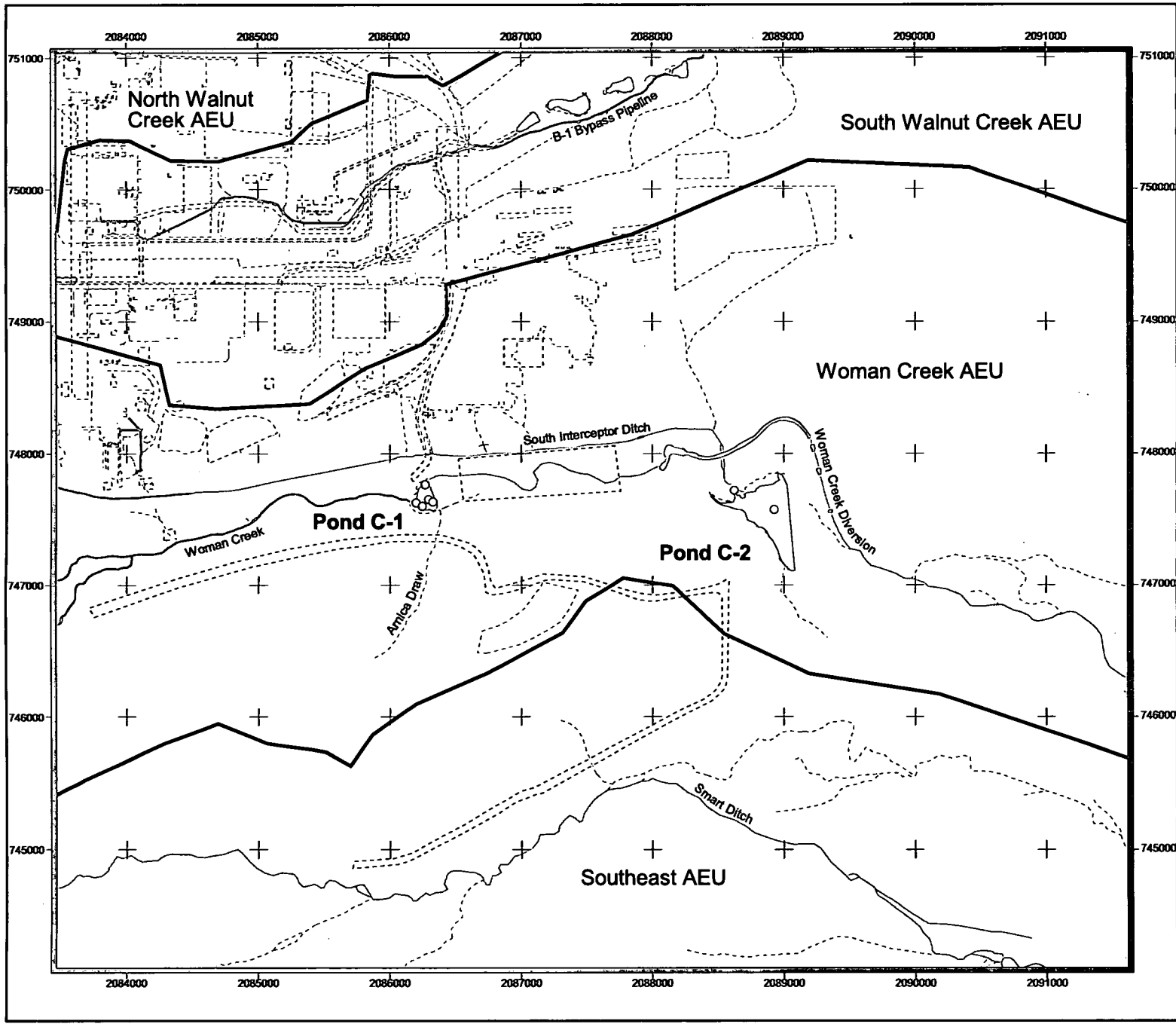

Figure 3.75
C Ponds
Sediment Sampling Locations
for Indeno(1,2,3-cd)pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 17 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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N W E S

275 0 275 550 825 1100 Feet

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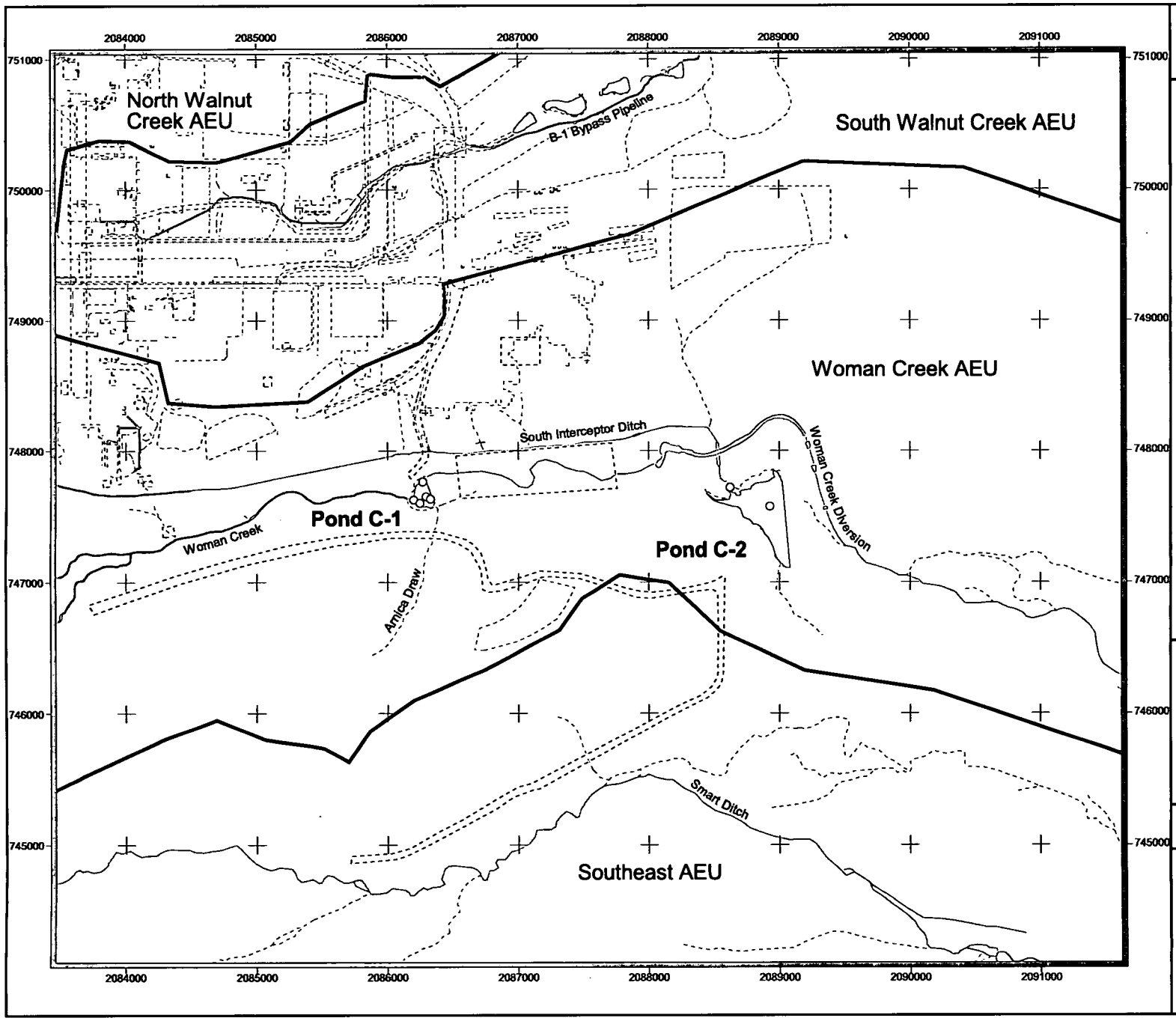

Figure 3.76
C Ponds
Sediment Sampling Locations
for Pentachlorophenol

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 255 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

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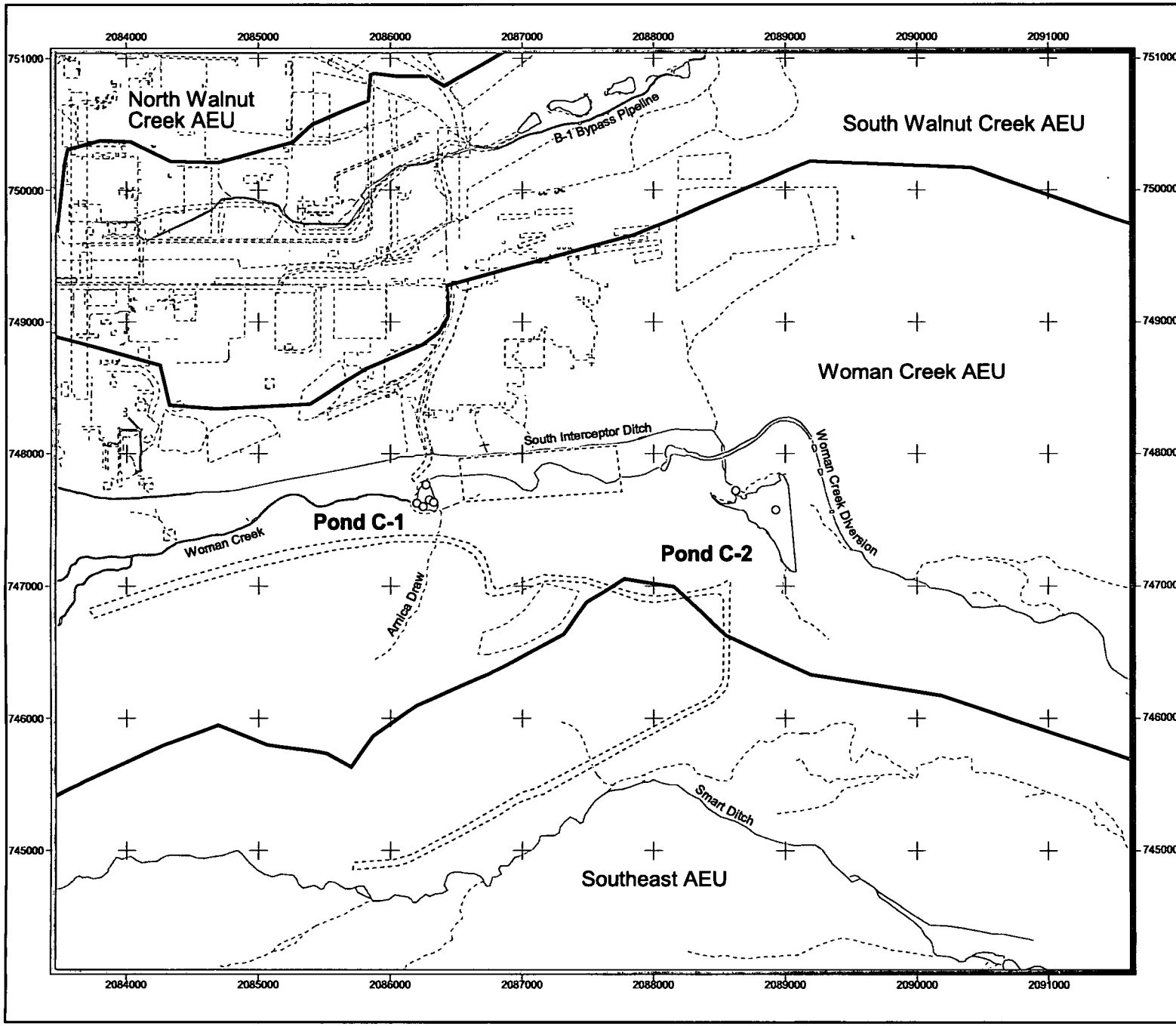

Figure 3.77
C Ponds
Sediment Sampling Locations
for Phenanthrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 204 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

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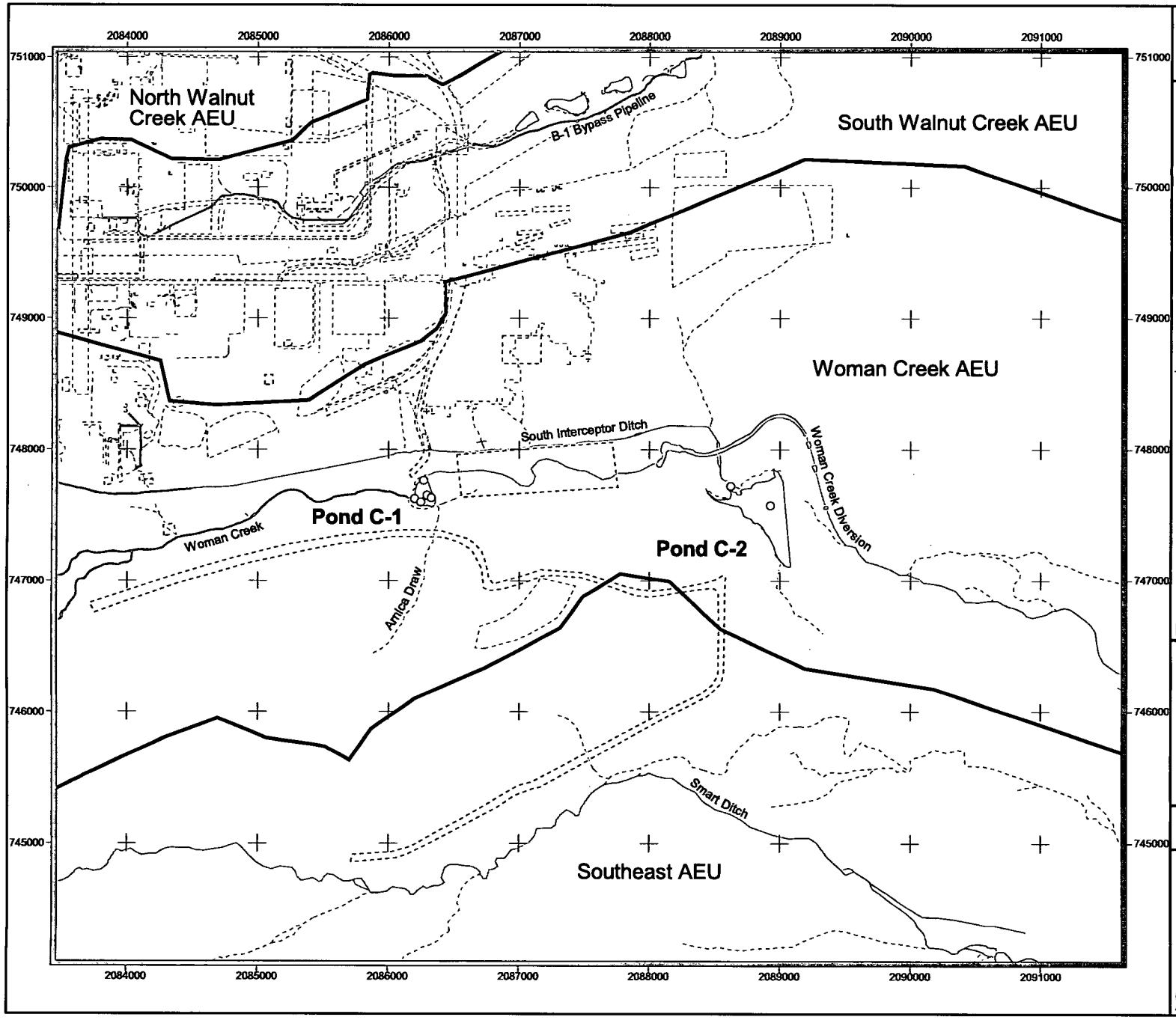

Figure 3.78
C Ponds
Sediment Sampling Locations
for Pyrene

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 195 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

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Data Set: 08/11/05 A1

N W E S

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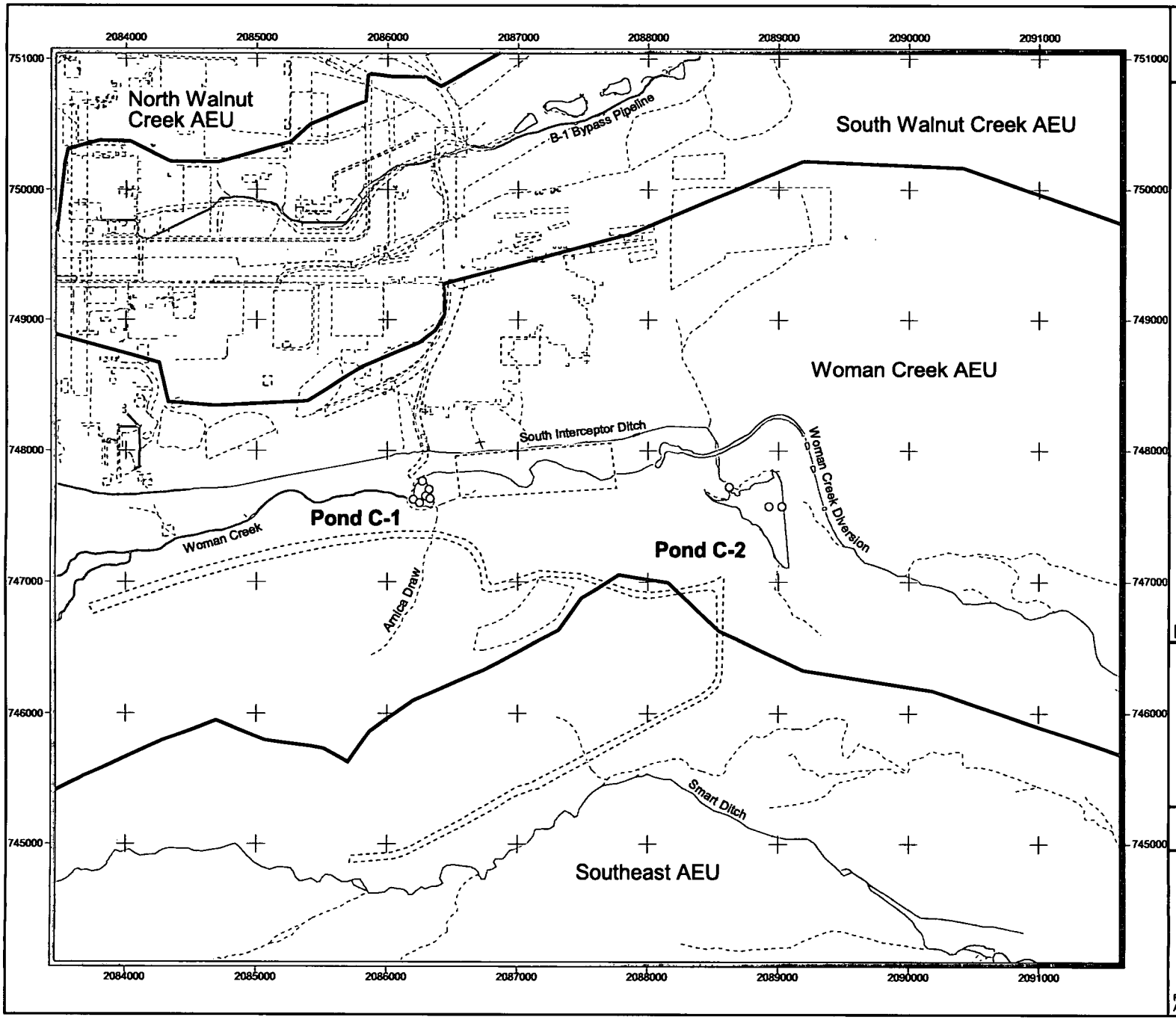

Figure 3.79
C Ponds
Sediment Sampling Locations
for PCB-1254

KEY

Sampling location
- >= ESL
- < ESL
- Nondetect

ESL = 40 ug/kg

- Aquatic Exposure Unit boundary
- Historical IHSS/PAC
- Pond
- Site boundary

Streams
- Perennial
- Intermittent
- Ephemeral

DRAFT

Data Set: 08/11/05 A1

N W E S

275 0 275 550 825 1100 Feet

Scale 1:13,200
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ECOLOGICAL SCREENING SUMMARY: ATTACHMENT 4

Other/Drainage Lines of Evidence in Support of the Risk Characterization

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1.0 INTRODUCTION

Previous research studies have been completed at the Rocky Flats Environmental Technology Site (RFETS) that help define the current ecological condition of the site. Many of these studies were focused within the ponds within the Aquatic Exposure Units (AEUs). For the purposes of the IHSS Group NE-1 Ponds Ecological Screen, a review of the studies that focused on ecological effects within the ponds was completed. Each study provides a "line of evidence" that describes the ecological risk setting of RFETS. These lines of evidence helped to determine if a chemical effect is occurring to the aquatic population within a given pond.

The information available in these previous studies includes tissue analyses, aquatic population studies, bioassay analyses, waterfowl/wading bird studies, and chemical loading analyses. Only those portions of each study that fell within these categories were reviewed and relied upon. Information that was not used includes hazard quotient (HQ) analyses, wildlife studies, vegetation studies, and studies not focused upon the AEU areas. The types of line of evidence studies available from the reviewed literature are summarized in Table 4.1. Figure 4.1 illustrates the onsite and offsite ponds and reservoirs.

Only studies completed since 1991 were reviewed. These studies were conducted over the same time frame of AEU databases and therefore, the results have a direct application to the Ecological Screen.

Several studies provided multiple lines of evidence. For instance, the U.S. Department of Energy (DOE) (1996) evaluation was a baseline Ecological Risk Assessment (ERA) of Operable Units (OUs) 5 and 6 (Woman Creek and Walnut Creek) using a multi-tiered approach. This study included tissue analyses, bioassay analyses, and food chain modeling for waterfowl species, thereby providing three different lines of evidence for the CRA.

Studies with common goals were combined into a single subsection (i.e., aquatic ecological characterization studies, tissue analyses, etc.). The types of studies reviewed describe impacts to populations of aquatic species, with one exception. Studies that describe chemical loading within a watershed were also reviewed as a line of evidence for surface water and/or sediment ecological contaminants of potential concern (ECOPCs) requiring further spatial extent analysis. These loading studies were not designed to address an ecological endpoint, but rather define a chemical behavior within a watershed system. The categories of studies that were compiled are described below.

1.1 Tissue Analyses

The measure of chemical body burden in an aquatic receptor is a direct measure of bioaccumulation/concentration processes. These measures are useful in determining whether a given surface water or sediment ECOPC is bioavailable and, thus, potentially harmful. Studies reviewed and used for their tissue analysis evaluations included:

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- DOE 1994, OU 3 Final RFI/RI – Appendix K. PCB Study: Results of PCB Sediment and Tissue Sampling For Walnut and Woman Creek Drainages and Offsite Reservoirs.
- DOE, 1996, Final Phase I RFI/RI Report. Woman Creek Priority Drainage, Operable Unit 5. Appendix N. Ecological Risk Assessment for Woman Creek and Walnut Creek Watersheds at the Rocky Flats Environmental Technology Site.

1.2 Aquatic Population Studies

The study of a given aquatic species population is a direct measure of surface water and/or sediment chemical effects. Sessile organisms such as benthic macroinvertebrates can be highly susceptible to habitat disturbance, including chemical releases. The measure of species and population indicators (biometrics) such as species richness, density, diversity, etc., is often a useful tool to determine chemical effects so long as a habitat reference condition is understood. Biometrics are influenced by chemical, physical, and biological factors, all of which need to be understood in order to isolate a single factor's effect on a given population. Numerous biological inventory studies have been completed within RFETS. A number of these were designed to define the aquatic health condition within a potentially affected watershed component (i.e., Woman Creek) as compared to a background or reference watershed component (i.e., Rock Creek). The endpoint of most of these studies was to determine the causative factor controlling the ecology, whether physical (habitat), biological (species inter or intra-actions), or chemical (RFETS chemical release). Many of these studies evaluated all the watershed components within RFETS at once. Some were focused on particular segments for a defined purpose (for example, ammonia spatial extent within Big Dry Creek). Aquatic population studies reviewed and integrated into the CRA included the following:

- Aquatics Associates Inc., 1998, Interim Report: Results of the Aquatic Monitoring Program in Big Dry Creek, 1997, Prepared for: Cities of Broomfield, Northglenn and Westminster, Colorado.
- DOE., 2003, Results of the Aquatic Monitoring Program in Streams at the Rocky Flats Site, Golden, Colorado 2001-2002 Rocky Flats Environmental Technology Site, Golden, Colorado.
- DOE, 1992, Baseline Biological Characterization of the Terrestrial and Aquatic Habitats at Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado.
- Kaiser-Hill, 1998, Final Report: Lower Walnut Creek Aquatic Sampling, Spring 1998, Rocky Flats Environmental Technology Site, Golden, Colorado.

1.3 Bioassay Analyses

Bioassays test the toxicity attributable to potentially contaminated media and provide a direct measure of chemical risk. Only one study was identified as having completed a bioassay analysis:

- DOE, 1996. Final Phase I RFI/RI Report. Woman Creek Priority Drainage, Operable Unit 5. Appendix N. Ecological Risk Assessment for Woman Creek and Walnut Creek Watersheds at the Rocky Flats Environmental Technology Site.

1.4 Waterfowl/Wading Bird Studies

Waterfowl, wading birds, and higher trophic organisms were not identified as target receptors for the AEU Ecological Screen. However, the CRA Methodology (DOE 2004a) suggests that studies of these organisms may be useful lines of evidence within the CRA. For that purpose, these studies were evaluated and included:

- DOE, 1996, Final Phase I RFI/RI Report. Woman Creek Priority Drainage, Operable Unit 5. Appendix N. Ecological Risk Assessment for Woman Creek and Walnut Creek Watersheds at the Rocky Flats Environmental Technology Site.
- DOE, 1994, OU 3 Final RFI/RI – Appendix K. PCB Study: Results of PCB Sediment and Tissue Sampling For Walnut and Woman Creek Drainages and Offsite Reservoirs.

2.0 TISSUE ANALYSES

Tissue analyses studies are their relevance to the Ecological Screen are described in the following sections.

2.1 Results of PCB Sediment and Tissue Sampling For Walnut and Woman Creek Drainages and Offsite Reservoirs DOE 1994

Review

This study was completed in response to preliminary results of sediment and tissue samples collected during the OU 6 RCRA Facility Investigation/Remedial Investigation (RFI/RI) between August 1992 and June 1993, which indicated elevated PCB concentrations occur for some of the A- and B-Series Ponds. Because the potential existed for sediment and/or specific biota in Great Western Reservoir and Standley Lake Reservoir to have been impacted by PCB contaminants from RFETS prior to 1989 (prior to the diversion canal that routes flow from Walnut Creek around Great Western Reservoir and back into Walnut Creek below the dam), a sediment and tissue PCB sampling project was undertaken as part of the Environmental Evaluation (EE) portion of the OU 6 RFI/RI.

