

**INFORMATION
ONLY**

Controlled Copy No. _____

665

3-END.01



ROCKY FLATS

**ROCKY FLATS
ENVIRONMENTAL TECHNOLOGY
SITE LAND USE MANUAL
TECHNICAL SITE INFORMATION
FOR THE RFETS PER DOE ORDER
4320**



SEPTEMBER 1994

ADMIN RECORD

A-SW-001205

**INFORMATION
ONLY**

**EG&G ROCKY FLATS
ENVIRONMENTAL TECHNOLOGY SITE
LAND USE MANUAL
Technical Site Information
for the RFETS per
DOE Order 4320**

**Manual No.
3-END.01
(formerly 3-21500-GD-END-.01)**

ROCKY FLATS PLANT	Manual No.:	3-ENDQ.01
LAND USE MANUAL	Procedure No.:	Table of Contents, Rev. 7
(formerly 3-21500-GD-END-.01)	Page:	1 of 2
	Effective Date:	09/02/94
	Organization:	Environmental Management

TABLE OF CONTENTS
FOR
ROCKY FLATS LAND USE MANUAL

<u>Section No.</u>	<u>Title</u>	<u>Rev. No.</u>	<u>Effective Date</u>
	Detailed Table of Contents	1	09/02/94
	Preface	1	09/02/94
	How to Use Manual	1	09/02/94
	Introduction	1	09/02/94
SE 1	Quadrant Southeast 1	1	09/02/94
SE 2	Quadrant Southeast 2	1	09/02/94
SE 3	Quadrant Southeast 3	1	09/02/94
SE 4	Quadrant Southeast 4	1	09/02/94
SW 1	Quadrant Southwest 1	1	09/02/94
SW 2	Quadrant Southwest 2	1	09/02/94
SW 3	Quadrant Southwest 3	1	09/02/94
SW 4	Quadrant Southwest 4	1	09/02/94
NE 1	Quadrant Northeast 1	1	09/02/94
NE 2	Quadrant Northeast 2	1	09/02/94
NE 3	Quadrant Northeast 3	1	09/02/94
NE 4	Quadrant Northeast 4	1	09/02/94
NW 1	Quadrant Northwest 1	1	09/02/94
NW 2	Quadrant Northwest 2	1	09/02/94

ROCKY FLATS PLANT**Manual No.:****3-END.01****LAND USE MANUAL****Procedure No.:****Table of Contents, Rev. 7****Page:****2 of 2****(formerly 3-21500-GD-END-.01)****Effective Date:****09/02/94****Organization:****Environmental Management**

<u>Section No.</u>	<u>Title</u>	<u>Rev. No.</u>	<u>Effective Date</u>
NW 3	Quadrant Northwest 3	1	09/02/94
NW 4	Quadrant Northwest 4	1	09/02/94
CS 1	Case Study 1: Present and Future Sanitary Landfill	1	08/25/94
CS 2	Case Study 2: North and East Live-Firing Rifle Ranges	1	08/25/94
CS 3	Case Study 3: Off-Road Vehicle Use/Environmental Monitoring	1	08/25/94
CS 4	Case Study 4: Off-Road Vehicle Use/WSI - RFP Protective Force	1	08/25/94
CS 5	Case Study 5: Western Aggregate Inc. Quarries	1	08/25/94
CS 6	Case Study 6: RFP 881 Hillside (OU1)/French Drain	1	08/25/94
CS 7	Case Study 7: West Spray Field	1	08/25/94
CS 8	Case Study 8: Borehole and Well Drilling	1	08/25/94
CS 9	Case Study 9: Detention Pond (Series A, B, & C)	1	08/25/94
CS 10	Case Study 10: South Interceptor Ditch	1	08/25/94
CS 11	Case Study 11: Installation of Utilities	1	08/25/94
CS 12	Case Study 12: Buffer Zone Fire	1	08/25/94
GLOS	Glossary	1	09/02/94
LEGE	Legends	0	08/06/93
BIBLIO	Bibliography	0	03/05/93
MAPS	Maps (Located in back of manual)	1	09/02/94

**INFORMATION
ONLY**

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

Manual No.: 3-END.01

Land Use Manual, Revision 1

Organization: Environmental Protection Management

Revision 1

Approved by: _____

Jean L. Reynolds
QA

8/25/94
Date

09/9/94
Effective Date

SM Neate
Manager

8/25/94
Date

Contents

Preface	vii
How To Use This Manual	viii
Introduction	xii
High-altitude, aerial photograph of Rocky Flats	xiii

Site Characterizations and Maps

Quadrant Southeast 1	SE	1-1
Wetlands	SE	1-7
Soil Types	SE	1-9
Geologic Units	SE	1-11
Sediment Sampling Locations	SE	1-13
Surface Water Sampling Locations	SE	1-15
Groundwater Monitoring Well Locations	SE	1-17
Borehole Sampling Locations	SE	1-19
Individual Hazardous Substance Sites	SE	1-21
Utilities and Vehicle Access	SE	1-23
Quadrant Southeast 2	SE	2-1
Wetlands	SE	2-9
Soil Types	SE	2-11
Geologic Units	SE	2-13
Sediment Sampling Locations	SE	2-15
Surface Water Sampling Locations	SE	2-17
Groundwater Monitoring Well Locations	SE	2-19
Borehole Sampling Locations	SE	2-21
Individual Hazardous Substance Sites	SE	2-23
Utilities and Vehicle Access	SE	2-25
Quadrant Southeast 3	SE	3-1
Wetlands	SE	3-7
Soil Types	SE	3-9
Geologic Units	SE	3-11
Surface Water Sampling Locations	SE	3-13
Groundwater Monitoring Well Locations	SE	3-15
Borehole Sampling Locations	SE	3-17
Utilities and Vehicle Access	SE	3-19
Quadrant Southeast 4	SE	4-1
Wetlands	SE	4-7
Soils Types	SE	4-9
Geologic Units	SE	4-11
Groundwater Monitoring Well Locations	SE	4-13
Borehole Sampling Locations	SE	4-15
Utilities and Vehicle Access	SE	4-19

Site Characterizations and Maps (continued)

Quadrant Southwest 1	SW	1-1
Wetlands	SW	1-7
Soil Types	SW	1-9
Geologic Units	SW	1-11
Sediment Sampling Locations	SW	1-13
Surface Water Sampling Locations	SW	1-15
Groundwater Monitoring Well Locations	SW	1-17
Borehole Sampling Locations	SW	1-19
Individual Hazardous Substance Sites	SW	1-21
Utilities and Vehicle Access	SW	1-23
Quadrant Southwest 2	SW	2-1
Wetlands	SW	2-7
Soil Types	SW	2-9
Geologic Units	SW	2-11
Sediment Sampling Locations	SW	2-13
Surface Water Sampling Locations	SW	2-15
Groundwater Monitoring Well Locations	SW	2-17
Borehole Sampling Locations	SW	2-19
Individual Hazardous Substance Sites	SW	2-21
Utilities and Vehicle Access	SW	2-23
Quadrant Southwest 3	SW	3-1
Wetlands	SW	3-5
Soil Types	SW	3-7
Geologic Units	SW	3-9
Surface Water Sampling Locations	SW	3-11
Groundwater Monitoring Well Locations	SW	3-13
Borehole Sampling Locations	SW	3-15
Utilities and Vehicle Access	SW	3-17
Quadrant Southwest 4	SW	4-1
Wetlands	SW	4-5
Soil Types	SW	4-7
Geologic Units	SW	4-9
Utilities and Vehicle Access	SW	4-11
Quadrant Northeast 1	NE	1-1
Wetlands	NE	1-7
Soils Types	NE	1-9
Geologic Units	NE	1-11
Sediment Sampling Locations	NE	1-13
Surface Water Sampling Locations	NE	1-15
Groundwater Monitoring Well Locations	NE	1-17
Borehole Sampling Locations	NE	1-19
Individual Hazardous Substance Sites	NE	1-21
Utilities and Vehicle Access	NE	1-23

Site Characterizations and Maps (continued)

Quadrant Northeast 2	NE	2-1
Wetlands	NE	2-7
Soils Types	NE	2-9
Geologic Units	NE	2-11
Sediment Sampling Locations	NE	2-13
Surface Water Sampling Locations	NE	2-15
Groundwater Monitoring Well Locations	NE	2-17
Borehole Sampling Locations	NE	2-19
Utilities and Vehicle Access	NE	2-21
Quadrant Northeast 3	NE	3-1
Wetlands	NE	3-9
Soils Types	NE	3-11
Geologic Units	NE	3-13
Sediment Sampling Locations	NE	3-15
Surface Water Sampling Locations	NE	3-17
Groundwater Monitoring Well Locations	NE	3-19
Borehole Sampling Locations	NE	3-21
Individual Hazardous Substance Sites	NE	3-23
Utilities and Vehicle Access	NE	3-25
Quadrant Northeast 4	NE	4-1
Wetlands	NE	4-7
Soils Types	NE	4-9
Geologic Units	NE	4-11
Surface Water Sampling Locations	NE	4-13
Groundwater Monitoring Well Locations	NE	4-15
Borehole Sampling Locations	NE	4-17
Utilities and Vehicle Access	NE	4-19
Quadrant Northwest 1	NW	1-1
Wetlands	NW	1-9
Soils Types	NW	1-11
Geologic Units	NW	1-13
Sediment Sampling Locations	NW	1-15
Surface Water Sampling Locations	NW	1-17
Groundwater Monitoring Well Locations	NW	1-19
Borehole Sampling Locations	NW	1-21
Utilities and Vehicle Access	NW	1-23
Quadrant Northwest 2	NW	2-1
Wetlands	NW	2-9
Soils Types	NW	2-11
Geologic Units	NW	2-13
Surface Water Sampling Locations	NW	2-15
Groundwater Monitoring Well Locations	NW	2-17
Utilities and Vehicle Access	NW	2-19

Site Characterizations and Maps (continued)

Quadrant Northwest 3	NW 3-1
Wetlands	NW 3-7
Soils Types	NW 3-9
Geologic Units	NW 3-11
Sediment Sampling Locations	NW 3-13
Surface Water Sampling Locations	NW 3-15
Groundwater Monitoring Well Locations	NW 3-17
Borehole Sampling Locations	NW 3-19
Individual Hazardous Substance Sites	NW 3-21
Utilities and Vehicle Access	NW 3-23
Quadrant Northwest 4	NW 4-1
Wetlands	NW 4-9
Soils Types	NW 4-11
Geologic Units	NW 4-13
Sediment Sampling Locations	NW 4-15
Surface Water Sampling Locations	NW 4-17
Groundwater Monitoring Well Locations	NW 4-19
Borehole Sampling Locations	NW 4-21
Individual Hazardous Substance Sites	NW 4-23
Utilities and Vehicle Access	NW 4-25

Case Studies and Photographs

Present Landfill	CS 1-1
Sanitary Landfill - spoils piles	CS 1-3
Sanitary Landfill - landfill pond	CS 1-5
North and East Live-Fire Rifle Ranges	CS 2-1
East Live-Fire Rifle Range	CS 2-3
Off-Road Vehicle Use/Environmental Monitoring	CS 3-1
Off-Road Vehicle Use/WSI-Rocky Flats Protective Force	CS 4-1
Jefferson County and Western Aggregate, Inc., Quarries	CS 5-1
Western Aggregate, Inc., Quarry - water-filled pit	CS 5-3
Western Aggregate, Inc., Quarry	CS 5-5
Rocky Flats 881 Hillside (OU 1)/French Drain	CS 6-1
881 Hillside - contaminated groundwater plumes	CS 6-5
881 Hillside - hay bales prevent soil erosion	CS 6-7
881 Hillside - revegetation with barley	CS 6-9
881 Hillside - scarifying soil	CS 6-11
881 Hillside - hydroseeding with barley	CS 6-13
881 Hillside - germinating barley	CS 6-15

Case Studies and Photographs (continued)

West Spray Field	CS 7-1
West Spray Field	CS 7-3
Borehole and Well Drilling	CS 8-1
Borehole and Well Drilling - typical drilling rig	CS 8-3
Detention Ponds (Series A, B, and C)	CS 9-1
A and B Series Detention Ponds	CS 9-3
South Interceptor Ditch	CS 10-1
South Interceptor Ditch - termination at Pond C-2	CS 10-3
South Interceptor Ditch - SID near Pond C-1	CS 10-5
Installation of Utilities	CS 11-1
Buffer Zone Fire	CS 12-1
Burned and Unburned Areas	CS 12-2
New Growth	CS 12-3

Appendices

Glossary/Acronyms	G 1-1
Legends	L 1-1
Bibliography	B 1-1

Large Site Maps

Wetlands at Rocky Flats	BZ 1
Soils map from SCS for Rocky Flats	BZ 2
Geologic Units at Rocky Flats	BZ 3
Sediment Sampling Locations	BZ 4
Surface Water Sampling Locations	BZ 5
Groundwater Monitoring Well Location Map	BZ 6
Borehole Sampling Locations	BZ 7
Individual Hazardous Substance Site by Operable Unit	BZ 8
Utilities & Vehicle Access	BZ 9

PREFACE

The Land Use Manual (LUM) for the Rocky Flats Environmental Technology Site (RFETS) is intended as technical support information for site planning. The Department of Energy (DOE) requires that two documents be maintained at each DOE facility: "Technical Site Information" and the "Site Development Plan."¹ The LUM is used as a reference for developing both documents, however it was specifically created to support the Technical Support Information (TSI). The TSI traces planning efforts so that others may follow the thought processes used to develop action plans and solutions. The LUM supports the TSI by identifying the present use of the Buffer Zone with respect to floodplains, geology, vegetation, wetlands, and wildlife, etc. The historical background on Buffer Zone projects, and attendant problems and options for reclaiming damaged lands are discussed in the Case Studies section of the manual.

The scope of the LUM exceeds the scope of *The Rocky Flats Land Management Plan*,² which represented the DOE's view of the basic elements required to comply with site planning policies, by characterizing current Buffer Zone use with published and unpublished ecological data. Major sources include, in part, the ongoing monitoring programs for the Individual Hazardous Substance Sites (IHSSs) and the Rocky Flats Environmental Database System (RFEDS).

¹ U.S. Department of Energy. DOE Order 4320.1B/CI, *Site Development Planning*. Washington, D.C.: U.S. Government Printing Office, March 26, 1992.

² Hickey, Margaret, comp. *The Rocky Flats Land Management Plan*. Edited by J.D. Hurley and D.C. Hunt. Golden, CO.: Dow Chemical USA, 1972.

HOW TO USE THIS MANUAL

The Land Use Manual is designed for rapid investigation of specific areas of the Buffer Zone. Each Tabbed chapter contains a description of one-sixteenth of the current 6,150 acres. The sections of the manual are described in detail below.

- The first section of the Land Use Manual consists of 16 chapters. In addition to a reference graphic, the quadrant boundaries are identified, and characterizations of vegetation, wildlife habitat, surface waters, jurisdictional wetlands, floodplain, soil, surface geology, utilities, archaeology, future plans, mineral rights, adjoining lands, and a contamination profile follow. Page-sized maps are included for specific topics whenever possible with abbreviations defined in the Glossary. In the interest of readability, citations in the text have been omitted. Instead, references are organized by topic at the beginning of the manual with a formal bibliography given after the Glossary.
- The second section of the Land Use Manual presents ten environmental case studies on the Buffer Zone. The reader will find information concerning the history of the activity, past environmental mitigation actions, the present situation, actions for preventing further environmental destruction, and methods for restoring previously damaged lands. There are scale maps of the Buffer Zone for Wetlands, Soils, Geologic Units, Surface Water Sampling Locations, Groundwater Sampling Locations, Borehole Sampling Locations, and Individual Hazardous Substance Sites, and Utilities and Vehicle Access at the back of the manual.
- Additional information may be obtained from the Manager of the Environmental Policy Implementation Division, EG&G Rocky Flats, Inc., Golden, CO 80402-0464, (303) 966-6386.

VEGETATION

Weber, William A. *Rocky Mountain Flora*. 5th ed. Boulder, CO.: Colorado Associated University Press, 1976.

U.S. Department of Energy. *Baseline Biological Characterization Of The Terrestrial And Aquatic Habitats*. Golden, CO.: U.S. Department of Energy, Rocky Flats Plant, 1992.

U.S. Department of Energy. *Baseline Wildlife/Vegetation Studies Status Report*. Golden, CO.: U.S. Department of Energy, Rocky Flats Plant, 1991.

Clark, S. V., P. J. Webber, V. Komarkova and W. A. Weber. *Map of Mixed Prairie Grassland Vegetation*. (Rocky Flats, Colorado). Institute of Arctic and Alpine Research, Occ. Paper no. 35, 66, Boulder, CO.: University of Colorado, 1980.

WILDLIFE

16 U.S.C.A. §661, et. seq., *The Fish and Wildlife Coordination Act*. St. Paul, MN.: West Publishing Co., 1986.

16 U.S.C.A. §1531, et. seq., *The Endangered Species Act of 1973*. St. Paul, MN.: West Publishing Co., 1986.

U.S. Department of Energy. *Baseline Biological Characterization Of The Terrestrial And Aquatic Habitats*. Golden, CO.:U.S. Department of Energy, Rocky Flats Plant, 1992.

SURFACE WATER

42 U.S.C.A. §300, et. seq., *The Drinking Water Act*. St. Paul, MN.: West Publishing Co., 1986.

U.S. Department of Energy. *Rocky Flats Plant Drainage and Flood Control Master Plan*. Golden, CO.: U.S. Department of Energy, Rocky Flats Plant, 1992.

WETLANDS

Advanced Sciences, Inc. *Wetlands Assessment Rocky Flats Site*. Lakewood, CO.: Advanced Sciences, Inc., 1990.

SOIL

U.S. Department of Agriculture. *Soil Survey of Golden Area, Colorado: Parts of Denver, Douglas, Jefferson, and Park Counties*. Denver, CO.: U.S.D.A., 1980.

GEOLOGY

U.S. Department of Energy. *Phase II Geologic Characterization Data Acquisition*. Golden, CO.: U.S. Department of Energy, Rocky Flats, 1992.

Anderson, Gregg A. ed. Golden, CO., 1992.

UTILITIES

U.S. Department of Energy, Rocky Flats Office. *Map of Utilities and Drainage, RFAO Plant Vicinity*. Issue F. Master "as-built" Drawing. Golden, CO.: Rockwell International, June 8, 1987.

ARCHAEOLOGY

16 U.S.C.A. §470, et. seq., *The National Historic Preservation Act of 1966*. St. Paul MN.: West Publishing Co., 1986.

Dames and Moore. *Cultural Resources Class III Survey of the Department of Energy Rocky Flats Plant, Northern Jefferson and Boulder Counties, Colorado*. Denver, CO.: Dames and Moore, 1991.

Burney, Michael S., Mehls, Steven F., and Grant, Marcus P. *An Archaeological and Historical Survey of Selected Parcels Within the Department of Energy, Rocky Flats Plant, Northern Jefferson County, Colorado*. Boulder, CO.: Burney and Associates, Inc., 1989.

