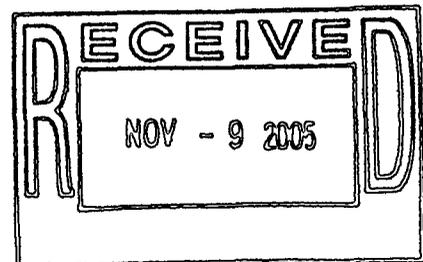


**Industrial Area and Buffer Zone
Sampling and Analysis Plan
Addendum #IABZ-05-06**

**IHSS Group NE-1
Additional Sampling of RFETS Pond Sediment**

Approval received from the U.S. Environmental Protection Agency, Region 8
(July 20, 2005).

Approval letter contained in the Administrative Record.



July 2005

ADMIN RECORD

BZ-A-000897

TABLE OF CONTENTS

1.0 Introduction..... 1
2.0 Existing Information 1
3.0 Sampling 12
4.0 References..... 13

LIST OF FIGURES

Figure 1 Locations of RFETS Ponds 2
Figure 2 Pond A-1 Existing and Proposed New Sampling Locations 3
Figure 3 Pond A-2 Existing and Proposed New Sampling Locations 4
Figure 4 Pond A-3 Existing and Proposed New Sampling Locations 5
Figure 5 Pond A-4 Existing and Proposed New Sampling Locations 6
Figure 6 Pond A-5 Existing and Proposed New Sampling Locations 7
Figure 7 Pond B-4 Existing and Proposed New Sampling Locations 8
Figure 8 Pond B-5 Existing and Proposed New Sampling Locations 9
Figure 9 Pond C-1 Existing and Proposed New Sampling Locations 10
Figure 10 Pond C-2 Existing and Proposed New Sampling Locations 11

LIST OF TABLES

Table 1 Sampling and Analysis Summary..... 12

2

ACRONYMS

AL	action level
BZ	Buffer Zone
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
DOE	U.S. Department of Energy
ERA	ecological risk assessment
ft	foot or feet
ft ²	square feet
FY	Fiscal Year
IA	Industrial Area
IABZSAP	Industrial Area and Buffer Zone Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
PCBs	polychlorinated biphenyls
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
SAP	Sampling and Analysis Plan
SVOC	semi-volatile organic compound
WRW	wildlife refuge worker

1.0 INTRODUCTION

This Industrial Area (IA) and Buffer Zone (BZ) Sampling and Analysis Plan (SAP) (IABZSAP) Addendum #BZ-05-06 includes specifications to conduct additional sediment sampling at the Rocky Flats Technology Site (RFETS or Site) ponds within Individual Hazardous Substance Site (IHSS) Group NE-1 during Fiscal Year (FY) 05. The ponds to be sampled include the following:

- A-1 – IHSS-142.1;
- A-2 – IHSS-142.2;
- A-3 – IHSS-142.3;
- A-4 – IHSS-142.4;
- A-5 – IHSS-142.12;
- B-4 – IHSS-142.8;
- B-5 – IHSS-142.9;
- C-1 – IHSS-142.10; and
- C-2 – IHSS-142.11.

This IABZSAP Addendum is a supplement to the IABZSAP (DOE 2004) and includes existing and proposed sampling locations, sampling depths and approach, and contaminants of concern (COCs). This sampling is intended to determine whether contaminant activities and concentrations in pond sediment exceed Rocky Flats Cleanup Agreement (RFCA) Wildlife Refuge Worker (WRW) action levels (ALs) (DOE et al. 2003) and require any accelerated action. Sampling and analysis results will also be used in the conduct of the Comprehensive Risk Assessment (CRA) and evaluated from an ecological risk assessment (ERA) perspective to determine whether accelerated action is warranted. The locations of the RFETS ponds to be sampled are shown on Figure 1.

2.0 EXISTING INFORMATION

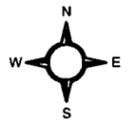
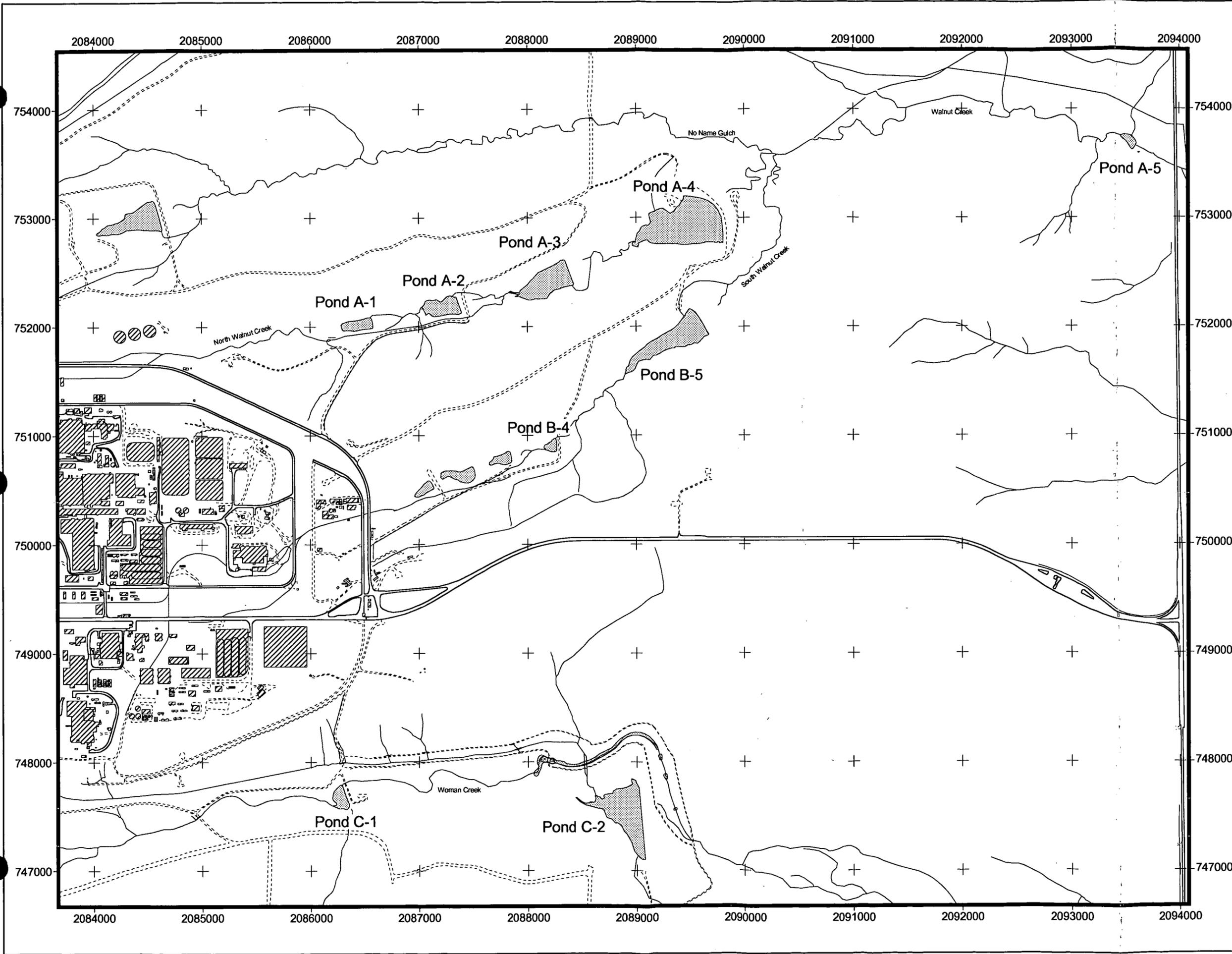
The RFETS A-, B-, and C-Series Ponds are retention ponds located downstream of the IA. Some of the ponds have been in operation since the Site began operations. Some of the pond sediments are contaminated due to releases from industrial processes within the IA. Potential COCs include radionuclides and metals. Semi-volatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs) are potential COCs in some of the ponds. Detailed histories of the ponds, as well as historical and accelerated action characterization data on pond sediments, are provided in various documents, including the Historical Release Reports for the Rocky Flats Plant (DOE 1992 – 2004), the Closeout Report for Ponds B-1, B-2, and B-3 (DOE 2005a), and the Draft Data Summary Report for IHSS Group NE-1 (DOE 2005b). Previous sampling locations, sampled during 1992, 1994, 1997, and 2004, are shown on Figures 2 through 10.