The effort entailed sampling sediment and fish tissue from the A- and B-Series Ponds. Fish samples also were collected from the Walnut Creek terminal pond at Indiana Street (OU 6) and Great Western Reservoir to determine if PCBs had migrated downstream of the terminal ponds; Mower Reservoir; Standley Lake Reservoir; and the C- and D-Series Ponds.

An attempt was made to collect three of each species of fish for whole body analysis. When additional numbers of the same species were sacrificed, they were used for filet or

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liver analysis. Results were compared to literature-derived values to determine potential effects. The following values were used to compare tissue results:

- Reproductive impairment in rainbow trout may occur at concentrations greater than 400 micrograms per kilogram (µg/kg) fresh weight (EPA 1980, as reported in Eisler 1986).
- The recommended maximum body burden for trout is 400 µg/kg fresh weight (Eisler 1986).
- A reported value of 5,000 µg/kg is protective of human health consumption (Hoeting 1983, as reported in Eisler 1986).
- An observed typical body burden concentration for fish is 1,000 µg/kg (Schnitt et al. 1983, as reported in Eisler 1986).
- Food concentration thresholds recommended by DOE (1994) for fish-eating birds are 667 parts per billion (ppb) for the belted kingfisher and 768 ppb for the great blue heron.

In addition, a sampling effort was undertaken to evaluate whether the Preble's meadow jumping mouse (PMJM) might be impacted by the presence of PCBs in the RFETS buffer zone (BZ). Because the PMJM has a diet similar to deer mice, 13 deer mice were collected adjacent to Ponds A-1, A-3, B-1, and B-4 for whole body tissue analysis to evaluate possible PCB contamination in PMJM. In addition, 12 voles were collected from the same locations to determine if they represent a pathway of PCBs to predatory birds that include voles in their diet.

Results from sediment (collected at depths of 0 to 6 inches) sampling program in both the A- and B-Series Ponds show a decreasing concentration of PCBs, primarily Aroclor-1254, with distance downstream. The mean values of Aroclor-1254 and Aroclor-1248 in the A- and B-Series Ponds are summarized in Table 4.2. Conclusions drawn from the sediment analysis are as follows:

- Sediments collected from Pond B-2 have a considerably higher mean Aroclor-1254 concentration than those collected from either Pond B-1 or B-3. It was speculated that this was due to the presence of an outfall that historically entered directly into Pond B-2, bypassing Pond B-1.
- Ponds B-1 and B-2 contain the only sediment sampling locations where Aroclor-1248 was detected.
- No PCBs were detected in either Terminal Ponds A-4 or B-5.
- No PCBs were detected in sediment collected from the Ponds C-1 and C-2.

PCB concentrations in both the A- and B-Series Ponds decrease with distance downstream to the point where no PCBs were detected in Terminal Ponds A-4 or B-5. In addition, no PCBs were detected in sediment samples collected from the C-1 and C-2 Ponds. Therefore, it is highly unlikely that sediments derived from RFETS would be currently contributing PCBs to any of the offsite reservoirs.

In the A- and B-Series Ponds, four types of whole body tissues were analyzed: largemouth bass (40-58 µg/kg), fathead minnows (14-479 µg/kg), tiger salamanders (26 – 134 µg/kg), and crayfish (BDL – 9.5 µg/kg). Summary conclusions are as follows:

- For the A-Series Ponds, no consistent trends were observed. Species were either present and collected in one pond only or the PCB concentrations were below detection limits.
- For the B-Series Ponds, the PCB concentrations increased in tiger salamanders from Pond B-1 to B-2 with no further specimens being found downstream, increased in plants from Pond B-1 to B-4, and decreased in fathead minnows from Pond B-4 to B-5. PCBs were detected in fathead minnows collected from Pond A-5 in even lower concentrations than in Pond B-5.
- Only one fish species was collected from Great Western Reservoir. Of the six carp specimens collected, only one contained detected quantities of PCBs (52.4 µg/kg).
- Fish tissue samples collected from Ponds C-1 and C-2 contained only low levels of PCBs (<100 µg/kg), and no PCBs were detectable in fish tissues collected from Ponds D-1 and D-2 or Mower reservoir.
- The highest concentration of PCBs found in any animal tissue during this study was in a carp (1,000 µg/kg) collected from Standley Lake Reservoir. Historically, less than 5 percent of the water flowing into Standley Lake Reservoir has come from RFETS. In addition, all of the Woman Creek drainage above the divide on Woman Creek below the Pond C-2 dam has been diverted to Mower Reservoir since 1989, and currently no surface water enters this reservoir. Therefore, it is highly unlikely that the PCBs found in the fish tissue samples collected from Standley Lake were derived from RFETS. Furthermore, the scarcity of detected PCBs in fish tissues collected from Great Western Reservoir supports the hypothesis that RFETS is not contributing PCBs to any of the offsite reservoirs.
- The only tissue samples collected at RFETS that exceeded Eisler's (1986) recommended maximum body burden for trout (400 µg/kg fresh weight) were three fathead minnow specimens (464 – 498 µg/kg for whole body) collected from Pond B-4.

Application to the Ecological Screen and Uncertainties

This study encapsulated several lines of evidence within its design. The A-, B-, and C-Series Ponds were sampled specifically to assess PCB transfer between abiotic (sediment) and biotic (fish tissue) media. The absence of PCB accumulation in excess of tissue threshold concentrations in almost all fish at the Site indicates there is a low potential for risk to fish in the pond habitat areas. Results of sediment samples did not yield any detectable levels of PCBs in Terminal Ponds A-4 and B-5.

The only tissue samples collected on RFETS to exceed Eisler's (1986) body burden for trout (400 µg/kg flesh weight) were three fathead minnow specimens collected from the Pond B-4 that had an average aroclor-1254 content of 188 µg/kg. The results from the B-

Series Ponds sediment were compared to this value to determine if a potential bioaccumulation pathway may exist.

This study also evaluated the potential effects of PCBs in sediment on predatory birds that may feed on organisms exposed to the sediment. Results from this study revealed that there is no risk to predatory birds (i.e., higher trophic organisms) as a result of ingesting prey that may have accumulated PCBs from the pond sediment. The absence of PCB accumulation exceeding tissue threshold concentrations in prey species indicates that there is a low potential for risk to these organisms within the A-Series, B-Series, and C-Series Ponds.

The time period in which this study was completed represents an historic condition for RFETS. A significant number of accelerated action efforts have been completed since this time. The sediments from Ponds B-1, B-2, and B-3 were removed, and the food web components that were initially sampled from each pond may no longer be present. Therefore, the study likely represents conservative conditions and over-estimates PCB risks when compared to current conditions at RFETS.

2.2 Final Phase I RFI/RI Report, Woman Creek Priority Drainage, Operable Unit 5, Appendix N. Ecological Risk Assessment for Woman Creek and Walnut Creek Watersheds at the Rocky Flats Environmental Technology Site, DOE, 1996

Review

The Ecological Risk Assessment (ERA) for OUs 5 and 6 used a multi-tiered approach to evaluate risks to aquatic and terrestrial receptors. The first tier represented a conservative screening approach that served to recommend additional steps of refinement for more baseline-level ERA evaluations. One additional step was the evaluation of PCBs, which initially indicated negligible risk to aquatic-feeding birds (as per the screening level findings). However, DOE (1996) recommended further analysis because: 1) biological tissue data were not available for all ponds in where PCBs were detected in sediments, and 2) development of the aquatic community in ponds could result in increased biological transport of sediment contaminants and increased exposure to aquatic-feeding birds.

During the OU 6 RFI/RI field sampling sediments were collected from multiple locations within each of the A- and B-Series Ponds and analyzed for several PCB congeners. Only Aroclor-1254 and Aroclor-1260 were detected in these samples, and concentrations varied considerably between ponds. The highest concentrations were in the upstream ponds in each watershed, with progressively lower concentrations down-gradient. In general, concentrations in sediments from the B-Series Ponds averaged ten times those in the A-Series Ponds, reflecting that the South Walnut Creek watershed includes most of the RFET IA and receives discharge from the Wastewater Treatment Plant. PCBs were detected in 100 percent of the samples from Ponds A-1, B-1, B-2, B-3, and B-4; in three of four samples from Pond A-2; and in none of the samples from Ponds A-3, A-4, or B-5. These data were from samples collected from the surface as well as at depth. Aquatic organisms typically are not exposed to sediments below the upper 15 cm (6 inches).

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Some data was collected from depths greater than 15 cm and could not be used for biological exposure evaluation. Consequently, sediments and biota in the ponds were re-sampled and re-analyzed to obtain data more appropriate for assessing ecological risk. Samples were collected from the upper 15 cm of sediment at the same sites sampled during the earlier investigation. Where available, tissue samples also were collected for fish, salamanders, crayfish, and benthic macroinvertebrates. Sampling was conducted in June and July 1994 (DOE 1994)..

Biota was sampled in all ponds, however, some of the ponds did not produce samples sufficient for analysis. Adequate samples were obtained only for Ponds A-2, A-3, A-4, B-1, B-2, B-4, and B-5. Largemouth bass were obtained from Pond A-2; fathead minnows from Ponds A-4, B-4, and B-5; tiger salamander larvae from Ponds B-1 and B-2; and crayfish from Ponds A-2, A-3, A-4, and B-5. A single sample of benthic macroinvertebrates was collected from Pond A-2.

As with the earlier sampling, the PCB concentrations were higher in the B Ponds than in the A Ponds, with the highest concentrations in Pond B-2. The maximum concentrations were generally lower than in the earlier (RFI/RI) samples. The sediments within the upper 15 cm had generally lower PCB concentrations than the deeper sediments, suggesting a lower risk to aquatic life than indicated by the earlier data.

Aroclor-1254 was the only PCB congener consistently detected in biota and sediments. Aroclor-1260 was detected in only one biota sample from B-3, and was not detected in sediment samples. Concentrations of Aroclor-1254 ranged from below detection limits to 500 milligrams per kilogram (mg/kg) in a fathead minnow sample from Pond B-4. High tissue PCB concentrations did not correlate to high PCB concentrations in pond sediment. Results of the sample analysis are provided in Table 4.3.

The ratio of Aroclor-1254 content in biota to that in sediments was calculated for ponds in which Aroclor-1254 was detected in both sediments and biological samples (Table 4.4). The variability of biota types available, and the lack of PCB detections in some ponds with biota, limited comparison of biota-sediment factor (BSF) values among ponds. BSF ratios varied among biota types, ranging from 0.1 in salamander neonates from Pond B-1 to 3.3 in fathead minnows from Pond B-4. Largemouth bass, which were found only in Pond A-2, had a BSF of 0.6. These values were comparable to BSFs estimated for aquatic biota in other studies (Rassmussen et al. 1990; Macdonald et al. 1993).

Application to the Ecological Screen and Uncertainties

This study encapsulated several lines of evidence within its design. A-, B-, and C-Series ponds were sampled specifically to assess PCB transfer between abiotic (sediment) and biotic (fish tissue) media. The biota results from the A-Series Ponds, Pond B-4, and Pond B-5 were compared to the results for PCBs in sediment in the B-Series Ponds to determine to what extent bioaccumulation may occur. The absence of bioaccumulation of PCBs in Ponds A-1 and A-2 indicates a low risk to higher trophic organisms, as well as the receptors directly exposed to pond sediments. The measured tissue concentrations in specimens collected from Pond B-4 are just above tissue thresholds protective of fish

(DOE 1994). This moderate level of bioaccumulation indicates a possible risk from PCBs.

3.0 AQUATIC POPULATION STUDIES

Aquatic population studies are their relevance to the Ecological Screen are described in the following sections.

3.1 Final Phase I RFI/RI Report, Woman Creek Priority Drainage, Operable Unit 5, Appendix N. Ecological Risk Assessment for Woman Creek and Walnut Creek Watersheds at the Rocky Flats Environmental Technology Site, (DOE, 1996)

Review

This study was completed as a part of the ecological risk evaluation of aquatic life for OUs 5 and 6. Risks to aquatic life from chemical concentrations in sediments were evaluated by a weight-of-evidence approach. HQs and hazard indices (HIs) were generated as a screening tool and indicated a relatively high potential for toxic effects in sediments. As a next step in the ERA tiered process, characteristics of benthic community structure and results of sediment bioassay tests were used to check predictions of toxic stress as indicated by the screening results. Community characteristics are described here; results of the bioassay analyses are presented in Section 4.1 This multi-tiered approach is similar to the Sediment Quality Triad procedure (Chapman 1986; EPA 1992), which uses toxicity, chemistry, and benthic community data to investigate the biological impact of sediment pollution and identify mechanisms of effects-based sediment studies (Chapman et al. 1992; Power and Chapman 1992; Canfield et al. 1994).

Benthos samples were collected from all of the A-, B-, C-, and D-Series Ponds during May through July 1994. Five replicate multi-core composite samples were obtained from different water depths and submerged habitat types to ensure complete representation of the pond biota. Samples were analyzed for taxonomic composition and abundance. Taxa were recorded at the lowest practical taxonomic level for the sample period.

Conventional interpretation of benthic community structure suggests that communities with low densities of organisms or reduced richness and diversity are subject to physical or chemical stress. Under sustained chemical stress, the benthic community may also contain high densities of pollution-tolerant species, which in turn may result in low richness and low diversity. Benthic communities for Ponds D-1 and D-2 were sampled to represent locations with no known contaminant input from RFETS.

Descriptive data were developed for community parameters including richness, density, Simpson and Shannon-Wiener diversity measures, number of dominant taxa, and abundance-based relationships for oligochaetes and dipterans. The data represent pond-level characteristics for a composite of data from the five different habitat samples.

A total of 81 different taxa representing all the major orders of aquatic organisms were identified in the pond benthos samples. A composite listing of identified taxa and mean abundance for each pond was compiled. Community description measures generated for

each pond are summarized in Table 4.5. Oligochaete worms and dipterans dominated the benthos samples from all locations. General conclusions drawn from the study include the following:

- The B-Series Ponds contained the highest abundance of all taxa except pelecypoda (snails), which were most abundant in the A-Series Ponds.
- The C-Series Ponds did not support a wide variety of organisms other than oligochaetes and dipterans.
- Ponds A-1 and A-3 had the least pollution-tolerant communities of all ponds, including the D-Series reference Ponds. Ponds A-2 and B-2 had the most pollution-tolerant communities.
- Ponds D-1 and D-2 exhibited a wide range of community characteristics including the second lowest (Pond D-1) and highest (Pond D-2) diversity values.
- A cursory review of the benthic community data indicates that Ponds A-4, B-3, and C-1 may have been under the most persistent chemical or physical stress. In each of these ponds, oligochaetes and dipterans were the dominant taxa. These organisms are considered good colonizers and frequently are the dominant taxa from habitats with high physical variability. The highly variable environmental (physicochemical) conditions at RFETS may account for the dominance of colonizers.

The data were analyzed to identify sites with benthic communities that were similar in composition and structure to sites with no known exposure to contaminants (Ponds D-1 and D-2). However, although the sediments from Pond D-1 were considered to be uncontaminated, the low richness and diversity and the high abundance of a single taxon at this site appear to reflect some type of environmental stress.

Cluster analysis techniques were used to determine the relationship between the HI estimate and community structure for each pond. Results from the analysis indicate that none of the community structure parameters mirror the HI site patterns. This result suggests a lack of correlation between the magnitude of the HIs and pond benthic community structure. Further analysis involving regression methods was used to estimate whether the proportion of variation in community structure could be explained by differences in HIs. Results indicate that predicted toxicity accounts for some of the variation in community composition, but other factors are clearly important. Factors such as pond size, fluctuating water levels, and the presence or absence of upper trophic levels also are important.

Applications to the Ecological Screen and Uncertainties

This study evaluated benthos samples collected from all of the A-, B-, C- and D-Series Ponds from May through July 1994 The results represent a snapshot in time of the aquatic ecology within the time-frame of the data collected for the Ecological Screen analysis. Results indicate that the pond populations at the time of the study were comparable to reference conditions. In addition, there was little correlation of population biometrics to chemical indices, indicating that there is no correlation between possible

chemical stressors and population conditions. The results indicate there were no ongoing chemical risk conditions during the sampling period in 1994.

Sampling captures aquatic population conditions during certain periods. Because the monitoring was completed over a short duration, it may not represent the year-round condition. In addition, the sampling took place prior to accelerated action efforts and likely represents worst-case conditions as compared to current conditions.

3.2 Baseline Biological Characterization of the Terrestrial and Aquatic Habitats at Rocky Flats Plant, (DOE 1992)

Review

This study provided an inventory and cursory assessment of the ecological health of the aquatic habitats within the RFETS BZ. A variety of methods were used to collect and observe aquatic species. Fish sampling employed gill nets, minnow traps, and limited electro-shock sampling. Benthic macroinvertebrate sampling used grab sampling techniques to collect field samples and repeatable laboratory methods to quantify the occurrence and abundance of benthic samples.

The occurrence of taxa within the benthic communities of streams and ponds were assessed, and generalizations about aquatic community health were made based on the presence or absence of various taxon, including those that may indicate tolerance or intolerance to pollutants.

The aquatic habitats were found to have high species richness, an indication of a healthy ecosystem. The report documents that aquatic habitats at RFETS have a high density of benthic macroinvertebrates. Fish species diversity is naturally low in the semiarid climate characterized by intermittent streams and small pools and ponds that are inadequate to support large fish populations. Nine species of fish were collected at RFETS, most in the minnow family *Cyprinidae* (six species). Most species were found in pools or impoundments that offer refuge from annual drought conditions. Several ponds had very high populations of golden shiners and fathead minnows.

The most disruptive environmental factor to aquatic communities at RFETS is the naturally semiarid climate. All streams have sections that are intermittent, while the perennial sections are fed by groundwater seeps. Aquatic communities at RFETS thrive despite the environmental limitations. Many aquatic organisms present are adapted to low stream flow conditions. These organisms are often classified as "tolerant" considering general water quality.

Benthic macroinvertebrate samples from Walnut Creek contained 59 taxa during fall sampling. Diptera had the highest species richness with 24 species. One species of fish, fathead minnows, was collected from the B-Series Ponds. Two species of fish were collected from the A-Series Ponds, fathead minnow and golden shiner. No predatory fish were found.

The East Landfill Pond supports no fish and only a depauperate benthic macroinvertebrate community. Macrobenthic sampling documented eight taxa of

macrobenthic organisms present in the pond, including organisms in the groups *Gastropoda, Pelecypoda, Oligochaeta, Hydracarina, Amphipoda,* and *Diptera.*

In Woman Creek, the benthic macroinvertebrate community was relatively rich and diverse. The most abundant and widespread groups overall in stream communities were the larvae of true flies (*Diptera*) and mayflies (*Ephemoptera*). The most common dipteran taxa are blackflies (*Simulidae*) and midges (*Chironomidae*). Both caenid and baetid mayflies also are common. Species richness for mayflies and caddisflies increased from headwater segments to the area east of Pond C-2, where flow in Woman Creek decreases (apparently due to loss to groundwater). Communities within the ponds are strongly dominated by midges and aquatic earthworms (*Oligochaeta*). Pond C-1 had a more developed aquatic plant community along the edge, supporting a more diverse assemblage of nektonic forms, including water striders (*Hemiptera: Gerridae*) and water boatmen (*Hemiptera: Corixidae*). Predatory dragonfly nymphs (*Odonota*) were present in the C Ponds, as were crayfish (*Astacidae*).

Fish species within the streams of Woman Creek included the creek chub, stoneroller, fathead minnow, and green sunfish. Fish communities in the C Ponds are influenced by the presence of suitable substrates, vegetation, and persistent water. The most common species included the golden shiner, white sucker, and largemouth bass found in Pond C-1; however, creek chubs and stonerollers were observed frequently throughout the upper sections of Woman Creek. Golden shiners feed on a variety of small prey and algae and may themselves be important prey for larger fish or piscivorous birds because of the large populations they attain and their relatively large size. Aquatic vertebrates in C-2 comprise fathead minnows and the aquatic form of tiger salamanders (*Ambystoma tigrinum*).

Application to the Ecological Screen and Uncertainties

This study documented the baseline conditions of aquatic organisms present at RFETS in 1991. It investigated streams, ponds, and wetlands in Walnut and Woman Creeks. The results of the population studies provide lines of evidence for the ponds in regard to populations and overall ecosystem health. The results indicate that the aquatic populations are at equilibrium with their environment and do not appear to be impacted by chemical stressors. The species composition is a reflection of the habitat condition. There does not appear to be any chemical stressor affecting the populations sampled from the ponds or stream channels.

The time period in which this study was completed represents an historic condition associated with RFETS. A significant amount of accelerated action efforts have been completed since this time period. The food web components that were initially sampled from certain ponds may no longer be present, and the flows of water into and out of some ponds have been altered. Pond C-1 was modified to have a lower depth, the B-Series Ponds receive less water, and the upper B Ponds were remediated by having sediments removed. Therefore, current conditions are likely different from those described in this study.

3.3 Final Report: Lower Walnut Creek Aquatic Sampling for the Rocky Flats Environmental Technology Site (Kaiser-Hill, 1998).

Review

The objectives of this study of lower Walnut Creek were to determine the quality of aquatic habitat and richness and abundance of benthic macroinvertebrates; identify the fish species present; determine the condition of the benthic macroinvertebrate and fish populations in Lower Walnut Creek; and compare these results to downstream areas. One site within RFETS and five sites located east (downstream) of RFETS were investigated. EPA-approved Rapid Bioassessment Protocols (RBP) were used to measure physical habitat characteristics, and habitat was then rated as optimal, suboptimal, marginal, or poor. Substrate composition and relative amounts of micro-habitats also were measured. Fish sampling was conducted during spring using seines and minnow traps. Macroinvertebrate sampling occurred in spring using kick nets to sample riffle, run, pool, and bank habitats. In addition, a Hess sampler was used in appropriate habitat.

The study concluded that aquatic life in Lower Walnut Creek was limited by stream flow, which had been modified from natural flow conditions. However, the assessment presented findings of good habitat and a relatively healthy macroinvertebrate community, which typically equates to good water quality. Compared to an earlier study (WWE 1994), habitat scores in 1998 improved at one site below Great Western Reservoir. Habitat scores at the remaining sites declined. Real estate development may have affected water quality offsite by creating increased siltation. RFETS had more tolerant and hardy macroinvertebrate taxa compared to the downstream sites. This may have been an indication of the water management at RFETS, which often alternates from conditions of no flow to moderate flow and back to no flow within a short period.

Application to the Ecological Screen and Uncertainties

The study concluded that the water quality in Walnut Creek was good and there were no indications that pollution was limiting aquatic life. The observed species were controlled/affected by the intermittent flows in the Creek. This study provides more evidence that RFETS aquatic communities in Lower Walnut Creek are limited by the physical conditions of the streams and ponds because of very limited or manipulated flows. Onsite water management and the general arid conditions limit the types of aquatic communities that are possible at RFETS. The findings that the aquatic communities are healthy downstream and are not impacted by chemical stressors were used as a line of evidence for the A-Series and the B-Series Ponds.

The findings of this study describe the aquatic condition within the lower portions of the Walnut Creek watershed. They do not reflect conditions within RFETS, but rather the conditions just inside the boundary to off-site down-gradient areas. The findings of this study must be viewed with caution because there was only one sampling event in the spring of 1998 and, thus, it is a "snapshot" of the creek condition. Habitat conditions of a stream can change rapidly over a season and can vary from year to year. The trend in the fluctuation of habitat and aquatic communities should be known in order to determine if conditions at RFETS are improving or declining.

3.4 Results of the Aquatic Monitoring Program in Big Dry Creek, 1997, Interim report. Prepared for the Cities of Broomfield, Northglenn, and Westminster, Colorado, (AAI, 1998).

Review

An aquatic monitoring program was initiated in 1997 for the Cities of Broomfield, Northglenn, and Westminster to document the abundance and distribution of fish and aquatic macroinvertebrate populations in Big Dry Creek. The study goal was to establish a database of aquatic conditions and to help determine appropriate surface water standards for Segment 1 of Big Dry Creek.

The Colorado Division of Wildlife conducted fish sampling using electroshocking equipment. Fish population data collected in the spring and fall 1997 were analyzed and summarized. A list of species collected, including mean lengths, mean weights, and relative abundance, was developed for each station and sampling occasion. Aquatic macroinvertebrates were collected at locations corresponding to fish sampling sites. Methods included Hess sampling in shallow riffle areas and kick net sampling in riffle, run, pool, and bank microhabitats.

Seven study sites were selected for this investigation, three upstream of city wastewater treatment plants and four at or below the effluent for the treatment plants. Big Dry Creek was characterized as a transition zone foothills-plains stream in areas upstream of the treatment plants. The reach below the treatment plants was characterized as a Plains stream type.

A total of 17 species of fish were collected over the two sampling seasons. Nine of the fish species collected in the Big Dry Creek in March and October 1997 are native to streams in the South Platte River Basin. Native species collected included longnose dace (*Rhinichthys cataractae*), creek chub (*Semotilus atromaculatus*), fathead minnow (*Pimephales promelas*), sand shiner (*Notropis stramineus*), white sucker (*Catostomus commersoni*), longnose sucker (*Catostomus catostomus*), brook stickleback (*Culaea inconstans*), green sunfish (*Lepomis cyanellus*), and Johnny darter (*Etheostoma nigrum*). Of the nine native species observed in Big Dry Creek, five species (longnose dace, creek chub, white sucker, longnose sucker, and Johnny darter) are common to cool water environments in transitional foothills-plains stream types. Most of the native fish collected in Big Dry Creek were classified as either abundant or common in a recent inventory of streams in the Front Range and eastern plains conducted by the Colorado Division of Wildlife. Conclusions from the biological assessment portion of this study suggested a relatively low risk of imperilment for most native fish species.