MINERAL RIGHTS

Jefferson County, Colorado Assessor's Office. *Map of Township 2 South Range 70 West of the 6th Principal Meridian, Colorado*. Golden, CO.: Jefferson County Assessor's Office, 1974.

Schiesswohl, Steve. Interview by R. A. Frishmuth. Golden, CO.: EG&G Rocky Flats, Inc. 1992.

ADJOINING LANDS

U.S. Department of Energy. *1989 Population, Economic and Land Use Data Base for Rocky Flats Plant*. Golden, CO.: Rockwell International, August 1990.

CONTAMINATION PROFILE

Costain, David, ed. *Rocky Flats Plant Site Environmental Report, January through December 1989*. Golden, CO.: EG&G Rocky Flats, Inc., 1990.

Costain, David, ed. *Rocky Flats Plant Site Environmental Report, January through December 1990*. Golden, CO.: EG&G Rocky Flats, Inc., 1991.

ChemRisk, *Rocky Flats History-Rocky Flats Toxicologic Review and Dose Reconstruction Task 3/4 Report (Draft)*. Denver, CO.: Colorado Department of Health, February 1992.

EG&G Rocky Flats, Inc. *Rocky Flats Environmental Database System. (RFEDS)*. Golden, CO.: EG&G Environmental Restoration Sample Management Office, 1986.

GENERAL

U.S. Department of Energy. *Site Development Planning Handbook*. Bethesda, MD.: Allen Booz and Hamilton, Inc., January 1981.

_____. *General Environmental Protection Program*. DOE Order 5400.1/P, Washington, D.C.: U.S. Government Printing Office, November 9 1988.

_____. *Site Development Planning*. DOE Order 4320.1B/CI, Washington, D.C., March 26, 1992.

_____. *Environmental Assessment New North Live-Fire Rifle Range Rocky Flats Plant (Draft)*. Golden, CO.: U.S. Department of Energy-Rocky Flats, October 1992.

33 U.S.C.A. §1251, et. seq., *The Federal Disaster Pollution Control Act*. St. Paul, MN.: West Publishing Co., 1986.

Hickey, Margaret, comp. *The Rocky Flats Land Management Plan*. Edited by J. D. Hurley and D. C. Hunt. Golden, CO.: Dow Chemical USA, 1979.

Guillaume, Michael. "Guidelines for Reclamation of the French Drain Area at Rocky Flats." Environmental Management Division, EG&G Rocky Flats, Inc., Golden, CO., February 1992.

INTRODUCTION

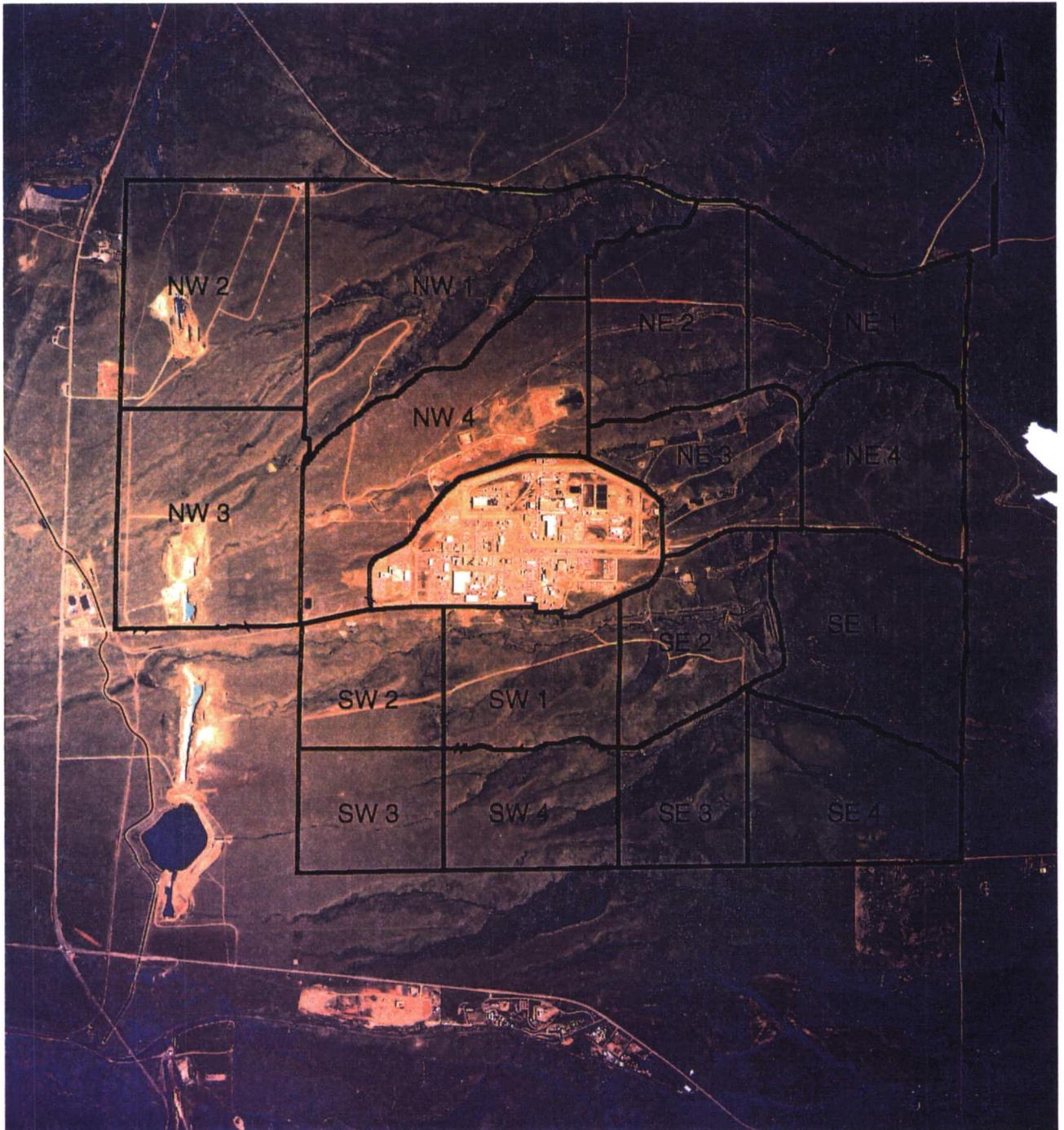
The Department of Energy (DOE) was established in 1977 to consolidate national energy policies, programs, and facilities. As a result, the DOE is the nation's second largest holder of property and facilities in the civilian sector of the federal government.¹ The DOE's goal is to use these facilities and the associated property effectively in order to carry out its mission, as defined by the U.S. Congress. Therefore, as a matter of public trust, any major change in site or facility use must be examined thoroughly in terms of programmatic need, environmental impact, energy consumption, community characteristics, and compatibility with surrounding land use.

Until 1972, the Rocky Flats Plant consisted of 2,520 acres in a rural and largely undeveloped area. With the acquisition of 4,620 acres, a Buffer Zone of approximately one, to one and a half mile was created around the facility. By acquiring this additional land the Atomic Energy Commission, later reorganized as the Energy Research and Development Administration, hoped to "minimize problems arising from the proximity of an industrial facility to a residential community."² Long-range goals were to "preserve and enhance the natural ecological state of the land, upgrade the aesthetic appearance of the land, decrease erosion, and encourage vegetation growth to provide shelter for wildlife."² Detailed instructions for compliance with these mandates are given in DOE Orders 4700.1, "Project Management System," 4300.1B, "Real Property and Site Development Planning," and 4320, "Site Development Planning." In support of these Orders, the Land Use Manual (LUM) was developed as a scientific reference to assist in the mitigation of environmental impacts from previous activities in the Buffer Zone. Additionally, the LUM serves as decision-making tool for future land use planning activities at the Rocky Flats Environmental Technology Site (RFETS).

The Rocky Flats Plant's climate is temperate and semiarid, characteristic of Colorado's Front Range. This results in large seasonal temperature variations and, occasionally, dramatic short-term temperature changes. The normal annual precipitation at RFETS is nearly 16 inches, including rainfall and melted snow, and the annual snowfall averages between 70 and 75 inches. Drought conditions occasionally develop along the Front Range, leading to wildfires in the prairie areas around the plant. High wind events are common along the Front Range during the winter months. So-called "Chinook" winds are forced over and accelerate as they cross the eastern slopes of the Continental Divide, yielding several days a year with peak wind gusts exceeding 60 mph.

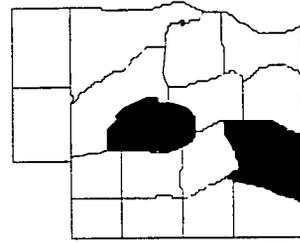
¹ U.S. Department of Energy. *Site Development Planning Handbook*. Bethesda, MD.: Allen Booz and Hamilton, Inc., 1981.

² U.S. Atomic Energy Commission. *Environmental Statement, Land Acquisition, Rocky Flats Plant, Colorado*. WASH-1518. Washington, D.C.: U. S. Atomic Energy Commission, April 1972.



A high-altitude, aerial photograph of the Rocky Flats Plant and Buffer Zone. June 27, 1989

1" = 3,296 feet



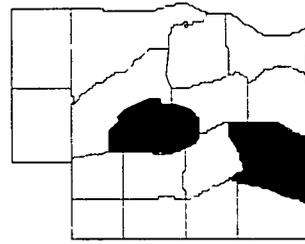
Quadrant: SE 1

Boundaries: **North** - East Rocky Flats Environmental Technology Site (RFETS) Access Road.
South - Road from west boundary ESE to Indiana Street (Jefferson County 17).
East - Indiana Street (Jefferson County 17).
West - Approximates the present dirt road that angles south from the East RFETS Access Road along drainage to the road that runs east of the Pond C-2 dam. The boundary follows this road, terminating at a dead-end in the SW corner of the quadrant.

Vegetation: Quadrant SE 1 is primarily classified as Mesic Mixed Grassland, with small areas of Xeric Mixed Grassland also present. Areas of Bottomland Shrub, intermixed with areas of Riparian Woodland and Tall Marsh, are present along Mower Ditch and Woman Creek as they flow through the southern portion of the quadrant. The Woman Creek drainage supports Cottonwood trees, low shrubbery and native grasses: Kentucky Bluegrass (*Poa pratensis*), Orange Arnica (*Arnica fulgens*), Golden Aster (*Heterotheca villosa*), Western Wheatgrass (*Agropyron smithii*), and Canada Bluegrass (*Poa compressa*).

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland in the north and central portions of the quadrant and Bottomland Shrub along Woman Creek and Mower Ditch.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. The reptile fauna is comprised of snakes, especially the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

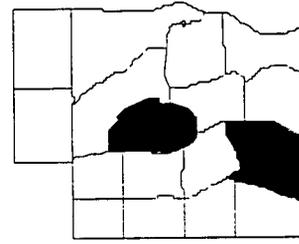


In the Bottomland Shrub areas, many species of arthropods are present, but are too numerous to list. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), and Red-winged Blackbirds (*Agelaius phoeniceus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: Woman Creek and Mower Ditch, which feed off Woman Creek approximately 700 feet downstream from the Pond C-2 Dam, flow east across the quadrant. During dry months the creek and the ditch may dry up or sustain reduced flow. If the water level in the creek becomes low, the ditch may take all of the water from the creek and the creek bed will be completely dry.

Jurisdictional Wetlands: Wetlands are present along Woman Creek and Mower ditch north of Woman Creek, and approximately 700 feet east of the Pond C-2 Dam. Other wetlands are located in the seeps on the hillside in the northwest quarter of the quadrant. It is possible that the seeps were more active during the operation of the east spray field located directly uphill. When the east spray field ceased operation, the seeps became dependent on precipitation and snowmelt. These areas are classified as wetlands by the United States Army Corps of Engineers (USACOE) and should be treated accordingly. Two areas along Woman Creek are classified as emergent, seasonal wetlands by the United States Fish and Wildlife Service (USFWS).

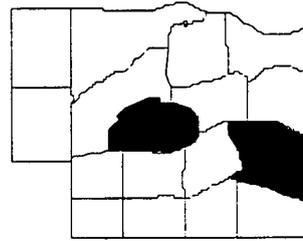


Floodplain: There is a small area of 100-year floodplain in the eastern half of the quadrant where Woman Creek intersects with Indiana Street (Jefferson County 17). Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

In the southern third of the quadrant, Torrifluvents are present along Woman Creek. They are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

Surface Geology: An outcrop of Cretaceous aged Arapahoe Formation comprises approximately 80 percent of the surface geology. Valley-fill Alluvium along the Woman Creek drainage constitutes the remaining 20 percent of the surface geology. Valley-fill Alluvium deposits are represented by well graded mixtures of reworked Rocky Flats Alluvium, colluvium, and weathered bedrock found in drainages. The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation.



Utilities: Aboveground Public Service Company of Colorado (PSC of CO) power lines run N-S across the western edge of the quadrant and N-S along Indiana Street. Another PSC of CO power line runs E-W from Indiana Street to the eastern edge of the Pond C-2 dam. At the dam, the line turns north, heading E-W again at the north end of the Pond C-2 dam. An 8-inch natural gas line owned by the PSC of CO runs E-W across the northern half of the quadrant.

Archaeology: State Site 5JF484 - Stone House. This site consists of a stone structure measuring approximately 12x15 feet. The structure served an unknown function and has suffered serious structural damage including roof loss. The site was not included in the NRHP because it is in poor condition, exhibits no rare construction, and has no historic interest.

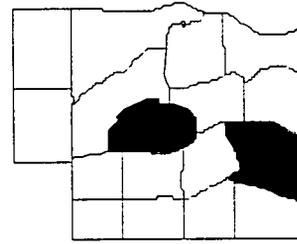
Archaeological maps were omitted from this document to protect the integrity of the cultural resources. If the location of specific sites must be known, contact the Environmental Policy Implementation Division.

Future Plans: None.

Mineral Rights: Tract 41-S1/2 of Section 12 - 317.84 acres. The mineral rights are reserved to grantor. Right of proprietor of a vein or lode to remove his ore therefrom, should the same be found to penetrate or intersect premises hereby said.

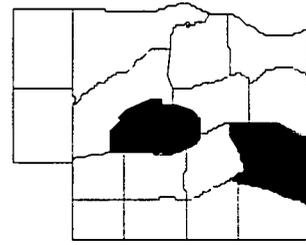
Tract 39 - Section 13 and a portion of Section 14 - 660.00 acres. The Union Pacific Railroad has coal rights. All coal, oil and gas reserved but without the right to enter upon or over surface of said land.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the north, south, and west sides. The land east of Indiana Street (Jefferson County 17) is zoned as Jefferson County Parks and Open Space, and as vacant land. The land is currently used as livestock pasture.



Contamination Profile

- Soil Sites: 2-108
- Sediment Sites: Reference the Sediment Sampling Locations map.
- Surface Water: Reference the Surface Water Sampling Locations map.
- Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.
- IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.
- Comments: IHSS 216.3 is located in the far northwest corner of the quadrant. The IHSS is the South Area of the East Spray Fields. The South Area was in operation from the early 1980s to 1990. The spray fields were a land irrigation site for water from Pond B-3 which received treated sanitary wastewater flows. Following a spill on February 4, 1989, chromic acid was inadvertently released into Pond B-3 and then spray-irrigated onto the spray fields. It is unknown exactly what levels of contamination may be present in the sprayfields.
- The quadrant is downwind from the RFETS and potentially is susceptible to wind-borne contaminants. Environmental monitoring data indicate slightly elevated levels of radiation in the soil. Two possible sources of this contamination are fallout from the Building 776 fire in 1969 and wind-borne contaminated soil from the 903 Pad. The quadrant is downstream from the main processing facility.
- Surface water site GS01, located in a culvert on Woman Creek where flows under Indiana St., recorded the following flows during the 1993 water year:
- Average Spring Flow: 0.077 cubic feet per second (cfs)
Average Summer Flow: 0.00 cfs
Average Winter/Fall Flow: 0.00 cfs



Surface water site GS02, located in a culvert on Mower Ditch where it flows under Indiana St., recorded the following flows during the 1993 water year:

Average Spring Flow: 0.42 cfs
Average Summer Flow: 0.01 cfs
Average Winter/Fall Flow: 0.01 cfs

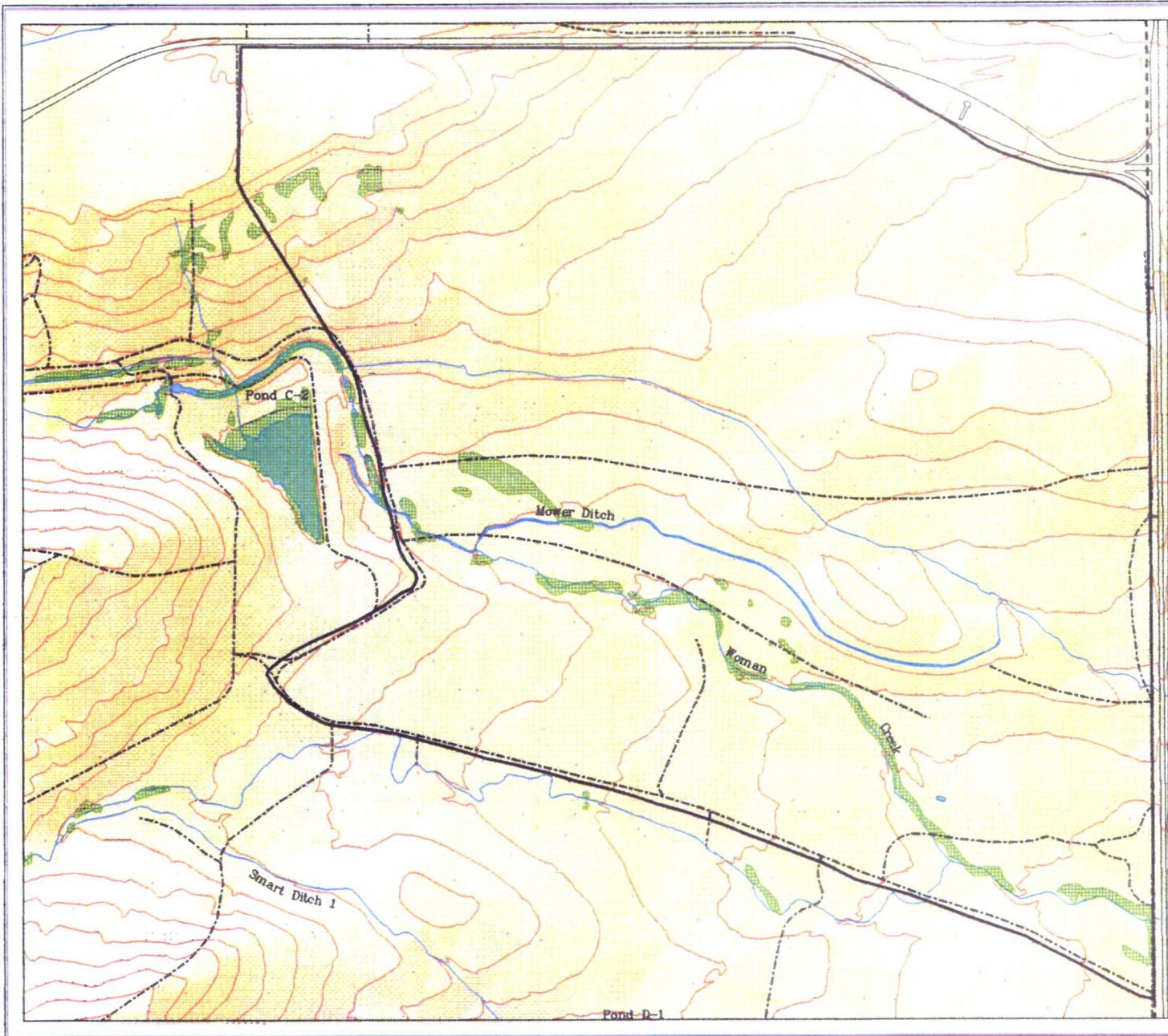
The flow data listed above should be used with the qualification that flows were computed using theoretical ratings for the culverts which are suspected to provide data that are +/- 30% from actual flows.