Figure 1

Locations of RFETS Ponds

KEY

-  Pond
-  Building/structure
-  Demolished structure
-  Paved area
-  Dirt road
-  Stream, ditch, or other drainage feature



500 0 500 Feet

Scale = 1:10,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: 

Prepared for: 

5

0

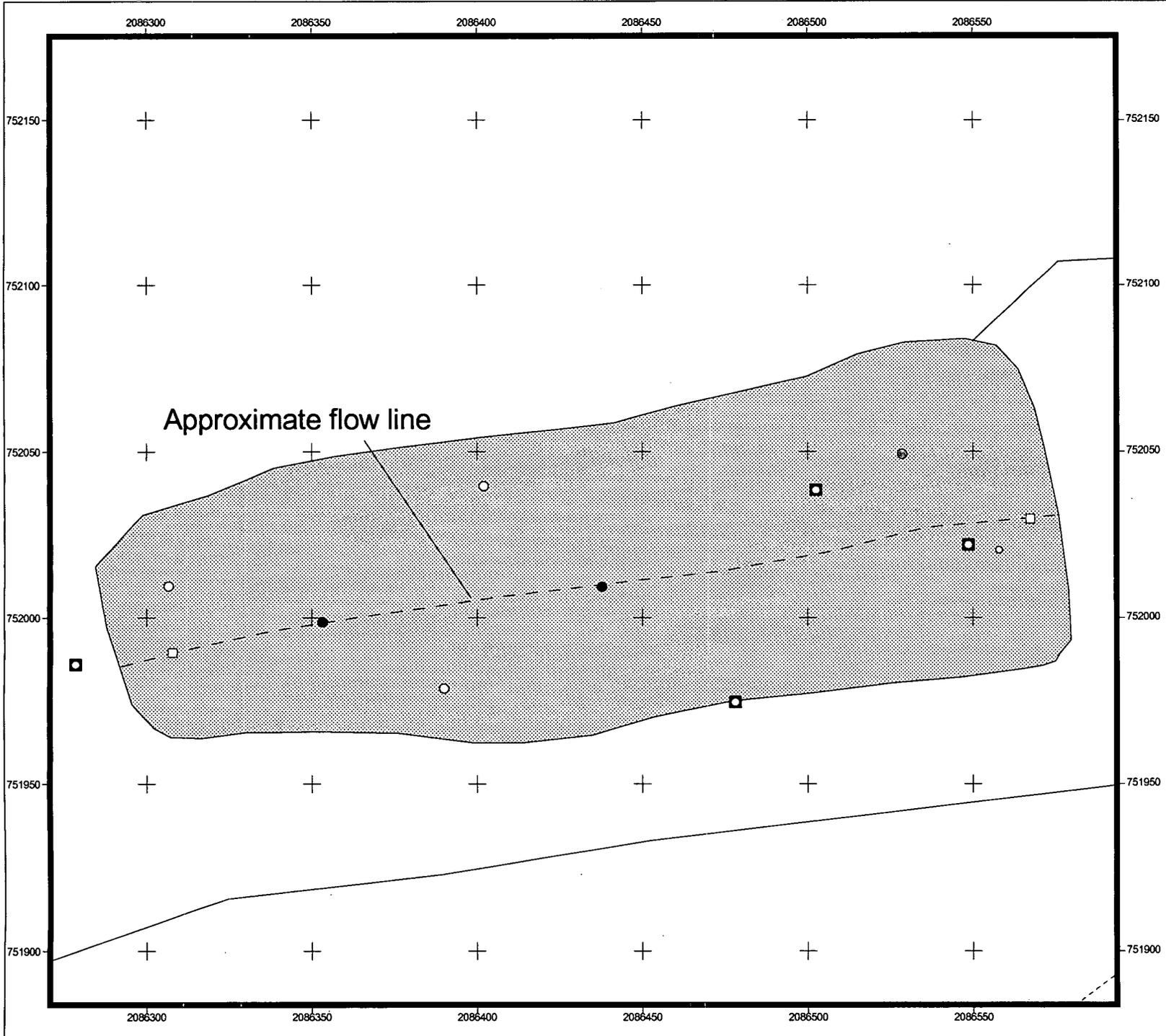


Figure 2
Pond A-1
Existing and Proposed
New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- ~ Topography
- ▨ Pond
- ~ Stream
- - - Dirt Road

Topography not displayed because the pond is empty and samples will be located based on current conditions.