The aquatic community of Big Dry Creek was represented by 18 orders of macroinvertebrates, including a total of 113 taxa. *Diptera* (midges and flies) were predominant at all sites in March. *Diptera* and *Ologochaeta* (aquatic earthworms) were abundant at all sites in October. The fauna present upstream of the Broomfield Treatment Plant was representative of a transitional foothills-plains stream, while in downsteam areas the aquatic community was more representative of plains stream habitats. Physical habitat and fluctuating stream flows most likely limit the macroinvertebrate community in Big Dry Creek, particularly in the low-gradient areas

down stream from the Broomfield Treatment Plant, where riffle habitats with cobble substrate are sparse and much of the streambed is channelized.

Application to the Ecological Screen and Uncertainties

Streams at RFETS are the same type, transitional foothills-plains streams, as those in the upper portion of Big Dry Creek. Conclusions from this study indicate a low risk to most native fish species within Big Dry Creek. These results suggest that flows from RFETS via Walnut and Woman Creeks are not causing a risk to aquatic life down gradient. This was used as a line of evidence for the ponds.

The study of Big Dry Creek represents only one year of aquatic community data, presenting uncertainty of the overall health of the streams and year-to-year fluctuations in fish and macroinvertebrate populations. Additionally, Big Dry Creek is influenced by adjacent real estate development and changing stormwater conditions that are not present at RFETS.

3.5 Annual Wildlife Survey for the Rocky Flats Environmental Technology Site (Kaiser-Hill, 1999, 2000, and 2001)

Review

Fish surveys were preformed using minnow traps in streams and ponds at RFETS over 3 consecutive years. The purpose of these surveys was to determine whether previously recorded fish species (DOE1992) were still present within RFETS streams. Streams were systematically surveyed in each drainage during May 1998. Ten stream locations within each drainage (40 over the entire Site) were selected based on water availability. Ponds were not surveyed in 1998. In early summer 1999, ponds and impoundments were surveyed. In summer 2000, Rock Creek was surveyed again. Nine stream locations were selected based on the availability of water in this ephemeral stream. Traps remained at each location for a minimum of 2 days and were checked by afternoon of each day. Aquatic or semi-aquatic vertebrates captured in the traps were identified and enumerated before being released.

Selection of sampling locations was limited by water availability. In 1998, locations in Rock Creek were clustered because large sections of the creek were dry. It was determined that surveys in Rock Creek should be conducted during another year when conditions were better. Therefore, Rock Creek was surveyed again in 2000.

During the 1998 surveys, fathead minnow (*Pimephales promelas*) were captured in all major drainages at RFETS. This included locations in Rock Creek, Lower Walnut Creek, Upper Woman Creek, and Lower Smart Ditch. Additionally, creek chub (*Semotilus atromaculatus*) and stoneroller (*Campostoma anomalum*) were captured in Upper Woman Creek. The greater variety of fish species in Woman Creek was attributed to the relatively large seep-wetland complexes that discharge into the Woman Creek drainage. Due to these conditions, a greater portion of Upper Woman Creek has sustained water flows. Not all survey locations had fish observations. Notably, McKay ditch had no fish present, and Walnut Creek above the A-Series Ponds had no fish.

Pond and impoundment surveys in 1999 revealed fathead minnows in all locations, though it is unclear if all ponds and impoundments were surveyed. In Pond C-1, fathead minnows, smallmouth bass (*Micropterus dolomieui*), and creek chub were captured. It is noteworthy that largemouth bass were collected just below Pond C-1 during the baseline study (DOE 1992). This suggests that the bass observed in 1999 may have been misidentified. This study, along with the earlier stream surveys, demonstrates the higher species richness in Woman Creek compared to other RFETS drainages. In Rock Creek, largemouth bass (*Micropterus salmoides*) were captured in the Lindsay Pond.

When Rock Creek was surveyed again in 2000, sites were located in a more systematic fashion and better represented stream habitats throughout the drainage. Fathead minnows were the only species captured at eight of the nine survey locations. Only the location furthest downstream did not have fish. Higher numbers of fathead minnows corresponded to the upper reaches of the stream.

With the exception of the bass observations, all fish species observed during the baseline study (DOE 1992) were observed again over this 3-year survey and found in the same general locations as they were in 1992. Other animal taxa also were recorded over the 3 years. Leeches, crayfish, garter snakes, and leopard frogs were observed.

Application to the Ecological Screen and Uncertainties

These studies indicate that all the RFETS streams are intermittent and that perennial flows and better aquatic habitats occur in the upper reaches of these streams. It is unrealistic to expect that vibrant aquatic communities, especially fish communities, can occur in the lower reaches. Overall, fish species richness is very low at RFETS.

The studies also confirm that fish species are present with the same richness and in the same general locations as they were nearly a decade earlier. No analysis is presented on the abundance of fish over time, however.

The years 1998 through 2000 were very dry in terms of precipitation, and it is interesting to note that drought conditions presented a problem in finding enough sites to sample. This reinforces the point that habitat, especially water availability, limits fish communities at RFETS. This information was used as a line of evidence for the ponds that aquatic life does not appear to be impacted by chemical stressors but rather is controlled by physical habitat limitations such as flow.

3.6 Results of the Aquatic Monitoring Program in Streams at the Rocky Flats Site, Golden, Colorado, 2001-2002DOE, 2003

Review

The purpose of this study was to characterize the existing aquatic communities (fish and macroinvertebrates) and physical habitat conditions in streams within the Walnut, Woman, and Rock Creek drainages in order to provide a baseline for monitoring the potential influences of site closure activities. Sampling in ponds did not occur. RBPs were used to measure physical habitat characteristics, and habitat was rated as optimal, suboptimal, marginal, or poor. Substrate composition and relative amounts of micro-

habitats were measured to supplement the RBP habitat analysis. Fish sampling was conducted during summer and/or fall using backpack electroshocking equipment. Macroinvertebrate sampling occurred in spring, summer, and fall using kick nets to sample riffle, run, pool, and bank habitats.

Findings from the study indicated that all of the streams at Rocky Flats were flow limited. Perennial flows were typical in the upper reaches of all three drainages, and flows diminish considerably in downstream reaches where the streams become largely intermittent. In the upper reaches where flows are perennial, habitat assessment scores were generally highest, indicating overall better habitat quality.

Woman Creek has more natural flows in the upper reaches. Below Pond C-2, flows are greatly reduced and heavily influenced by pond releases and water management. The natural flows in the upper reaches are seep-fed and also influenced by seasonal precipitation. Rock Creek has natural seep-fed flows.

In the effluent-dominated reach of Upper Walnut Creek and the discharge-dependent Lower Walnut Creek, bank erosion results in poor bank stability and sediment inputs to the stream, which negatively affects physical habitat and aquatic life. Stream bank erosion was further aggravated by the periodic discharges from the terminal ponds.

Fish abundance and distribution in these streams is severely limited due to the lack of permanent water. Fish were collected at only seven of the twelve study sites, and only three species were collected. Fathead minnows were found in every drainage. Naturally self-sustaining populations of fathead minnows were found at one site in South Walnut Creek between Ponds B-4 and B-5 and at a site below the Lindsey Pond. A stable and healthy creek chub population was found at the upper two sites in Woman Creek. A single specimen of longnose dace also was collected in Woman Creek.

The macroinvertebrate community across all drainages was observed to be rich and diverse, and comprised mainly hardy and tolerant species. The dominant organisms were similar in each drainage, with oligochaetes most abundant in Woman Creek and dipterans most abundant in Walnut Creek. *Ephemeroptera* were relatively abundant throughout the drainages and included moderate to tolerant taxa. *Trichoptera* (caddisflies) in Walnut Creek were generally present in higher numbers compared to other RFETS drainages, likely due to the effluent-dominated flows. Amphipods are also found in higher numbers in Walnut Creek, thriving in the slower moving or standing water environments provided by the ponds.

A comparison of study results to other, earlier studies of Rocky Flats streams showed that community structure and abundance were somewhat similar to those found in Walnut, Woman, and Rock Creeks during the 2001- 2002 study and are similar to other transitional foothills-plains and plains type streams.

Application to the Ecological Screen and Uncertainties

This study concluded that, within the aquatic habitats present in Walnut and Woman Creeks, whether perennial or intermittent, aquatic communities persist over time and are comparable to communities found at other locations at RFETS and within the region. While only one fish species is prevalent (fathead minnows), the manipulated nature of the

ponds and streams precludes the establishment of large or diverse fish populations. Macroinvertebrate populations so not appear as affected, likely due to their ability to re-colonize newly inundated habitats and their comparatively shorter life cycles. Macroinvertebrate communities in Walnut Creek and Woman Creek are similar to those found in Rock Creek. This supports the line of evidence that Walnut Creek and Woman Creek aquatic communities are healthy, albeit limited, and these creeks are capable of sustaining rich and diverse aquatic life that comprise hardy and tolerant species adapted to the limiting environmental conditions. The results indicate that there were no chemical stressors impacting the ecological setting within these streams. The study was used as a line of evidence for the ponds with regard to populations and overall ecosystem health.

The ponds were not sampled in this study. The RBP methods are not intended to sample large ponds. Therefore, conclusions about the aquatic health of the ponds cannot be made without some uncertainty. Only one sampling location was established in North Walnut Creek, and it was located above the A-Series Ponds. Because the ponds represent a significant habitat portion of the aquatic areas within RFETS, the lack of pond sampling presents uncertainty in the use of this study as a line of evidence.

4.0 BIOASSAY ANALYSES

Bioassay studies and their relevance to the Ecological Screen are described in the following sections.

4.1 Final Phase I RFI/RI Report. Woman Creek Priority Drainage, Operable Unit 5. Appendix N. Ecological Risk Assessment for Woman Creek and Walnut Creek Watersheds at the Rocky Flats Environmental Technology Site, DOE, 1996

Review

This study was completed as part of the ecological risk evaluation of aquatic life for OUs 5 and 6. Risks to aquatic life from chemical concentrations in sediments were evaluated by a weight-of-evidence approach. HQs and HIs were generated as a screening tool, and indicated a relatively high potential for toxic effects in sediments. As a next step in the multi-tiered ERA process, characteristics of benthic community structure and results of sediment bioassay tests were used to check predictions of toxic stress as indicated by the screening results. The results of the community characteristics were summarized in Section 3.1; the results of the bioassay analysis are presented here.

Laboratory sediment toxicity tests were conducted on composite sediment samples collected from each pond during October and November 1992. Whole sediment tests following protocols outlined in Nelson et al. (1990) were used for 28-day exposure of the amphipod *Hyalella azteca* and for 10-day exposure of the dipteran *Chironomus tentans*. Fine sands were used as controls. Sediments from the A-, B-, and C-Series Ponds were tested with *Hyalella azteca*. Toxicity tests using *Chironomus tentans* were limited to Ponds A-3, A-4, B-3, B-4, and B-5 because of reduced availability of acceptable test organisms.

Bioassay results for Pond B-2 sediments indicated that survival of *Hyalella azteca* after 28 days of exposure (64 percent) was significantly lower than in controls (85 percent) (t=3.72, t0.05 =2.18). No toxic effects were observed for *Hyalella azteca* or *Chironomus tentans* in any other sediment exposures (DOE 2004b). Table 4.6 presents a summary of the bioassay test results.

Sediment bioassays indicated toxicity only in sediments from Pond B-2. These results are not consistent with the high levels of toxicity indicated by HQs and HIs, especially in Ponds A-1 and B-1.

Application to the Ecological Screen and Uncertainities

This study determined that, despite predictive risk analysis of chemicals using HQs and HIs, the actual toxicity conditions were low. It appears that the chemicals present within the sediment were not bioavailable and did not yield a toxic response. This points to the uncertainty inherent in using HQ and HI tools in determining realistic risk conditions. HQs and HIs may occur in orders of magnitude that indicate a potential concern, whereas the risk in the real environment is low.

Sediments from the A-, B-, and C-Series Ponds were tested with *Hyalella azteca*. Toxicity tests using *Chironomus tentans* were limited to Ponds A-3, A-4, B-3, B-4, and B-5 because of reduced availability of acceptable test organisms. The results will be used as a line of evidence for the ponds tested, as a direct measure of sediment toxicity. The study was completed during the time-frame from which the CRA data sets were derived.

The period in which this study was completed represents an historic condition at RFETS. A significant number of accelerated action efforts have been completed since this time. The samples tested are a small set of the collected media samples and may not represent the entire drainage system. Therefore, these results may be over or under conservative. In addition, the sampling represents a single event in time and likely does not represent year-round conditions or current conditions.

5.0 WATERFOWL/WADING BIRD STUDIES

Waterfowl and wading bird studies and their relevance to the Ecological Screen are described in the following sections.

5.1 Final Phase I RFI/RI Report: Woman Creek Priority Drainage, Operable Unit 5. Volume 5, Appendix N Ecological Risk Assessment for Woman Creek and Walnut Creek Watersheds at the Rocky Flats Environmental Technology Site, DOE, 1996

Review

As part of the multi-tiered ERA provided in this study, an evaluation of potential risk to waterfowl and wading birds was completed using standard screening-level risk methods. The mallard and great blue heron were selected to represent aquatic-feeding wildlife because they are common species and known to occur at RFETS. In addition, birds are more sensitive than mammals to organic contaminants because they lack the same

capacity for detoxification and therefore represent a more limiting exposure and risk scenario. Exposure to these two receptors was assessed by using measured concentrations of contaminants in biota or by estimating the transfer of contaminants from sediments to prey species. The purpose of this study was to:

> *Determine if ECOC concentrations in surface water and sediments of the detention ponds could result in exposures that reduce the survivorship or reproductive capacity of aquatic feeding birds. (Ho: exposure less than TRV)*

The primary exposure pathway for both birds would be through ingestion of aquatic organisms that have become contaminated. Herons feed primarily on fish. Amphibians and invertebrates are usually minor components of their diets but can be important in localized areas. Herons have relatively little direct contact with sediments during feeding. Mallards have more contact with sediments because they may feed by filtering plant material and invertebrates. However, the amount of sediment ingested by mallards does not greatly exceed that of other more selective feeders (EPA 1993). Thus, the primary pathway for exposure of both birds to ecological chemicals of concern (ECOCs) in sediments is through ingestion of aquatic organisms that have become contaminated. The birds could also be exposed to surface water contaminants.

The risk characterization was based on exposure and risk to individual birds because both great blue herons and mallards are protected under the Migratory Bird Treaty Act. The exposure and risk evaluation was conducted under two exposure scenarios: 1) current aquatic community structure and contaminant distribution; and 2) more complex aquatic communities that could result in increased biological transport of sediment contaminants and increased PCB concentrations in prey.

Two methods were used to determine the potential risk to the mallard and great blue heron. The first relied on available, current tissue data. The second used a modeling approach to extrapolate and determine potential prey tissue burdens for aquatic areas that did not have measured values due the lack of prey species at the time of the study.

Chemicals identified as ECOCs for aquatic feeding birds included di-n-butylphthalate, PCBs, mercury, and antimony.

Investigations indicate that current concentrations of ECOCs in sediment and biota are probably non-toxic (DOE 1994). However, ponds with the highest PCB concentrations apparently do not support significant fish or amphibian populations. More extensive colonization of the ponds could result in more complex food webs, increased biological transport of sediment contaminants, and exposure of birds or mammals to higher concentrations in biota. The OU 5 risk characterization includes evaluation of potential exposures as well as those based on existing conditions.

Sitewide results of the exposure estimation indicated potentially significant risk in all source areas that might be used by great blue herons, including the ponds in Woman Creek and Walnut Creek. Based on the HIs calculated for all source areas, the ECOPCs that contributed substantially to the risk estimate were mercury, antimony, and

di-n-butylphthalate. HIs for source areas are provided in Table 4.7. Receptor-specific HQs by source area are provided in Tables 4.8 and A1.9.

Unfortunately, no HIs or HQs are reported from individual ponds for aquatic-feeding birds. Because the ECOCs bioaccumulate, their concentrations in sediments and in aquatic life forms (e.g., macroinvertebrates) are relatively low. ECOCs that presented potential risk tended to be different for aquatic life than for aquatic-feeding birds. Therefore, knowing what ECOCs in ponds contribute the most risk to aquatic organisms does not translate to the risk to aquatic-feeding birds.

The A-Series Ponds HI for aquatic-feeding birds was primarily from di-n-butylphthalate in fish tissue eaten by great blue herons that spend 100 percent of their time foraging on site. Di-n-butylphthalate and mercury were the only ECOCs for the B-Series Ponds relevant to the great blue heron. Mercury was the only ECOC in the C-Series Ponds and the Old Landfill (upstream from Pond C-1). Other exposure point concentrations (EPCs) came from estimated prey tissue values from 903 Pad (PCBs), with portions in both watersheds; 881 Hillside Area (magnesium) in the Woman Creek watershed; and the Ash Pits (cadmium) in the Woman Creek watershed.

Based on screening estimates, the A-, B-, and C-Series Ponds represent the highest risk of potential exposure to di-n-butylphthalate, with the A-Series Ponds presenting the greatest risk. However, all HIs were less than 5. Di-n-butylphthalate in surface water (EPC = 0.002, Intake = 4.79E-05) in the A-Series Ponds was the only potential contaminant of concern with an HQ greater than 1 and was identified as an ECOC. Di-n-butylphthalate risk to mallards was due to ingestion of benthic macroinvertebrates. Risk characterization for the mallard, therefore, focused on characterizing the potential for di-n-butylphthalate bioconcentration in the aquatic prey species in each of the A-Series ponds. Unfortunately, sediment concentrations for individual ponds were not reported.

PCBs in pond sediments were a concern, and Table 4.10 presents a summary of the findings included in the report. The table includes total PCB concentrations in each pond and the Aroclor-1254 concentrations when reported. PCBs were included as an ECOC due to their potential bioconcentration in aquatic prey.

Aroclor-1254 EECs were compared to current concentrations of Aroclor-1254 in sediments at RFETS for the following:

- Great blue herons feeding in ponds with piscivorous fish present (i.e., long food chain);
- Great blue herons feeding in ponds without piscivorous fish present (i.e., short food chain); and
- Mallard feeding in ponds 100 percent of the time.

Risk was identified only for the first scenario, great blue herons feeding in ponds with piscivorous fish present. The long food chain resulted in the greatest amount of bioconcentration and the longest exposure period. The remaining two scenarios resulted in maximum concentrations of Aroclor-1254 below benchmark criteria. Because the first scenario is very unlikely to occur, the authors concluded that risk in Woman Creek did not exceed criteria developed for sediment at RFETS. Walnut Creek Aroclor-1254

concentrations in sediment exceeded the criteria for Ponds B-1, B-2, and B-3 only if the top aquatic predators were present. These ponds did not support this type of community at the time.

In Woman Creek, mercury was detected in two of 24 fish taken from Pond C-1. Fish from other areas (i.e., streams) had no mercury detections. Therefore, the risk to aquatic birds is significant only if all food is obtained exclusively from Pond C-1. Although mercury was detected in 75 percent of the fish in the B-Series Ponds, the source of mercury in fish was unclear. Mercury does not appear to represent risk to herons as HQs from the ponds are low (max of 2). Mercury was not an ECOC for North Walnut Creek.

Other ECOCs include antimony in Woman Creek and di-n-butylphthalate in Walnut Creek. These chemicals were determined not to present risk to the great blue heron or mallard.

Application to the Ecological Screen and Uncertainties

This study documented the potential risk to great blue heron and mallard from ponds and streams of Walnut Creek and Woman Creek. It provides a risk characterization specific to aquatic-feeding birds. This risk characterization was used as a line of evidence for the ponds in regards to populations and overall ecosystem health. The conclusions indicate that higher trophic organisms that rely on the AEUs for food items would not be at risk unless individual ponds represented their entire dietary intake, which is highly unlikely.

The time period in which this study was completed represents an historic condition at RFETS. A significant number of accelerated action efforts, especially in the B-Series Ponds, have been completed since this time. The food web components that were initially sampled in the ponds may no longer be present. Also, the flows of water into and out of certain ponds have been altered. Pond C-1 was modified to have a lower depth, the B-Series ponds receive less water, and the upper B-Series Ponds have been remediated by having sediments removed. Therefore, current conditions are likely different from those described in the study.

As described previously, two methods were used to determine the potential risk to the mallard and great blue heron. The first relied upon available, current tissue data. The second used a modeling approach to extrapolate and determine potential prey tissue burdens for aquatic areas that did not have measured values due to the lack of prey species. There is uncertainty in the first method because it represents site conditions from an historic perspective and may not represent current conditions. There is uncertainty with the second method due to the extrapolation necessary for modeling approaches. This uncertainty can result in either over or under-conservative estimates of tissue burden.

5.2 OU3 Final RFI/RI – Appendix K: PCB Study: Results of PCB Sediment and Tissue Sampling For Walnut and Woman Creek Drainages and Offsite Reservoirs Stiger, 1994

Review

This study was completed in response to preliminary results of sediment and tissue samples collected during the OU 6 RFI/RI (August 1992 to June 1993), which indicated elevated PCB concentrations occur for some of the A- and B-Series Ponds. Because the potential exists for sediment and/or specific biota in Great Western Reservoir and Standley Lake Reservoir to have been impacted by PCB contaminants from RFETS prior to 1989 (prior to the construction of the diversion canal that routes flow coming from Walnut Creek around Great Western Reservoir and back into Walnut Creek below the dam), a sediment and tissue PCB sampling project was undertaken as part of the EE portion of the OU 6 RFI/RI.

This effort entailed collecting sediment, fish, and small mammal tissue samples from the A- and B-Series Ponds to evaluate whether PMJM might be impacted by the presence of PCBs in the RFETS BZ. Because PMJM have a diet similar to deer mice, 13 deer mice were collected adjacent to Ponds A-1, A-3, B-1, and B-4 for whole body tissue analysis to evaluate possible PCB contamination in PMJM. In addition, 12 voles were collected from the same locations to determine if they represent a pathway of PCBs to predatory birds, which include voles in their diet.

Results of the deer mice and vole tissue analysis revealed that no PCBs were detected in any of the small mammal tissue samples (whole body) collected from around Ponds A-1, A-3, B-1, and B-4. Comparison to PCB food threshold values for birds revealed that PCB levels in fish do not exceed food concentration threshold values prescribed by DOE (1994). These results suggest that PCBs have not bioaccumulated up the food chain further than the fish species collected at RFETS and that neither the PMJM nor predatory birds are threatened with PCB contamination from RFETS.

Application to the Ecological Screen and Uncertainties

This study encapsulated several lines of evidence within its design. The sediment and tissue analysis will be used as a line of evidence for the ponds with regard to pond bioaccumulation processes. The study evaluated the A-, B-, and C-Series Ponds specifically for PCB transfer between abiotic (sediment) and biotic (fish tissue) media. The absence of PCB accumulation at concentrations exceeding tissue threshold concentrations in almost all fish at the site indicates that there is a low potential for risk to fish in the pond habitat.

This study also evaluated the potential effects of PCBs in sediment to predatory birds that may feed on organisms that are exposed to PCB-contaminated sediment. Results from this study were obtained for the A- and B-Series Ponds, and were used as a line of evidence for the pond risk characterization of PCB ECOPCs in pond sediments.

The time period in which this study was completed represents an historic condition at RFETS. A significant number of accelerated action efforts have been completed since

this time. The food web components that were initially sampled from each pond may no longer be present. Similarly, the sediments from certain Ponds (i.e., B-1, B-2, and B-3) have been removed. Therefore, current conditions are different from those described in the study. The study likely represents conservative conditions because the sampling took place closer in time to historic events that lead to the initial release of the PCBs to the ponds.

6.0 SUMMARY OF FINDINGS

This attachment provides a summary of the methods, results, conclusions, uncertainties, and applications of individual studies conducted within RFETS that provide supporting lines of evidence for the pond risk characterizations. The purpose of this effort was to compile the information gathered from these studies to determine if there are chemical stressors affecting the aquatic ecology within each pond. Each study can be viewed as a single line of evidence for a given pond. In combination, these lines of evidence, coupled with the ECOPC evaluation form the weight-of-evidence risk characterization of the chemical stressors.

A summary of the conclusions drawn from each study, and their application to each pond, are provided in the main body of this Appendix. As described here, the aquatic ecosystems are clearly impacted by stressors other than chemicals related to RFETS activities. Habitat conditions of flow appear to be the most significant controlling factor to the aquatic ecology. The aquatic ecology of RFETS is comparable to reference or background sites and does not exhibit signs of chemical stress. Numerous accelerated action activities have occurred which will impact the receiving drainages, it is likely that future conditions within these drainages will improve further, re-establish as habitat over time, and equilibrate. The anticipated ecology will appear much as it has in the past, with opportunistic assemblages of aquatic invertebrates, plants, and fish. It will retain its warm-water ecology character and perhaps will provide sustainable wetted habitat of sufficient size to support smaller species of fish over time.

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Table 4.1
Summary of Other/Drainage Lines of Evidence Available for each Pond Series

AEU	Line of Evidence Category and Source			
	Tissue Analysis	Aquatic Population Studies	Bioassay Analysis	Waterfowl/Wading Bird Evaluations
A-Series	DOE 1994	DOE, 1992	DOE, 1996	DOE, 1994
	DOE, 1996	DOE, 1996		DOE, 1996
		Exponent, 1998		
		Aquatic Assoc., 1998		
		Kaiser-Hill, 1999, 2000 and 2001		
		Aquatic Assoc., 2003		
B-Series	DOE, 1994	DOE, 1992	DOE, 1996	DOE, 1994
	DOE, 1996	DOE, 1996		DOE, 1996
		K-H, 1998		
		Aquatic Assoc., 1998		
		Kaiser-Hill, 1999, 2000 and 2001		
		Aquatic Assoc., 2003		
C-Series	DOE, 1994	DOE, 1992	DOE, 1996	DOE, 1996
		DOE, 1996		
		Aquatic Assoc., 1998		
		Kaiser-Hill, 1999, 2000 and 2001		
		Aquatic Assoc., 2003		

N/A = Not available.

Table 4.2
Unvalidated Sediment Sampling Results (units in ug/kg)

A Ponds	Mean* A-1254	Mean A-1248	B Ponds	Mean* A-1254	Mean* A-1248
A -1	75.9	ND	B- 1	868	253.6
A- 2	83.8	ND	B -2	2073	589
A -3	25	ND	B -3	572	ND
A -4	ND	ND	B -4	188	ND
			B- 5	ND	ND

*Calculated using 20 ug/kg, one-half of the instrument detection limits of 40 ug/kg, for nondetects where averaged with detects; n = 5.
ND indicates that PCB was not detected in sediment samples of the pond.