Current data for sediment sites and groundwater wells are accessible through the Rocky Flats Environmental Database System (RFEDS).

Other: There are two permanent Colorado Department of Public Health and Environment (CDPHE) Air Sampling Stations located in this quadrant. One station exists along Indiana Street just NE of State Site 5JF484. The second station is located on the south side of the RFETS East Access road across from the Ground Wave Emergency Network (GWEN) tower and just south of the power lines. In addition, there are two Radioactive Ambient Air monitoring Program (RAAMP) samplers located within the quadrant. One is located at the intersection of the east access road and Indiana Street, and the other lies at the intersection of Mower Ditch and Indiana Street.

A meteorological tower and monitoring trailer are located along Woman Creek approximately 1,500 feet downstream from the Pond C-2 dam. The tower and trailer are inactive with no current plans for future use.

SE 1-7



SE1 WETLANDS

- Buildings or other structures
- Wetlands
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' Intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

DATA SOURCES:
 Buildings, roads, and fences provided by
 Facilities Dept.
 EG&G Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - (data not shown)



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

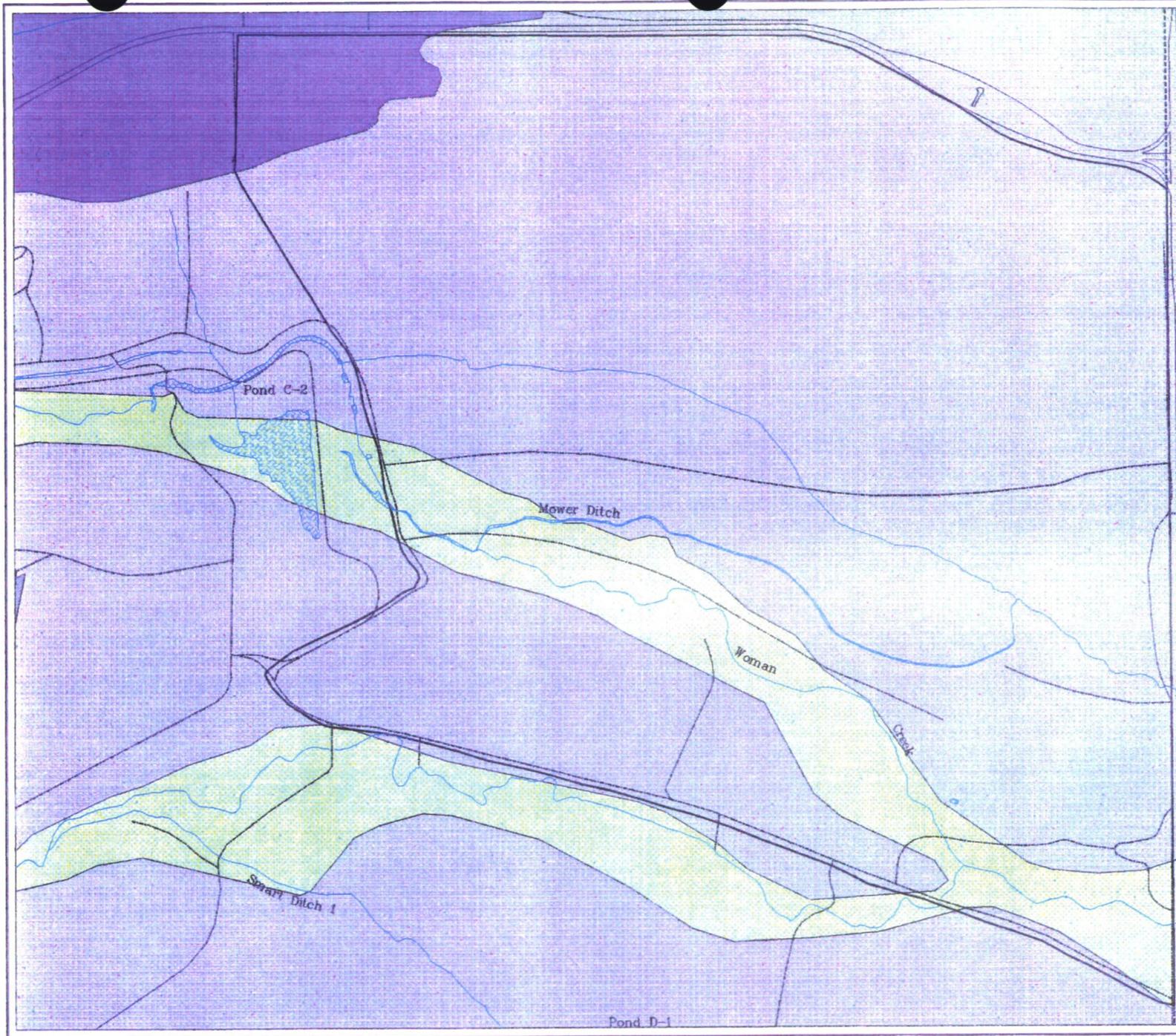
Prepared by:
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: Wet94-0001

August 22, 1994

A:\maps\1811\02\jpl\sew\0005\wetlands\1811\eg&g\wetlands.mxd

SE 1-9



SE1 SOIL TYPES

- Argiustolls
- Palcstolls
- Haplargids
- Mollic/Rock Outcrop complex
- Torrifluvents
- Haplustolls
- Torrorthents
- Camborthids
- Haplustolls
- Cryofluvents
- Haplaquolls
- Netragids
- Argiborolls
- Gravel and Clay Pit
- Rock Outcrop
- DAM
- WATER
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

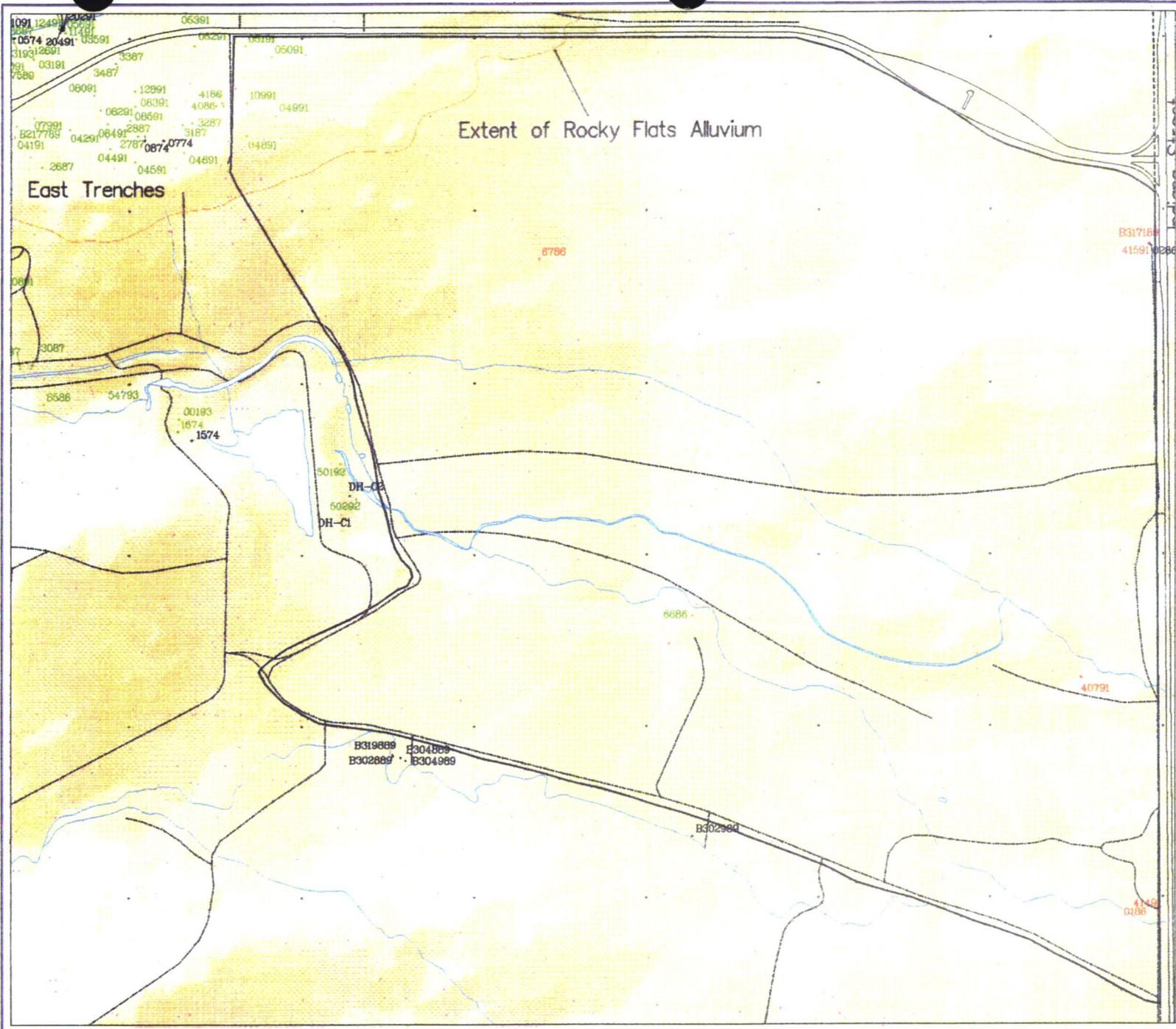
DATA SOURCES:
 Soil types, maps, and bases provided by:
 - National Map
 - 1980 Rocky Flats, Mo. - 1981.
 Hydrology provided by:
 - USGS - (data unknown)
 Soil Conservation Service maps:
 - Quantitative Soils Area Soil Survey
 All mapping software prepared by Jim Wadding



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

Prepared by
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 480
 Golden, Colorado 80402-0480

SE1 GROUNDWATER MONITORING WELL LOCATIONS MAP



- Boundary Wells
 - CERCLA Characterization Wells
 - RCRA Regulatory
 - RCRA Characterization Wells
 - Special Purpose Wells
- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock
- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ✦ Abandoned Groundwater Monitoring Wells

- Other**
- ▨ Buildings and other structures
 - Ponds and Lakes
 - Extent of Rocky Flats Alluvium

- Standard Map Features**
- Fences
 - - Rocky Flats boundary
 - Paved roads
 - - Dirt roads

DATE 08/08/02
 1992 Southern Area Groundwater Investigation, 404
 Buildings, roads, and fences provided by
 Pacific Eng.
 1997 Rocky Flats, Inc. - 1997.
 Hydrology provided by
 CERL - (data withdrawn)



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

Prepared by:
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

SE 1-17

SE1 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCES:
 Buildings, roads, and fences provided by
 Frontier Eng'g.
 2000 Rocky Flats Site - 1997.
 Hydrology provided by
 USGS - (data unknown)
 BOREHOLE LOCATIONS FROM GEORACORP



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

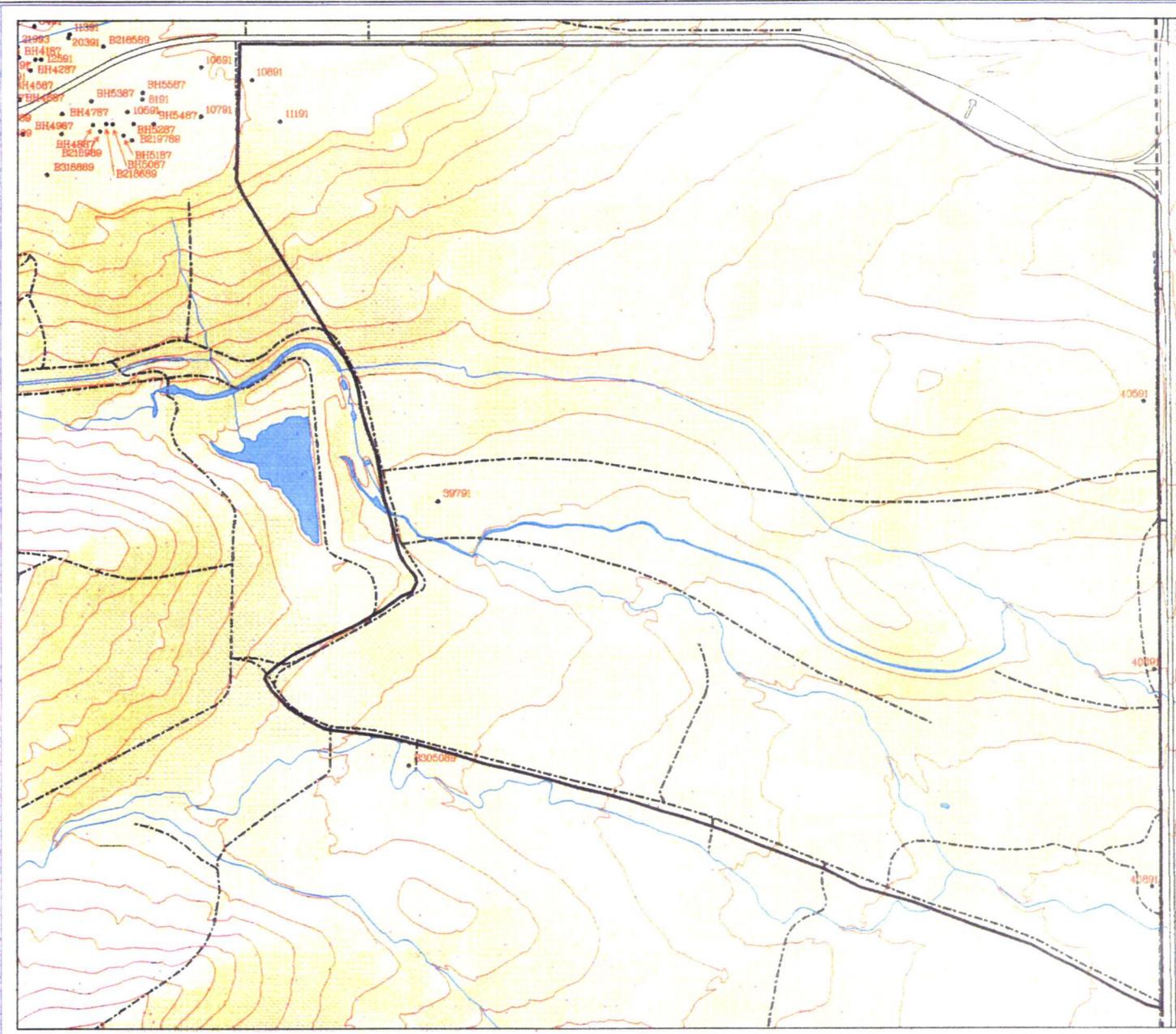
Prepared by:
 **EG&G ROCKY FLATS**
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: bh94-0001

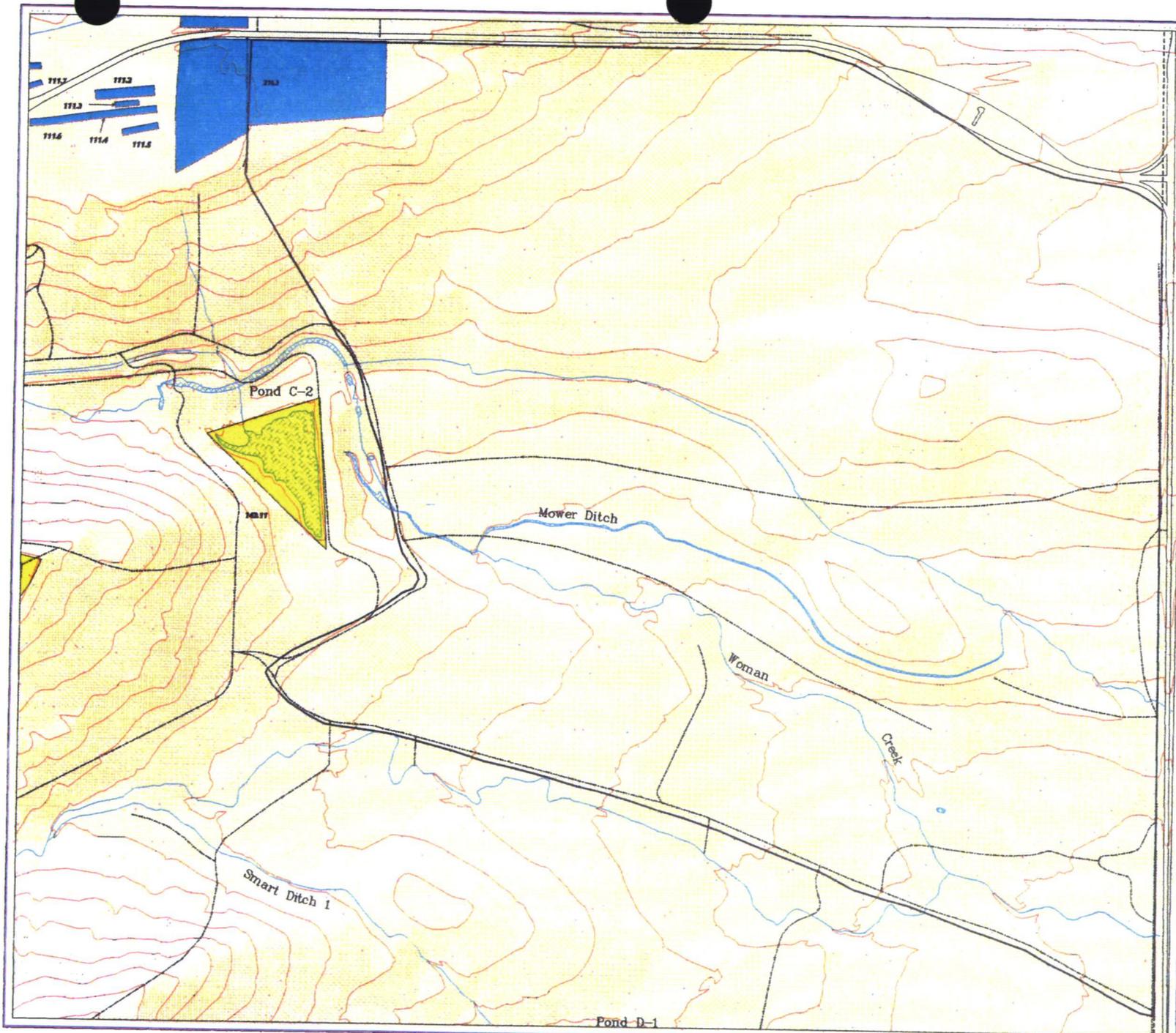
August 22, 1994

A:\mwf\111813\proj\mwf\0000\figs\sew\se1bh\111813sewse1bh.mxd

SE 1-19



SE 1-21



**SE1 INDIVIDUAL HAZARDOUS
SUBSTANCE SITES**

- Operable Unit 1
 - Operable Unit 2
 - Operable Unit 4
 - Operable Unit 5
 - Operable Unit 6
 - Operable Unit 7
 - Operable Unit 8
 - Operable Unit 9
 - Operable Unit 10
 - Operable Unit 11
 - Operable Unit 12
 - Operable Unit 13
 - Operable Unit 14
 - Operable Unit 15
 - Operable Unit 16
-
- Buildings or other structures
 - Lakes and ponds
 - Streams, ditches, or other drainage features
 - Fences
 - Contours (20' Interval)
 - Rocky Flats boundary
 - Paved roads
 - Dirt roads
 - Buffer Zone Quadrants