10 0 10 20 30 Feet

Scale = 1:500

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



Prepared for:



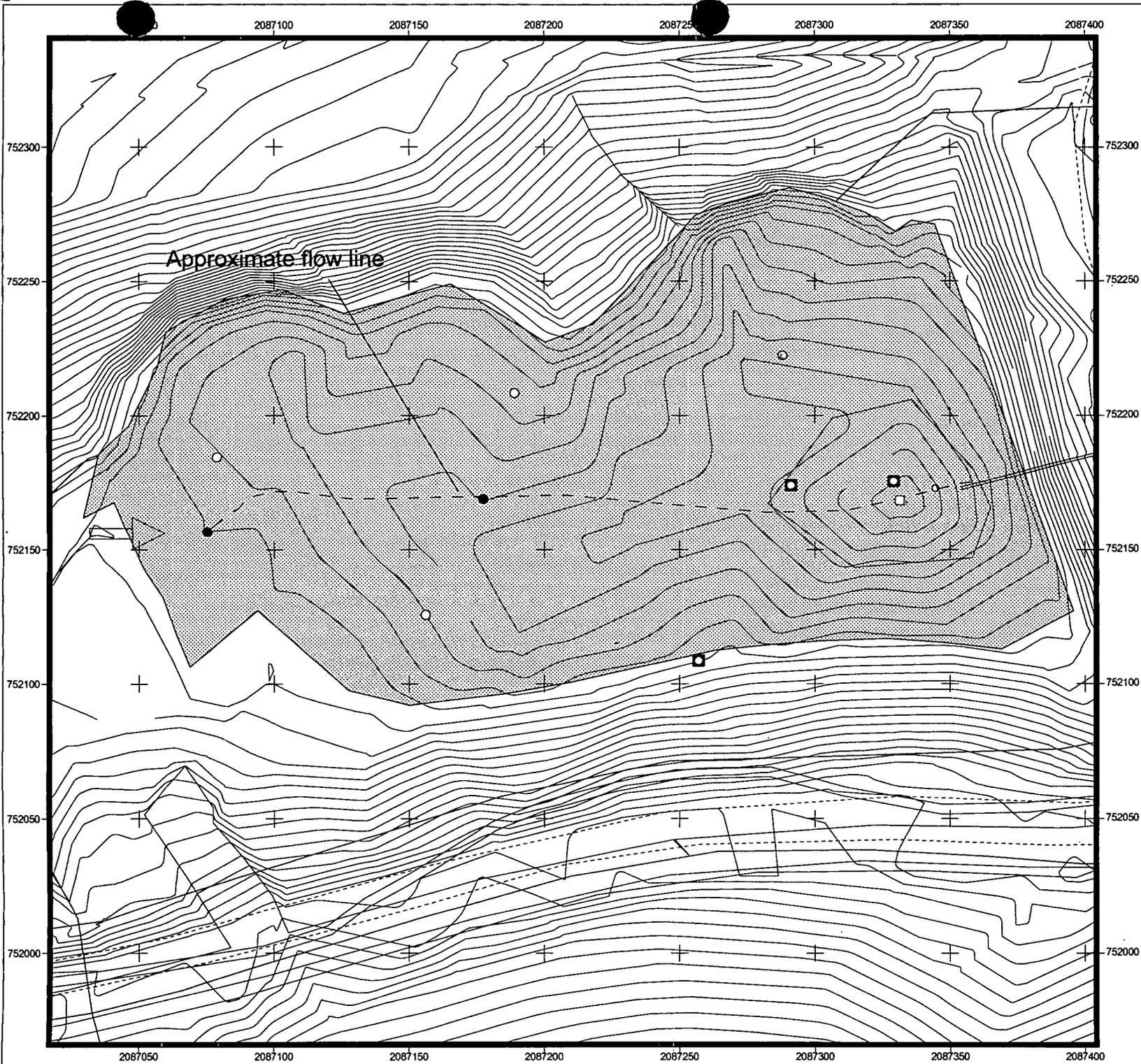
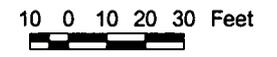
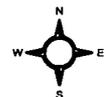


Figure 3
Pond A-2
Existing and Proposed
New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- ~ Topography
- ▨ Pond
- ~ Stream
- - - Dirt Road



Scale = 1:600

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



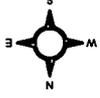
Prepared for:



Figure 4
 Pond A-3
 Existing and Proposed
 New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- Topography
- Pond
- Stream
- Dirt Road



Scale = 1:1,000
 20 0 20 40 60 Feet

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:

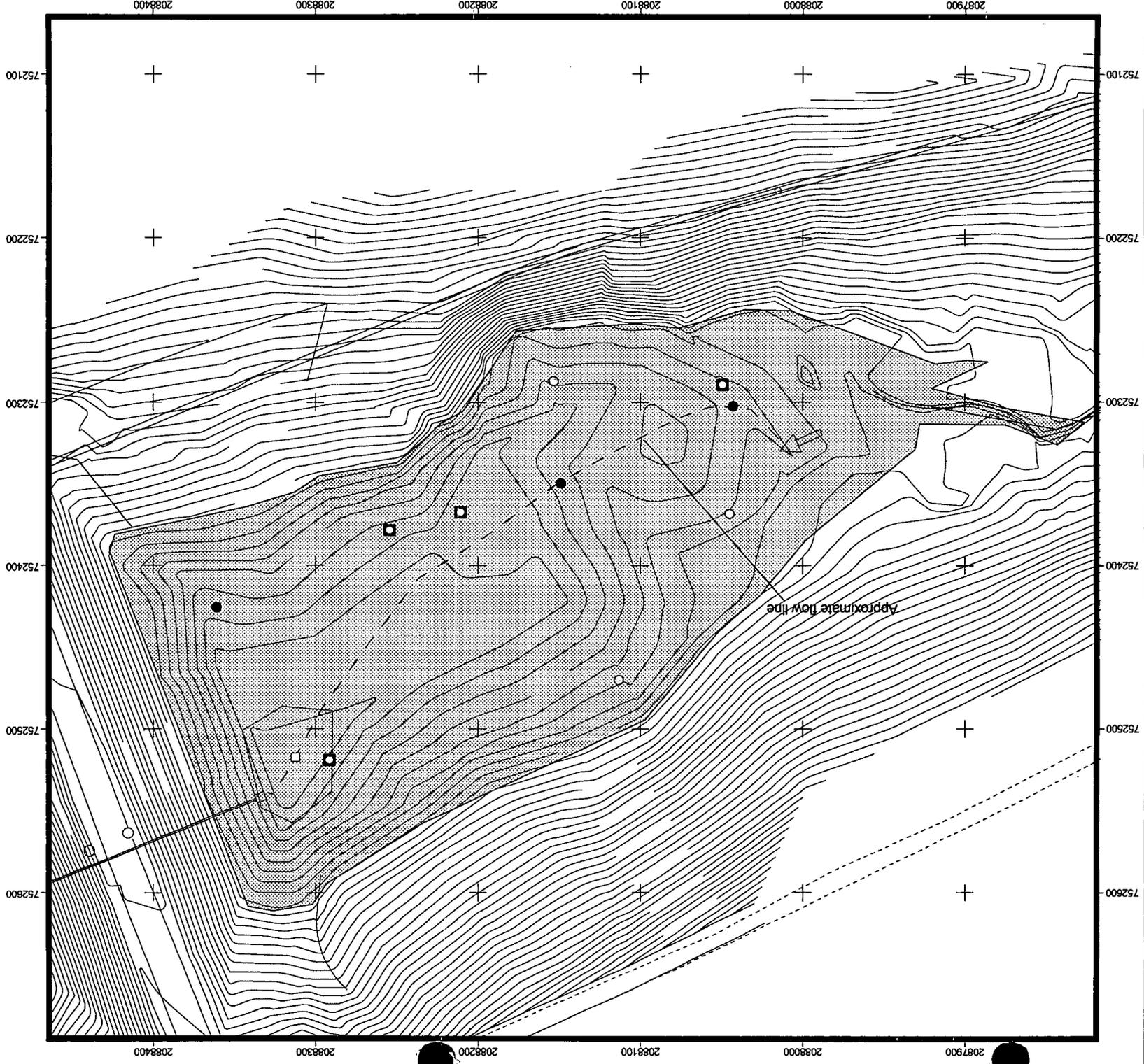


Figure 5
Existing and Proposed
Pond A-4
New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- Topography
- Pond
- Stream
- Dirt Road



Scale = 1:1,500
 30 0 30 60 90 Feet

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:

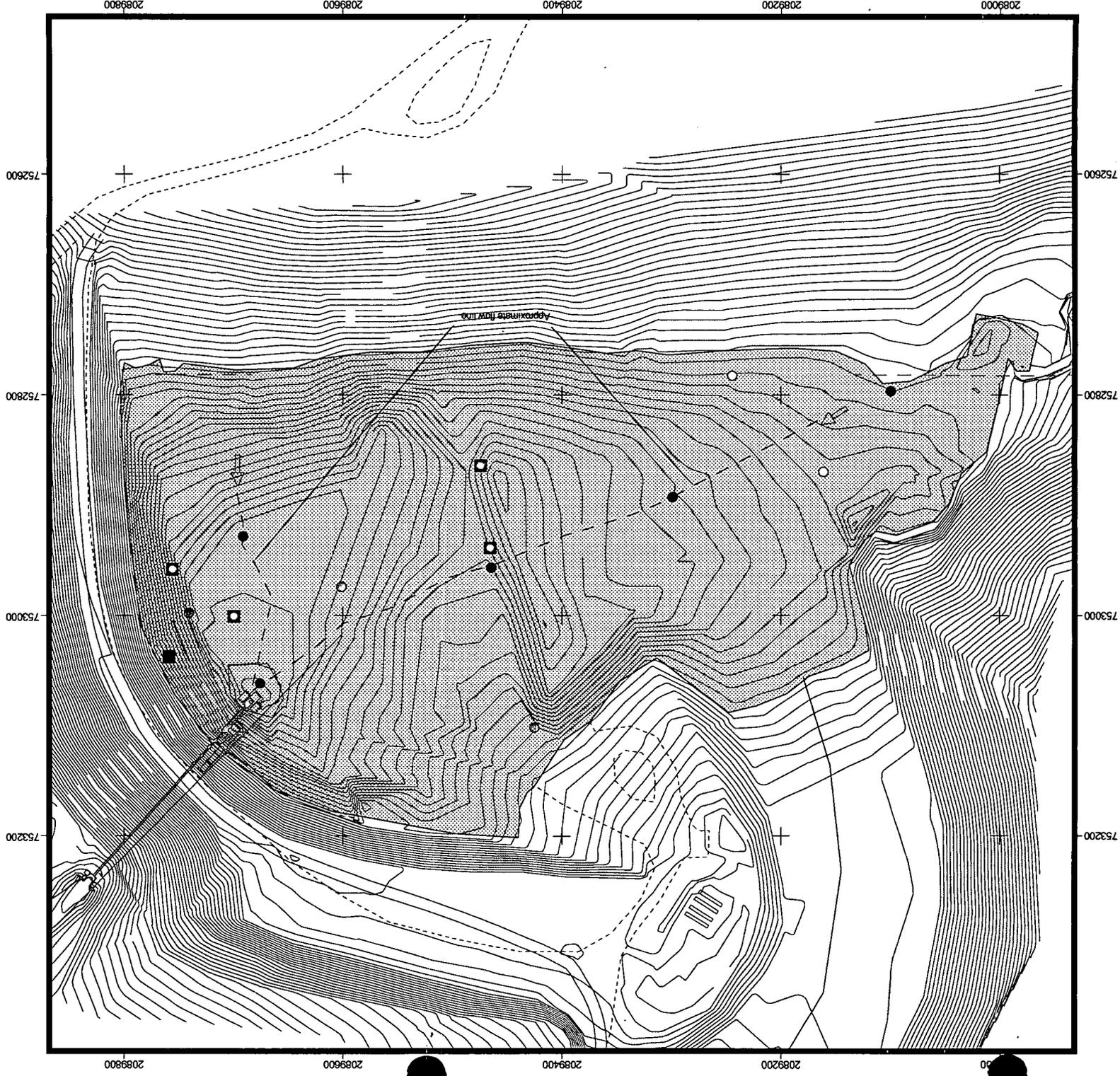
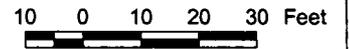


Figure 6
Pond A-5
Existing and Proposed
New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- ~ Topography
- ▨ Pond
- ~ Stream
- - - Dirt Road

Topography not available



Scale = 1:400

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



Prepared for:

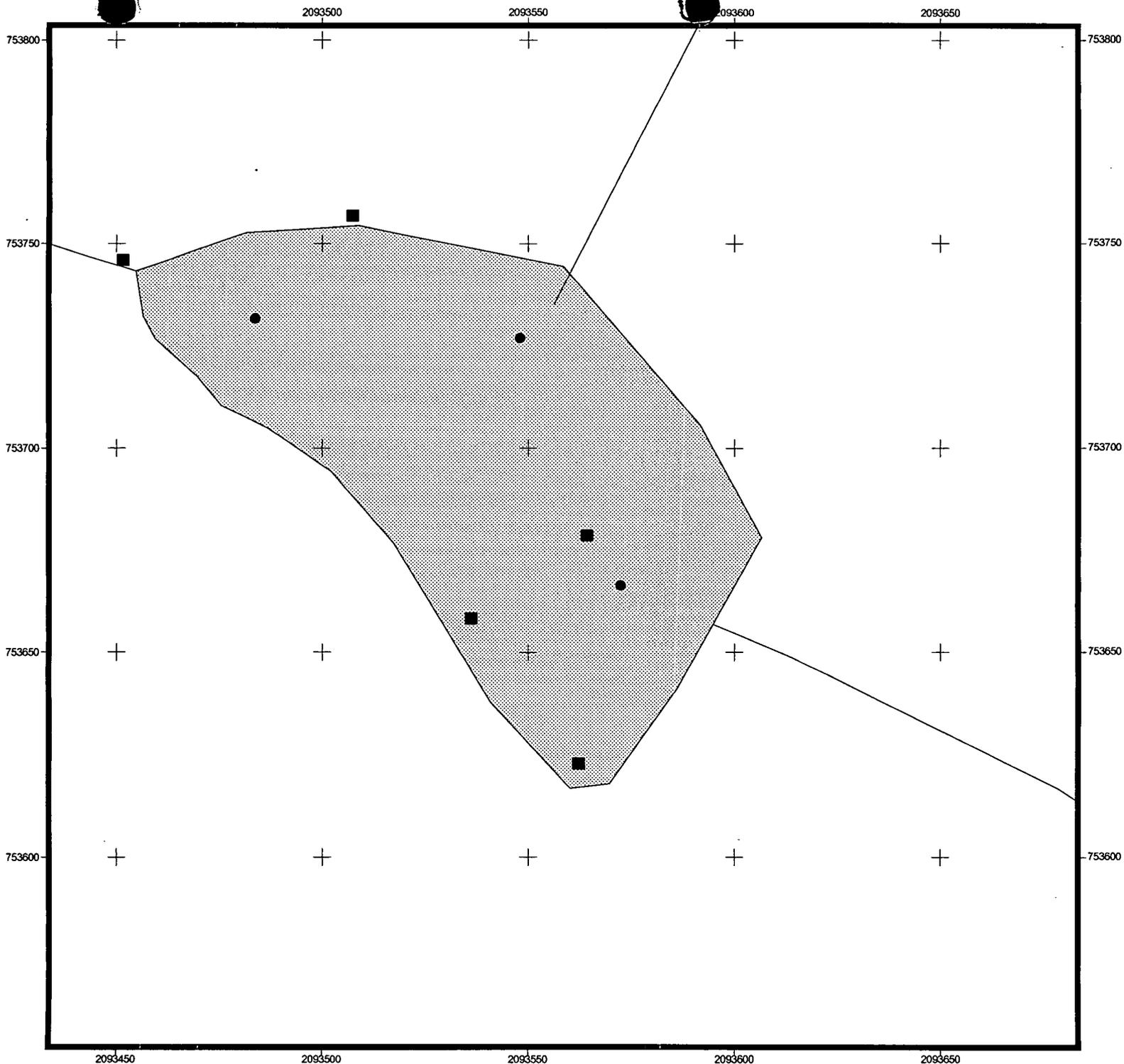


Figure 7
Pond B-4
Existing and Proposed
New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- ~ Topography
- ▨ Pond
- ~ Stream
- - - Dirt Road



Scale = 1:450

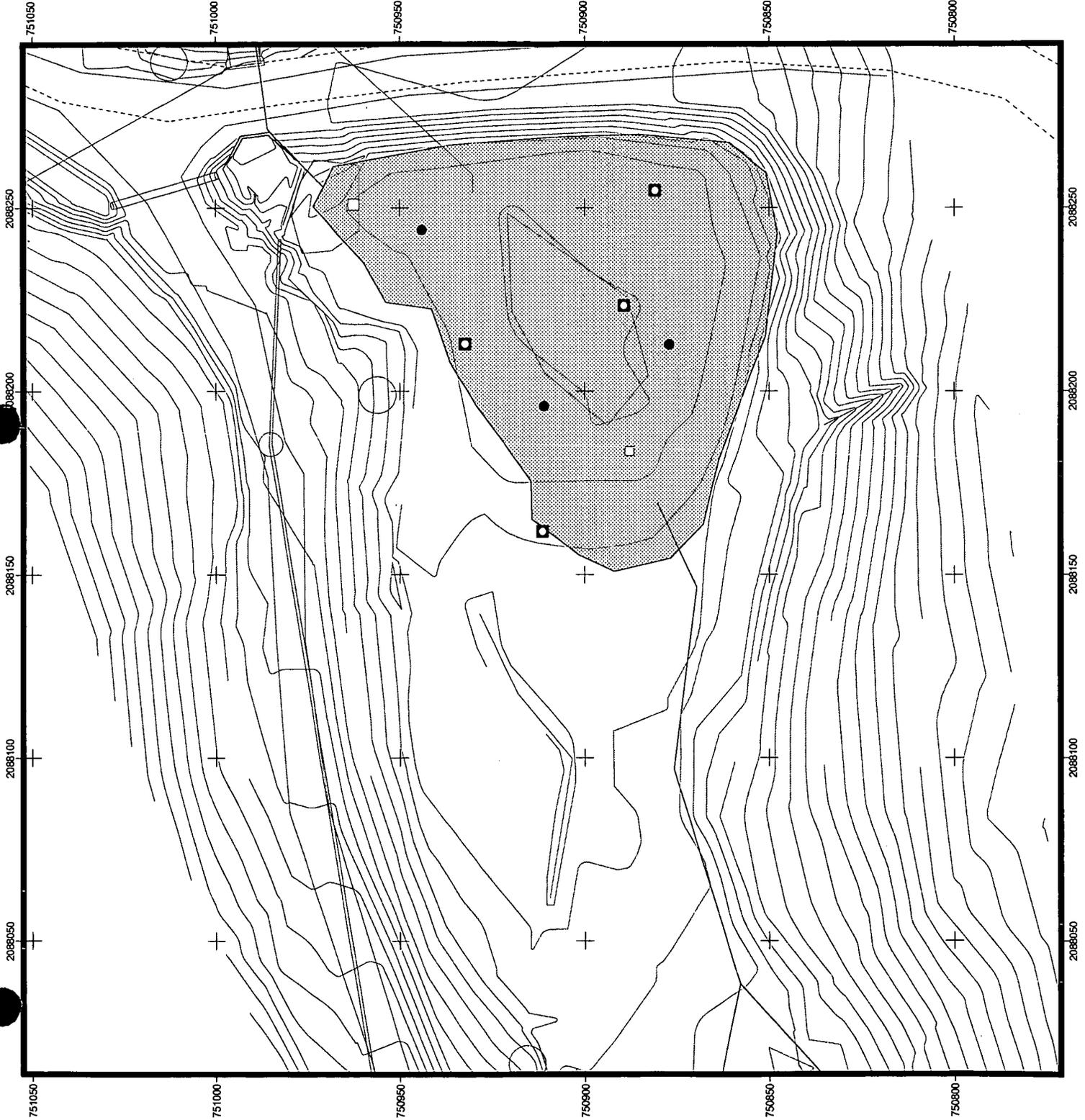
State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