Table 4.3
Aroclor-1254 in Aquatic Biota Collected from A- and B-Series Detention Ponds

Pond	Biota Type	Number of Samples	Detection Frequency	Mean[a] (ug/kg)	Standard Deviation1 (ug/kg)
A-1	None	N/A	N/A	N/A	N/A
A-2	Benthos	1	1/1	20	N/A
A-2	Crayfish	4	0/4	N/A	N/A
A-2	Largemouth bass	3	3/3	48	9.1
A-3	Crayfish	4	0/4	N/A	N/A
A-4	Crayfish	3	0/3	N/A	N/A
A-4	Fathead minnow	3	3/3	17	5.8
A-5	Crayfish	3	0/3	N/A	N/A
A-5	Fathead minnow	5	3/5	73	41
B-1	Salamander larvae	2	2/2	33	9.9
B-2	Salamander larvae	2	2/2	120	21
B-3	None	N/A	N/A	N/A	N/A
B-4	Fathead minnow	6	3/6	480	17
B-5	Crayfish	3	0/3	N/A	N/A
B-5	Fathead minnow	3	3/3	160	17

[a] Mean and standard deviation values were calculated using the values reported for the "real" Aroclor-1254 detections.

N/A = Not applicable.
Source: DOE 1996.

Table 4.4

Aroclor-1254 Concentration Ratios in Sediment and Biological Tissues[a]

Pond[b] (species)	Concentration in Sediments		Concentration in Biological Tissues		Aroclor-1254 Concentration Ratios	
	Bulk Sediment (ug/kg)	Organic Carbon (ug/kg C)	Whole Body (ug/kg)	Lipids[c] (ug/kg lipid)	Whole Body/Bulk Sediment	Lipid/Organic Carbon (BSF)
Pond A-2 (largemouth bass)	215	8,270	48	4,800	0.2	0.6
Pond A-2 (benthos)	215	8,270	20	2,000	0.1	0.2
Pond B-1 (tiger salamander)	868	37,700	40	4,000	0	0.1
Pond B-2 (tiger salamander)	2,050	89,000	134	13,000	0.1	0.2
Pond B-4 (fathead minnow)	188	14,500	480	48,000	2.6	3.3

[a] Mean for pond.

[b] Data presented only for ponds in which Aroclor-1254 was detected in both sediment and biota.

[c] Assume 1% lipids.

Source: DOE 1996.

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Table 4.5
Pond Benthos Community Structure Summary

Characteristic	Pond A-1	Pond A-2	Pond A-3	Pond A-4	Pond A-5	Pond B-1	Pond B-2	Pond B-3	Pond B-4	Pond B-5	Pond C-1	Pond C-2	Pond D-1	Pond D-2
Total Richness	48	24	27	7	19	36	35	12	20	17	6	18	13	31
Mean Density	25,256.6	10,354.7	30,557.4	8,509.8	4,960.0	17,591.3	11,145.2	55,047.4	32,415.2	26,919.6	66.4	117.6	24,762.9	4,962.0
Simpson's Diversity	0.65	0.43	0.75	0.57	0.19	0.16	0.16	0.84	0.44	0.44	0.44	0.22	0.75	0.1
Shannon-Weiner Diversity	1.07	1.39	0.53	0.81	2.1	2.35	2.22	0.32	1.04	1.16	1.11	1.95	0.51	2.73
Shannon-Weiner Max.[a]	3.87	3.17	3.29	1.94	2.94	3.58	3.55	2.48	2.99	2.83	1.79	2.89	2.56	3.43
Percent Max. Diversity	27.7	43.85	16.11	41.75	71.43	65.64	62.54	12.9	34.78	40.99	62.01	67.47	19.92	79.59
Number Dominant Taxa	2.9	4	1.7	2.2	7.5	10.5	9.2	1.4	2.8	3.2	3	7	1.7	15.4
Dominant Taxa Density	21,917.7	9,120.4	29,790.8	7,951.2	4,544.0	15,863.4	10,172.9	49,538.8	31,388.8	21,592.8	61.6	105.4	24,204.2	4,482.1
% Density Dominant Taxa	86.7	88.1	97.5	93.4	91.6	90.1	91.3	89.9	96.8	80.2	92.7	89.6	97.7	90.3
Oligochaeta Density	20,241.7	1,676.0	26,257.0	6,145.3	1,720.0	5,014.9	194.9	4,586.2	17,455.0	16,837.7	41.6	42.0	21,255.0	39.0
% Density Oligochaeta	80.1	16.2	85.9	72.2	34.6	28.5	1.8	8.3	55.3	62.5	62.6	35.7	85.8	8
Diptera Density	3,167.8	8,367.1	4,066.5	1,974.9	2,552.0	1,232.5	3,339.0	571.7	12,263.6	5,105.9	24.8	68.4	3,422.1	3,001.1
% Density Diptera	12.5	80.8	13.3	23.2	51.4	7	30	1	37.8	19	37.4	58.1	13.8	60.4

[a] Maximum Shannon-Weiner Diversity based on richness.
Source: DOE 1996.

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Table 4.6
Sediment Bioassay Test Results

Test Media	Sample Date	*Hyalella azteca*							*Chironomus tentans*			
		Control % Survival	Test % Survival	Survival T Statistic	Survival $T_{0.05}$ Value	Control Mean Wt.[a]	Test Mean Wt.	Mean Wt. T Statistic	Control % Survival	Test % Survival	Survival T Statistic	Survival $T_{0.05}$ Value
Pond A-1	10/29/92	74[g]	95	N/A	N/A	0.06	0.11	N/A	N/A[d]	N/A	N/A	N/A
Pond A-2	11/12/92	74[g]	89	N/A	N/A	0.06	0.15	N/A	N/A	N/A	N/A	N/A
Pond A-3	10/21/92	89	76	0.971	2.46	0.13	0.10	N/A	82	103[e]	-2.618[f]	2.46
Pond A-4	10/19/92	89	99	-0.777	2.46	0.13	0.17	N/A	82	73	1.007	2.46
Pond A-5	11/19/92	38g	89	N/A	N/A	0.06	0.33	N/A	N/A	N/A	N/A	N/A
Pond B-1	11/16/92	85	91	-1.094	2.18	0.05	0.16	N/A	N/A	N/A	N/A	N/A
Pond B-2	11/18/92	85	64	3.72[h]	2.18	0.05	0.14	N/A	N/A	N/A	N/A	N/A
Pond B-3	10/27/92	89	84	0.388	2.46	0.13	0.11	N/A	82	88	-0.805	2.46
Pond B-4	10/22/92	89	91	-0.194	2.46	0.13	0.19	N/A	82	62	2.416	2.46
Pond B-5	10/20/92	89	60	2.233	2.46	0.13	0.12	N/A	82	72	1.208	2.46
Pond C-1[b]	11/9/92	74[g]	80	N/A	N/A	0.06	0.14	N/A	N/A	N/A	N/A	N/A
Pond C-1[c]	11/9/92	74[g]	94	N/A	N/A	0.06	0.10	N/A	N/A	N/A	N/A	N/A
Pond C-2	11/10/92	74[g]	96	N/A	N/A	0.06	0.16	N/A	N/A	N/A	N/A	N/A

[a] Mean Weight in grams.
[b] Sediment material from.
[c] Sediment material from
[d] Tests not conducted.
[e] Sample showed evidence of reproduction.
[f] Statistically higher than control; attributed to resident *Chironomus* in test sediments.
[g] Control treatment below acceptable test limit of 80 percent survival.
[h] Statistically lower than control treatment.
N/A = Data not available.
Source: DOE 1996.

Table 4.7

Source Area Hazard Index for Mallard and Great Blue Heron

Source Area	Watershed	Mallard HI	GB Heron HI
OU6 A-Ponds	Walnut	4.55	23.5
OU6 B-Ponds	Walnut	1.61	18.7
OU2 903 Pad	Walnut/Woman	0.5	7.84
OU5 C-Ponds	Woman	1.65	17.19
OU1 881 Hillside	Woman	0.26	8.91
OU5 Old Landfill	Woman	0.7	41.23
OU5 Ash Pits	Woman	0.04	8.05

Table 4.8
Hazard Quotients Contributing to Risk in Great Blue Heron

Source Area	ECOC	GB Heron HQ (% if HI)	Prey Est. Value Intake (mg/kg)	Sediment Concentration (mg/kg)	Total Intake Concentration[1] (mg/kg)
OU 6 A-Ponds	DBP	16.56 (70.45%)	0.744	ND	0.745
OU 6 B-Ponds	DBP	8.27 (44.21%)	0.372	ND	0.372
OU 6 B-Ponds	Hg	2.40 (12.83%)	0.011	0.001	0.012
OU 2 903 Pad	Aroclor-1254	5.78 (73.66%)	0.78	0	0.78
OU 5 C-Ponds	Hg	6.40 (37.24%)	0.031	0.002	0.032
OU 1 881 Hillside	Mg	1.95 (21.95%)	No BCF	22.681	23.292
OU 5 Old Landfill	Hg	28.80 (69.85%)	0.132	0.013	0.144
OU 5 Ash Pits	Cd	2.98 (37.03%)	3.466	0.005	3.471

1 = total intake may be larger due to surface water contaminant intake, usually small portion.
ND = Not detected in laboratory samples.

Table 4.9
Hazard Quotients Contributing to Risk in Mallard

Source Area	ECOC	Mallard HQ (% if HI)	Prey Est. Value Intake (mg/kg)	Sediment Concentration (mg/kg)	Total Intake Concentration[1] (mg/kg)
OU6 A-Ponds	DBP	2.00 (43.92%)	0.114	ND	0.114
OU6 B-Ponds	DBP	0.47 (29.66%)	0.027	ND	0.027
OU6 B-Ponds	Hg	0.25 (15.65%)	0.006	6.93E-05	0.006
OU2 903 Pad	Aroclor-1254	0.31 (61.27%)	0.053	3.64E-06	0.053
OU5 C-Ponds	Zn	1.00 (53.90%)	2.613	0.016	2.718
OU1 881 Hillside	Phenanthrene	0.06 (21.33%)	ND	6.08E-06	0.002
OU5 Old Landfill	Zn	0.26 (37.27%)	0.692	0.051	0.791
OU5 Ash Pits	Al	0.01 (21.67%)	0.005	0.06	0.533

1 = total intake may be larger due to vegetation, soil or surface water contaminant intake, usually small portion.
ND = Not detected in laboratory samples.

Table 4.10

PCB Concentrations in Sediments, 1996[1]

Pond	PCB Conc.[2] (mg/kg)	Aroclor-1254 Conc.[3] (ug/kg)	TRV[4]	HQ
A-1	0.48	350	270	1.3
A-2	0.3	270	518	0.5
A-3	0.17	NR	-------	-------
A-4	0.17	NR	-------	-------
B-1	1.7	4,100	460	8.9
B-2	2.3	NP	-------	-------
B-3	1.5	NP	-------	-------
B-4	0.2	430	258	1.7
B-5	0.1	NP	-------	-------

1 = Information taken from Figure N5-11 (Sediment PCB's) and Attachment 4 –Table 1 Summary of Sediment ECOC Screen).

2 = Concentrations are estimated from the figure and not used in the HQ calculation.

3 = Exposure Point Concentration.

4 = Pond-specific TRVs for sediment.

NR = Not reported, noted that PCOCs with records less than TRV were not shown.

NP = Not presented; a table was not presented for this pond.

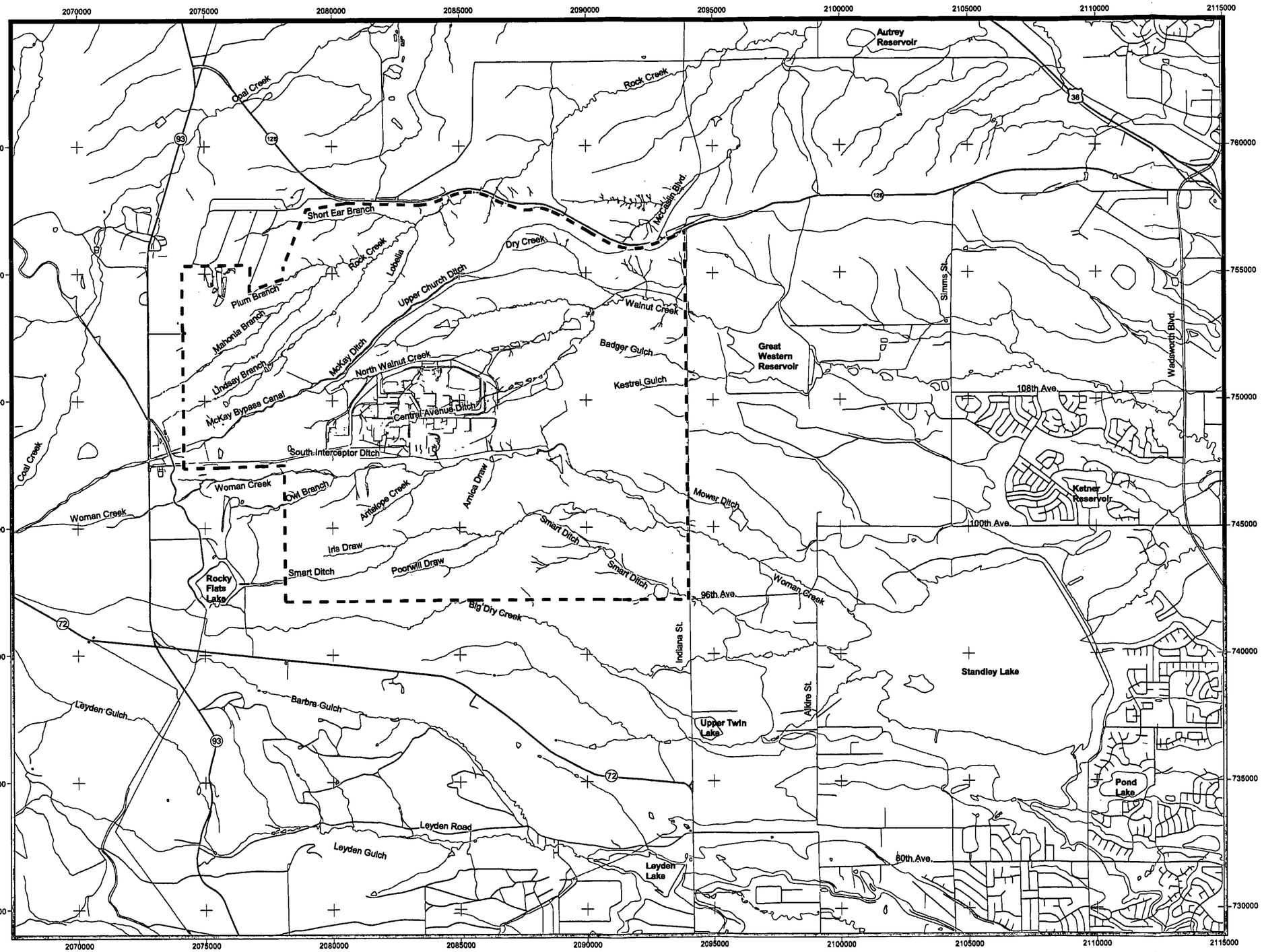


Figure 4.1

Regional Hydrology

KEY

Standard Map Features

- Stream
- Pond or Lake
- Site boundary
- Road

DRAFT

N
W E
S

500 0 500 1000 Feet

Scale = 1 :48,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: August 15, 2005

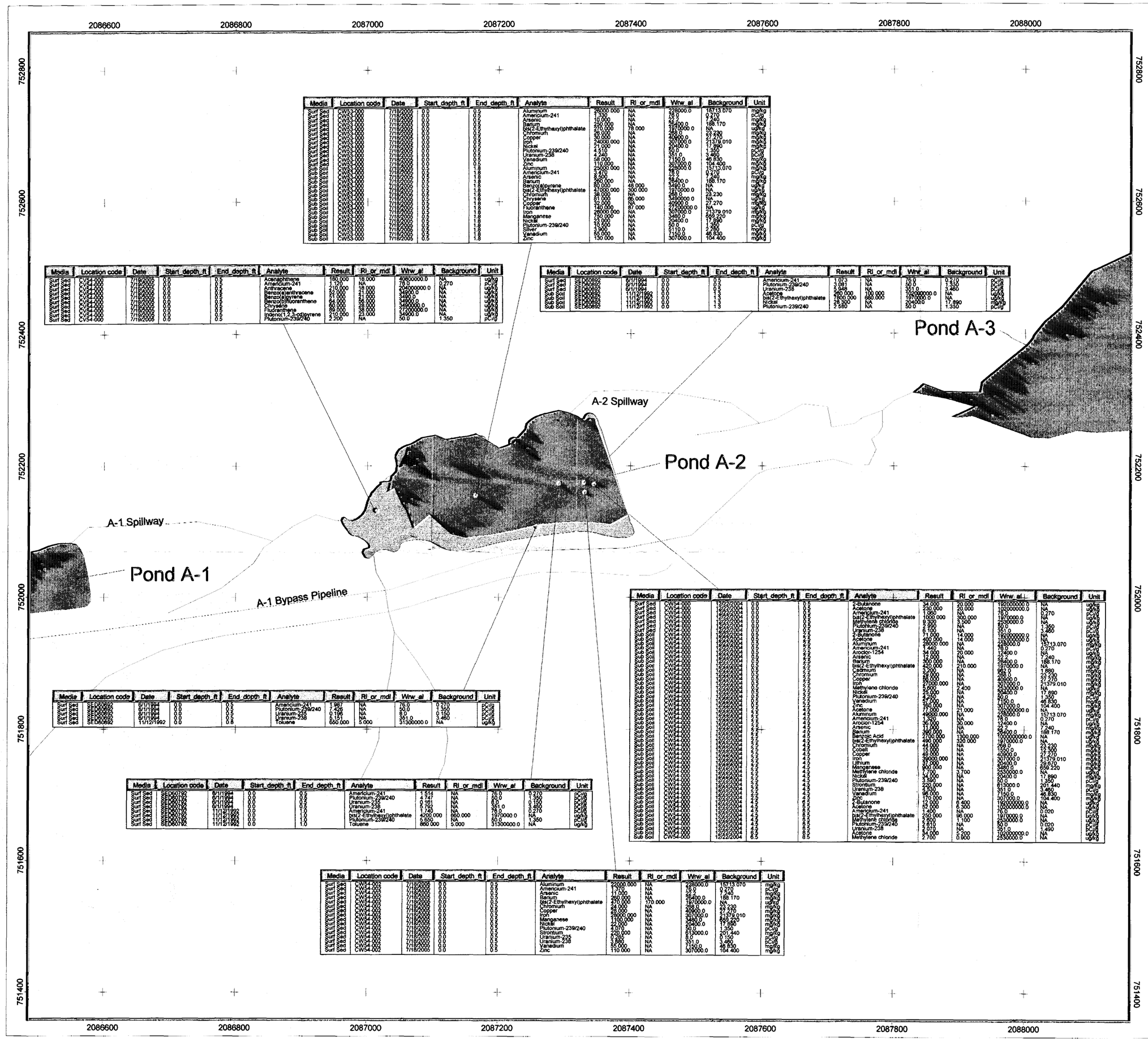
Prepared for:

KAISER•HILL COMPANY

File: W:\Projects\FY2004\CRA\Volume_15\GIS Pond_Maps\regional_hydrology.apr

544/544

10



Media	Location code	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Aluminum	28000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Americium-241	1.330	NA	76.0	0.270	pCi/g
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Arsenic	10.000	NA	22.2	7.240	mg/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Barium	290.000	NA	25400.0	188.170	mg/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	bis(2-Ethylhexyl)phthalate	570.000	78.000	1970000.0	NA	ug/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Chromium	46.000	NA	268.0	23.230	mg/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Copper	30.000	NA	40900.0	27.270	mg/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Iron	24000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Nickel	21.000	NA	20400.0	17.890	mg/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Plutonium-239/240	4.510	NA	50.0	1.350	pCi/g
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Uranium-238	4.240	NA	351.0	3.460	pCi/g
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Vanadium	58.000	NA	7150.0	46.830	mg/kg
Surf Sed	CW53-000	7/18/2005	0.0	0.5	Zinc	110.000	NA	307000.0	104.400	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Aluminum	24000.000	NA	228000.0	15713.070	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Americium-241	2.420	NA	76.0	0.270	pCi/g
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Arsenic	9.800	NA	22.2	7.240	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Barium	260.000	NA	25400.0	188.170	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Benzo(a)pyrene	80.000	48.000	3490.0	NA	ug/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	bis(2-Ethylhexyl)phthalate	47000.000	300.000	1970000.0	NA	ug/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Chromium	38.000	NA	268.0	23.230	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Chrysene	81.000	25.000	3490000.0	NA	ug/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Copper	32.000	NA	40900.0	27.270	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Fluoranthene	140.000	87.000	2290000.0	NA	ug/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Iron	28000.000	NA	307000.0	21379.010	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Manganese	730.000	NA	3490.0	692.220	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Nickel	23.000	NA	20400.0	17.890	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Plutonium-239/240	10.500	NA	50.0	1.350	pCi/g
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Silver	3.900	NA	5110.0	2.280	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Vanadium	65.000	NA	7150.0	46.830	mg/kg
Sub Soil	CW53-000	7/18/2005	0.5	1.8	Zinc	130.000	NA	307000.0	104.400	mg/kg

Media	Location code	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Acenaphthene	180.000	18.000	4080000.0	NA	ug/kg
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Americium-241	1.100	NA	76.0	0.270	pCi/g
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Anthracene	210.000	18.000	20400000.0	NA	ug/kg
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Benzo(a)anthracene	92.000	21.000	34900.0	NA	ug/kg
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Benzo(a)pyrene	51.000	21.000	3490.0	NA	ug/kg
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Benzo(b)fluoranthene	64.000	56.000	34900.0	NA	ug/kg
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Chrysene	60.000	28.000	3490000.0	NA	ug/kg
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Fluoranthene	89.000	38.000	2290000.0	NA	ug/kg
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Indeno(1,2,3-cd)pyrene	210.000	23.000	34900.0	NA	ug/kg
Surf Sed	CV54-000	7/19/2005	0.0	0.5	Plutonium-239/240	2.200	NA	50.0	1.350	pCi/g

Media	Location code	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED60892	6/1/1994	0.0	0.5	Americium-241	1.073	NA	76.0	0.270	pCi/g
Surf Sed	SED60892	6/1/1994	0.0	0.5	Plutonium-239/240	3.091	NA	50.0	1.350	pCi/g
Surf Sed	SED60892	6/1/1994	0.0	0.5	Uranium-238	3.948	NA	351.0	3.460	pCi/g
Sub Soil	SED60892	11/1/1992	0.0	1.3	Acetone	260.000	100.000	102000000.0	NA	ug/kg
Sub Soil	SED60892	11/1/1992	0.0	1.3	bis(2-Ethylhexyl)phthalate	1600.000	660.000	1970000.0	NA	ug/kg
Sub Soil	SED60892	11/1/1992	0.0	1.3	Nickel	28.300	NA	20400.0	17.890	mg/kg
Sub Soil	SED60892	11/1/1992	0.0	1.3	Plutonium-239/240	2.580	NA	50.0	1.350	pCi/g

Media	Location code	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CW54-000	12/22/2004	0.0	0.5	2-Butanone	34.000	20.000	102000000.0	NA	ug/kg
Surf Sed	CW54-000	12/22/2004	0.0	0.5	Acetone	230.000	20.000	102000000.0	NA	ug/kg
Surf Sed	CW54-000	12/22/2004	0.0	0.5	Americium-241	1.060	NA	76.0	0.270	pCi/g
Surf Sed	CW54-000	12/22/2004	0.0	0.5	bis(2-Ethylhexyl)phthalate	1000.000	300.000	1970000.0	NA	ug/kg
Surf Sed	CW54-000	12/22/2004	0.0	0.5	Methylene chloride	9.300	3.500	2530000.0	NA	ug/kg
Surf Sed	CW54-000	12/22/2004	0.0	0.5	Plutonium-239/240	2.890	NA	50.0	1.350	pCi/g
Surf Sed	CW54-000	12/22/2004	0.0	0.5	Uranium-238	6.100	NA	351.0	3.460	pCi/g
Sub Soil	CW54-000	12/22/2004	0.5	2.5	2-Butanone	71.000	14.000	102000000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Acetone	400.000	14.000	102000000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Aluminum	29000.000	NA	228000.0	15713.070	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Americium-241	1.440	NA	76.0	0.270	pCi/g
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Aroclor-1254	34.000	20.000	12400.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Arsenic	12.000	NA	22.2	7.240	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Barium	350.000	NA	25400.0	188.170	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	bis(2-Ethylhexyl)phthalate	420.000	210.000	1970000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Cadmium	3.200	NA	962.0	1.880	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Chromium	28.000	NA	268.0	23.230	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Copper	58.000	NA	40900.0	27.270	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Iron	27000.000	NA	307000.0	21379.010	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Methylene chloride	5.000	2.400	2530000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Nickel	36.000	NA	20400.0	17.890	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Plutonium-239/240	4.230	NA	50.0	1.350	pCi/g
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Vanadium	57.000	NA	7150.0	46.830	mg/kg
Sub Soil	CW54-000	12/22/2004	0.5	2.5	Zinc	160.000	NA	307000.0	104.400	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Acetone	77.000	21.000	102000000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Aluminum	49000.000	NA	228000.0	15713.070	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Americium-241	1.330	NA	76.0	0.270	pCi/g
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Aroclor-1254	36.000	30.000	12400.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Arsenic	11.000	NA	22.2	7.240	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Barium	340.000	NA	25400.0	188.170	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Benzoic Acid	2700.000	1300.000	102000000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	bis(2-Ethylhexyl)phthalate	490.000	320.000	1970000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Chromium	44.000	NA	268.0	23.230	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Cobalt	15.000	NA	1550.0	12.300	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Copper	49.000	NA	40900.0	27.270	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Iron	39000.000	NA	307000.0	21379.010	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Lithium	31.000	NA	20400.0	29.870	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Manganese	900.000	NA	3490.0	692.220	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Methylene chloride	5.700	2.700	2530000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Nickel	37.000	NA	20400.0	17.890	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Plutonium-239/240	3.390	NA	50.0	1.350	pCi/g
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Strontium	220.000	NA	613000.0	201.440	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Uranium-238	4.530	NA	351.0	3.460	pCi/g
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Vanadium	98.000	NA	7150.0	46.830	mg/kg
Sub Soil	CW54-000	12/22/2004	2.5	4.5	Zinc	170.000	NA	307000.0	104.400	mg/kg
Sub Soil	CW54-000	12/22/2004	4.5	6.5	2-Butanone	17.000	6.400	102000000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	4.5	6.5	Acetone	25.000	6.300	102000000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	4.5	6.5	Americium-241	1.400	NA	76.0	0.020	pCi/g
Sub Soil	CW54-000	12/22/2004	4.5	6.5	bis(2-Ethylhexyl)phthalate	250.000	96.000	1970000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	4.5	6.5	Methylene chloride	2.800	1.100	2530000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	4.5	6.5	Plutonium-239/240	2.810	NA	50.0	0.020	pCi/g
Sub Soil	CW54-000	12/22/2004	4.5	6.5	Uranium-238	2.070	NA	351.0	1.490	pCi/g
Sub Soil	CW54-000	12/22/2004	6.5	8.5	Acetone	34.000	5.200	102000000.0	NA	ug/kg
Sub Soil	CW54-000	12/22/2004	6.5	8.5	Methylene chloride	2.700	0.800	2530000.0	NA	ug/kg