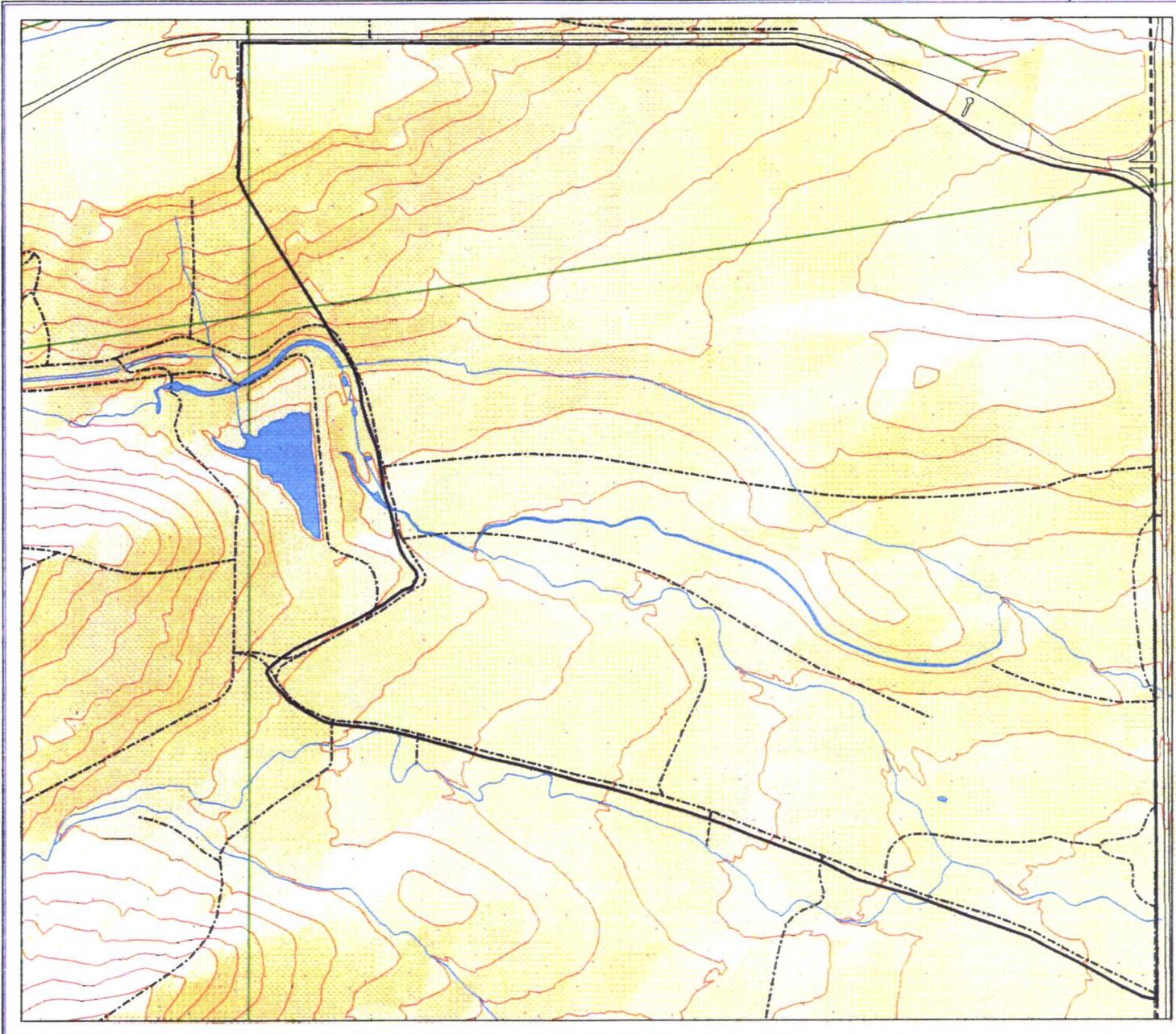
DATA SOURCES:
 Buildings, roads, and fences provided by Facility Dept.
 Rocky Flats Site - 1991.
 Hydrology provided by USGS - data obtained
 Individual Hazardous Substance Site Status
 as determined by the Individual
 OUI - 1999 from 89 Report
 OUI, 4, 2, 11, 8, 16 - 1999
 The remaining OUI's are defined by their respective Operable Unit Maps.



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

Prepared by
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 400
 Golden, Colorado 80402-0400

SE 1-23



SE1 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)



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

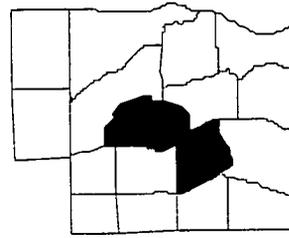
Prepared by:
EG&G ROCKY FLATS

Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util64-0001

August 22, 1994

From: F:\18182\proj\se1\util64\util64-0001\042294\util64-0001.mxd

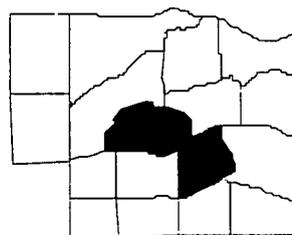


Quadrant: SE 2

Boundaries: **North** - East RFETS Access Road and inner security fence.
South - Road ENE along original Buffer Zone boundary fence.
East - Approximates the present dirt road that angles south from the East RFETS Access Road along the drainage to the road that runs east of the Pond C-2 dam. The boundary follows this road, terminating in a dead end in the SE corner of the quadrant.
West - Line from the west side of the 903 Pad south to the road running due south to the original Buffer Zone boundary fence.

Vegetation: Quadrant SE 2 is primarily classified as Mesic Mixed Grassland, with small areas of Reclaimed Grassland (artificially produced grassland communities) in the northeast portion of the quadrant, and areas damaged by overgrazing. Areas of Bottomland Shrub, intermixed with areas of Riparian Woodland and Tall Marsh, are present along Woman Creek as it flows through the central portion of the quadrant. Cottonwood trees and shrubs are present along Woman Creek, Pond C-1, and Pond C-2. The dominant species of vegetation are: Western Wheatgrass (*Agropyron smithii*), Canada Bluegrass (*Poa compressa*), Short Brome (*Bromus inermis*), and Kentucky Bluegrass (*Poa pratensis*).

Wildlife Habitat: The major wildlife habitats consist of areas of Reclaimed Grassland in the northeast corner of the quadrant, Mesic Mixed Grassland throughout the quadrant, and Bottomland Shrub along Woman Creek, Pond C-1, and Pond C-2.

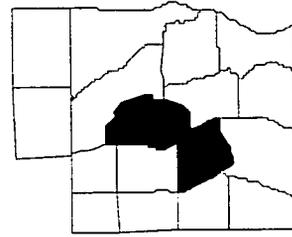


In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. The reptile fauna is represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

In the Bottomland Shrub areas many species of arthropods are present, but are too numerous to list and the number of individuals per species is fairly low. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*) and Vesper Sparrows (*Pooecetes gramineus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*). The South Interceptor Ditch north of Woman Creek also provides habitat for Mule Deer (*Odocoileus hemionus*), Herons (*Ardeidae*), and other aquatic wildlife. The Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*), a Colorado Species of Special Concern, is also known to inhabit this area.

Surface Waters: The South Interceptor Ditch is directly north of the Woman Creek Channel. The ditch was constructed to prevent any potential contamination from reaching Woman Creek, and possibly the Standley Lake Reservoir, by intercepting all surface drainage from the RFETS. The ditch drains into Pond C-2.

Automated flow monitoring equipment and radio telemetry hardware are used to remotely monitor flow rates and basic water quality at selected stations.



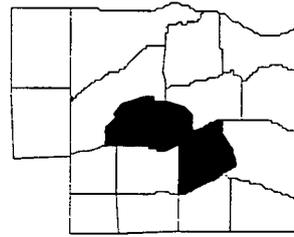
Pond C-2 historically discharged into Woman Creek. The discharge was stopped in the Fall of 1989 at the request of the City of Westminster. Currently no untreated or untested water is released from Pond C-2 on a regular basis. All water that is captured by the pond is diverted to Pond B-5 and then to Pond A-4 for treatment and discharge. Occasionally untreated water from Pond C-2 is discharged directly into the Broomfield Diversion Ditch, provided that the water is tested for contamination and the results comply with regulatory levels. Water flows through Woman Creek to Ponds C-1 and around Pond C-2 throughout the year. Flows from Pond C-1 to Woman Creek can reach 4,000 gallons per minute (gpm) during the spring and can drop to 0 gpm during dry months.

Jurisdictional Wetlands:

Wetlands exist along Woman Creek and in the South Interceptor Ditch north of the creek. Wetlands are also located in the seeps in the NE corner of the quadrant. It is theorized that the seeps were more active during the operation of the east spray field located directly uphill. When the east spray field ceased operation, the seeps became dependent on precipitation and snowmelt. These areas remain classified as wetlands by the USACOE and should be treated accordingly. Ponds C-1 and C-2 are classified as open water, artificial, semi-permanent wetlands by the USFWS. The north shore of Pond C-2 is classified as an emergent, intermittently flooded, temporary wetland by the USFWS.

Floodplain:

There is an area of 100-year floodplain surrounding Woman Creek as it flows through the central portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."



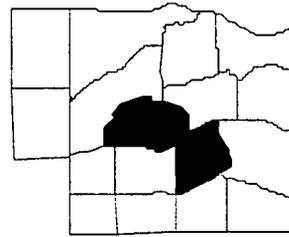
Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

The northern border of the quadrant contains clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

There is a band of Torrifluents in the central portion of the quadrant along Woman Creek. Torrifluents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and they are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

Surface Geology: An outcrop of the Arapahoe Formation composes approximately 90 percent of the surface geology. Valley-fill Alluvium along the woman Creek drainage constitutes 5 percent of the surface geology. The remaining 5 percent of the surface geology is composed of an outcrop of the Rocky Flats Alluvium along the north edge of the quadrant. Valley-fill Alluvium deposits are represented by well graded mixtures of reworked Rocky Flats Alluvium, colluvium, and weathered bedrock found in drainages. The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays.

Utilities: Two natural gas lines cross the quadrant. An 8-inch line owned by the PSC of CO runs E-W across the center of the quadrant. A second 12-inch line owned by the Coors Energy Company runs N-S just west of the Pond C-2 dam. A power line runs from the RFETS to Pond C-1. In addition, there are several aboveground power lines near the east security guard post at the RFETS.



Archaeology: None.

Future Plans: The Woman Creek drainage will be remediated in accordance with plans for OU 5.

Mineral Rights: Unknown.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the north, south, east, and west sides. The RFETS is located immediately NW of the quadrant.

Contamination Profile

Soil Sites: 1-090 and 1-108

Sediment Sites: Reference the Sediment Sampling Locations map.

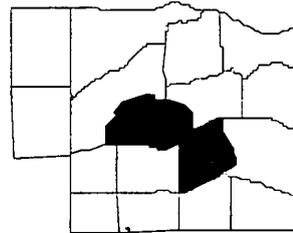
Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: IHSS 111.2 - 111.6 are trenches previously used for the disposal of sanitary sewage sludge, empty drums, uranium-contaminated scrap metal, plutonium-contaminated scrap metal, and asphalt planking. The trenches began operation in 1954. Detailed information is available from the "Rocky Flats History-Rocky Flats Toxicologic Review and Dose Reconstruction Task Report."

IHSS 142.10 and 142.11 are the C-series detention ponds. These ponds may be contaminated with various wastes containing nitrates and low levels of radioactivity, and are scheduled for cleaning in accordance with plans to remediate OU 5.



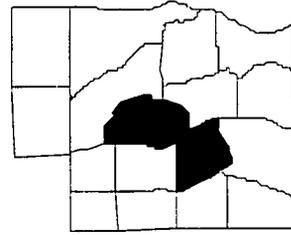
IHSS 209 is a surface disturbance located southeast of the main processing facility. The area was a burrow-pit for gravel used in the construction of RFETS structures. It is believed that waste management and disposal did not occur here. During the Interagency Agreement (IAG) negotiations, EG&G Rocky Flats, Inc. agreed to investigate the site.

IHSS 216.3 is located in the far northeast corner of the quadrant. The IHSS is the South Area of the East Spray Fields. The South Area was in operation from the early 1980s to 1990. The spray fields were a land irrigation site for water from Pond B-3 which received treated sanitary wastewater flows. Following a spill on February 4, 1989, chromic acid was inadvertently released into Pond B-3 and then spray-irrigated onto the spray fields. It is unknown exactly what levels of contamination may be present in the sprayfields.

The spray fields were also used as an irrigation site for the water from Pond B-3 which received treated sanitary wastewater. Following a chromic acid spill on February 4, 1989, chromic acid was inadvertently released to Pond B-3 and then spray-irrigated onto the spray fields. The contamination levels in the East Spray Fields are unknown.

Comments: The quadrant encompasses part of the Operable Unit 2 (OU 2) remediation area. OU 2 is under remediation for high concentrations of Volatile Organic Compounds (VOCs) in the groundwater. TCE, PCE and carbon tetrachloride constitute the majority of the contaminants. A work permit is required to access the northern end of the quadrant because of americium-contaminated soil.

The quadrant is downwind from the RFETS and is potentially susceptible to wind-borne contaminants. Environmental monitoring data indicate elevated levels of radiation in the soil. Two possible sources of this contamination are fallout from the Building 776 fire in 1969 and wind-borne contaminated soil from the 903 Pad. In addition, this area is downstream from the former main processing building.



Surface water site GS07, located on Woman Creek just east of Pond C-1, recorded the following flows during the 1993 water year:

Average Spring Flow: 0.57 cubic feet per second (cfs)

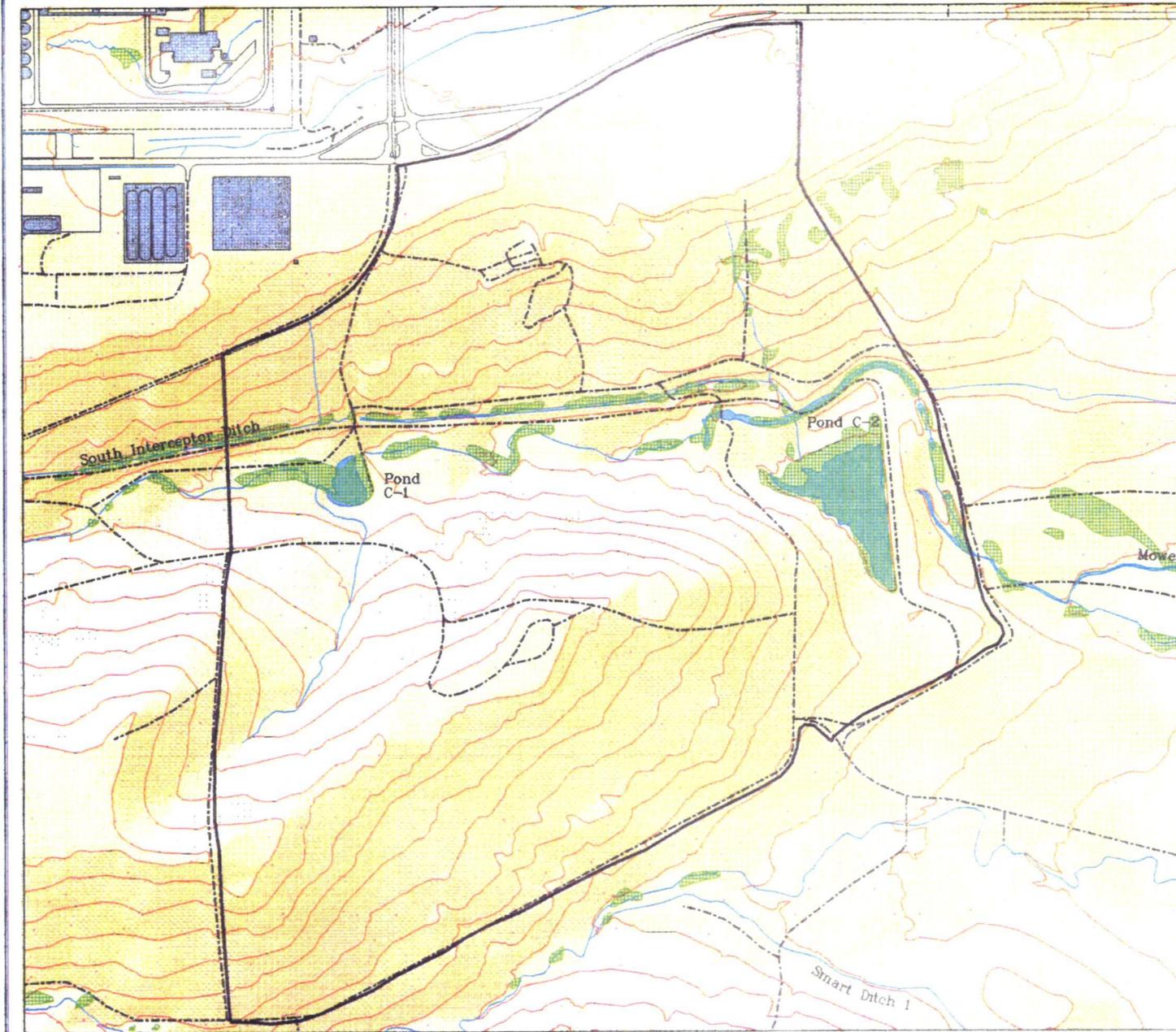
Average Summer Flow: 0.03 cfs

Average Winter/Fall Flow: 0.44 cfs

The flow data listed above should be used as analytical data with an estimated +/- 10% accuracy.

Current data for soil sites, sediment sites, and groundwater wells are accessible through RFEDS.