Prepared for:



12

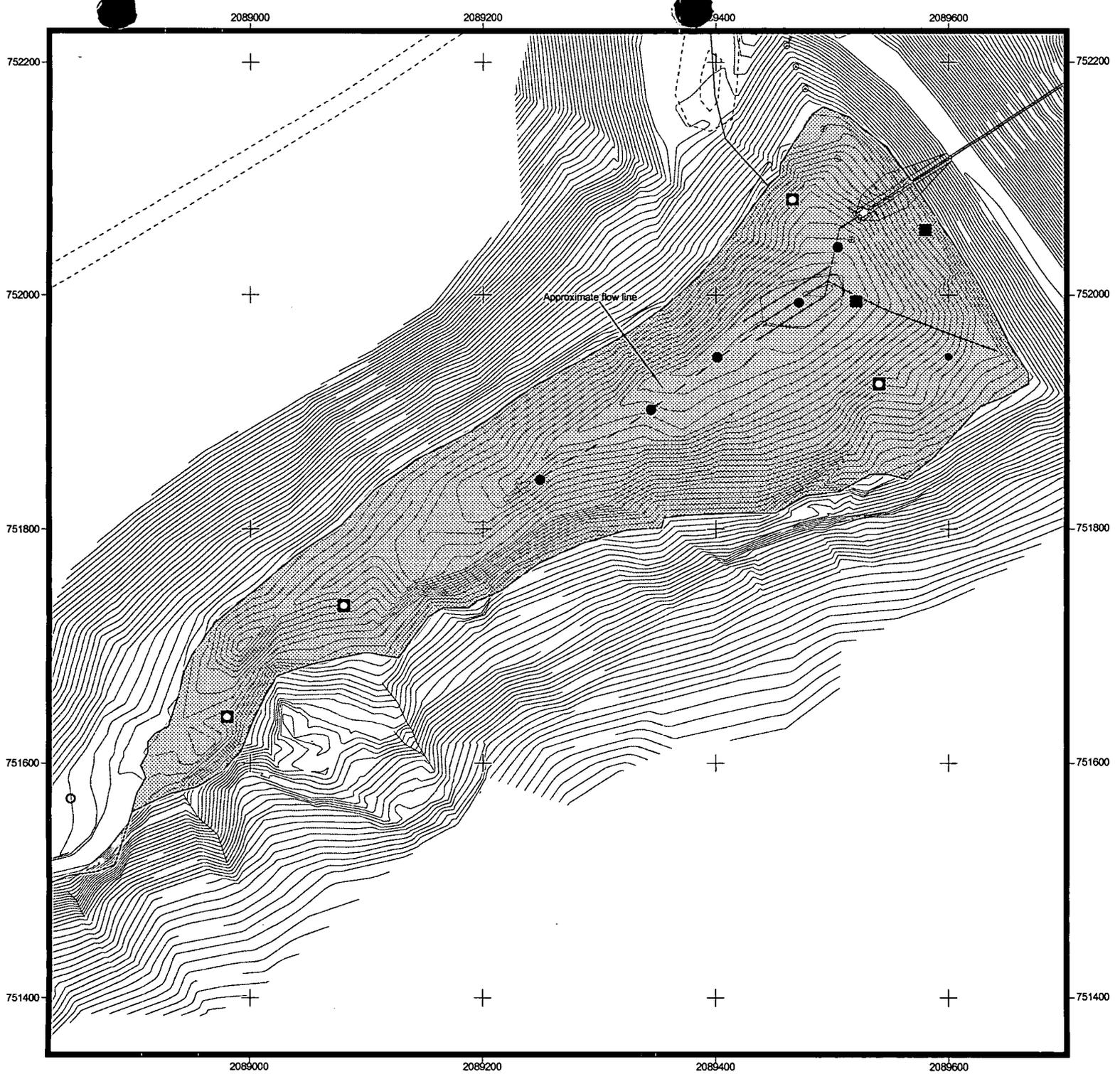
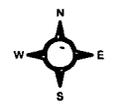


Figure 8
Pond B-5
Existing and Proposed
New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- ⌄ Topography
- ▨ Pond
- ⌄ Stream
- - - Dirt Road



20 0 20 40 60 80 Feet

Scale = 1:1,400

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



Prepared for:



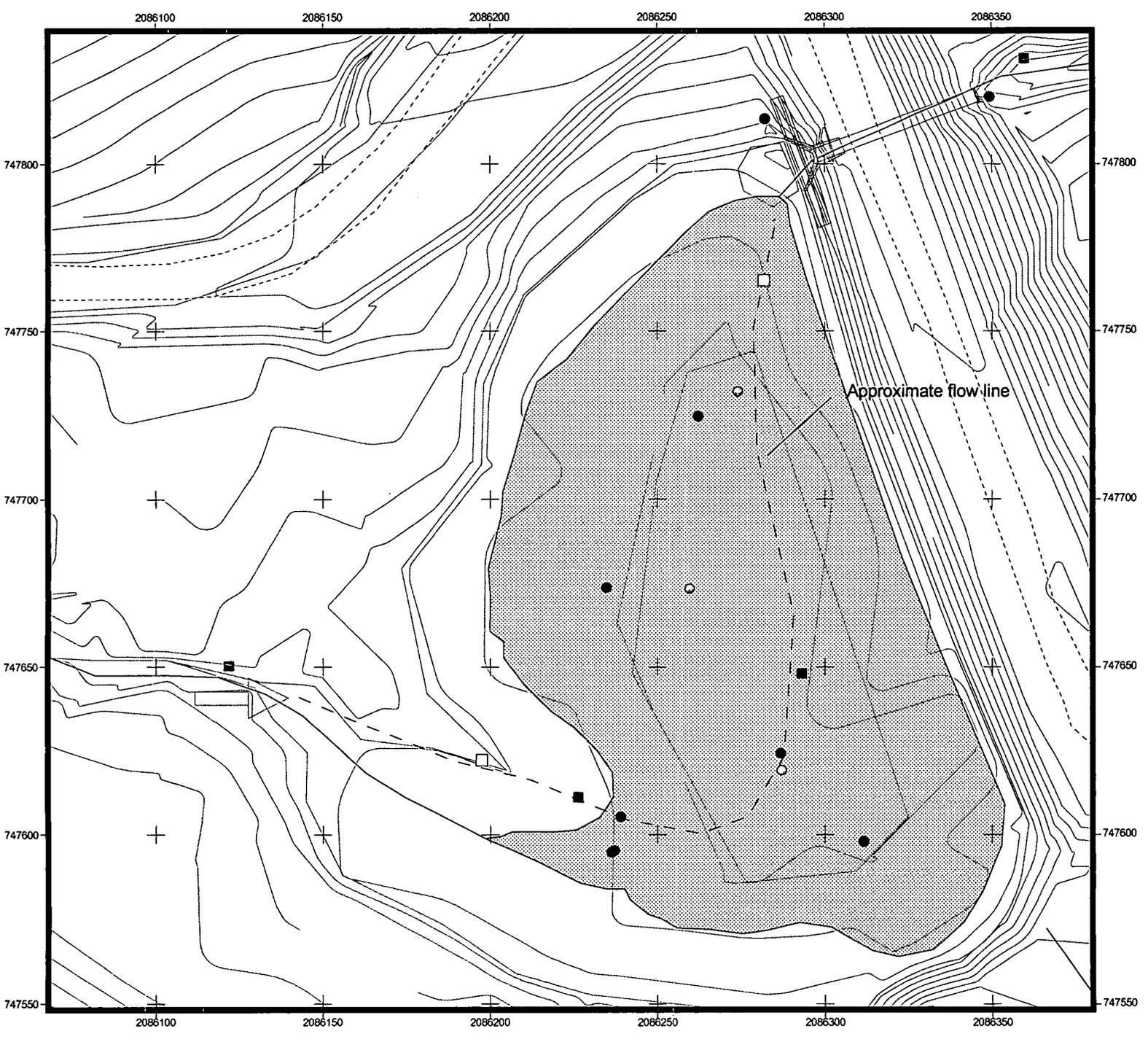


Figure 9
Pond C-1
Existing and Proposed
New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 2002 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- ~ Topography
- ▨ Pond
- ~ Stream
- - - Dirt Road



10 0 10 20 Feet

Scale = 1:500

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



Prepared for:



Figure 10
Pond C-2
Existing and Proposed
New Sampling Locations

KEY

- Proposed Surface Sediment Sampling Location
- Proposed Borehole Sampling Location
- 2004 Sampling Location
- 1997 Sampling Location
- 1994 Sampling Location
- 1992 Sampling Location
- ~ Topography
- ▨ Pond
- ~ Stream
- - - Dirt Road



20 0 20 40 60 80 Feet

Scale = 1:1,400

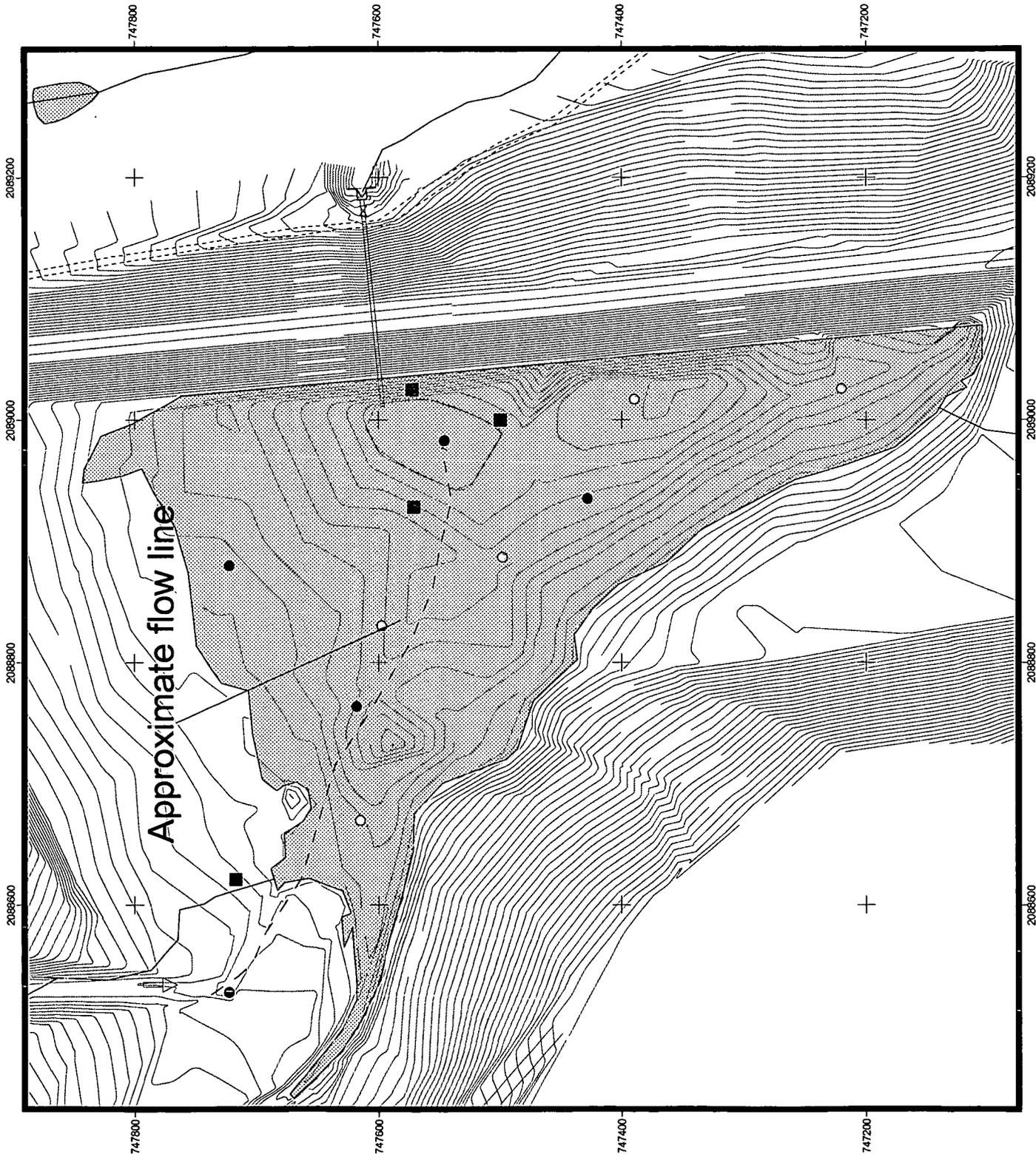
State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