Media	Location code	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED60892	6/1/1994	0.0	0.5	Americium-241	1.987	NA	76.0	0.270	pCi/g
Surf Sed	SED60892	6/1/1994	0.0	0.5	Plutonium-239/240	7.426	NA	50.0	1.350	pCi/g
Surf Sed	SED60892	6/1/1994	0.0	0.5	Uranium-235	0.195	NA	8.0	0.150	pCi/g
Surf Sed	SED60892	6/1/1994	0.0	0.5	Uranium-238	5.151	NA	351.0	3.460	pCi/g
Surf Sed	SED60892	11/1/2/1992	0.0	0.5	Toluene	660.000	5.000	31300000.0	NA	ug/kg

Media	Location code	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED60792	6/1/1994	0.0	0.5	Americium-241	1.514	NA	76.0	0.270	pCi/g
Surf Sed	SED60792	6/1/1994	0.0	0.5	Plutonium-239/240	4.747	NA	50.0	1.350	pCi/g
Surf Sed	SED60792	6/1/1994	0.0	0.5	Uranium-235	0.181	NA	8.0	0.150	pCi/g
Surf Sed	SED60792	6/1/1994	0.0	0.5	Uranium-238	5.792	NA	351.0	3.460	pCi/g
Surf Sed	SED60792	11/1/2/1992	0.0	1.0	Americium-241	1.740	NA	76.0	0.270	pCi/g
Surf Sed	SED60792	11/1/2/1992	0.0	1.0	bis(2-Ethylhexyl)phthalate	4200.000	960.000	1970000.0	NA	ug/kg
Surf Sed	SED60792	11/1/2/1992	0.0	1.0	Plutonium-239/240	5.850	NA	50.0	1.350	pCi/g
Surf Sed	SED60792	11/1/2/1992	0.0	1.0	Toluene	660.000	5.000	31300000.0	NA	ug/kg

Media	Location code	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Aluminum	22000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Americium-241	1.370	NA	76.0	0.270	pCi/g
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Arsenic	11.000	NA	22.2	7.240	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Barium	260.000	NA	25400.0	188.170	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	bis(2-Ethylhexyl)phthalate	470.000	170.000	1970000.0	NA	ug/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Chromium	24.000	NA	268.0	23.230	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Copper	28.000	NA	40900.0	27.270	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Iron	28000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Manganese	1100.000	NA	3490.0	692.220	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Nickel	22.000	NA	20400.0	17.890	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Plutonium-239/240	4.070	NA	50.0	1.350	pCi/g
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Strontium	220.000	NA	613000.0	201.440	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Uranium-235	0.282	NA	8.0	0.150	pCi/g
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Uranium-238	3.880	NA	351.0	3.460	pCi/g
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Vanadium	55.000	NA	7150.0	46.830	mg/kg
Surf Sed	CW54-002	7/18/2005	0.0	0.5	Zinc	110.000	NA	307000.0	104.400	mg/kg

Figure 3
Pond A-2 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Sampling Location
- Pond
- IHSS
- Stream

DRAFT

N
W E
S

50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

Prepared for:

KAISER-HILL COMPANY

projects/fy2005/ponds/dsr/pondresults.apr
August 2005:

0406-A-00608

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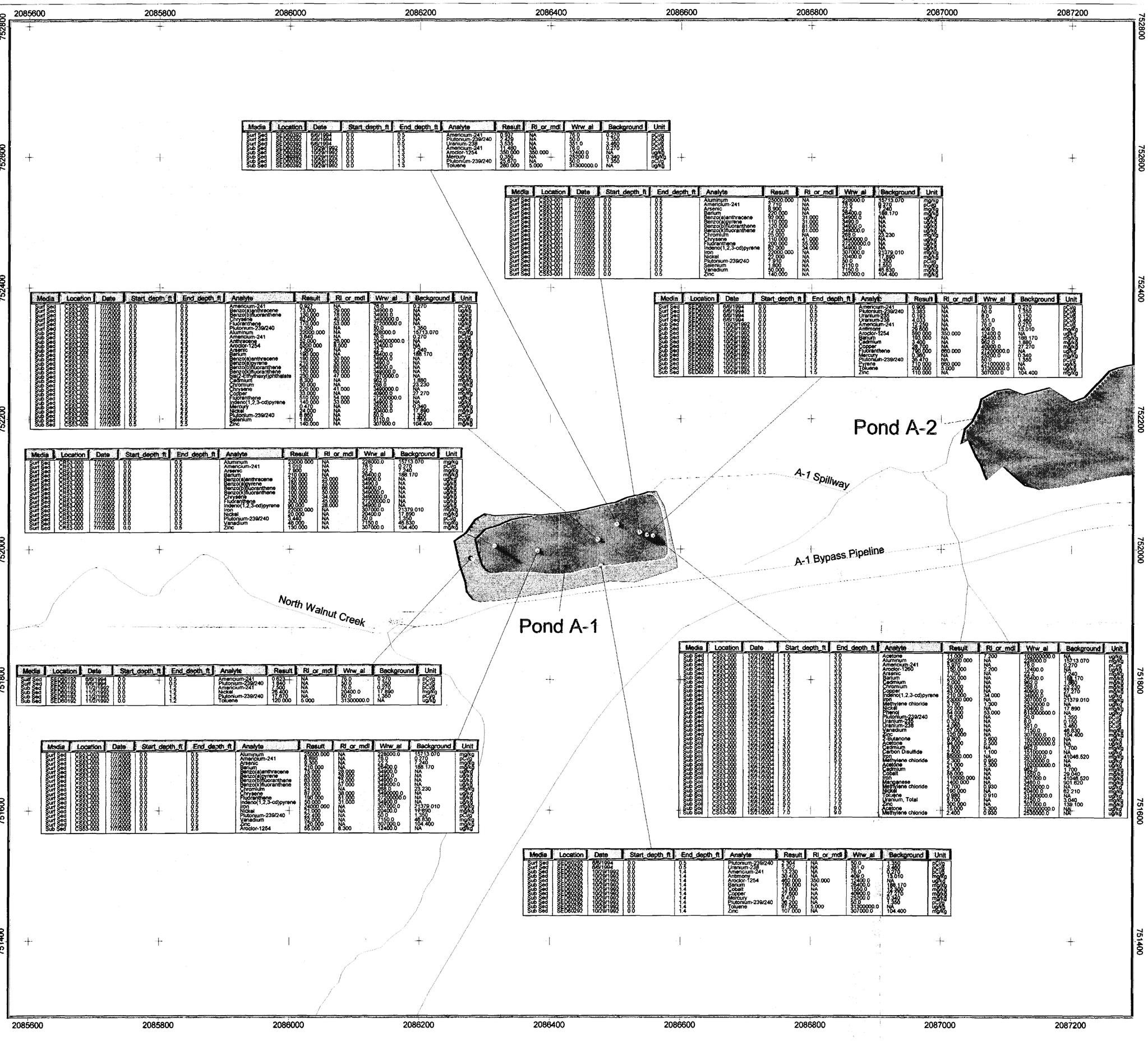


Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED60392	6/6/1994	0.0	0.5	Americium-241	0.323	NA	76.0	0.270	pCi/g
Surf Sed	SED60392	6/6/1994	0.0	0.5	Plutonium-239/240	3.235	NA	50.0	1.350	pCi/g
Surf Sed	SED60392	6/6/1994	0.0	0.5	Uranium-238	3.535	NA	351.0	3.480	pCi/g
Sub Sed	SED60392	10/29/1992	0.0	1.3	Americium-241	11.480	NA	76.0	0.270	pCi/g
Sub Sed	SED60392	10/29/1992	0.0	1.3	Aroclor-1254	350.000	350.000	12400.0	NA	ug/kg
Sub Sed	SED60392	10/29/1992	0.0	1.3	Mercury	0.350	NA	25200.0	0.340	mg/kg
Sub Sed	SED60392	10/29/1992	0.0	1.3	Plutonium-239/240	25.870	NA	50.0	1.350	pCi/g
Sub Sed	SED60392	10/29/1992	0.0	1.3	Toluene	280.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Aluminum	25000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Americium-241	2.710	NA	76.0	0.270	pCi/g
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Arsenic	8.890	NA	22.2	7.240	mg/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Barium	527.000	NA	26400.0	188.170	mg/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Benzo(a)anthracene	72.000	31.000	34900.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Benzo(a)pyrene	110.000	31.000	3490.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Benzo(b)fluoranthene	120.000	81.000	34900.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Benzo(k)fluoranthene	72.000	61.000	349000.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Chromium	25.000	NA	268.0	23.230	mg/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Chrysene	110.000	41.000	3490000.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Fluoranthene	200.000	55.000	27200000.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Indeno(1,2,3-cd)pyrene	82.000	32.000	34900.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Iron	23000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Nickel	21.000	NA	20400.0	17.890	mg/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Plutonium-239/240	1.910	NA	50.0	1.350	pCi/g
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Selenium	1.800	NA	5110.0	1.550	mg/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Vanadium	50.000	NA	7150.0	46.830	mg/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Zinc	140.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Americium-241	0.921	NA	76.0	0.270	pCi/g
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Benzo(a)anthracene	73.000	29.000	34900.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Benzo(b)fluoranthene	130.000	78.000	34900.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Chrysene	82.000	40.000	3490000.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Fluoranthene	170.000	53.000	27200000.0	NA	ug/kg
Surf Sed	CS53-001	7/7/2005	0.0	0.5	Plutonium-239/240	3.350	NA	50.0	1.350	pCi/g
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Aluminum	22000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Americium-241	3.240	NA	76.0	0.270	pCi/g
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Anthracene	52.000	28.000	204000000.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Aroclor-1254	5200.000	8.300	12400.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Arsenic	7.890	NA	22.2	7.240	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Barium	187.000	NA	26400.0	188.170	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Benzo(a)anthracene	190.000	30.000	34900.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Benzo(a)pyrene	210.000	30.000	3490.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Benzo(b)fluoranthene	190.000	80.000	34900.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Benzo(k)fluoranthene	120.000	60.000	349000.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	bis(2-Ethylhexyl)phthalate	230.000	47.000	107000.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Cadmium	8.300	NA	962.0	1.880	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Chromium	30.000	NA	268.0	23.230	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Chrysene	220.000	41.000	3490000.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Copper	33.000	NA	40600.0	27.270	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Fluoranthene	310.000	54.000	27200000.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Indeno(1,2,3-cd)pyrene	140.000	33.000	34900.0	NA	ug/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Mercury	0.470	NA	25200.0	0.340	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Nickel	24.000	NA	20400.0	17.890	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Plutonium-239/240	6.860	NA	50.0	1.350	pCi/g
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Selenium	1.800	NA	5110.0	1.550	mg/kg
Sub Sed	CS53-002	7/7/2005	0.5	2.5	Zinc	140.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED60092	6/6/1994	0.0	0.5	Americium-241	0.906	NA	76.0	0.270	pCi/g
Surf Sed	SED60092	6/6/1994	0.0	0.5	Plutonium-239/240	3.393	NA	50.0	1.350	pCi/g
Surf Sed	SED60092	6/6/1994	0.0	0.5	Uranium-235	0.193	NA	8.0	0.150	pCi/g
Surf Sed	SED60092	6/6/1994	0.0	0.5	Uranium-238	4.033	NA	351.0	3.480	pCi/g
Sub Sed	SED60092	10/29/1992	0.0	1.5	Americium-241	12.250	NA	76.0	0.270	pCi/g
Sub Sed	SED60092	10/29/1992	0.0	1.5	Antimony	29.500	NA	409.0	13.010	mg/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Aroclor-1254	560.000	350.000	12400.0	NA	ug/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Barium	193.000	NA	26400.0	188.170	mg/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Cadmium	3.400	NA	962.0	1.880	mg/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Copper	28.700	NA	40600.0	27.270	mg/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Fluoranthene	1790.000	860.000	27200000.0	NA	ug/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Mercury	0.360	NA	25200.0	0.340	mg/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Pyrene	710.000	860.000	21100000.0	NA	ug/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Toluene	200.000	5.000	31300000.0	NA	ug/kg
Sub Sed	SED60092	10/29/1992	0.0	1.5	Zinc	110.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Aluminum	23000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Americium-241	1.010	NA	76.0	0.270	pCi/g
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Arsenic	7.840	NA	22.2	7.240	mg/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Barium	210.000	NA	26400.0	188.170	mg/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Benzo(a)anthracene	120.000	25.000	34900.0	NA	ug/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Benzo(a)pyrene	160.000	22.000	3490.0	NA	ug/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Benzo(b)fluoranthene	190.000	66.000	34900.0	NA	ug/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Benzo(k)fluoranthene	130.000	50.000	349000.0	NA	ug/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Chrysene	180.000	34.000	3490000.0	NA	ug/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Fluoranthene	330.000	45.000	27200000.0	NA	ug/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Indeno(1,2,3-cd)pyrene	90.000	28.000	34900.0	NA	ug/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Iron	25000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Nickel	20.000	NA	20400.0	17.890	mg/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Plutonium-239/240	1.440	NA	50.0	1.350	pCi/g
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Vanadium	48.000	NA	7150.0	46.830	mg/kg
Surf Sed	CR53-000	7/7/2005	0.0	0.5	Zinc	190.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED60192	6/6/1994	0.0	0.5	Americium-241	0.623	NA	76.0	0.270	pCi/g
Surf Sed	SED60192	6/6/1994	0.0	0.5	Plutonium-239/240	1.940	NA	50.0	1.350	pCi/g
Surf Sed	SED60192	11/2/1992	0.0	1.2	Americium-241	7.500	NA	76.0	0.270	pCi/g
Sub Sed	SED60192	11/2/1992	0.0	1.2	Nickel	26.400	NA	20400.0	17.890	mg/kg
Sub Sed	SED60192	11/2/1992	0.0	1.2	Plutonium-239/240	17.670	NA	50.0	1.350	pCi/g
Sub Sed	SED60192	11/2/1992	0.0	1.2	Toluene	120.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Aluminum	26000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Americium-241	6.890	NA	76.0	0.270	pCi/g
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Arsenic	9.890	NA	22.2	7.240	mg/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Barium	210.000	NA	26400.0	188.170	mg/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Benzo(a)anthracene	75.000	28.000	34900.0	NA	ug/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Benzo(a)pyrene	83.000	42.000	3490.0	NA	ug/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Benzo(b)fluoranthene	83.000	75.000	34900.0	NA	ug/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Benzo(k)fluoranthene	53.000	57.000	349000.0	NA	ug/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Chromium	24.000	NA	268.0	23.230	mg/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Chrysene	87.000	38.000	3490000.0	NA	ug/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Fluoranthene	180.000	51.000	27200000.0	NA	ug/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Indeno(1,2,3-cd)pyrene	50.000	31.000	34900.0	NA	ug/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Iron	24000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Nickel	21.000	NA	20400.0	17.890	mg/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Plutonium-239/240	22.400	NA	50.0	1.350	pCi/g
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Vanadium	52.000	NA	7150.0	46.830	mg/kg
Surf Sed	CS53-003	7/7/2005	0.0	0.5	Zinc	120.000	NA	307000.0	104.400	mg/kg
Sub Sed	CS53-003	7/7/2005	0.5	2.5	Aroclor-1254	65.000	8.300	12400.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Acetone	11.000	7.200	102000000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Aluminum	19000.000	NA	228000.0	15713.070	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Americium-241	5.870	NA	76.0	0.270	pCi/g
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Aroclor-1260	18.000	2.200	12400.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Arsenic	7.000	NA	22.2	7.240	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Barium	230.000	NA	26400.0	188.170	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Cadmium	1.000	NA	962.0	1.880	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Chromium	28.000	NA	268.0	23.230	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Copper	43.000	NA	40600.0	27.270	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Indeno(1,2,3-cd)pyrene	210.000	34.000	34900.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Iron	23000.000	NA	307000.0	21379.010	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Methylene chloride	3.700	1.300	2530000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Nickel	52.000	NA	20400.0	17.890	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Phenol	74.000	53.000	61300000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Plutonium-239/240	16.200	NA	50.0	1.350	pCi/g
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Uranium-235	0.302	NA	8.0	0.150	pCi/g
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Uranium-238	4.060	NA	351.0	3.480	pCi/g
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Vanadium	57.000	NA	7150.0	46.830	mg/kg
Sub Soil	CS53-000	12/21/2004	1.5	3.0	Zinc	120.000	NA	307000.0	104.400	mg/kg
Sub Soil	CS53-000	12/21/2004	3.0	5.0	2-Butanone	9.800	5.800	102000000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	3.0	5.0	Acetone	14.000	5.500	102000000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	3.0	5.0	Cadmium	1.900	0.5	962.0	1.700	mg/kg
Sub Soil	CS53-000	12/21/2004	3.0	5.0	Carbon Disulfide	2.500	1.100	15100000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	3.0	5.0	Iron	84000.000	NA	307000.0	41046.520	mg/kg
Sub Soil	CS53-000	12/21/2004	3.0	5.0	Methylene chloride	2.300	0.950	2530000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Acetone	21.000	5.300	102000000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Cadmium	2.300	NA	962.0	1.700	mg/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Cobalt	56.000	NA	1265.0	29.040	mg/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Iron	110000.000	NA	307000.0	41046.520	mg/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Manganese	1400.000	NA	3480.0	901.820	mg/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Methylene chloride	2.700	0.930	2530000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Nickel	190.000	NA	20400.0	62.210	mg/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Toluene	0.980	0.910	31300000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Uranium, Total	5.700	NA	4750.0	3.040	mg/kg
Sub Soil	CS53-000	12/21/2004	5.0	7.0	Zinc	300.000	NA	307000.0	139.100	mg/kg
Sub Soil	CS53-000	12/21/2004	7.0	9.0	Acetone	15.000	5.300	102000000.0	NA	ug/kg
Sub Soil	CS53-000	12/21/2004	7.0	9.0	Methylene chloride	2.400	0.930	2530000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED60292	6/6/1994	0.0	0.5	Plutonium-239/240	2.304	NA	50.0	1.350	pCi/g
Surf Sed	SED60292	6/6/1994	0.0	0.5	Uranium-238	5.352	NA	351.0	3.480	pCi/g
Sub Sed	SED60292	10/29/1992	0.0	1.4	Americium-241	13.230	NA	76.0	0.270	pCi/g
Sub Sed	SED60292	10/29/1992	0.0	1.4	Antimony	30.400	NA	409.0	13.010	mg/kg
Sub Sed	SED60292	10/29/1992	0.0	1.4	Aroclor-1254	460.000	350.000	12400.0	NA	ug/kg
Sub Sed	SED60292	10/29/1992	0.0	1.4	Barium	190.000	NA	26400.0	188.170	mg/kg
Sub Sed	SED60292	10/29/1992	0.0	1.4	Cobalt	13.000	NA	1265.0	29.040	mg/kg
Sub Sed	SED60292	10/29/1992	0.0	1.4	Copper	27.600	NA	40600.0	27.270	mg/kg
Sub Sed	SED60292	10/29/1992	0.0	1.4	Mercury	0.470	NA	25200.0	0.340	mg/kg
Sub Sed	SED60292	10/29/1992	0.0	1.4	Plutonium-239/240	36.200	NA	50.0	1.350	pCi/g
Sub Sed	SED60292	10/29/1992	0.0	1.4	Toluene	97.000	5.000	31300000.0	NA	ug/kg
Sub Sed	SED60292	10/29/1992	0.0	1.4	Zinc	107.000	NA	307000.0	104.400	mg/kg

Figure 2
Pond A-1 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Sampling Location
- Pond
- IHSS
- Stream

DRAFT

N
W E
S

50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

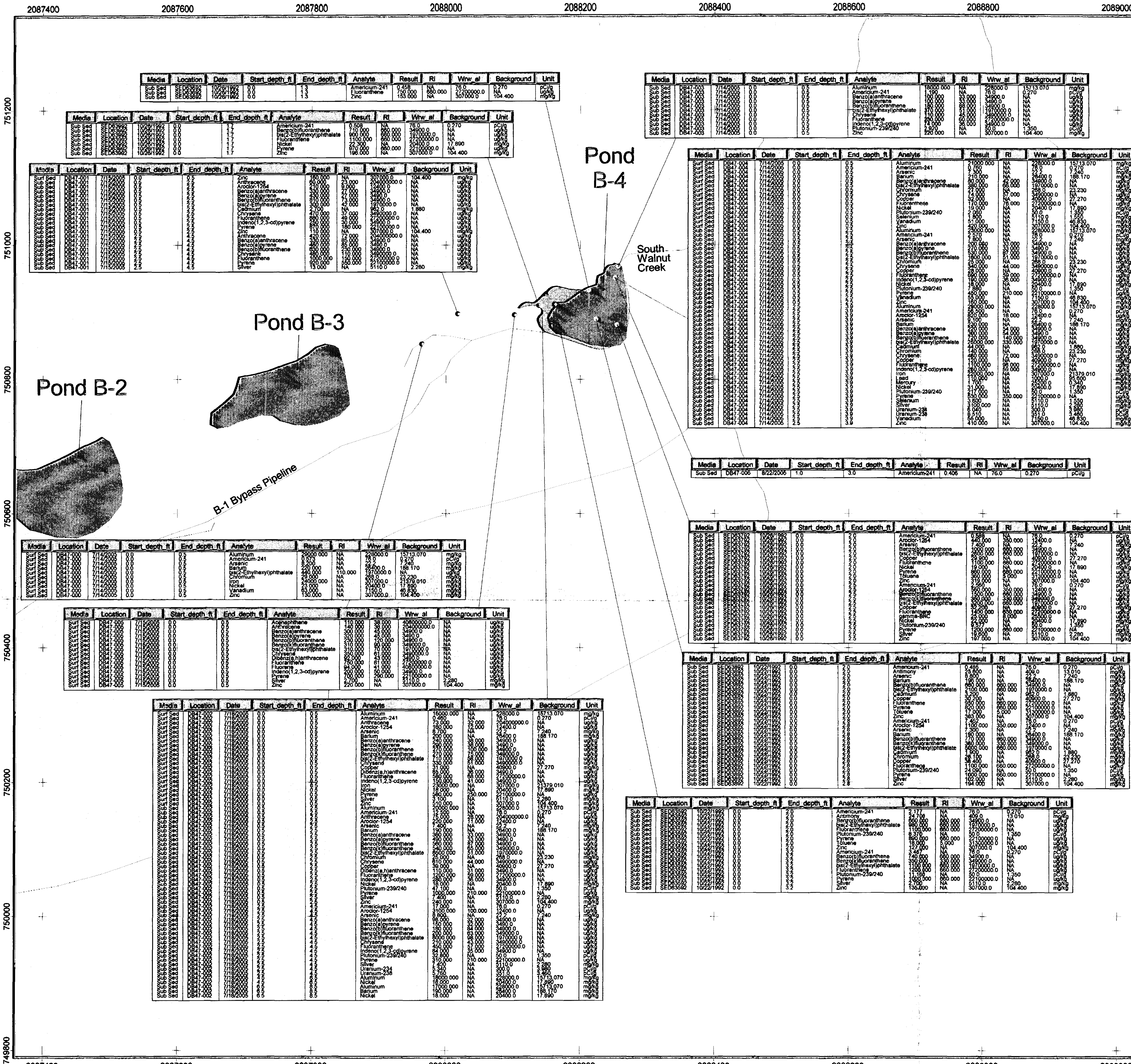
Prepared for:

KAISER-HILL COMPANY

projects/fy2005/ponds/dsr/pondresults.apr
August 2005.