SE 2-9



SE2 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Engr.,
 EG&G Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - (data unknown)



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

Prepared by:
 **EG&G ROCKY FLATS**
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: Wet94-0001

August 22, 1994

SE2 SOIL TYPES

- Argiustolls
- Paluustolls
- Haplargide
- Mollisol/Rook Outerop complex
- Torrifluvents
- Hapluustolls
- Torriorthents
- Camberthide
- Haplustolls
- Cryofluvents
- Haplaquolls
- Netrargide
- Argiborolls
- Gravel and Clay Pit
- Rock Outerop
- DAM
- WATER

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

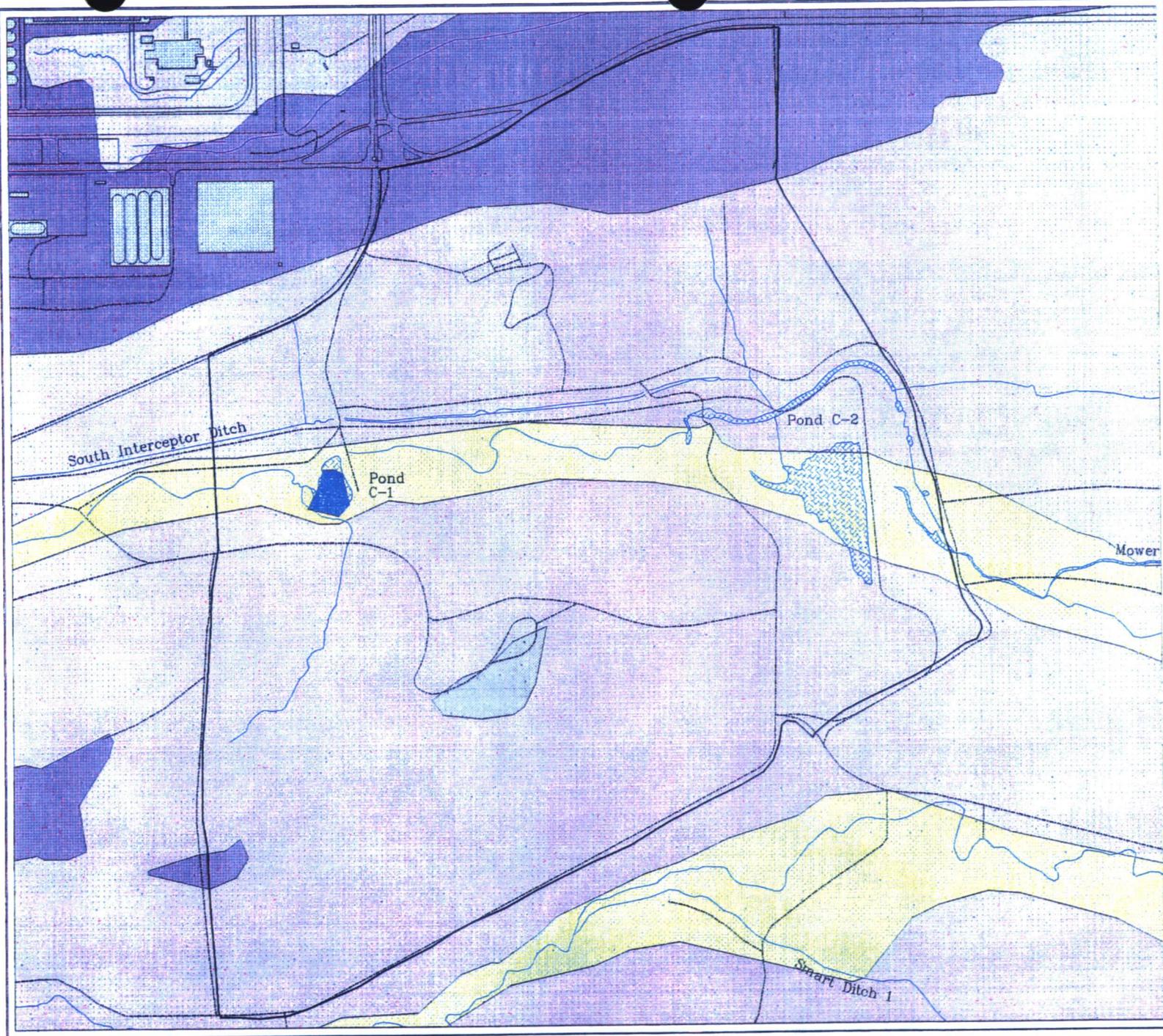
DATA SOURCES:
 Buildings, roads, and fences provided by
 Phillips Corp.,
 1978 Rocky Flats, Inc. - 1981.
 Hydrology provided by
 USGS - John Anderson
 Civil Engineering Service Center
 Unpublished State Area Soil Survey
 Soil mapping scheme suggested by Jim Willey



U.S. Department of Energy
 Rocky Flats Environmental Test Facility Site

Prepared by
EG&G ROCKY FLATS

Rocky Flats Environmental Test Facility Site
 P.O. Box 4044
 Golden, Colorado 80422-0444



SE 2-11

SE 2-15

SE2 SEDIMENT SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Sediment sampling locations

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)



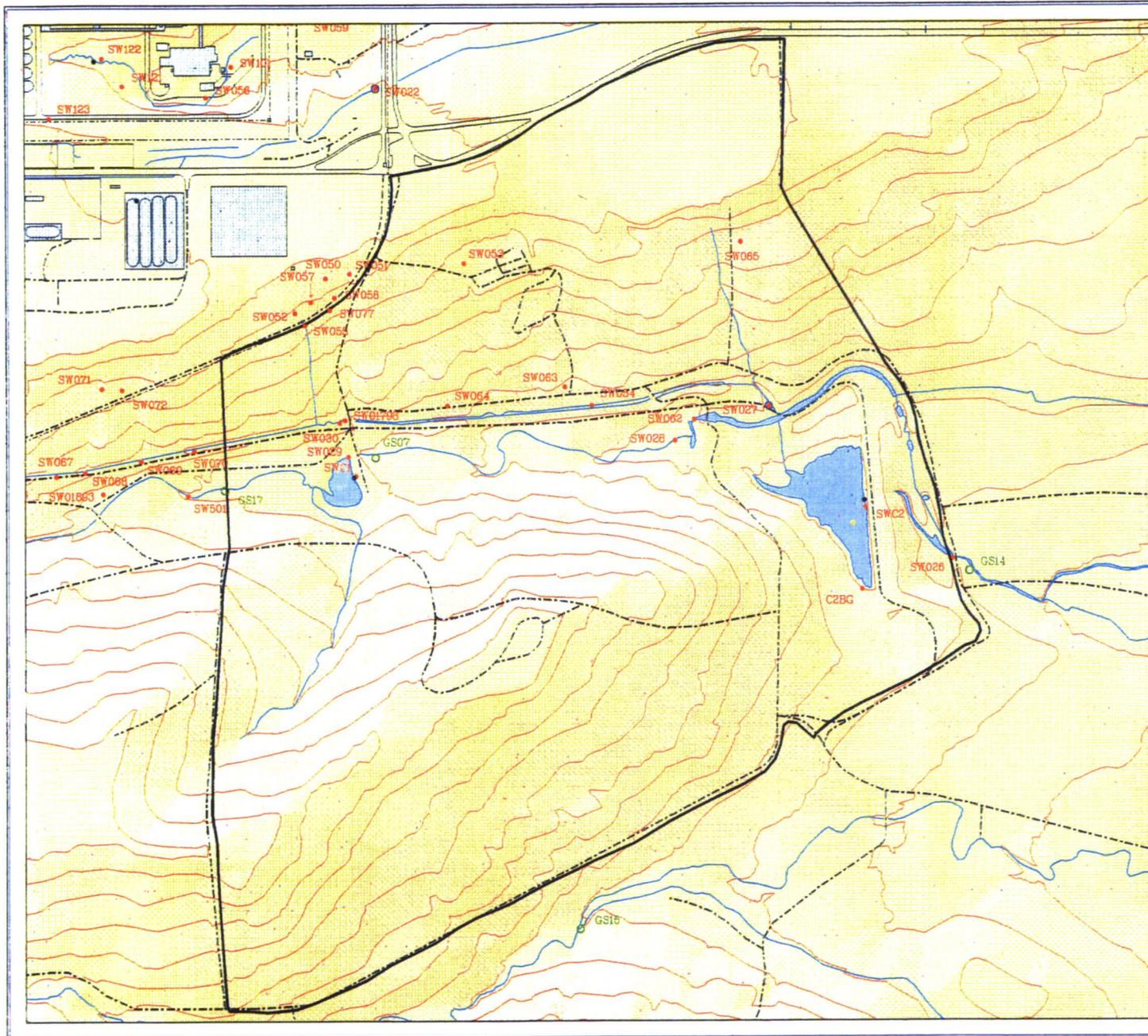
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464

MAP ID: bbs4-0001

August 23, 1994

SE 2-17



SE2 SURFACE WATER SAMPLING LOCATIONS

- Buffer Zone Quadrants
- Surface water stations
- Routine operational sites
- NPDES/FFCA permit monitoring sites
- Gaging stations
- NPDES storm water permit sampling sites
- ▭ Buildings or other structures
- ▭ Lakes and ponds
- Streams, ditches, or other drainage features
- - - Fences
- Contours (20' Intervals)
- - - Rocky Flats boundary
- Paved roads
- - - Dirt roads

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Dept.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)



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

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464

MAP ID: sw94-0001

August 23, 1994

SE2 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)
BOREHOLE LOCATIONS FROM GEOSCIENCES



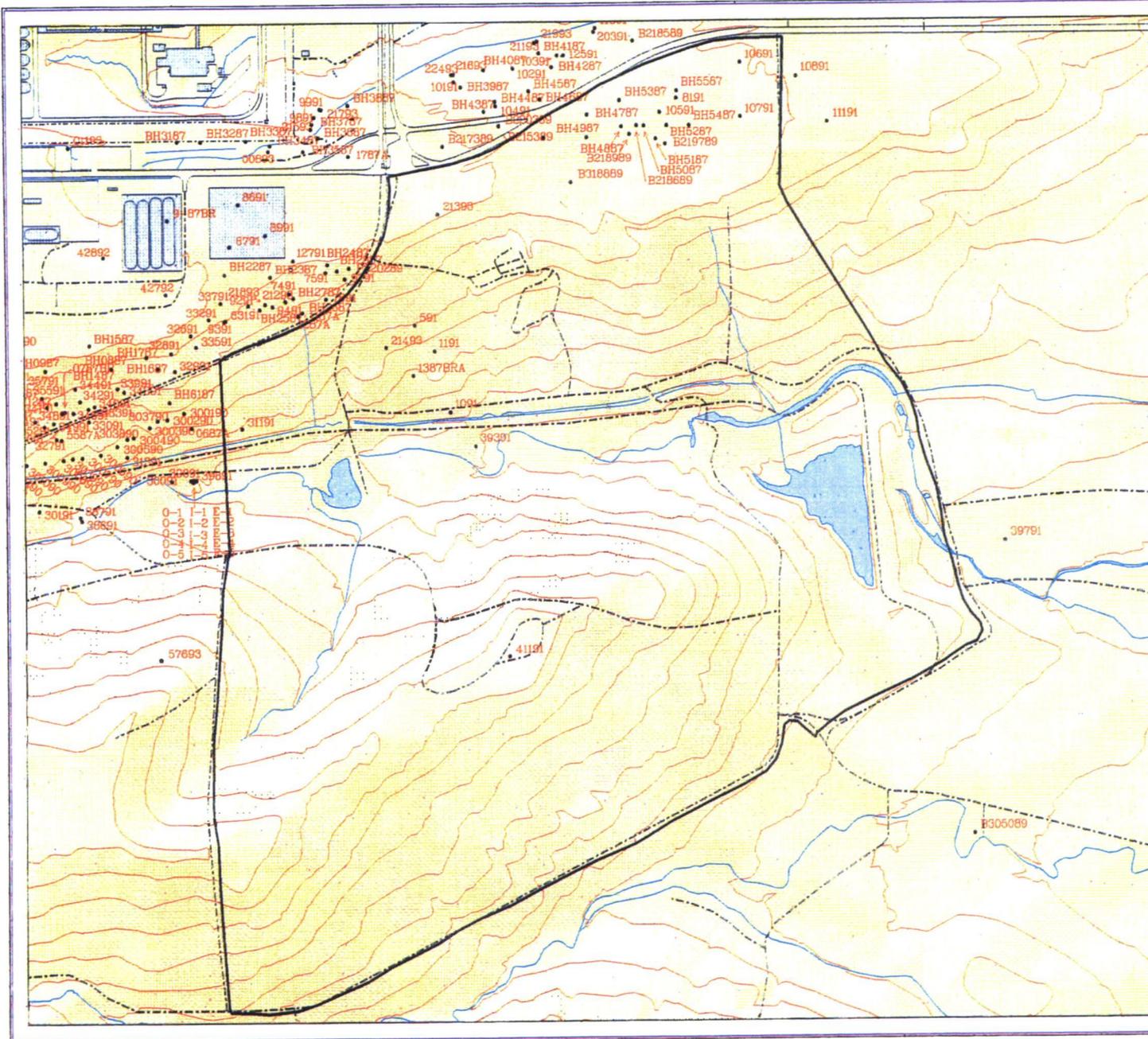
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

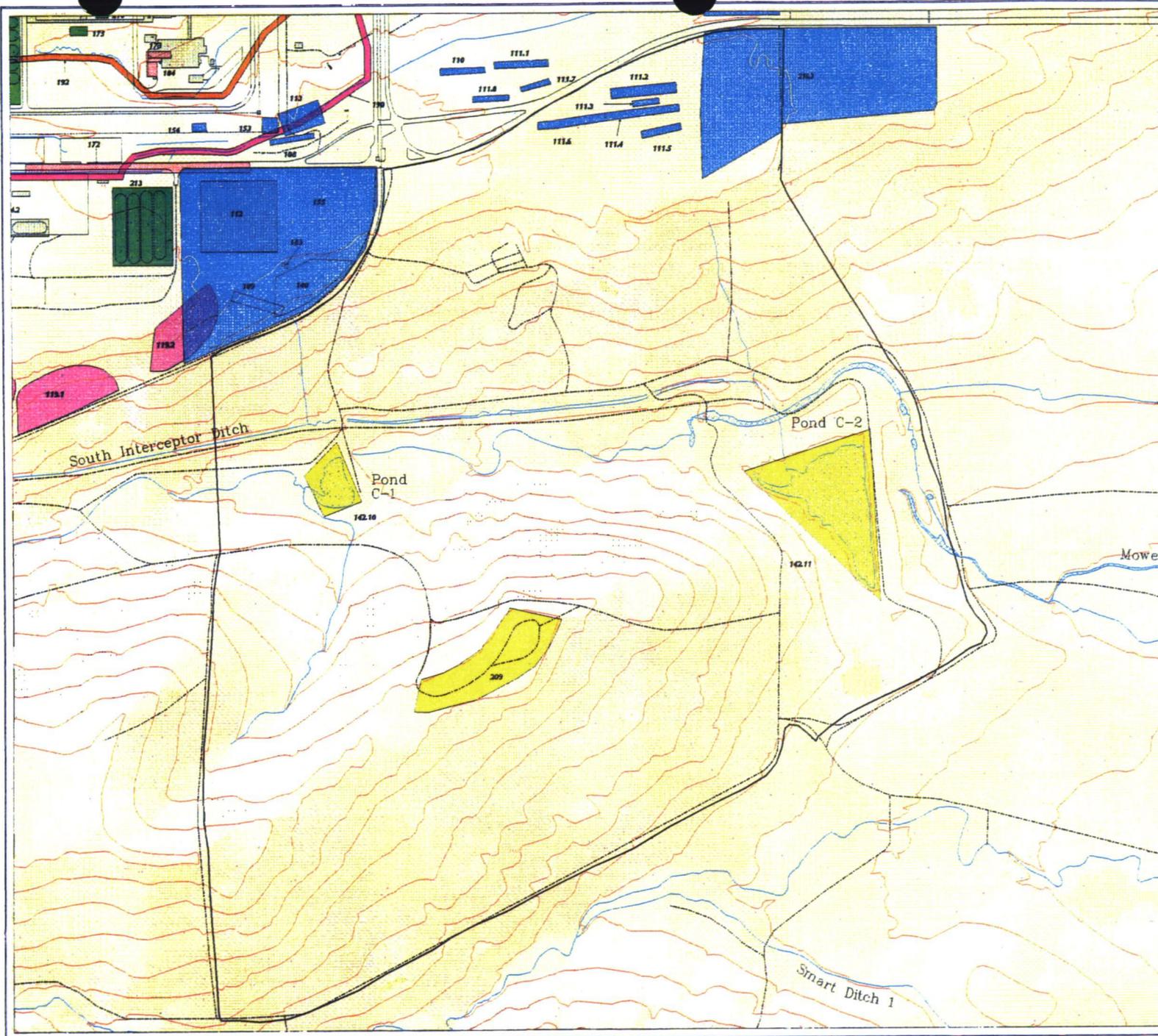
MAP ID: bh04-0001

August 22, 1994

SE 2-21



SE 2-23



SE2 INDIVIDUAL HAZARDOUS SUBSTANCE SITES

- Operable Unit 1
- Operable Unit 2
- Operable Unit 4
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7
- Operable Unit 8
- Operable Unit 9
- Operable Unit 10
- Operable Unit 11
- Operable Unit 12
- Operable Unit 13
- Operable Unit 14
- Operable Unit 15
- Operable Unit 16

- Building or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' Intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

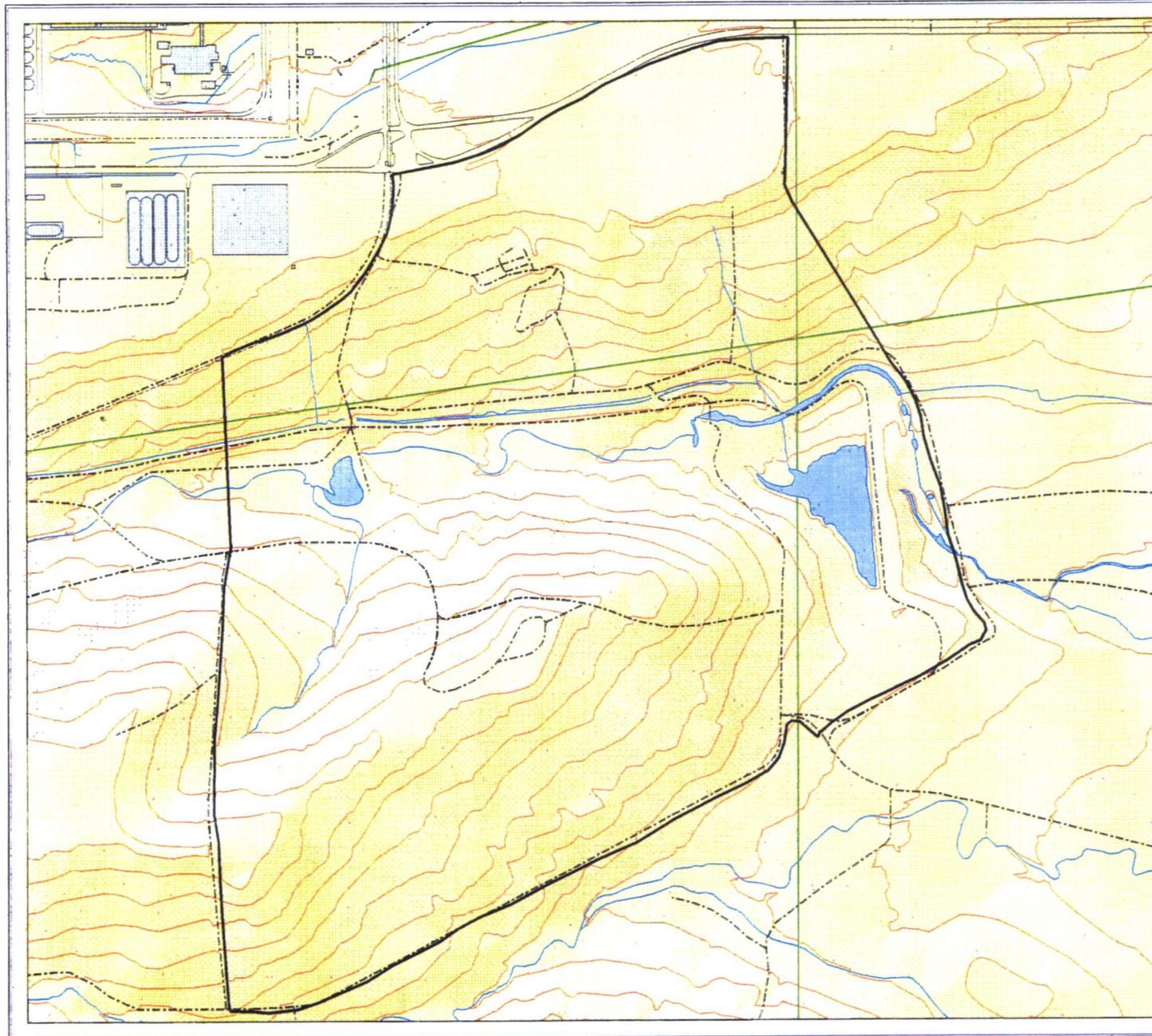
DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Dept.
 1992 Rocky Flats, Inc. - 1801.
 Hydrology provided by
 USGS - (Data released)
 Individual Hazardous Substance Sites (IHS) are
 as identified by the following:
 OUI - IHSI From II Report
 OUI, 4, 7, 11, & 16 - IHSI
 The remaining OUIs are defined by their
 respective Question Unit Mapfiles.