Prepared for:



3.0 SAMPLING

Biased sediment sampling will be conducted to augment the existing information and data and to provide additional information on the nature and extent of potential contamination. Proposed biased sampling locations (38) are shown on Figures 2 through 10. Proposed sampling and analysis specifications for the pond sediments are summarized in Table 1.

Table 1
Sampling and Analysis Summary

Pond	Approximate Area (ft ²)	Number of Proposed Sample Locations	Analytes	Depth of Surface/Subsurface Samples
Pond A-1	25,000	2 for Surface/Subsurface Sediments 2 for Surface Sediments	Radionuclides Metals PCBs SVOCs	From top of sediment (0 to 6 inches) to top of native soil
Pond A-2	47,000	2 for Surface/Subsurface Sediments 1 for Surface Sediment	Radionuclides Metals PCBs SVOCs	From top of sediment (0 to 6 inches) to top of native soil
Pond A-3	99,000	3 for Surface/Subsurface Sediments 1 for Surface Sediment	Radionuclides Metals	From top of sediment (0 to 6 inches) to top of native soil
Pond A-4	254,000	5 for Surface/Subsurface Sediments	Radionuclides Metals	From top of sediment (0 to 6 inches) to top of native soil
Pond A-5	11,000	1 for Surface/Subsurface Sediments 2 for Surface Sediments <i>(note: an additional boring will be collected if the 1st boring finds sediment depths greater than historic samples)</i>	Radionuclides Metals	From top of sediment (0 to 6 inches) to top of native soil
Pond B-4	9,500	3 for Surface/Subsurface Sediments 2 for Surface Sediments	Radionuclides Metals PCBs SVOCs	From top of sediment (0 to 6 inches) to top of native soil
Pond B-5	130,000	5 for Surface/Subsurface Sediments	Radionuclides Metals	From top of sediment (0 to 6 inches) to top of native soil
Pond C-1	22,000	2 for Surface/Subsurface Sediments 2 for Surface Sediments	Radionuclides Metals PCBs SVOCs	From top of sediment (0 to 6 inches) to top of native soil
Pond C-2	156,000	5 for Surface/Subsurface Sediments	Radionuclides Metals	From top of sediment (0 to 6 inches) to top of native soil

As shown in Table 1, the number of samples to be collected will vary by pond. For each pond, samples will be collected near the pond inlet and near the deepest part of the pond or where sediment depth is anticipated to be the greatest. Additional samples will be collected as agreed upon during the consultative process with the regulatory agencies.

Sampling locations will be chosen based on actual field conditions, as appropriate. Samples will collect the thickest sediment package in the designated areas with regard to surface and topological features and the inlet and deepest locations of the pond.

Sampling locations will be chosen based on the approximate flow path and in areas where sediment could accumulate including topographic breaks and low points. Sampling locations shown on Figures 2 through 10 will be adjusted in the field based on information obtained from engineering drawings, topographical data, and field conditions. Samples will be collected from the surface and subsurface of the sediment to the top of native soil. A third subsurface sample will be collected from Pond A-5 if the sediment is more than 2 feet (ft) deep. Sampling intervals will be consistent with the IABZSAP. All samples will be analyzed for radionuclides and metals based on the consultative process. Subsurface samples will be analyzed in an intermediate interval for SVOCs and PCBs only if there are no existing subsurface SVOC or PCB data. Otherwise, SVOCs and PCBs will be collected from the surface and the deepest sediment interval for ponds requiring SVOC analysis. Changes to sampling specifications will be made in consultation with the regulatory agencies.

Samples will be collected from each pond by the most appropriate methods for each location, including geoprobe, manual core samplers, and dredges. Samples will be collected from the surface (defined as 0 to 6 inches of retrievable sediment) and at depth intervals of 2 ft until native soil or bedrock is reached (identified as refusal when using manual collection methods). Because of the unconsolidated/fluid nature of the surface fraction, other less precise methods of sample collection will be used to obtain sufficient sample mass where required. If the surface fraction is found to be extremely fluid with the solids portion of the sample estimated at less than 2 grams (thereby resulting in large detection limits upon analysis), then a surface grab sample will be obtained using a direct surface sampler such as a dredge. If the 0- to 6-inch interval is mostly liquid, the sample will be submitted as a water or liquid sludge to the laboratory for analysis. The remaining surface samples within each pond will then be collected in the same manner. This will assure sufficient mass for each sample to obtain adequate detection limits. If sufficient sample mass cannot be obtained, then multiple nearby locations will be sampled to create a composite sample. These additional sample locations will exist within a 5-ft radius of the original sample location.

4.0 REFERENCES

DOE, 1992 - 2004, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

DOE, 2004, Industrial Area and Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005a, Closeout Report for Ponds B-1, B-2, and B-3, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

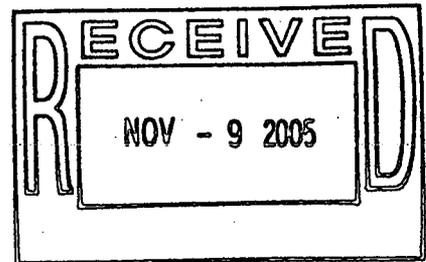
DOE, 2005b, Draft Data Summary Report for IHSS Group NE-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.



**Industrial Area and Buffer Zone
Sampling and Analysis Plan
Addendum #IABZ-05-06**

**IHSS Group NE-1
Additional Sampling of RFETS Pond Sediment**



July 2005

ADMIN RECORD

15/18