0406-A-00608

Figure 7
Pond B-4 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits



Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Sub Sed	SED63692	10/26/1992	0.0	1.3	Americium-241	0.458	NA	76.0	0.270	pCi/g
Sub Sed	SED63692	10/26/1992	0.0	1.3	Fluoranthene	750.000	660.000	27200000.0	NA	ug/kg
Sub Sed	SED63692	10/26/1992	0.0	1.3	Zinc	153.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Sub Sed	SED63992	10/26/1992	0.0	1.7	Americium-241	0.508	NA	76.0	0.270	pCi/g
Sub Sed	SED63992	10/26/1992	0.0	1.7	Benzo(b)fluoranthene	710.000	660.000	34900.0	NA	ug/kg
Sub Sed	SED63992	10/26/1992	0.0	1.7	bis(2-Ethylhexyl)phthalate	900.000	660.000	1970000.0	NA	ug/kg
Sub Sed	SED63992	10/26/1992	0.0	1.7	Fluoranthene	1100.000	660.000	27200000.0	NA	ug/kg
Sub Sed	SED63992	10/26/1992	0.0	1.7	Nickel	22.300	NA	20400.0	17.890	mg/kg
Sub Sed	SED63992	10/26/1992	0.0	1.7	Pyrene	970.000	660.000	22100000.0	NA	ug/kg
Sub Sed	SED63992	10/26/1992	0.0	1.7	Zinc	196.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Surf Sed	DB47-001	7/15/2005	0.0	0.5	Zinc	160.000	NA	307000.0	104.400	mg/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Anthracene	60.000	23.000	204000000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Aroclor-1254	210.000	9.000	12400.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Benzo(a)anthracene	330.000	27.000	34900.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Benzo(a)pyrene	430.000	27.000	3490.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Benzo(b)fluoranthene	810.000	73.000	34900.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	bis(2-Ethylhexyl)phthalate	300.000	42.000	1970000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Cadmium	2.700	NA	962.0	1.880	mg/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Chrysene	470.000	37.000	3490000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Fluoranthene	880.000	49.000	27200000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Indeno(1,2,3-cd)pyrene	250.000	30.000	34900.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Pyrene	870.000	180.000	22100000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	0.5	2.5	Zinc	110.000	NA	307000.0	104.400	mg/kg
Sub Sed	DB47-001	7/15/2005	2.5	4.5	Anthracene	420.000	72.000	204000000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	2.5	4.5	Benzo(a)anthracene	330.000	85.000	34900.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	2.5	4.5	Benzo(a)pyrene	460.000	85.000	3490.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	2.5	4.5	Benzo(b)fluoranthene	630.000	230.000	34900.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	2.5	4.5	Chrysene	480.000	110.000	3490000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	2.5	4.5	Fluoranthene	1000.000	150.000	27200000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	2.5	4.5	Pyrene	920.000	550.000	22100000.0	NA	ug/kg
Sub Sed	DB47-001	7/15/2005	2.5	4.5	Silver	13.000	NA	5110.0	2.280	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Aluminum	18000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Americium-241	1.190	NA	76.0	0.270	pCi/g
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Benzo(a)anthracene	100.000	33.000	34900.0	NA	ug/kg
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Benzo(a)pyrene	100.000	33.000	3490.0	NA	ug/kg
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Benzo(b)fluoranthene	180.000	88.000	34900.0	NA	ug/kg
Sub Sed	DB47-003	7/14/2005	0.0	0.5	bis(2-Ethylhexyl)phthalate	370.000	51.000	1970000.0	NA	ug/kg
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Chrysene	110.000	45.000	3490000.0	NA	ug/kg
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Fluoranthene	230.000	60.000	27200000.0	NA	ug/kg
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Indeno(1,2,3-cd)pyrene	74.000	36.000	34900.0	NA	ug/kg
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Plutonium-239/240	2.920	NA	50.0	1.350	pCi/g
Sub Sed	DB47-003	7/14/2005	0.0	0.5	Zinc	220.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Aluminum	21000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Americium-241	0.760	NA	76.0	0.270	pCi/g
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Arsenic	7.300	NA	22.2	7.240	mg/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Barium	210.000	NA	26400.0	188.170	mg/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Benzo(a)anthracene	80.000	42.000	34900.0	NA	ug/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	bis(2-Ethylhexyl)phthalate	380.000	66.000	1970000.0	NA	ug/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Chromium	27.000	NA	268.0	23.230	mg/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Chrysene	74.000	57.000	3490000.0	NA	ug/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Copper	32.000	NA	40900.0	27.270	mg/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Fluoranthene	170.000	76.000	27200000.0	NA	ug/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Nickel	19.000	NA	20400.0	17.890	mg/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Plutonium-239/240	2.060	NA	50.0	1.350	pCi/g
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Selenium	1.800	NA	5110.0	1.550	mg/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Vanadium	51.000	NA	7150.0	46.830	mg/kg
Surf Sed	DB47-004	7/14/2005	0.0	0.5	Zinc	420.000	NA	307000.0	104.400	mg/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Aluminum	23000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Americium-241	2.570	NA	76.0	0.270	pCi/g
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Arsenic	7.800	NA	22.2	7.240	mg/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Benzo(a)anthracene	200.000	33.000	34900.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Benzo(a)pyrene	270.000	33.000	3490.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Benzo(b)fluoranthene	530.000	87.000	34900.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	bis(2-Ethylhexyl)phthalate	1600.000	51.000	1970000.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Chromium	25.000	NA	268.0	23.230	mg/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Chrysene	340.000	44.000	3490000.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Copper	28.000	NA	40900.0	27.270	mg/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Fluoranthene	690.000	59.000	27200000.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Indeno(1,2,3-cd)pyrene	190.000	36.000	34900.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Nickel	18.000	NA	20400.0	17.890	mg/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Plutonium-239/240	7.880	NA	50.0	1.350	pCi/g
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Pyrene	450.000	210.000	22100000.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Vanadium	55.000	NA	7150.0	46.830	mg/kg
Sub Sed	DB47-004	7/14/2005	0.5	2.5	Zinc	160.000	NA	307000.0	104.400	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Aluminum	29000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Americium-241	56.500	NA	76.0	0.270	pCi/g
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Aroclor-1254	820.000	18.000	12400.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Arsenic	9.100	NA	22.2	7.240	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Barium	230.000	NA	26400.0	188.170	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Benzo(a)anthracene	220.000	54.000	34900.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Benzo(a)pyrene	300.000	54.000	3490.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Benzo(b)fluoranthene	720.000	140.000	34900.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	bis(2-Ethylhexyl)phthalate	26000.000	330.000	1970000.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Cadmium	44.000	NA	962.0	1.880	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Chromium	140.000	NA	268.0	23.230	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Chrysene	460.000	72.000	3490000.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Copper	120.000	NA	40900.0	27.270	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Fluoranthene	1100.000	96.000	27200000.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Indeno(1,2,3-cd)pyrene	260.000	59.000	34900.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Iron	22000.000	NA	307000.0	21379.010	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Lead	110.000	NA	1000.0	95.600	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Mercury	1.700	NA	25200.0	0.340	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Nickel	31.000	NA	20400.0	17.890	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Plutonium-239/240	217.000	NA	50.0	1.350	pCi/g
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Pyrene	530.000	350.000	22100000.0	NA	ug/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Selenium	3.600	NA	5110.0	1.550	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Silver	3100.000	NA	5110.0	2.280	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Uranium-234	6.040	NA	300.0	3.980	pCi/g
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Uranium-238	8.510	NA	351.0	3.460	pCi/g
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Vanadium	55.000	NA	7150.0	46.830	mg/kg
Sub Sed	DB47-004	7/14/2005	2.5	3.9	Zinc	410.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Sub Sed	DB47-006	8/22/2005	1.0	3.0	Americium-241	0.406	NA	76.0	0.270	pCi/g

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Aluminum	29000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Americium-241	0.573	NA	76.0	0.270	pCi/g
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Arsenic	8.200	NA	22.2	7.240	mg/kg
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Barium	220.000	NA	26400.0	188.170	mg/kg
Surf Sed	DB47-000	7/14/2005	0.0	0.5	bis(2-Ethylhexyl)phthalate	440.000	110.000	1970000.0	NA	ug/kg
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Chromium	29.000	NA	268.0	23.230	mg/kg
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Iron	24000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Nickel	23.000	NA	20400.0	17.890	mg/kg
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Vanadium	63.000	NA	7150.0	46.830	mg/kg
Surf Sed	DB47-000	7/14/2005	0.0	0.5	Zinc	130.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Acenaphthene	110.000	38.000	40800000.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Anthracene	140.000	38.000	204000000.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Benzo(a)anthracene	300.000	45.000	34900.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Benzo(a)pyrene	320.000	45.000	3490.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Benzo(b)fluoranthene	230.000	120.000	34900.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Benzo(k)fluoranthene	310.000	90.000	349000.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	bis(2-Ethylhexyl)phthalate	310.000	70.000	1970000.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Chrysene	350.000	61.000	3490000.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Dibenz(a,h)anthracene	92.000	43.000	3490.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Fluoranthene	750.000	81.000	27200000.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Fluorene	94.000	41.000	40800000.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Indeno(1,2,3-cd)pyrene	200.000	50.000	34900.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Pyrene	700.000	290.000	22100000.0	NA	ug/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Silver	2.700	NA	5110.0	2.280	mg/kg
Surf Sed	DB47-005	7/15/2005	0.0	0.5	Zinc	220.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Aluminum	16000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Americium-241	0.460	NA	76.0	0.270	pCi/g
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Anthracene	73.000	32.000	204000000.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Aroclor-1254	160.000	12.000	12400.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Arsenic	8.700	NA	22.2	7.240	mg/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Barium	200.000	NA	26400.0	188.170	mg/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Benzo(a)anthracene	240.000	38.000	34900.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Benzo(a)pyrene	290.000	38.000	3490.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Benzo(b)fluoranthene	270.000	100.000	34900.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Benzo(k)fluoranthene	270.000	75.000	349000.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	bis(2-Ethylhexyl)phthalate	710.000	58.000	1970000.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Chrysene	330.000	51.000	3490000.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Copper	31.000	NA	40900.0	27.270	mg/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Dibenz(a,h)anthracene	65.000	38.000	3490.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Fluoranthene	580.000	68.000	27200000.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Indeno(1,2,3-cd)pyrene	150.000	41.000	34900.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Iron	23000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Nickel	18.000	NA	20400.0	17.890	mg/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Pyrene	580.000	250.000	22100000.0	NA	ug/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Silver	3.100	NA	5110.0	2.280	mg/kg
Surf Sed	DB47-002	7/18/2005	0.0	0.5	Zinc	510.000	NA	307000.0	104.400	mg/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Aluminum	20000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Americium-241	12.500	NA	76.0	0.270	pCi/g
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Anthracene	75.000	28.000	204000000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Aroclor-1254	220.000	11.000	12400.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Arsenic	7.400	NA	22.2	7.240	mg/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Barium	190.000	NA	26400.0	188.170	mg/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Benzo(a)anthracene	360.000	33.000	34900.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Benzo(a)pyrene	490.000	33.000	3490.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Benzo(b)fluoranthene	560.000	87.000	34900.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Benzo(k)fluoranthene	540.000	65.000	349000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	bis(2-Ethylhexyl)phthalate	6500.000	51.000	1970000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Chromium	25.000	NA	268.0	23.230	mg/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Chrysene	610.000	44.000	3490000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Copper	39.000	NA	40900.0	27.270	mg/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Dibenz(a,h)anthracene	110.000	31.000	3490.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Fluoranthene	1200.000	59.000	27200000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Indeno(1,2,3-cd)pyrene	280.000	36.000	34900.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Nickel	18.000	NA	20400.0	17.890	mg/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Plutonium-239/240	47.100	NA	50.0	1.350	pCi/g
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Pyrene	1000.000	210.000	22100000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Silver	7.400	NA	5110.0	2.280	mg/kg
Sub Sed	DB47-002	7/18/2005	0.5	2.5	Zinc	240.000	NA	307000.0	104.400	mg/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Americium-241	17.000	NA	76.0	0.270	pCi/g
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Aroclor-1254	3100.000	100.000	12400.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Arsenic	8.800	NA	22.2	7.240	mg/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Benzo(a)anthracene	98.000	32.000	34900.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Benzo(a)pyrene	150.000	32.000	3490.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Benzo(b)fluoranthene	180.000	84.000	34900.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Benzo(k)fluoranthene	200.000	63.000	349000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	bis(2-Ethylhexyl)phthalate	8000.000	98.000	1970000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Chrysene	210.000	43.000	3490000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Fluoranthene	450.000	57.000	27200000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Indeno(1,2,3-cd)pyrene	84.000	35.000	34900.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Plutonium-239/240	32.800	NA	50.0	1.350	pCi/g
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Pyrene	310.000	210.000	22100000.0	NA	ug/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Silver	7.400	NA	5110.0	2.280	mg/kg
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Uranium-234	5.340	NA	300.0	3.980	pCi/g
Sub Sed	DB47-002	7/18/2005	2.5	4.5	Uranium-238	5.760	NA	351.0	3.460	pCi/g
Sub Sed	DB47-002	7/18/2005	4.5	6.5	Aluminum	18000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DB47-002	7/18/2005	4.5	6.5	Nickel	18.000	NA	20400.0	17.890	mg/kg
Sub Sed	DB47-002	7/18/2005	6.5	8.5	Aluminum	17000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DB47-002	7/18/2005	6.5	8.5	Barium	190.000	NA	26400.0	188.170	mg/kg
Sub Sed	DB47-002	7/18/2005	6.5	8.5	Nickel	18.000	NA	20400.0	17.890	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Sub Sed	SED63792	10/26/1992	0.0	2.0	Americium-241	0.588	NA	76.0	0.270	pCi/g
Sub Sed	SED63792	10/26/1992	0.0	2.0	Aroclor-1254	440.000	350.000	12400.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	Arsenic	7.400	NA	22.2	7.240	mg/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	Benzo(b)fluoranthene	1000.000	660.000	34900.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	bis(2-Ethylhexyl)phthalate	2600.000	660.000	1970000.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	Copper	29.900	NA	40900.0	27.270	mg/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	Fluoranthene	1100.000	660.000	27200000.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	Nickel	19.000	NA	20400.0	17.890	mg/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	Pyrene	860.000	660.000	22100000.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	Toluene	360.000	5.000	31300000.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.0	Zinc	319.000	NA	307000.0	104.400	mg/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Americium-241	2.560	NA	76.0	0.270	pCi/g
Sub Sed	SED63792	10/26/1992	0.0	2.5	Aroclor-1254	560.000	350.000	12400.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Benzo(b)fluoranthene	1500.000	660.000	34900.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Benzo(k)fluoranthene	360.000	330.000	349000.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	bis(2-Ethylhexyl)phthalate	3200.000	660.000	1970000.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Copper	32.200	NA	40900.0	27.270	mg/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Fluoranthene	1450.000	660.000	27200000.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	gamma-BHC	25.000	8.000	25500.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Nickel	22.000	NA	20400.0	17.890	mg/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Plutonium-239/240	9.577	NA	50.0	1.350	pCi/g
Sub Sed	SED63792	10/26/1992	0.0	2.5	Pyrene	1200.000	660.000	22100000.0	NA	ug/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Silver	19.600	NA	5110.0	2.280	mg/kg
Sub Sed	SED63792	10/26/1992	0.0	2.5	Zinc	197.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Sub Sed	SED63892	10/22/1992	0.0	2.0	Americium-241	0.485	NA	76.0	0.270	pCi/g
Sub Sed	SED63892	10/22/1992	0.0	2.0	Antimony	25.600	NA	409.0	13.010	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Arsenic	8.800	NA	22.2	7.240	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Barium	196.000	NA	26400.0	188.170	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Benzo(b)fluoranthene	660.000	660.000	34900.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	bis(2-Ethylhexyl)phthalate	2100.000	660.000	1970000.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Cadmium	3.200	NA	962.0	1.880	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Copper	30.200	NA	40900.0	27.270	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Fluoranthene	950.000	660.000	27200000.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Pyrene	820.000	660.000	22100000.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Toluene	17.000	5.000	31300000.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.0	Zinc	303.000	NA	307000.0	104.400	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Americium-241	7.452	NA	76.0	0.270	pCi/g
Sub Sed	SED63892	10/22/1992	0.0	2.8	Aroclor-1254	1100.000	350.000	12400.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Arsenic	7.300	NA	22.2	7.240	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Barium	190.000	NA	26400.0	188.170	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Benzo(b)fluoranthene	770.000	660.000	34900.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Benzo(k)fluoranthene	360.000	330.000	349000.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	bis(2-Ethylhexyl)phthalate	5000.000	660.000	1970000.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Cadmium	1.900	NA	962.0	1.880	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Chromium	26.100	NA	268.0	23.230	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Copper	38.400	NA	40900.0	27.270	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Fluoranthene	1100.000	660.000	27200000.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Plutonium-239/240	24.090	NA	50.0	1.350	pCi/g
Sub Sed	SED63892	10/22/1992	0.0	2.8	Pyrene	1000.000	660.000	22100000.0	NA	ug/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Silver	102.000	NA	5110.0	2.280	mg/kg
Sub Sed	SED63892	10/22/1992	0.0	2.8	Zinc	194.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI	Wrw_al	Background	Unit
Sub Sed	SED63592	10/22/1992	0.0	2.0	Americium-241	2.177	NA	76.0	0.270	pCi/g
Sub Sed	SED63592	10/22/1992	0.0	2.0	Antimony	24.700	NA	409.0	13.010	mg/kg
Sub Sed	SED63592	10/22/1992	0.0	2.0	Benzo(b)fluoranthene	660.000	660.000	34900.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	2.0	bis(2-Ethylhexyl)phthalate	980.000	660.000	1970000.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	2.0	Fluoranthene	1100.000	660.000	27200000.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	2.0	Plutonium-239/240	8.370	NA	50.0	1.350	pCi/g
Sub Sed	SED63592	10/22/1992	0.0	2.0	Pyrene	890.000	660.000	22100000.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	2.0	Toluene	18.000	5.000	31300000.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	2.0	Zinc	127.000	NA	307000.0	104.400	mg/kg
Sub Sed	SED63592	10/22/1992	0.0	3.2	Americium-241	3.467	NA	76.0	0.270	pCi/g
Sub Sed	SED63592	10/22/1992	0.0	3.2	Benzo(b)fluoranthene	740.000	660.000	34900.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	3.2	Benzo(k)fluoranthene	350.000	330.000	349000.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	3.2	bis(2-Ethylhexyl)phthalate	1100.000	660.000	1970000.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	3.2	Fluoranthene	1200.000	660.000	27200000.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	3.2	Plutonium-239/240	11.160	NA	50.0	1.350	pCi/g
Sub Sed	SED63592	10/22/1992	0.0	3.2	Pyrene	1000.000	660.000	22100000.0	NA	ug/kg
Sub Sed	SED63592	10/22/1992	0.0	3.2	Silver	2.700	NA	5110.0	2.280	mg/kg
Sub Sed	SED63592	10/22/1992	0.0	3.2	Zinc	135.000	NA	307000.0	104.400	mg/kg

KEY

Sampling Location

Pond

IHSS

Stream

DRAFT

N
W E
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50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

Prepared for:

KAISER-HILL COMPANY

projects/fy2005/ponds/dsr/pondresults.apr
August 2005:

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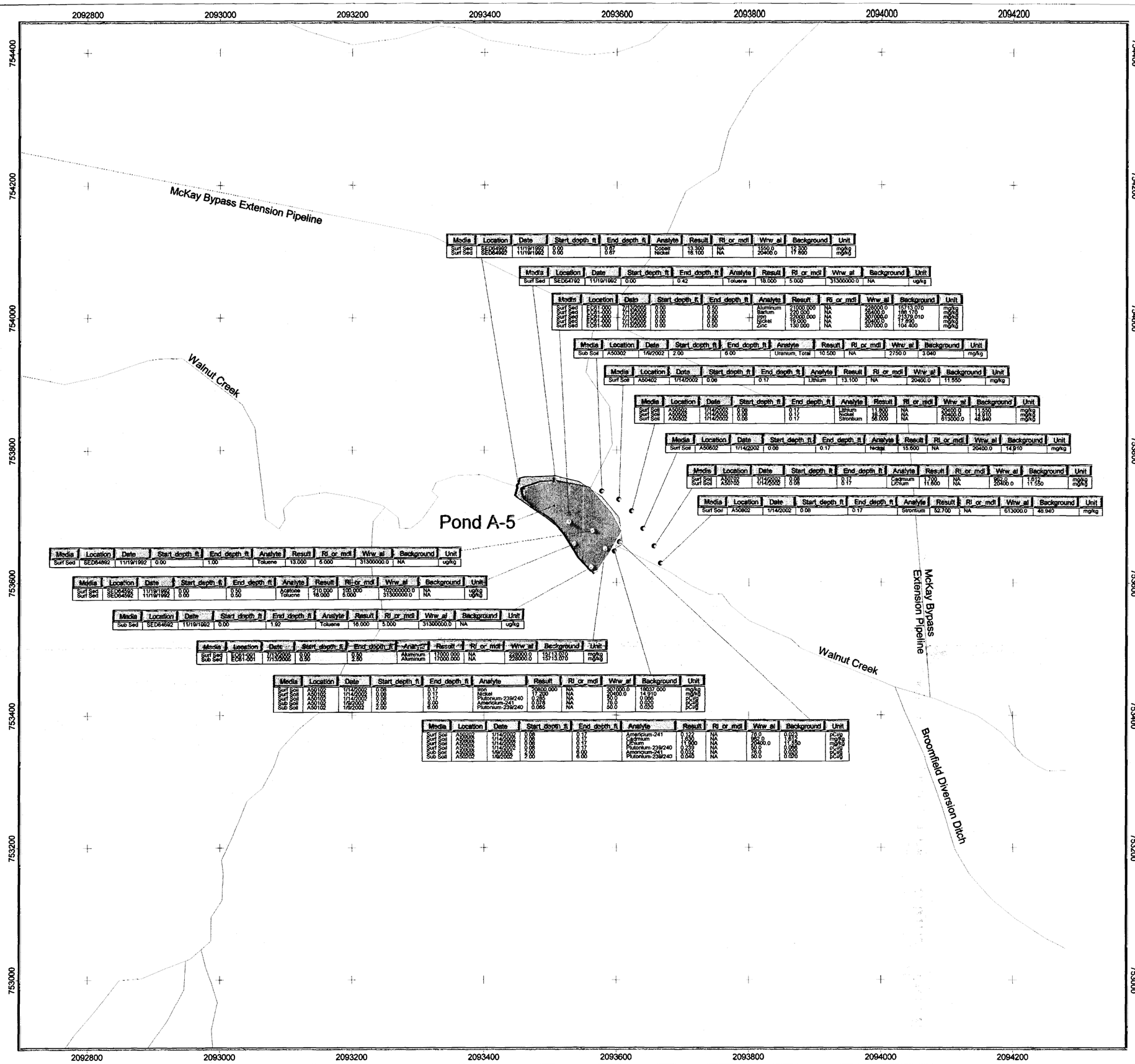

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64892	11/19/1992	0.00	0.87	Cobalt	13.300	NA	1550.0	12.300	mg/kg
Surf Sed	SED64892	11/19/1992	0.00	0.87	Nickel	18.100	NA	20400.0	17.890	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64792	11/19/1992	0.00	0.42	Toluene	18.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	EC81-000	7/13/2005	0.00	0.50	Aluminum	21000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	EC81-000	7/13/2005	0.00	0.50	Barium	220.000	NA	38400.0	198.170	mg/kg
Surf Sed	EC81-000	7/13/2005	0.00	0.50	Iron	23000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	EC81-000	7/13/2005	0.00	0.50	Nickel	19.000	NA	20400.0	17.890	mg/kg
Surf Sed	EC81-000	7/13/2005	0.00	0.50	Zinc	130.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Sub Soil	A50302	1/6/2002	2.00	6.00	Uranium, Total	10.500	NA	2750.0	3.040	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Soil	A50402	1/14/2002	0.06	0.17	Lithium	13.100	NA	20400.0	11.550	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Soil	A50202	1/14/2002	0.06	0.17	Lithium	11.800	NA	20400.0	11.550	mg/kg
Surf Soil	A50202	1/14/2002	0.06	0.17	Nickel	18.300	NA	20400.0	14.910	mg/kg
Surf Soil	A50202	1/14/2002	0.06	0.17	Strontium	56.000	NA	613000.0	48.940	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Soil	A50602	1/14/2002	0.06	0.17	Nickel	15.600	NA	20400.0	14.910	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Soil	A50702	1/14/2002	0.06	0.17	Cadmium	1.700	NA	962.0	1.610	mg/kg
Surf Soil	A50702	1/14/2002	0.06	0.17	Lithium	11.800	NA	20400.0	11.550	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Soil	A50802	1/14/2002	0.06	0.17	Strontium	52.700	NA	613000.0	48.940	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64892	11/19/1992	0.00	1.00	Toluene	13.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64592	11/19/1992	0.00	0.50	Acetone	210.000	100.000	307000000.0	NA	ug/kg
Surf Sed	SED64592	11/19/1992	0.00	0.50	Toluene	18.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Sub Sed	SED64692	11/19/1992	0.00	1.92	Toluene	16.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	EC81-001	7/13/2005	0.00	0.50	Aluminum	17000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	EC81-001	7/13/2005	0.50	2.80	Aluminum	17000.000	NA	228000.0	15713.070	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Soil	A50102	1/14/2002	0.06	0.17	Iron	20600.000	NA	307000.0	18037.000	mg/kg
Surf Soil	A50102	1/14/2002	0.06	0.17	Nickel	17.300	NA	20400.0	14.910	mg/kg
Surf Soil	A50102	1/14/2002	0.06	0.17	Plutonium-239/240	0.282	NA	50.0	0.066	pCi/g
Sub Soil	A50102	1/6/2002	2.00	6.00	Americium-241	0.018	NA	78.0	0.020	pCi/g
Sub Soil	A50102	1/6/2002	2.00	6.00	Plutonium-239/240	0.060	NA	50.0	0.020	pCi/g

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Soil	A50202	1/14/2002	0.06	0.17	Americium-241	0.122	NA	78.0	0.023	pCi/g
Surf Soil	A50202	1/14/2002	0.06	0.17	Cadmium	1.630	NA	962.0	1.610	mg/kg
Surf Soil	A50202	1/14/2002	0.06	0.17	Lithium	11.900	NA	20400.0	11.550	mg/kg
Surf Soil	A50202	1/14/2002	0.06	0.17	Plutonium-239/240	0.339	NA	50.0	0.066	pCi/g
Sub Soil	A50202	1/6/2002	2.00	6.00	Americium-241	0.032	NA	78.0	0.020	pCi/g
Sub Soil	A50202	1/6/2002	2.00	6.00	Plutonium-239/240	0.040	NA	50.0	0.020	pCi/g

Figure 6
Pond A-5 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Sampling Location
- Pond
- IHSS
- Stream

DRAFT

N
W E
S

50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

Prepared for:

KAISER-HILL COMPANY

projects/fy2005/ponds/dsr/pondresults.apr
August 2005:

0406-A-00608

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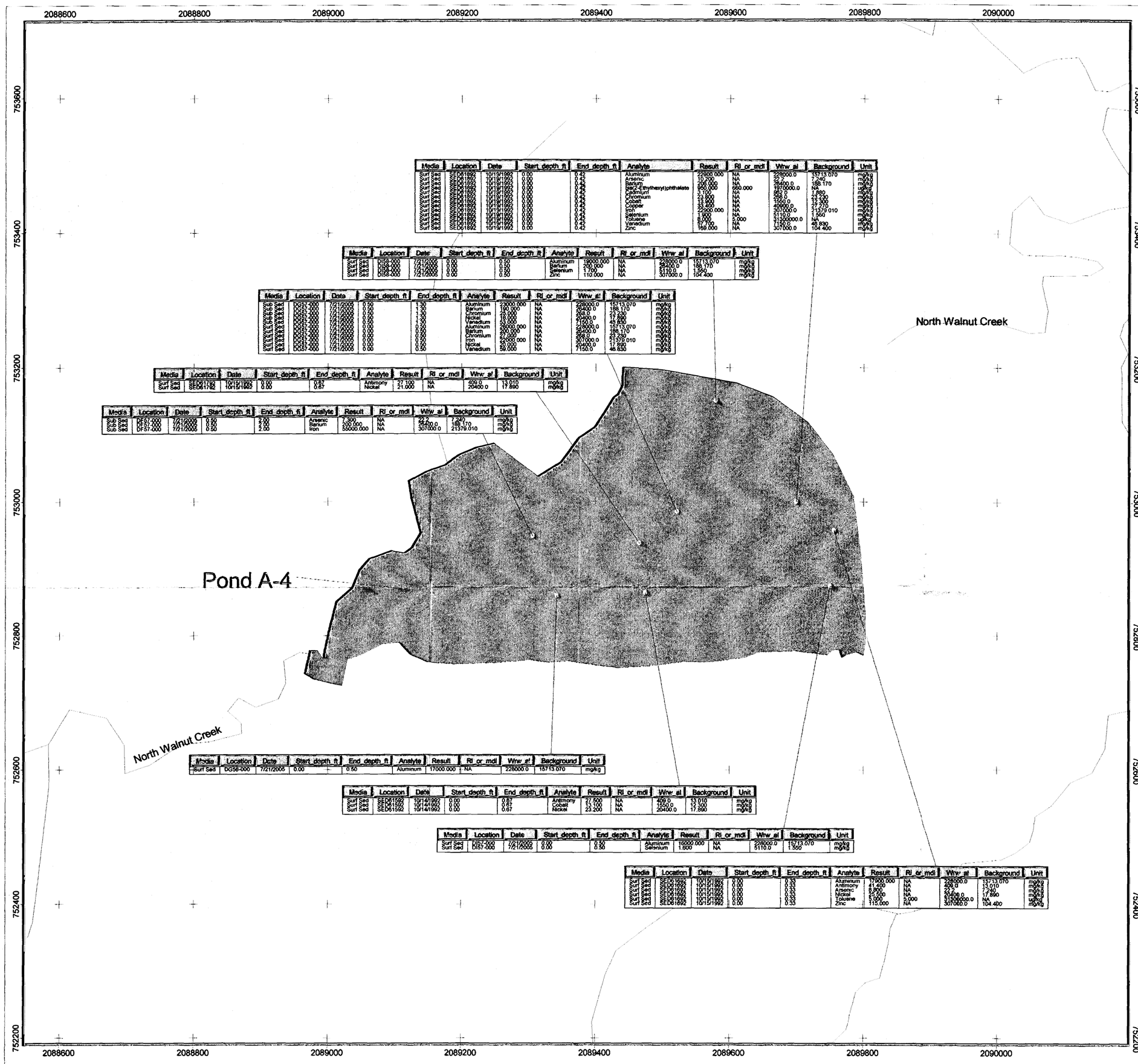

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED61592	10/19/1992	0.00	0.42	Aluminum	22800.000	NA	228000.0	15713.070	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Arsenic	10.200	NA	22.2	7.240	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Barium	206.000	NA	26400.0	188.170	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	bis(2-Ethylhexyl)phthalate	950.000	950.000	1970000.0	NA	ug/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Cadmium	3.100	NA	862.0	1.880	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Chromium	23.800	NA	268.0	23.230	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Cobalt	13.100	NA	1550.0	12.300	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Copper	33.400	NA	40900.0	27.270	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Iron	22900.000	NA	307000.0	21379.010	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Selenium	1.800	NA	5110.0	1.560	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Toluene	6.000	2.000	5130000.0	NA	ug/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Vanadium	57.700	NA	7150.0	46.830	mg/kg
Surf Sed	SED61592	10/19/1992	0.00	0.42	Zinc	169.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Sub Sed	DS58-000	7/21/2005	0.50	0.50	Aluminum	18000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DS58-000	7/21/2005	0.50	0.50	Barium	200.000	NA	26400.0	188.170	mg/kg
Sub Sed	DS58-000	7/21/2005	0.50	0.50	Selenium	1.700	NA	5110.0	1.560	mg/kg
Sub Sed	DS58-000	7/21/2005	0.50	0.50	Zinc	110.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Sub Sed	DS57-000	7/21/2005	0.50	1.30	Aluminum	23000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DS57-000	7/21/2005	0.50	1.30	Barium	190.000	NA	26400.0	188.170	mg/kg
Sub Sed	DS57-000	7/21/2005	0.50	1.30	Chromium	28.000	NA	268.0	23.230	mg/kg
Sub Sed	DS57-000	7/21/2005	0.50	1.30	Nickel	18.000	NA	40400.0	17.890	mg/kg
Sub Sed	DS57-000	7/21/2005	0.50	1.30	Vanadium	53.000	NA	7150.0	46.830	mg/kg
Surf Sed	DS57-000	7/21/2005	0.00	0.50	Aluminum	28000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DS57-000	7/21/2005	0.00	0.50	Barium	200.000	NA	26400.0	188.170	mg/kg
Surf Sed	DS57-000	7/21/2005	0.00	0.50	Chromium	27.000	NA	268.0	23.230	mg/kg
Surf Sed	DS57-000	7/21/2005	0.00	0.50	Iron	22000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	DS57-000	7/21/2005	0.00	0.50	Nickel	20.000	NA	40400.0	17.890	mg/kg
Surf Sed	DS57-000	7/21/2005	0.00	0.50	Vanadium	56.000	NA	7150.0	46.830	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED61592	10/15/1992	0.00	0.67	Antimony	27.100	NA	409.0	13.010	mg/kg
Surf Sed	SED61592	10/15/1992	0.00	0.67	Nickel	21.000	NA	40400.0	17.890	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Sub Sed	DF57-000	7/21/2005	0.50	2.00	Arsenic	7.300	NA	22.2	7.240	mg/kg
Sub Sed	DF57-000	7/21/2005	0.50	2.00	Barium	200.000	NA	26400.0	188.170	mg/kg
Sub Sed	DF57-000	7/21/2005	0.50	2.00	Iron	55000.000	NA	307000.0	21379.010	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DG58-000	7/21/2005	0.00	0.50	Aluminum	17000.000	NA	228000.0	15713.070	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED61592	10/14/1992	0.00	0.67	Antimony	27.500	NA	409.0	13.010	mg/kg
Surf Sed	SED61592	10/14/1992	0.00	0.67	Cobalt	13.100	NA	1550.0	12.300	mg/kg
Surf Sed	SED61592	10/14/1992	0.00	0.67	Nickel	23.200	NA	40400.0	17.890	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DS7-000	7/21/2005	0.00	0.50	Aluminum	16000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DS7-000	7/21/2005	0.00	0.50	Selenium	1.600	NA	5110.0	1.560	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED61592	10/15/1992	0.00	0.33	Aluminum	17900.000	NA	228000.0	15713.070	mg/kg
Surf Sed	SED61592	10/15/1992	0.00	0.33	Antimony	41.400	NA	409.0	13.010	mg/kg
Surf Sed	SED61592	10/15/1992	0.00	0.33	Arsenic	8.800	NA	22.2	7.240	mg/kg
Surf Sed	SED61592	10/15/1992	0.00	0.33	Nickel	32.500	NA	40400.0	17.890	mg/kg
Surf Sed	SED61592	10/15/1992	0.00	0.33	Toluene	5.100	2.000	5130000.0	NA	ug/kg
Surf Sed	SED61592	10/15/1992	0.00	0.33	Zinc	115.000	NA	307000.0	104.400	mg/kg

Figure 5
Pond A-4 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Sampling Location
- Pond
- IHSS
- Stream

DRAFT

N
W E
S

50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

Prepared for:

KAISER-HILL COMPANY

projects/fy2005/ponds/dsr/pondresults apr
August 2005:

OU06-A-00608

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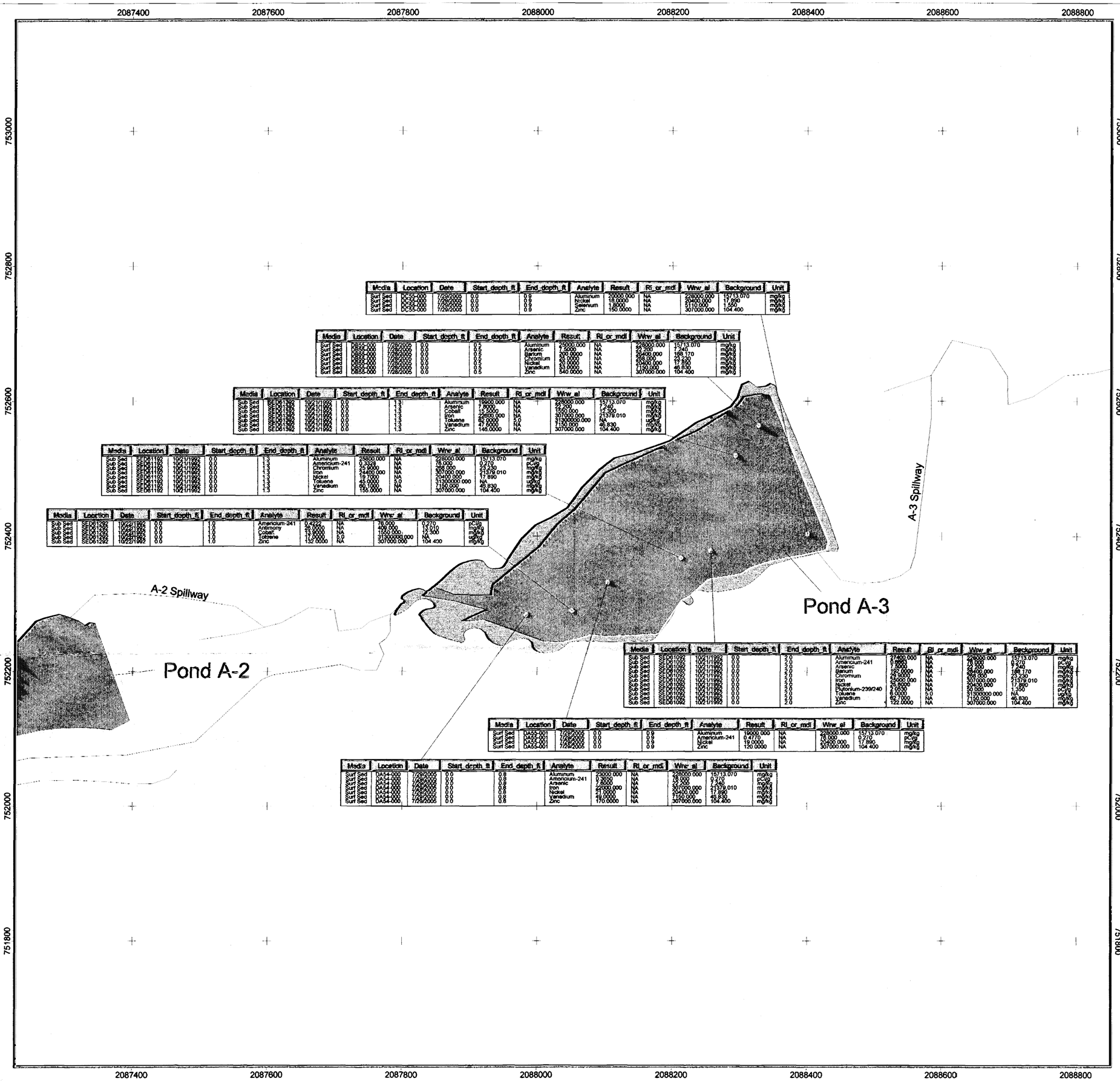

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wnv_al	Background	Unit
Surf Sed	DC55-000	7/28/2005	0.0	0.9	Aluminum	20000.000	NA	228000.000	15713.070	mg/kg
Surf Sed	DC55-000	7/28/2005	0.0	0.9	Nickel	18.0000	NA	20400.000	17.890	mg/kg
Surf Sed	DC55-000	7/28/2005	0.0	0.9	Selenium	1.8000	NA	3110.000	1.550	mg/kg
Surf Sed	DC55-000	7/28/2005	0.0	0.9	Zinc	150.0000	NA	307000.000	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wnv_al	Background	Unit
Surf Sed	DB55-000	7/28/2005	0.0	0.5	Aluminum	25000.000	NA	228000.000	15713.070	mg/kg
Surf Sed	DB55-000	7/28/2005	0.0	0.5	Arsenic	1.2000	NA	22.200	7.240	mg/kg
Surf Sed	DB55-000	7/28/2005	0.0	0.5	Barium	200.0000	NA	26400.000	188.170	mg/kg
Surf Sed	DB55-000	7/28/2005	0.0	0.5	Chromium	20.0000	NA	268.000	23.230	mg/kg
Surf Sed	DB55-000	7/28/2005	0.0	0.5	Nickel	20.0000	NA	20400.000	17.890	mg/kg
Surf Sed	DB55-000	7/28/2005	0.0	0.5	Vanadium	53.0000	NA	7150.000	46.830	mg/kg
Surf Sed	DB55-000	7/28/2005	0.0	0.5	Zinc	540.0000	NA	307000.000	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wnv_al	Background	Unit
Sub Sed	SED61192	10/21/1992	0.0	1.3	Aluminum	19600.000	NA	228000.000	15713.070	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Arsenic	7.8000	NA	22.200	7.240	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Cobalt	15.5000	NA	19.600	12.300	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Iron	22600.000	NA	307000.000	21379.010	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Toluene	6.0000	5.0	31300000.000	NA	ug/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Vanadium	47.0000	NA	7150.000	46.830	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Zinc	146.0000	NA	307000.000	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wnv_al	Background	Unit
Sub Sed	SED61192	10/21/1992	0.0	1.3	Aluminum	25800.000	NA	228000.000	15713.070	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Americium-241	0.3328	NA	18.000	0.270	pCi/g
Sub Sed	SED61192	10/21/1992	0.0	1.3	Chromium	29.9000	NA	268.000	23.230	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Iron	23400.000	NA	307000.000	21379.010	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Nickel	19.7000	NA	20400.000	17.890	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Toluene	45.0000	5.0	31300000.000	NA	ug/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Vanadium	60.1000	NA	7150.000	46.830	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.3	Zinc	155.0000	NA	307000.000	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wnv_al	Background	Unit
Sub Sed	SED61192	10/21/1992	0.0	1.0	Americium-241	0.4000	NA	18.000	0.270	pCi/g
Sub Sed	SED61192	10/21/1992	0.0	1.0	Antimony	22.0000	NA	409.000	13.100	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.0	Cobalt	13.9000	NA	19.600	12.300	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	1.0	Toluene	17.0000	5.0	31300000.000	NA	ug/kg
Sub Sed	SED61192	10/21/1992	0.0	1.0	Zinc	132.0000	NA	307000.000	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wnv_al	Background	Unit
Sub Sed	SED61192	10/21/1992	0.0	2.0	Aluminum	21400.000	NA	228000.000	15713.070	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	2.0	Americium-241	0.6800	NA	18.000	0.270	pCi/g
Sub Sed	SED61192	10/21/1992	0.0	2.0	Arsenic	7.5000	NA	22.200	7.240	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	2.0	Barium	183.0000	NA	26400.000	188.170	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	2.0	Chromium	25.0000	NA	268.000	23.230	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	2.0	Iron	25000.000	NA	307000.000	21379.010	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	2.0	Nickel	20.0000	NA	20400.000	17.890	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	2.0	Plutonium-239/240	2.5000	NA	50.000	1.320	pCi/g
Sub Sed	SED61192	10/21/1992	0.0	2.0	Toluene	6.0000	5.0	31300000.000	NA	ug/kg
Sub Sed	SED61192	10/21/1992	0.0	2.0	Vanadium	62.7000	NA	7150.000	46.830	mg/kg
Sub Sed	SED61192	10/21/1992	0.0	2.0	Zinc	122.0000	NA	307000.000	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wnv_al	Background	Unit
Surf Sed	DA55-001	7/28/2005	0.0	0.9	Aluminum	19000.000	NA	228000.000	15713.070	mg/kg
Surf Sed	DA55-001	7/28/2005	0.0	0.9	Americium-241	0.4770	NA	18.000	0.270	pCi/g
Surf Sed	DA55-001	7/28/2005	0.0	0.9	Nickel	19.0000	NA	20400.000	17.890	mg/kg
Surf Sed	DA55-001	7/28/2005	0.0	0.9	Zinc	120.0000	NA	307000.000	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wnv_al	Background	Unit
Surf Sed	DA54-000	7/28/2005	0.0	0.8	Aluminum	23000.000	NA	228000.000	15713.070	mg/kg
Surf Sed	DA54-000	7/28/2005	0.0	0.8	Americium-241	0.3600	NA	18.000	0.270	pCi/g
Surf Sed	DA54-000	7/28/2005	0.0	0.8	Arsenic	7.6000	NA	22.200	7.240	mg/kg
Surf Sed	DA54-000	7/28/2005	0.0	0.8	Iron	22000.000	NA	307000.000	21379.010	mg/kg
Surf Sed	DA54-000	7/28/2005	0.0	0.8	Nickel	21.0000	NA	20400.000	17.890	mg/kg
Surf Sed	DA54-000	7/28/2005	0.0	0.8	Vanadium	49.0000	NA	7150.000	46.830	mg/kg
Surf Sed	DA54-000	7/28/2005	0.0	0.8	Zinc	170.0000	NA	307000.000	104.400	mg/kg

Figure 4
Pond A-3 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Sampling Location
- Pond
- IHSS
- Stream

DRAFT

N
W E
S

50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

Prepared for:

KAISER-HILL COMPANY

projects/fy2005/ponds/dsr/pondresults.apr
August 2005:

OU06-A-00608

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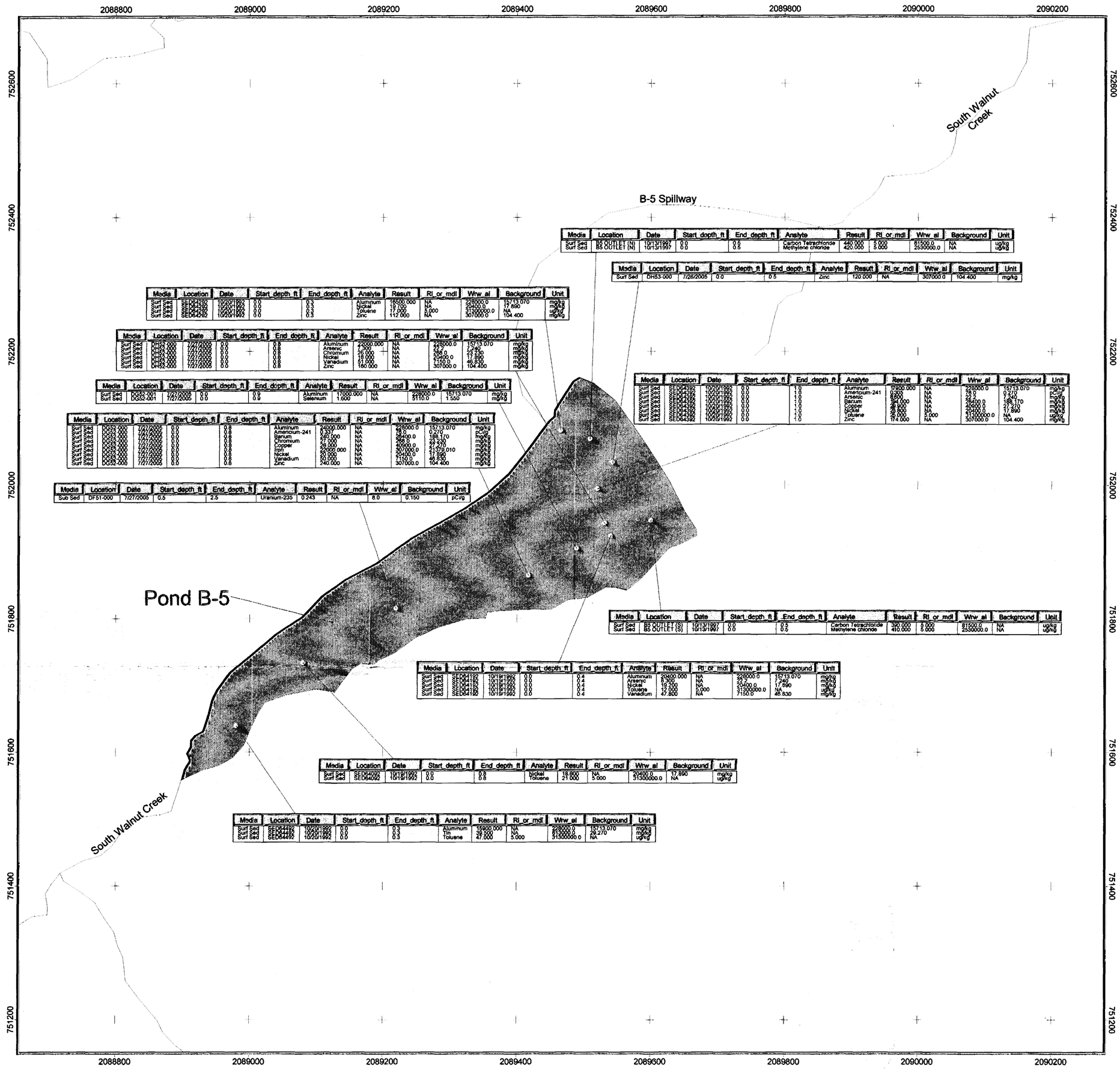


Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	BS OUTLET (N)	10/13/1997	0.0	0.5	Carbon Tetrachloride	440.000	5.000	81500.0	NA	ug/kg
Surf Sed	BS OUTLET (N)	10/13/1997	0.0	0.5	Methylene chloride	420.000	5.000	2530000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DH53-000	7/26/2005	0.0	0.5	Zinc	120.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64392	10/20/1992	0.0	0.3	Aluminum	18500.000	NA	228000.0	15713.070	mg/kg
Surf Sed	SED64392	10/20/1992	0.0	0.3	Nickel	19.700	NA	20400.0	17.890	mg/kg
Surf Sed	SED64392	10/20/1992	0.0	0.3	Toluene	17.000	5.000	31300000.0	NA	ug/kg
Surf Sed	SED64392	10/20/1992	0.0	0.3	Zinc	112.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DH52-000	7/27/2005	0.0	0.8	Aluminum	22000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DH52-000	7/27/2005	0.0	0.8	Arsenic	4.500	NA	59.0	7.240	mg/kg
Surf Sed	DH52-000	7/27/2005	0.0	0.8	Chromium	26.000	NA	266.0	23.230	mg/kg
Surf Sed	DH52-000	7/27/2005	0.0	0.8	Nickel	18.000	NA	20400.0	17.890	mg/kg
Surf Sed	DH52-000	7/27/2005	0.0	0.8	Vanadium	51.000	NA	7150.0	46.830	mg/kg
Surf Sed	DH52-000	7/27/2005	0.0	0.8	Zinc	160.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DG52-001	7/27/2005	0.0	0.9	Aluminum	17000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DG52-001	7/27/2005	0.0	0.9	Selenium	1.600	NA	5110.0	1.550	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Aluminum	24000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Americium-241	0.333	NA	78.0	0.270	pCi/g
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Barium	240.000	NA	26400.0	188.170	mg/kg
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Chromium	27.000	NA	266.0	23.230	mg/kg
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Copper	28.000	NA	40900.0	17.890	mg/kg
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Iron	22000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Nickel	20.000	NA	20400.0	17.890	mg/kg
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Vanadium	50.000	NA	7150.0	46.830	mg/kg
Surf Sed	DG52-000	7/27/2005	0.0	0.8	Zinc	240.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Sub Sed	DF51-000	7/27/2005	0.5	2.5	Uranium-235	0.243	NA	8.0	0.150	pCi/g

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64392	10/20/1992	0.0	1.0	Aluminum	17900.000	NA	228000.0	15713.070	mg/kg
Surf Sed	SED64392	10/20/1992	0.0	1.0	Americium-241	0.303	NA	78.0	0.270	pCi/g
Surf Sed	SED64392	10/20/1992	0.0	1.0	Arsenic	8.600	NA	22.2	7.240	mg/kg
Surf Sed	SED64392	10/20/1992	0.0	1.0	Barium	194.000	NA	26400.0	188.170	mg/kg
Surf Sed	SED64392	10/20/1992	0.0	1.0	Copper	28.900	NA	40900.0	17.890	mg/kg
Surf Sed	SED64392	10/20/1992	0.0	1.0	Nickel	28.800	NA	20400.0	17.890	mg/kg
Surf Sed	SED64392	10/20/1992	0.0	1.0	Toluene	32.000	5.000	31300000.0	NA	ug/kg
Surf Sed	SED64392	10/20/1992	0.0	1.0	Zinc	174.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	BS OUTLET (S)	10/13/1997	0.0	0.5	Carbon Tetrachloride	390.000	5.000	81500.0	NA	ug/kg
Surf Sed	BS OUTLET (S)	10/13/1997	0.0	0.5	Methylene chloride	410.000	5.000	2530000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64192	10/19/1992	0.0	0.4	Aluminum	20400.000	NA	228000.0	15713.070	mg/kg
Surf Sed	SED64192	10/19/1992	0.0	0.4	Arsenic	8.300	NA	59.0	7.240	mg/kg
Surf Sed	SED64192	10/19/1992	0.0	0.4	Nickel	19.200	NA	20400.0	17.890	mg/kg
Surf Sed	SED64192	10/19/1992	0.0	0.4	Toluene	17.000	5.000	31300000.0	NA	ug/kg
Surf Sed	SED64192	10/19/1992	0.0	0.4	Vanadium	47.800	NA	7150.0	46.830	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64092	10/18/1992	0.0	0.8	Nickel	18.600	NA	20400.0	17.890	mg/kg
Surf Sed	SED64092	10/18/1992	0.0	0.8	Toluene	21.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED64492	10/20/1992	0.0	0.3	Aluminum	15900.000	NA	228000.0	15713.070	mg/kg
Surf Sed	SED64492	10/20/1992	0.0	0.3	Tin	39.500	NA	61000.0	29.270	mg/kg
Surf Sed	SED64492	10/20/1992	0.0	0.3	Toluene	47.000	5.000	31300000.0	NA	ug/kg

Figure 8
Pond B-5 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Sampling Location
- Pond
- IHSS
- Stream