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

Prepared by
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 494
 Golden, Colorado 80402-0494

SE 2-25



SE2 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1981.
Hydrology provided by
USGS - (files unknown)

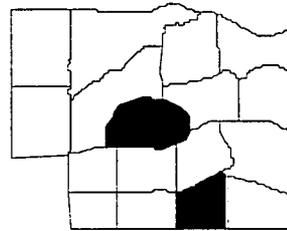


U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util94-0001

August 22, 1994



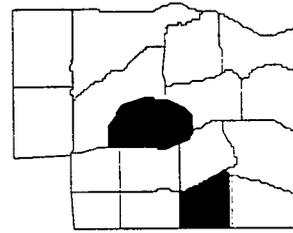
Quadrant: SE 3

Boundaries: **North** - Road running ENE along original Buffer Zone boundary fence.
South - RFETS Buffer Zone south perimeter fence (barbed wire).
East - Line running south from the southern end of the Pond C-2 dam.
West - Line running south from the intersection of the road running N-S crossing the original Buffer Zone boundary fence.

Vegetation: Quadrant SE 3 is primarily classified as Mesic Mixed Grassland, with small areas of Xeric Mixed Grassland. Areas of Short Upland Shrub, intermixed with areas of Bottomland Shrub, Riparian Woodland, and Short Marsh, are present along Smart Ditch as it flows through the northern portion of the quadrant. The Smart Ditch drainage supports Cottonwood trees and some low shrubs. The prominent species of vegetation are: Orange Arnica (*Arnica fulgens*), Western Wheatgrass (*Agropyron smithii*), Canada Bluegrass (*Poa compressa*), Needle and Thread (*Stipa comata*), Yucca (*Yucca glauca*), and June Grass (*Koeleria*).

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland throughout the majority of the quadrant and Short Upland Shrub along Smart Ditch.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. The reptile fauna is represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).



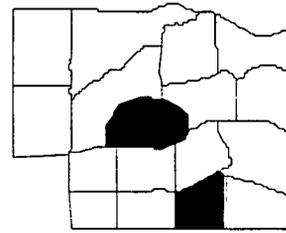
In the Short Upland Shrub area, many species of arthropods are present, and the number of individuals per species is fairly high, and are too numerous to list. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*) and Vesper Sparrows (*Poocetes gramineus*). The foliage along the ditch provides habitat for Mule Deer (*Odocoileus hamionus*) and raptors such as hawks. A pair of Red-tailed Hawks (*Buteo jamaicensis*) nest in a tree near Smart Ditch. This mammal population also is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), and Coyotes (*Canis latrans*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: Smart Ditch flows ENE through the quadrant. There is a stream gage on the ditch above Pond D-1 which has collected flow records since late 1992. The ditch carries water from Rocky Flats Lake to the Standley Lake reservoir and is neither controlled nor affected by the RFETS.

Jurisdictional Wetlands: Wetlands are found along Smart Ditch. The USFWS has classified the area of Smart Ditch in the northern half of the quadrant as emergent, seasonal wetlands.

Floodplain: There is an area of 100-year floodplain surrounding Smart Ditch as it flows through the northern portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."



Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

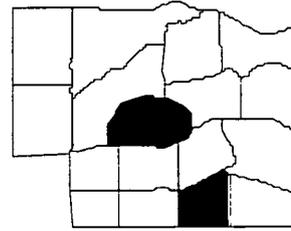
There is a band of Torrifluents in the northern portion of the quadrant along Smart Ditch. Torrifluents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and they are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

The southern section of the quadrant contains two patches of clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

Surface Geology: An outcrop of the Arapahoe formation comprises approximately 60 percent of the surface geology. A landslide deposit on the north side of the hill in the center of the quadrant accounts for 10 percent of the area. Verdos alluvium in the southern portion of the quadrant accounts for an additional 10 percent. The remaining 20 percent of the surface geology is covered by Rocky Flats Alluvium. This alluvium is found in the higher areas along the ridges running E-W across the quadrant.

The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays.

Utilities: Aboveground PSC of CO power lines run NE-SW through the middle of the quadrant. A 12-inch natural gas line owned by the Coors Energy Company runs N-S along the eastern border of the quadrant.



Archaeology: None.

Future Plans: None.

Mineral Rights: Tract 36 - S 1/2 of Section 15 and SW 1/4 of Section 14 - 480.00 acres. The Union Pacific Railroad owns coal rights. All coal, oil and gas reserved, without the right to enter upon or over the land. Right of proprietor of a vein or lode to extract and remove ore therefrom.

Tracts 37 and 38 - SE 1/4 of Section 14 - 160.00 acres. Grantor has all minerals.

Tract 39 - Section 13, and a portion of Section 14 - 660.00 acres. The Union Pacific Railroad owns coal rights. All coal, oil and gas reserved but without the right to enter upon or over surface of said land.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the north, east, and west. The adjoining land from the south is vacant and is currently being used for livestock grazing.

Contamination Profile

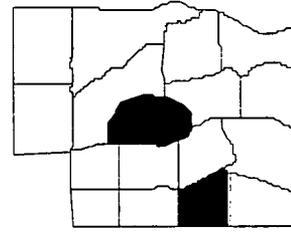
Soil Sites: 1-144, 1-126 and 2-144

Sediment Sites: Reference the Sediment Sampling Locations map.

Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

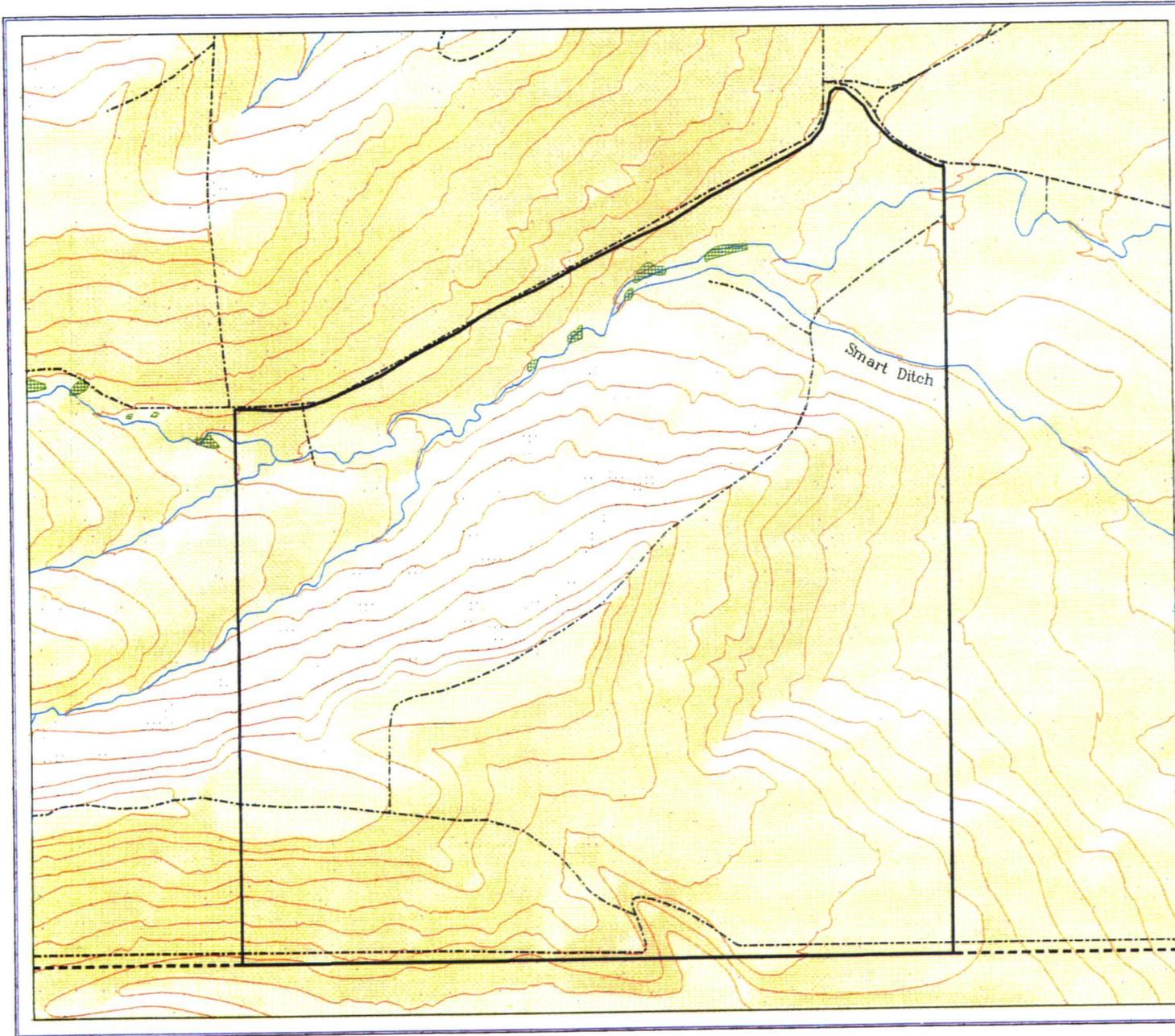
IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.



Comments: Current data for soil sites and groundwater wells are accessible through RFEDS.

Other: There are abandoned barbed wire fences continuing due east where the original perimeter fence veers NE, running along the eastern border, and the western edge of quadrant, then heading north from the RFETS Buffer Zone southern boundary.

SE 3-7



SE3 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATE SOURCE:
Buildings, roads, and fences provided by
Foothills Eng.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - data unknown



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

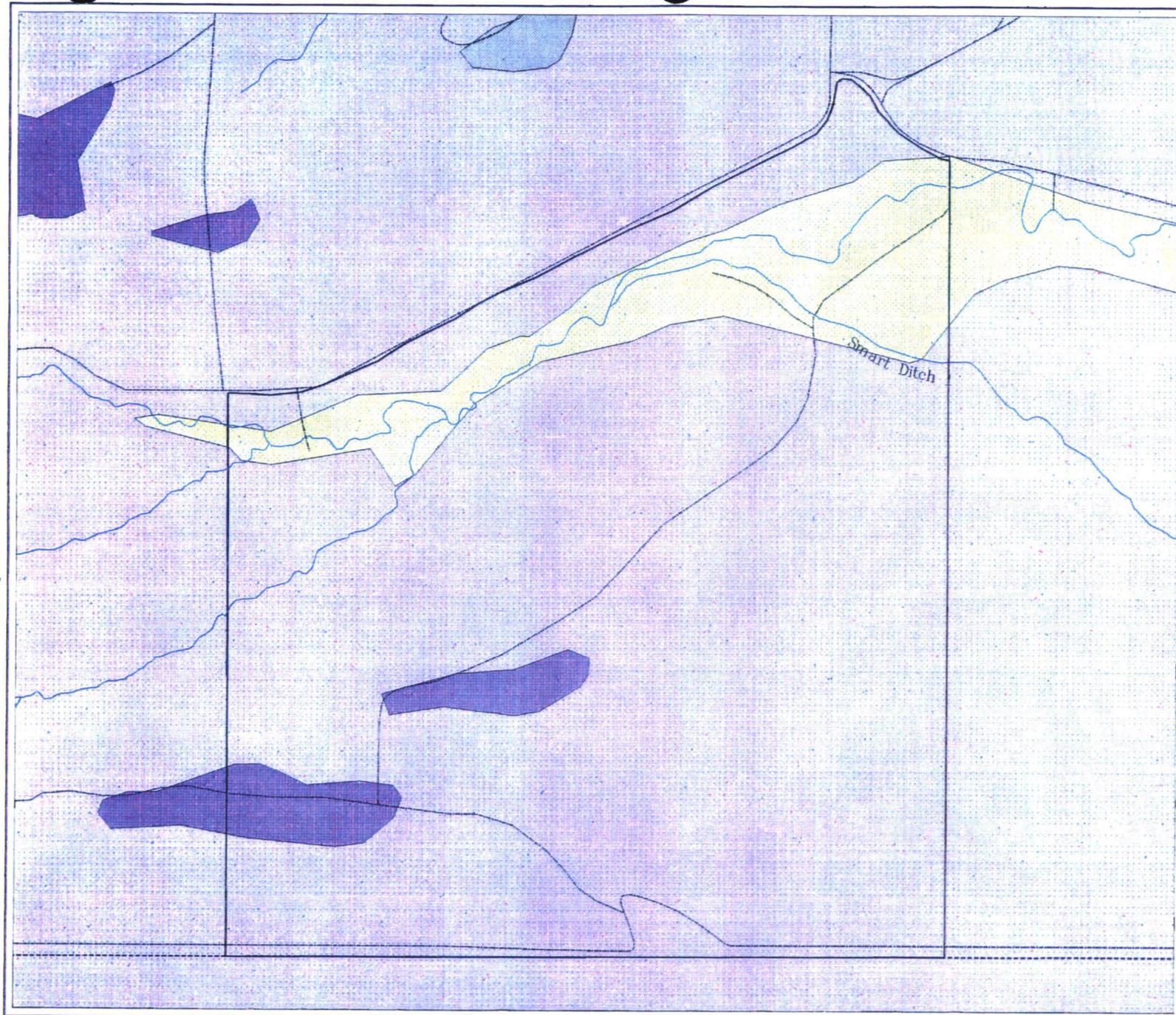
Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Wet94-0001

August 22, 1994

Armed&S181823projectand0005\wetlands\10\qual\wetlands.mxd

SE 3-9



SE3 SOIL TYPES

- Argiustolls
- Paleustolls
- Haplargide
- Mollic/Flak Outcrop complex
- ★ Torrifluvents
- Haplustolls
- Torriorthents
- Camborthide
- Haplustolls
- Cryofluvents
- Haploquolls
- Natrargide
- Argiborolls
- Gravel and Clay Pitt
- Rock Outcrop
- DAM
- WATER

- Buildings or other structures
- Lake and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

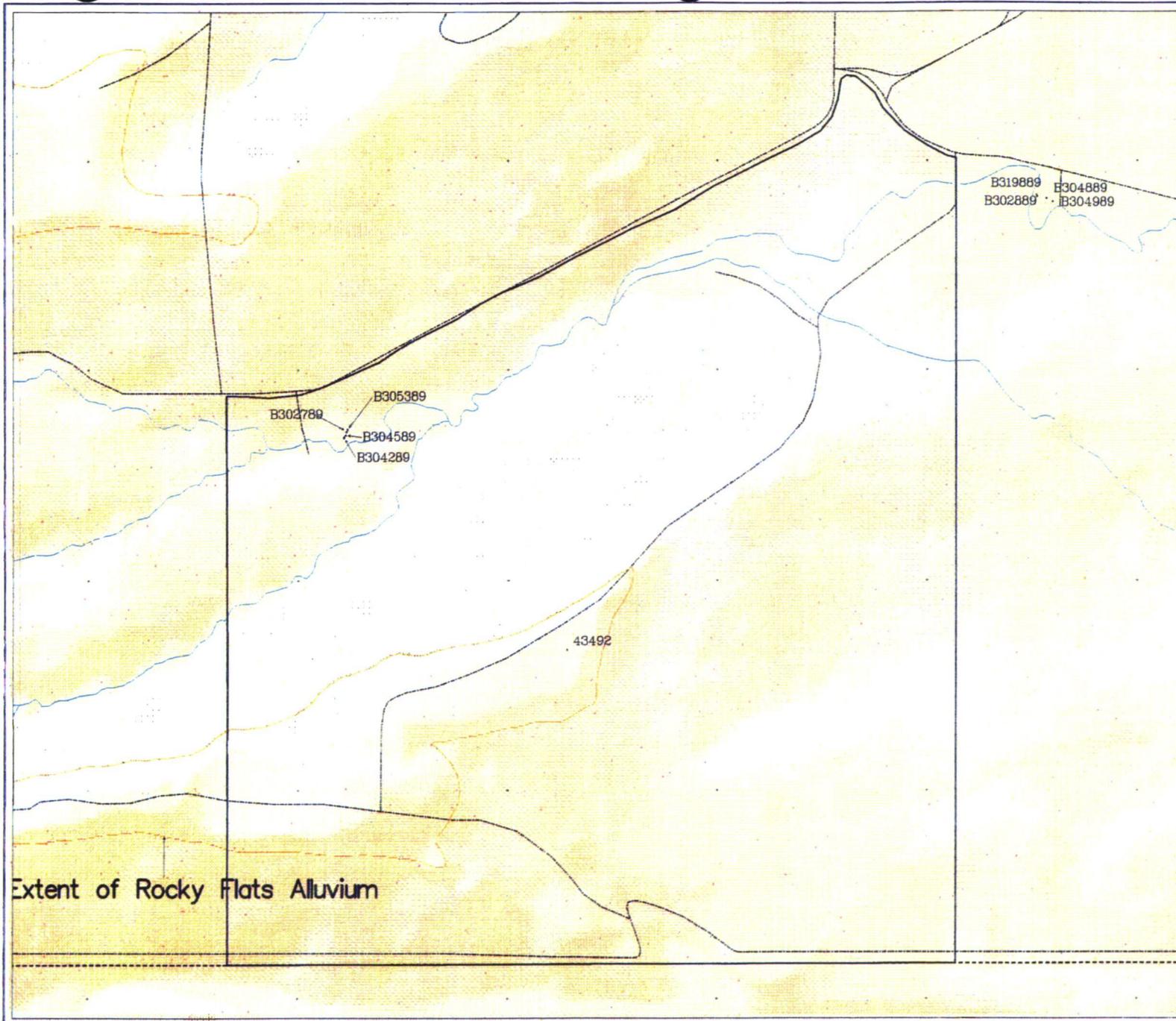
DATA SOURCES
 Buildings, roads, and fences provided by
 Rockwell Corp.
 1988 Rocky Flats, Inc. - 1987.
 Hydrology provided by
 USGS - State University
 Soil Characteristics Service
 Unconsolidated Hydrologic Data
 Soil mapping scheme originated by John White



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

Prepared by:
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 490
 Golden, Colorado 80602-0490

SE 3-15



SE3 GROUNDWATER MONITORING WELL LOCATIONS MAP

- Boundary Wells
 - CERCLA Characterization Wells
 - RCRA Regulatory
 - RCRA Characterization Wells
 - Special Purpose Wells
- Groundwater Monitoring Program Wells**
- ◻ Bedrock
 - ◻ Alluvium
 - ◻ Alluvium/Bedrock
- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ◆ Abandoned Groundwater Monitoring Wells

- Other**
- ▨ Buildings and other structures
 - Ponds and Lakes
 - ~ Extent of Rocky Flats Alluvium

- Standard Map Features**
- Fences
 - - - Rocky Flats boundary
 - Paved roads
 - - - Dirt roads

DATA SOURCES:
 Well locations from Groundwater spreadsheet, 4/94
 Buildings, roads, and fences provided by Facilities Dept., Rocky Flats, Inc. - 1991.
 Hydrology provided by USGS - (data unknown)

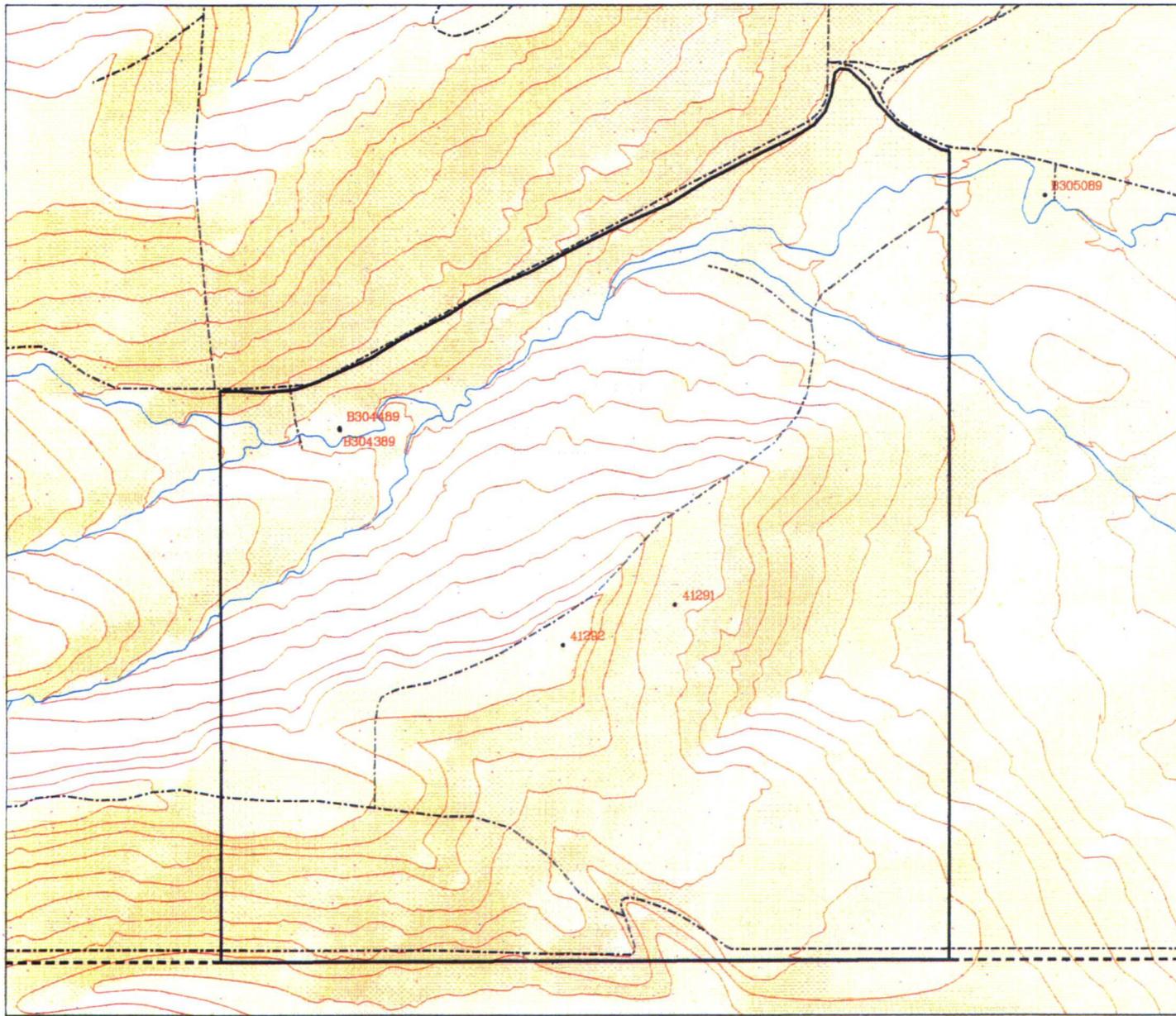


Extent of Rocky Flats Alluvium

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

Prepared by:
SE3 ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 499
 Golden, Colorado 80422-0499

SE 3-17



SE3 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCE:
Buildings, roads, and fences provided by
Foothills Eng'g,
Rocky Flats, Inc. - 1981.
Hydrology provided by
USGS - 1980
BOREHOLE LOCATIONS FROM ARCHIVES



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

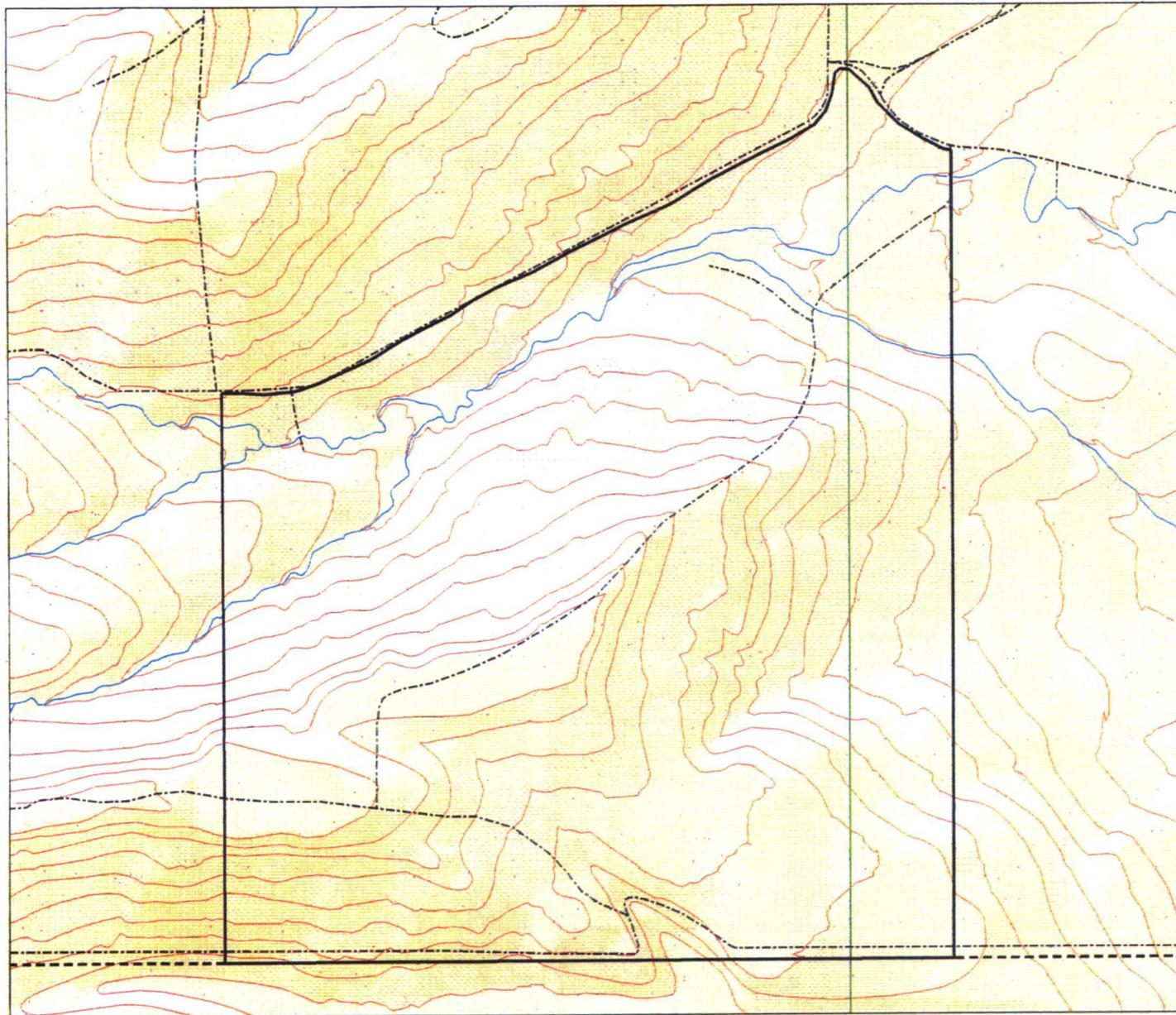
Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: bh94-0001

August 22, 1994

From: 18133proj\se3\EG0001\bh-se3-17-17\eg&g\se3\se3-borehole-map.gsm

SE 3-19



SE3 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Eng.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)

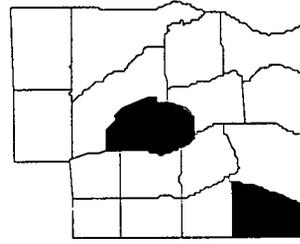


U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util94-0001

August 22, 1994

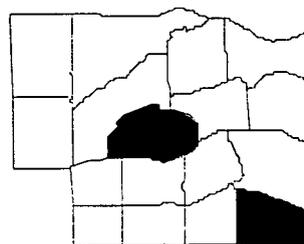


Quadrant: SE 4

Boundaries: **North** - Road from NW Corner of the quadrant ESE to Indiana Street (Jefferson County 17).
South - RFETS Buffer Zone south perimeter fence (barbed wire).
East - Indiana Street (Jefferson County 17).
West - Line running south from the southern end of the Pond C-2 dam.

Vegetation: Quadrant SE 4 is primarily classified as Reclaimed Grassland (artificially produced grassland community), with a small area of Mesic Mixed Grassland in the southwest portion of the quadrant. Areas of Riparian Woodland, intermixed with areas of Bottomland Shrub and Short Upland Shrub, are present along Smart Ditch as it flows through the northern portion of the quadrant. Areas of Wet Meadow and Marsh surround Pond D-1 and Pond D-2. The pond levels are dependent upon releases from the Smart Ditch drainage and storm events. The drainages in the quadrant support Cottonwood trees and low shrubs. The dominant species of vegetation in this quadrant are: Canada Bluegrass (*Poa compressa*), Smooth Brome (*Bromus inermis*), Yellow Sweetclover (*Melilotus officinalis*), Cat-tail (*Typha latifolia*), and Western Wheatgrass (*Agropyron smithii*).

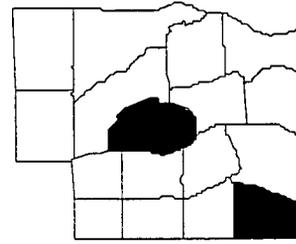
Wildlife Habitat: The major wildlife habitats consist of areas of Reclaimed Grassland throughout the majority of the quadrant, and Riparian Woodland along Smart Ditch.



In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. The reptile fauna is represented by the Bull Snake (*Pituophis melanoleucus*) and Prairie Rattlesnake (*Crotalis viridis*). The bird population consists of Meadowlarks (*Sturnella neglecta*), House Finches (*Carpodacus mexicanus*), Vesper Sparrows (*Pooecetes gramineus*), Grasshopper Sparrows (*Ammodramus savannarum*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*); a colony of Black-tailed Prairie dogs (*Cynomys ludovicianus*), and Mule Deer (*Odocoileus hemionus*).

In the Riparian Woodland areas, many species of arthropods are present and are too numerous to list. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*), Racer (*Coluber constrictor*), and Plains Garter Snake (*Thamnophis radix*). The bird population consists of primarily Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), Red-winged Black Birds (*Agelaius phoeniceus*), and Mallards (*Anas platyrhynchos*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Desert Cottontails (*Sylvilagus audobonii*), Porcupines (*Erethizon dorsatum*), and Mule Deer (*Odocoileus hemionus*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

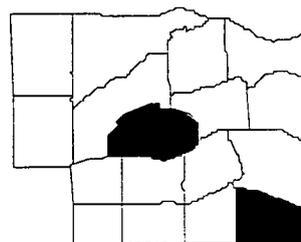


Surface Waters: Smart Ditch flows SE through the quadrant. There is no flow data available for flows in the ditch. The ditch carries water from Rocky Flats Lake to the Standley Lake reservoir and is neither controlled nor affected by RFETS. The D-series ponds are in line with the ditch and serve as water storage and flood control for the ditch. The flow in Smart Ditch and water levels in the ponds are controlled by Charlie McKay who owns and exercises all of the water rights for the ditch and ponds. Pond D-1 is generally at or near capacity year-round. Pond D-2 is occasionally dry and is near capacity only during the wet spring season and after major precipitation events. Pond D-2 is connected to a french drain which sub-irrigates land east of the RFETS.

Jurisdictional Wetlands: Wetlands lie along Smart Ditch and between D-1 and D-2 ponds. The USFWS has classified the area of Smart Ditch in the northern half of the quadrant and the area between the D-series ponds as emergent seasonal wetlands. Ponds D-1 and D-2 are classified as open water, artificial, and semi-permanent wetlands. Although pond D-2 is occasionally dry it is still considered a wetland and should be treated as such until the USACOE changes the status.

Floodplain: There is an area of 100-year floodplain surrounding Smart Ditch, Pond D-1, and Pond D-2, as they flow through the southern portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.



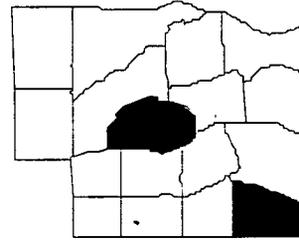
There is a band of Torrfluvents in the northern portion of the quadrant along the drainage between Smart Ditch and Woman Creek. Torrfluvents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and they are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

In the southern section of the quadrant, surrounding Pond D-2, there is an area of Haplaquolls, which are mostly "wet" soils associated with drainage bottoms. Haplaquolls are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

Surface Geology: An outcrop of the Laramie Formation comprises approximately 50 percent of the surface geology of the quadrant. The majority of this outcrop is located in the southern half of the quadrant to the south of Smart Ditch. Valley-fill and Terrace Alluviums along Smart Ditch and the D-series ponds constitute the remaining 50 percent of the surface geology. The Laramie Formation is approximately 800 feet thick and is comprised of two distinct intervals. The lower portion is 300 feet thick and is composed of a sandstone and coal interval, while the upper portion is approximately 500 feet thick and composed of claystone. The claystones are predominantly light to medium gray and kaolinitic. Valley-fill Alluvium deposits are represented by well graded mixtures of reworked Rocky Flats Alluvium, colluvium, and weathered bedrock found in drainages. High resolution and deep seismic acquisition activities have shown the existence of small, low-angle thrust faulting present in bedrock claystones. These paleo-thrust faults are considered to be inactive and the probability for seismic activity related to these structures is low.

Utilities: Aboveground PSC of CO power lines run NE-SW across the NW Corner of the quadrant and N-S along Indiana Street.

Archaeology: None.



Future Plans: Maintenance of Smart Ditch and the D-series detention ponds will continue indefinitely.

Mineral Rights: Tract 39 - Section 13 and a portion of Section 14 - 660.00 acres. The Union Pacific Railroad owns coal rights. All coal, oil and gas reserved but without the right to enter upon or over surface of said land.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the north and west. The adjoining land east of Indiana Street is vacant. The land south of the quadrant is zoned for agricultural use and vacant land. The lands south and east of the quadrant are currently used for pasture and agriculture.

Contamination Profile

Soil Sites: 2-126

Sediment Sites: Reference the Sediment Sampling Locations map.