DRAFT

N
W E
S

50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

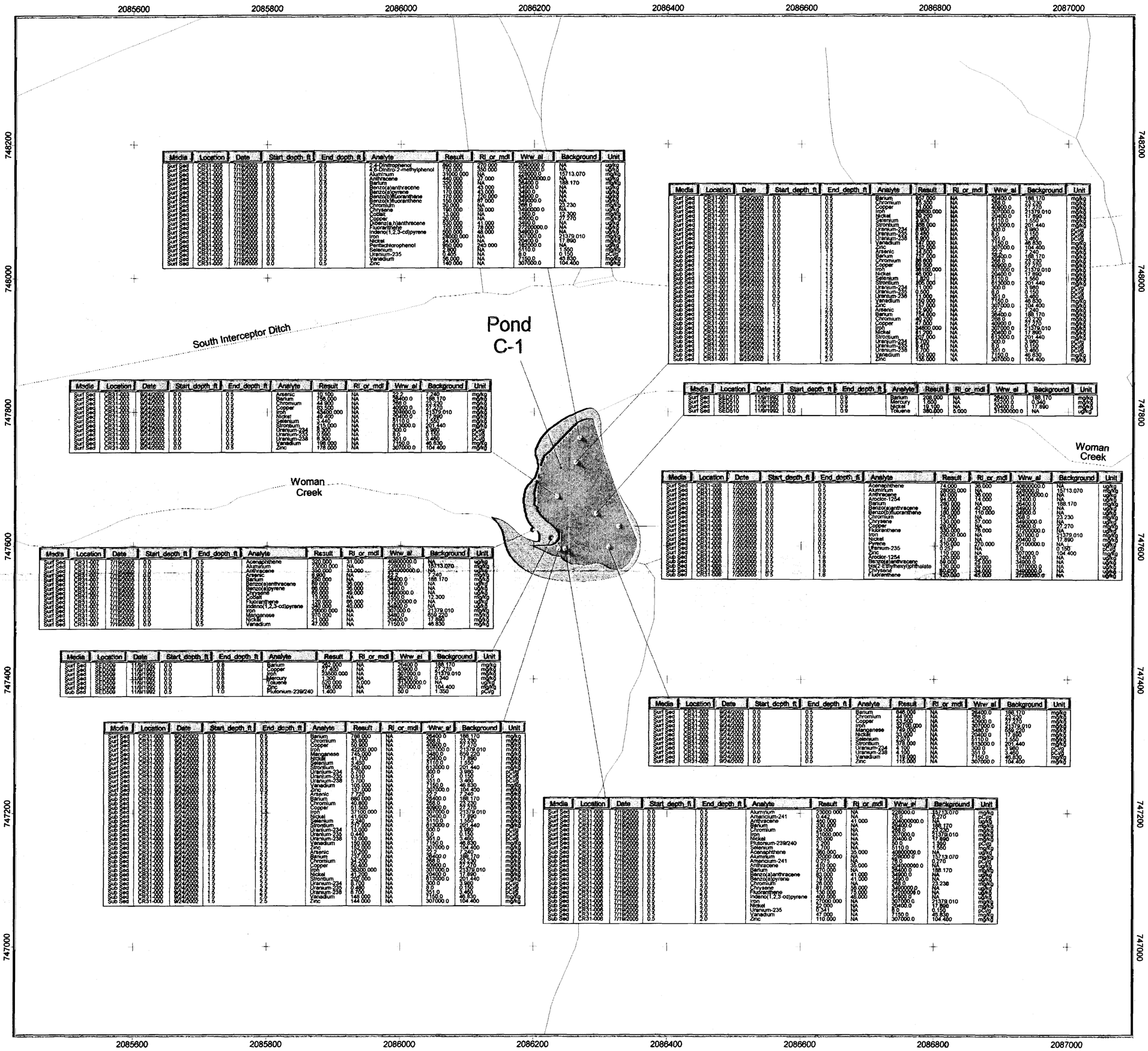
RADMS

Prepared for:

KAISER-HILL COMPANY

projects/fy2005/ponds/dsr/pondresults.apr
August 2005

OU06-A-00608



Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Arsenic	10.100	NA	22.2	7.240	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Barium	796.000	NA	26400.0	188.170	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Chromium	44.100	NA	268.0	23.230	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Copper	53.200	NA	40900.0	27.270	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Iron	34400.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Nickel	49.400	NA	20400.0	17.890	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Selenium	3.440	NA	5110.0	1.550	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Strontium	413.000	NA	613000.0	201.440	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Uranium-234	8.300	NA	300.0	3.960	pCi/g
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Uranium-235	0.290	NA	8.0	0.150	pCi/g
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Uranium-238	8.300	NA	351.0	3.460	pCi/g
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Vanadium	198.000	NA	7150.0	46.830	mg/kg
Surf Sed	CR31-003	9/24/2002	0.0	0.5	Zinc	178.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Acenaphthene	320.000	31.000	408000000.0	NA	ug/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Aluminum	25000.000	NA	226000.0	15713.070	mg/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Anthracene	350.000	31.000	204000000.0	NA	ug/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Arsenic	8.900	NA	22.2	7.240	mg/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Barium	620.000	NA	26400.0	188.170	mg/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Benzo(a)anthracene	66.000	36.000	34900.0	NA	ug/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Benzo(a)pyrene	65.000	45.000	3490000.0	NA	ug/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Chrysene	63.000	49.000	3490000.0	NA	ug/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Cobalt	9.700	NA	1550.0	12.300	mg/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Fluoranthene	120.000	95.000	27200000.0	NA	ug/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Indeno(1,2,3-cd)pyrene	340.000	40.000	34900.0	NA	ug/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Iron	29000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Manganese	970.000	NA	3490.0	656.220	mg/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Nickel	21.000	NA	20400.0	17.890	mg/kg
Surf Sed	CR31-007	7/18/2005	0.0	0.5	Vanadium	47.000	NA	7150.0	46.830	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED509	11/8/1992	0.0	0.8	Barium	262.000	NA	26400.0	188.170	mg/kg
Surf Sed	SED509	11/8/1992	0.0	0.8	Copper	27.400	NA	40900.0	27.270	mg/kg
Surf Sed	SED509	11/8/1992	0.0	0.8	Iron	23350.000	NA	307000.0	21379.010	mg/kg
Surf Sed	SED509	11/8/1992	0.0	0.8	Mercury	1.300	NA	39.0	0.340	mg/kg
Surf Sed	SED509	11/8/1992	0.0	0.8	Toluene	520.000	5.000	31300000.0	NA	ug/kg
Surf Sed	SED509	11/8/1992	0.0	0.8	Zinc	106.000	NA	307000.0	104.400	mg/kg
Sub Sed	SED509	11/8/1992	0.5	1.0	Plutonium-239/240	1.400	NA	50.0	1.350	pCi/g

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Barium	788.000	NA	26400.0	188.170	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Chromium	35.900	NA	268.0	23.230	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Copper	50.800	NA	40900.0	27.270	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Iron	42200.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Manganese	745.000	NA	3490.0	656.220	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Nickel	41.700	NA	20400.0	17.890	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Selenium	3.460	NA	5110.0	1.550	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Strontium	250.000	NA	613000.0	201.440	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Uranium-234	5.700	NA	300.0	3.960	pCi/g
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Uranium-235	0.510	NA	8.0	0.150	pCi/g
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Uranium-238	5.700	NA	351.0	3.460	pCi/g
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Vanadium	100.000	NA	7150.0	46.830	mg/kg
Surf Sed	CR31-000	9/24/2002	0.0	0.5	Zinc	107.000	NA	307000.0	104.400	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Arsenic	7.720	NA	22.2	7.240	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Barium	880.000	NA	26400.0	188.170	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Chromium	40.800	NA	268.0	23.230	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Copper	51.300	NA	40900.0	27.270	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Iron	37100.000	NA	307000.0	21379.010	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Nickel	41.900	NA	20400.0	17.890	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Selenium	3.440	NA	5110.0	1.550	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Strontium	217.000	NA	613000.0	201.440	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Uranium-234	13.000	NA	300.0	3.960	pCi/g
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Uranium-235	0.440	NA	8.0	0.150	pCi/g
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Uranium-238	13.000	NA	351.0	3.460	pCi/g
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Vanadium	150.000	NA	7150.0	46.830	mg/kg
Sub Sed	CR31-000	9/24/2002	0.5	1.5	Zinc	124.000	NA	307000.0	104.400	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Arsenic	10.700	NA	22.2	7.240	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Barium	137.000	NA	26400.0	188.170	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Chromium	42.300	NA	268.0	23.230	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Copper	50.400	NA	40900.0	27.270	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Iron	36300.000	NA	307000.0	21379.010	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Nickel	31.200	NA	20400.0	17.890	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Strontium	202.000	NA	613000.0	201.440	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Uranium-234	8.100	NA	300.0	3.960	pCi/g
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Uranium-235	0.460	NA	8.0	0.150	pCi/g
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Uranium-238	6.700	NA	351.0	3.460	pCi/g
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Vanadium	148.000	NA	7150.0	46.830	mg/kg
Sub Sed	CR31-000	9/24/2002	1.5	2.5	Zinc	144.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Barium	657.000	NA	26400.0	188.170	mg/kg
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Chromium	45.300	NA	268.0	23.230	mg/kg
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Copper	71.600	NA	40900.0	27.270	mg/kg
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Iron	36500.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Nickel	63.200	NA	20400.0	17.890	mg/kg
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Selenium	3.930	NA	5110.0	1.550	mg/kg
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Strontium	488.000	NA	613000.0	201.440	mg/kg
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Uranium-234	6.900	NA	300.0	3.960	pCi/g
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Uranium-235	0.490	NA	8.0	0.150	pCi/g
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Uranium-238	6.900	NA	351.0	3.460	pCi/g
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Vanadium	147.000	NA	7150.0	46.830	mg/kg
Surf Sed	CR31-001	9/24/2002	0.0	0.5	Zinc	154.000	NA	307000.0	104.400	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Arsenic	12.300	NA	22.2	7.240	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Barium	1.540	NA	26400.0	188.170	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Chromium	47.700	NA	268.0	23.230	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Copper	71.200	NA	40900.0	27.270	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Iron	38100.000	NA	307000.0	21379.010	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Nickel	61.000	NA	20400.0	17.890	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Selenium	3.920	NA	5110.0	1.550	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Strontium	505.000	NA	613000.0	201.440	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Uranium-234	11.000	NA	300.0	3.960	pCi/g
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Uranium-235	0.500	NA	8.0	0.150	pCi/g
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Uranium-238	11.000	NA	351.0	3.460	pCi/g
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Vanadium	190.000	NA	7150.0	46.830	mg/kg
Sub Sed	CR31-001	9/24/2002	0.5	1.5	Zinc	157.000	NA	307000.0	104.400	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Arsenic	12.400	NA	22.2	7.240	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Barium	754.000	NA	26400.0	188.170	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Chromium	40.700	NA	268.0	23.230	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Copper	47.000	NA	40900.0	27.270	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Iron	34800.000	NA	307000.0	21379.010	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Nickel	51.700	NA	20400.0	17.890	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Strontium	507.000	NA	613000.0	201.440	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Uranium-234	9.700	NA	300.0	3.960	pCi/g
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Uranium-235	0.470	NA	8.0	0.150	pCi/g
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Uranium-238	9.700	NA	351.0	3.460	pCi/g
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Vanadium	152.000	NA	7150.0	46.830	mg/kg
Sub Sed	CR31-001	9/24/2002	1.5	2.0	Zinc	135.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED510	11/8/1992	0.0	0.9	Barium	208.000	NA	26400.0	188.170	mg/kg
Surf Sed	SED510	11/8/1992	0.0	0.9	Mercury	1.800	NA	15.0	0.340	mg/kg
Surf Sed	SED510	11/8/1992	0.0	0.9	Nickel	19.100	NA	20400.0	17.890	mg/kg
Surf Sed	SED510	11/8/1992	0.0	0.9	Toluene	380.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Acenaphthene	74.000	38.000	408000000.0	NA	ug/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Aluminum	28000.000	NA	226000.0	15713.070	mg/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Anthracene	90.000	38.000	204000000.0	NA	ug/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Aroclor-1254	94.000	14.000	12400.0	NA	ug/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Barium	280.000	NA	26400.0	188.170	mg/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Benzo(a)anthracene	140.000	45.000	34900.0	NA	ug/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Benzo(b)fluoranthene	160.000	110.000	34900.0	NA	ug/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Cobalt	25.000	NA	268.0	23.230	mg/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Chrysene	130.000	57.000	3490000.0	NA	ug/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Copper	48.000	NA	40900.0	27.270	mg/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Fluoranthene	350.000	78.000	27200000.0	NA	ug/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Iron	32000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Nickel	31.000	NA	20400.0	17.890	mg/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Pyrene	310.000	270.000	20100000.0	NA	ug/kg
Surf Sed	CR31-008	7/20/2005	0.0	0.5	Uranium-235	0.257	NA	8.0	0.150	pCi/g
Sub Sed	CR31-008	7/20/2005	0.5	1.8	Zinc	110.000	NA	307000.0	104.400	mg/kg
Sub Sed	CR31-008	7/20/2005	0.5	1.8	Aroclor-1254	120.000	9.200	12400.0	NA	ug/kg
Sub Sed	CR31-008	7/20/2005	0.5	1.8	Benzo(a)anthracene	58.000	25.000	34900.0	NA	ug/kg
Sub Sed	CR31-008	7/20/2005	0.5	1.8	bis(2-Ethylhexyl)phthalate	130.000	39.000	107000.0	NA	ug/kg
Sub Sed	CR31-008	7/20/2005	0.5	1.8	Chrysene	160.000	34.000	3490000.0	NA	ug/kg
Sub Sed	CR31-008	7/20/2005	0.5	1.8	Fluoranthene	420.000	45.000	27200000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Barium	646.000	NA	26400.0	188.170	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Chromium	44.900	NA	268.0	23.230	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Copper	53.500	NA	40900.0	27.270	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Iron	37100.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Manganese	749.000	NA	3490.0	656.220	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Nickel	33.000	NA	20400.0	17.890	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Selenium	3.470	NA	5110.0	1.550	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Strontium	576.000	NA	613000.0	201.440	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Uranium-234	4.100	NA	300.0	3.960	pCi/g
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Uranium-238	4.100	NA	351.0	3.460	pCi/g
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Vanadium	118.000	NA	7150.0	46.830	mg/kg
Surf Sed	CR31-002	9/24/2002	0.0	0.5	Zinc	115.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	RI_or_mdl	Wrw_al	Background	Unit
Surf Sed	CR31-006	7/18/2005	0.0	0.5	Aluminum	23000.000	NA	226000.0	15713.070	mg/kg
Surf Sed	CR31-006	7/18/2005	0.0	0.5	Americium-241	0.442	NA	15.0	0.210	pCi/g
Surf Sed	CR31-006	7/18/2005	0.0	0.5	Anthracene	450.000	41.000	204000000.0	NA	ug/kg
Surf Sed	CR31-006	7/18/2005	0.0	0.5	Barium	330.000	NA	26400.0	188.170	mg/kg
Surf Sed	CR31-006	7/18/2005	0.0	0.5	Chromium	26.000	NA	268.0	23.230	mg/kg
Surf Sed	CR31-006	7/18/2005	0.0	0.5	Iron	31000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	CR31-006	7/18/2005	0.0	0.5	Nickel	20.000	NA	20400.0	17.890	mg/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Plutonium-239/240	2.200	NA	50.0	1.350	pCi/g
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Selenium	4.700	NA	5110.0	1.550	mg/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Acenaphthene	360.000	35.000	408000000.0	NA	ug/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Aluminum	35000.000	NA	226000.0	15713.070	mg/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Americium-241	0.775	NA	15.0	0.210	pCi/g
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Anthracene	410.000	35.000	204000000.0	NA	ug/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Barium	270.000	NA	26400.0	188.170	mg/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Benzo(a)anthracene	83.000	41.000	34900.0	NA	ug/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Benzo(a)pyrene	78.000	41.000	3490.0	NA	ug/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Chromium	28.000	NA	268.0	23.230	mg/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Chrysene	81.000	38.000	3490000.0	NA	ug/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Fluoranthene	130.000	73.000	27200000.0	NA	ug/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Indeno(1,2,3-cd)pyrene	400.000	45.000	34900.0	NA	ug/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Iron	27000.000	NA	307000.0	21379.010	mg/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Nickel	22.000	NA	20400.0	17.890	mg/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Uranium-235	0.341	NA	8.0	0.150	pCi/g
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Vanadium	47.000	NA	7150.0	46.830	mg/kg
Sub Sed	CR31-006	7/18/2005	0.5	2.0	Zinc	110.000	NA	307000.0	104.400	mg/kg

Figure 9
Pond C-1 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Sampling Location
- Pond
- IHSS
- Stream

DRAFT

N
W E
S

50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

Prepared for:

KAISER-HILL COMPANY

projects/fy2005/ponds/dsr/pondresults.apr

August 2005:

0U06-A-00608

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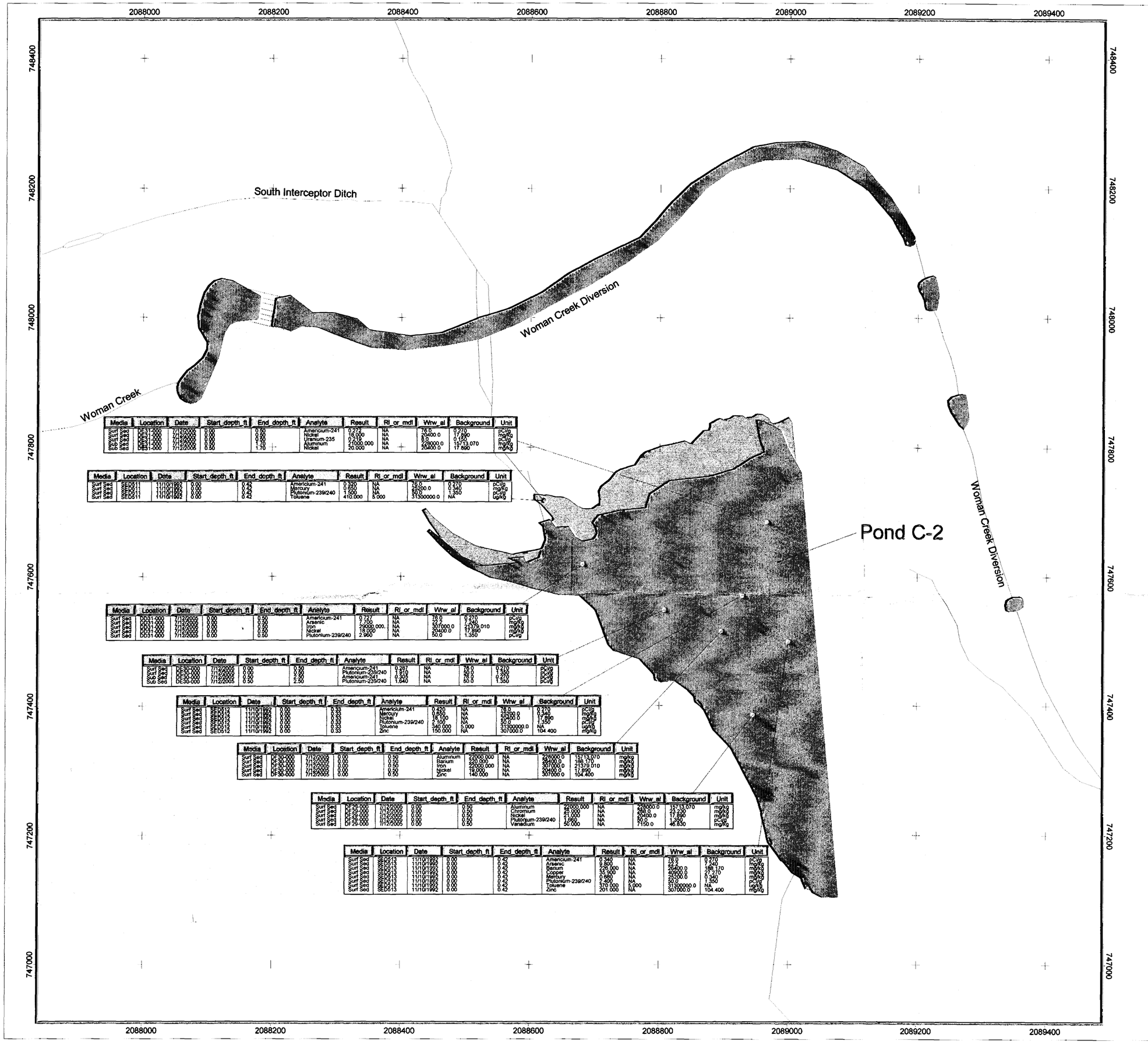

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DE31-000	7/12/2005	0.00	0.50	Americium-241	0.077	NA	76.0	0.270	pCi/g
Surf Sed	DE31-000	7/12/2005	0.00	0.50	Nickel	16.000	NA	20400.0	17.890	mg/kg
Surf Sed	DE31-000	7/12/2005	0.00	0.50	Uranium-235	0.110	NA	6.0	0.160	pCi/g
Sub Sed	DE31-000	7/12/2005	0.50	1.70	Aluminum	21000.000	NA	228000.0	15713.070	mg/kg
Sub Sed	DE31-000	7/12/2005	0.50	1.70	Nickel	20.000	NA	20400.0	17.890	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED511	11/10/1992	0.00	0.42	Americium-241	0.320	NA	76.0	0.270	pCi/g
Surf Sed	SED511	11/10/1992	0.00	0.42	Mercury	0.650	NA	25200.0	0.340	mg/kg
Surf Sed	SED511	11/10/1992	0.00	0.42	Plutonium-239/240	1.520	NA	50.0	1.350	pCi/g
Surf Sed	SED511	11/10/1992	0.00	0.42	Toluene	410.000	5.000	31300000.0	NA	ug/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DE31-000	7/12/2005	0.00	0.50	Americium-241	0.727	NA	76.0	0.270	pCi/g
Surf Sed	DE31-000	7/12/2005	0.00	0.50	Arsenic	7.700	NA	7.7	7.340	mg/kg
Surf Sed	DE31-000	7/12/2005	0.00	0.50	Iron	29000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	DE31-000	7/12/2005	0.00	0.50	Nickel	18.000	NA	20400.0	17.890	mg/kg
Surf Sed	DE31-000	7/12/2005	0.00	0.50	Plutonium-239/240	2.960	NA	50.0	1.350	pCi/g

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DE30-000	7/12/2005	0.00	0.50	Americium-241	0.291	NA	76.0	0.270	pCi/g
Surf Sed	DE30-000	7/12/2005	0.00	0.50	Plutonium-239/240	1.810	NA	50.0	1.350	pCi/g
Sub Sed	DE30-000	7/12/2005	0.50	2.50	Americium-241	0.423	NA	76.0	0.270	pCi/g
Sub Sed	DE30-000	7/12/2005	0.50	2.50	Plutonium-239/240	1.640	NA	50.0	1.350	pCi/g

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED512	11/10/1992	0.00	0.33	Americium-241	0.420	NA	76.0	0.270	pCi/g
Surf Sed	SED512	11/10/1992	0.00	0.33	Mercury	0.860	NA	25200.0	0.340	mg/kg
Surf Sed	SED512	11/10/1992	0.00	0.33	Nickel	16.100	NA	20400.0	17.890	mg/kg
Surf Sed	SED512	11/10/1992	0.00	0.33	Plutonium-239/240	2.100	NA	50.0	1.350	pCi/g
Surf Sed	SED512	11/10/1992	0.00	0.33	Toluene	340.000	5.000	31300000.0	NA	ug/kg
Surf Sed	SED512	11/10/1992	0.00	0.33	Zinc	150.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DE30-000	7/12/2005	0.00	0.50	Aluminum	22000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DE30-000	7/12/2005	0.00	0.50	Barium	220.000	NA	58400.0	198.170	mg/kg
Surf Sed	DE30-000	7/12/2005	0.00	0.50	Iron	22000.000	NA	307000.0	21379.010	mg/kg
Surf Sed	DE30-000	7/12/2005	0.00	0.50	Nickel	19.000	NA	20400.0	17.890	mg/kg
Surf Sed	DE30-000	7/12/2005	0.00	0.50	Zinc	140.000	NA	307000.0	104.400	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	DE29-000	7/12/2005	0.00	0.50	Aluminum	22000.000	NA	228000.0	15713.070	mg/kg
Surf Sed	DE29-000	7/12/2005	0.00	0.50	Chromium	25.000	NA	568.0	37.430	mg/kg
Surf Sed	DE29-000	7/12/2005	0.00	0.50	Nickel	21.000	NA	20400.0	17.890	mg/kg
Surf Sed	DE29-000	7/12/2005	0.00	0.50	Plutonium-239/240	1.560	NA	50.0	1.350	pCi/g
Surf Sed	DE29-000	7/12/2005	0.00	0.50	Vanadium	50.000	NA	7150.0	46.830	mg/kg

Media	Location	Date	Start_depth_ft	End_depth_ft	Analyte	Result	Rl_or_mdl	Wrw_al	Background	Unit
Surf Sed	SED513	11/10/1992	0.00	0.42	Americium-241	0.340	NA	76.0	0.270	pCi/g
Surf Sed	SED513	11/10/1992	0.00	0.42	Arsenic	9.800	NA	7.7	7.340	mg/kg
Surf Sed	SED513	11/10/1992	0.00	0.42	Barium	126.000	NA	58400.0	198.170	mg/kg
Surf Sed	SED513	11/10/1992	0.00	0.42	Copper	33.900	NA	40900.0	21.210	mg/kg
Surf Sed	SED513	11/10/1992	0.00	0.42	Mercury	0.660	NA	25200.0	0.340	mg/kg
Surf Sed	SED513	11/10/1992	0.00	0.42	Plutonium-239/240	2.400	NA	50.0	1.350	pCi/g
Surf Sed	SED513	11/10/1992	0.00	0.42	Toluene	370.000	5.000	31300000.0	NA	ug/kg
Surf Sed	SED513	11/10/1992	0.00	0.42	Zinc	201.000	NA	307000.0	104.400	mg/kg

Figure 10
Pond C-2 Sample Locations And Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Sampling Location
- Pond
- IHSS
- Stream

DRAFT

N
W E
S

50 0 50 100 150 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

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