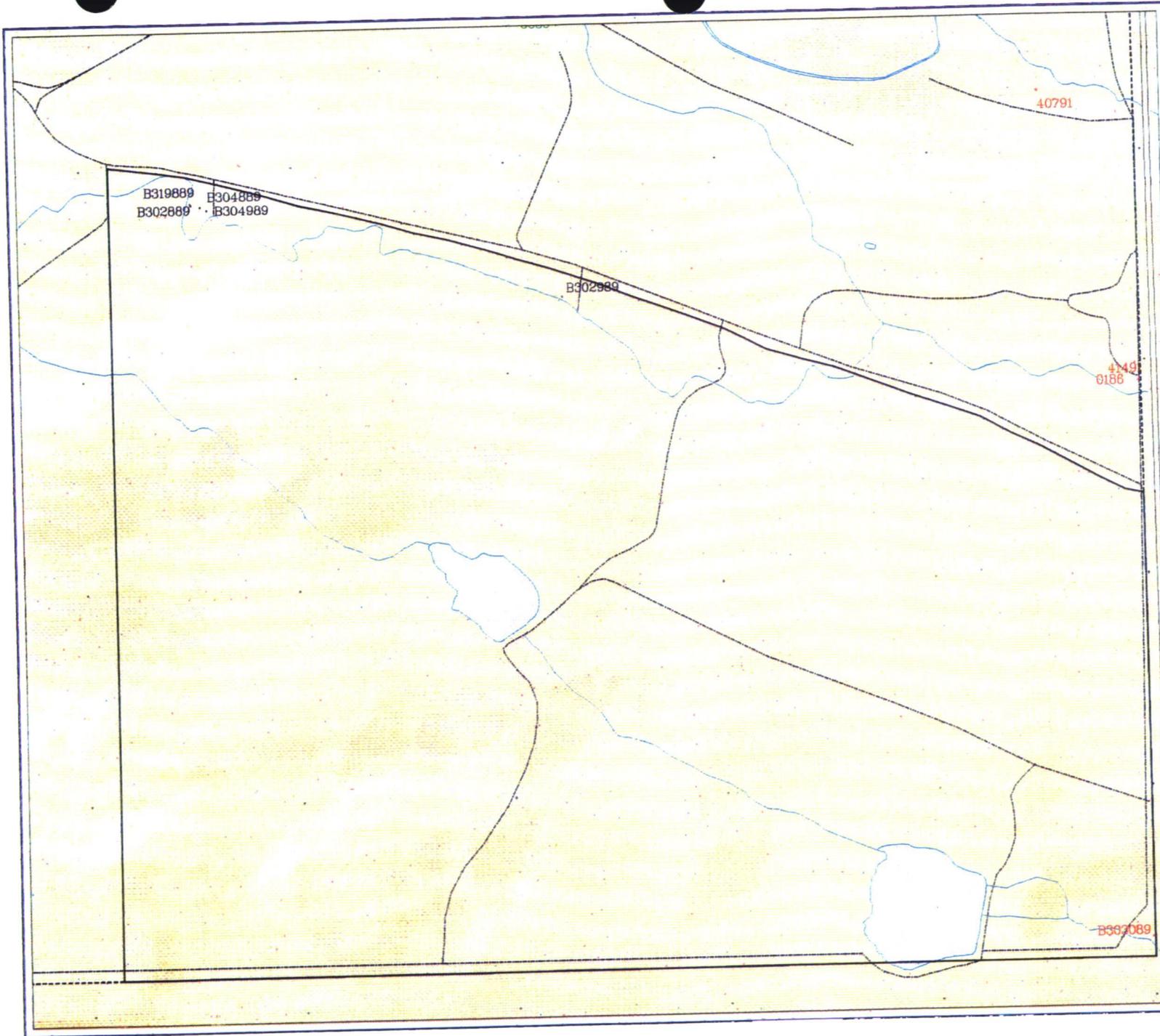
Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: The quadrant is downwind from the RFETS and potentially is susceptible to wind-borne contaminants. Environmental monitoring data indicate elevated levels of radiation in the soil. Two possible sources for this contamination are fallout from the Building 776 fire in 1969 and wind-borne contaminated soil from the 903 Pad. In addition, this area is downstream from the main processing facility. Current data for soil sites and groundwater wells are accessible through RFEDS.

SE 4-13



SE4 GROUNDWATER MONITORING WELL LOCATIONS MAP

- Boundary Wells
- CERCLA Characterization Wells
- RCRA Regulatory
- RCRA Characterization Wells
- Special Purpose Wells

- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock

- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ✦ Abandoned Groundwater Monitoring Wells

- Other**
- ▨ Buildings and other structures
 - Ponds and Lakes
 - Extent of Rocky Flats Alluvium

- Standard Map Features**
- Fences
 - Rocky Flats boundary
 - Paved roads
 - Dirt roads

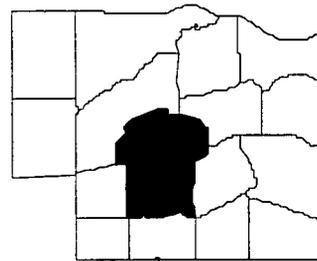
DATA SOURCE:
Well locations from Steamtown spreadsheet, 4/99
Buildings, roads, and fences provided by
Facilities Dept.,
EG&G Rocky Flats, Inc. - 1997.
Hydrology provided by
USGS - (Site unknown)



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

Prepared by:
EG&G ROCKY FLATS

Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80422-0484

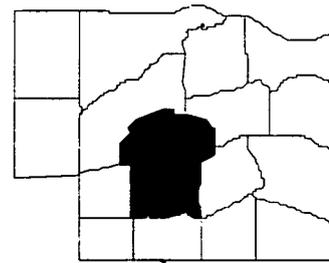


Quadrant: SW 1

Boundaries: North - Inner security fence.
South - Road following original Buffer Zone boundary fence.
East - Line from west side of the 903 Pad south to road running due south to the original Buffer Zone boundary fence.
West - Line running N-S from RFETS water tower to original Buffer Zone boundary fence.

Vegetation: Quadrant SW 1 is primarily classified as Mesic Mixed Grassland, with small areas of Reclaimed Grassland (artificially produced grassland communities) and Xeric Mixed Grassland also present. Areas of Bottomland Shrub and Riparian Woodland, intermixed with areas of Short Upland Shrub and Marsh, are present along Woman Creek as it flows through the northern portion of the quadrant. The drainages in this quadrant support some low shrubs and trees. The dominant species of vegetation in this quadrant are: Sandbar Willow (*Salix exigua*), Winter-Cress (*Orthocera barbarea*), Western Wheatgrass (*Agropyron smithii*), Kentucky Bluegrass (*Poa pratensis*), Blue Grama (*Boutelous gracilis*), Canada Bluegrass (*Poa compressa*), Snowberry (*Symphoricarpos occidentalis*), and Cheat Grass (*Bromus tectorum*).

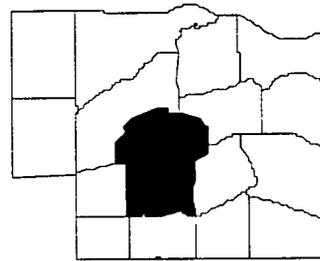
Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland throughout the quadrant, Xeric Mixed Grassland in the southeast portion of the quadrant, Reclaimed Grassland towards the northern portion, and Shrub and Marsh along Woman Creek.



In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*) and Prairie Rattlesnake (*Crotalis viridis*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

In the Shrub areas, many species of arthropods are present (too numerous to list). Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Mallards (*Anas platyrhynchos*), Red-tailed Hawks (*Buteo jamaicensis*), and Great Horned Owls (*Bubo virginianus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*). The foliage along the creek provides habitat for Mule Deer (*Odocoileus hemionus*), herons and others aquatic species. White-tailed Deer (*Odocoileus virginianus*) have been observed in the heavy brush along the creek and trench.

The interceptor trenches north of Woman Creek also provide habitat for Mule Deer (*Odocoileus hemionus*), herons (*Ardea herodias*), and other aquatic life. Wetlands in the seeps south of Woman Creek provide habitat for birds indigenous to marshlands; Red-winged Blackbird (*Agelaius phoeniceus*) and the Great Blue Heron (*Ardea herodias*).



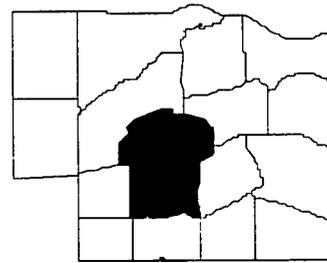
In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: Two branches of Woman Creek flow through the quadrant. The branches join near the center of the quadrant forming Woman Creek. Antelope Springs are located on the hillsides in the Woman Creek drainage. These seeps are perennial and typically have a low flow dependent upon groundwater elevation. The larger seeps flow year-round while the smaller ones are dependant upon seasonal precipitation. The largest seep in the area forms the headwaters of the southern branch of Woman Creek.

Jurisdictional Wetlands: Wetlands exist along Woman Creek and the small tributary south of the creek. There are additional wetlands in the large seep located on the hillside south of the creek. The USFWS has classified the area of wetlands along Woman Creek and its tributary to the south as emergent, seasonal wetlands.

Floodplain: There is an area of 100-year floodplain surrounding Woman Creek and Woman Creek Tributary D as they flow through the northern portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.



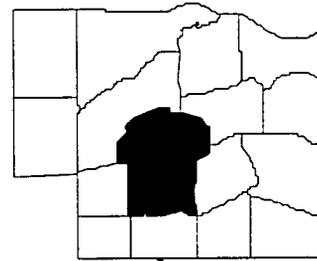
There is a band of Torrfluvents in the northern portion of the quadrant along Woman Creek. Torrfluvents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and they are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

The southern section of the quadrant contains some clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

Surface Geology: Approximately 30 percent of the surface geology of the quadrant is comprised of Rocky Flats Alluvium. This alluvium covers the flats found throughout the RFETS, particularly on the western side. In this quadrant the alluvium is found south and west of the Woman Creek drainage on the flats above the creek. The remaining 70 percent of the surface geology is covered by an outcrop of the Arapahoe Formation. The outcrop is found throughout the Woman Creek drainage and the tributary to the south. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays.

The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation.

Utilities: An aboveground PSC of CO power line runs E-W across the northern end of the quadrant turning due north near the middle of the quadrant and running into the main facility. An abandoned 8-inch natural gas line lies directly beneath the power line. This line was permanently replaced by another PSC of CO 6-inch line located along the railroad spur outside the main facility security fence.



Archaeology: State Site 5JF474 - Firebreak Site. This site is a former stagecoach stop located along the firebreak due south of the RFETS water tower and old apple orchard. The structure is no longer standing although a portion of a root cellar is still visible and accessible along the south side of the firebreak. Several artifacts dating from the late 19th and early 20th centuries have been found at the site. The area was once referred to as the "Antelope Ranch."

State Site 5JF483 - Orchard. Located north of the Firebreak Site, the orchard consists of 14 apple trees. The orchard is thought to have been used when the Antelope Ranch operated. The trees are now abandoned and are the subject of a Colorado State University (CSU) vegetation study.

The aforementioned sites are not included in the NRHP because they are in poor condition, exhibit no rare construction, and have no historic interest.

Archaeological maps for the RFETS were omitted from this document to protect the integrity of the cultural resources. If the location of archaeological sites must be known, contact the Environmental Policy Implementation Division.

Future Plans: The Woman Creek drainage will be remediated in accordance with plans for OU 5.

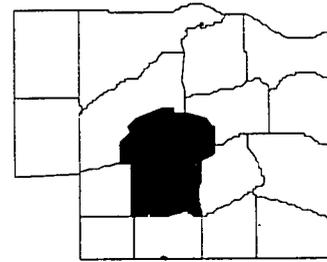
Mineral Rights: Unknown.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the south, east and west sides. The main plant facility lies north of the quadrant.

Contamination Profile:

Soil Sites: None.

Sediment Sites: Reference the Sediment Sampling Locations map.



Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: IHSS 102 was used as a burial pit for oil sludge in 1958. Approximately 30 to 50 barrels of oil sludge from No. 6 fuel oil tanks were disposed of here in 1958. The oil sludge is the primary pollutant in this area.

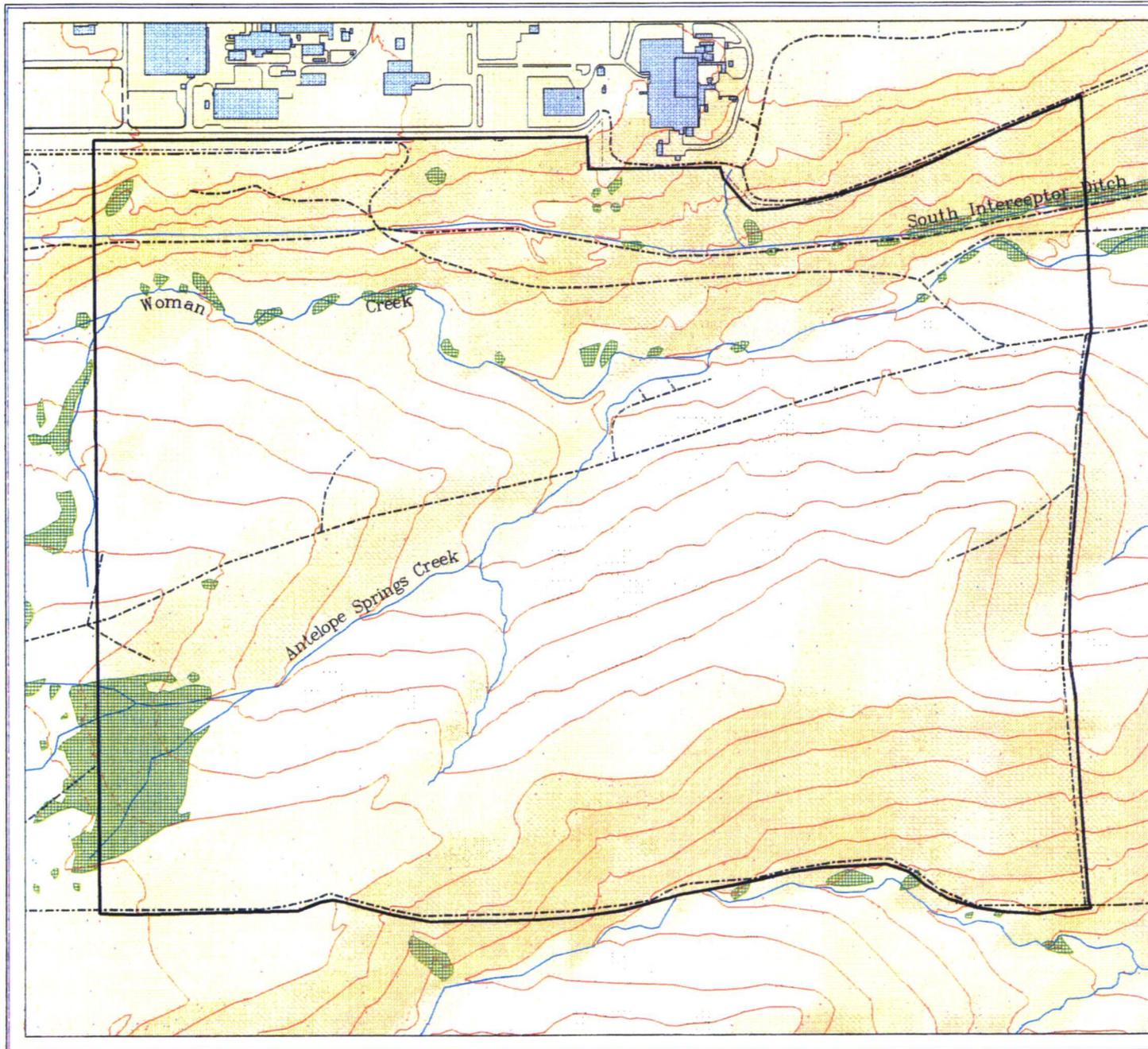
IHSS 106 is an outfall for a clean out pipe for an overflow line from the Building 881 cooling tower. The line is a 6-inch vitrified clay pipe. The last known discharge from the pipe was in December of 1977.

IHSS 107 is the site of a leak of No. 6 fuel oil. No. 6 fuel oil was discovered leaking from the hillside in May of 1973. It is believed that the oil was leaking from the storage tanks on the south side of Building 881. Contaminated soil saturated with oil was removed and placed in the present landfill.

IHSS 115 is the site of the original RFETS landfill which operated from 1952 to 1968. This site, in the hillside immediately south of the RFETS, was a disposal site for general plant waste. Twenty kilograms of depleted uranium ash were inadvertently dumped in the landfill and are now the major pollutants in the IHSS. Both IHSS 107 and IHSS 115 are included in the "OU 5 Remediation Plan."

Current data for soil sites, sediment sites, and groundwater wells are accessible through RFEDS.

SW 1-7



SW1 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)



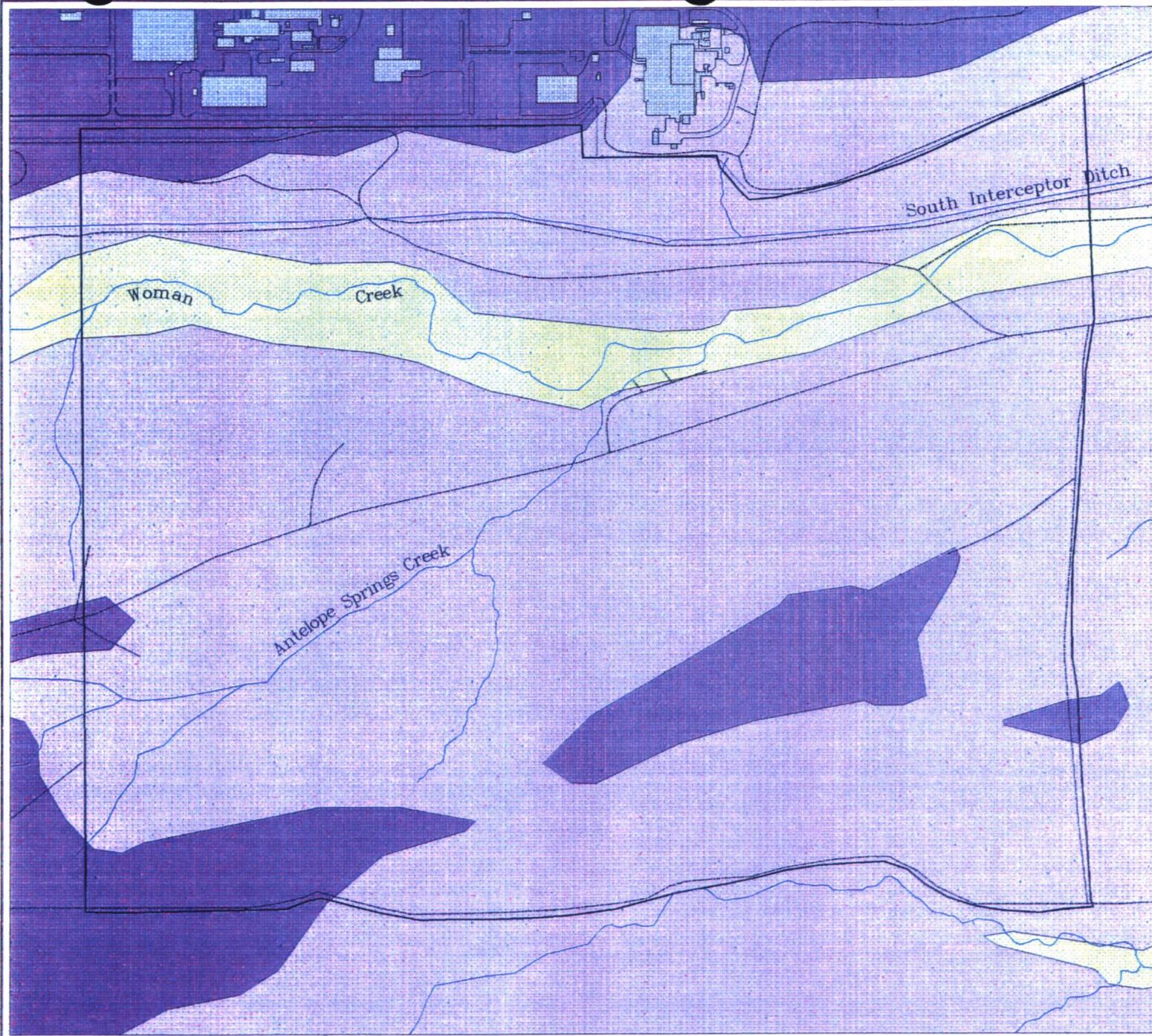
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Wet94-0001

August 22, 1994

SW 1-9



SW1 SOIL TYPES

- Argiustolls
- Paleustolls
- Haplargids
- Mollisol/Rock Outcrop complex
- Torrifluvents
- Haplustolls
- Torrorthents
- Camborthids
- Haplustolls
- Cryofluvents
- Haploquolls
- Netrargids
- Argiborolls
- Gravel and Clay Pit
- Rock Outcrop
- DAM
- WATER
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

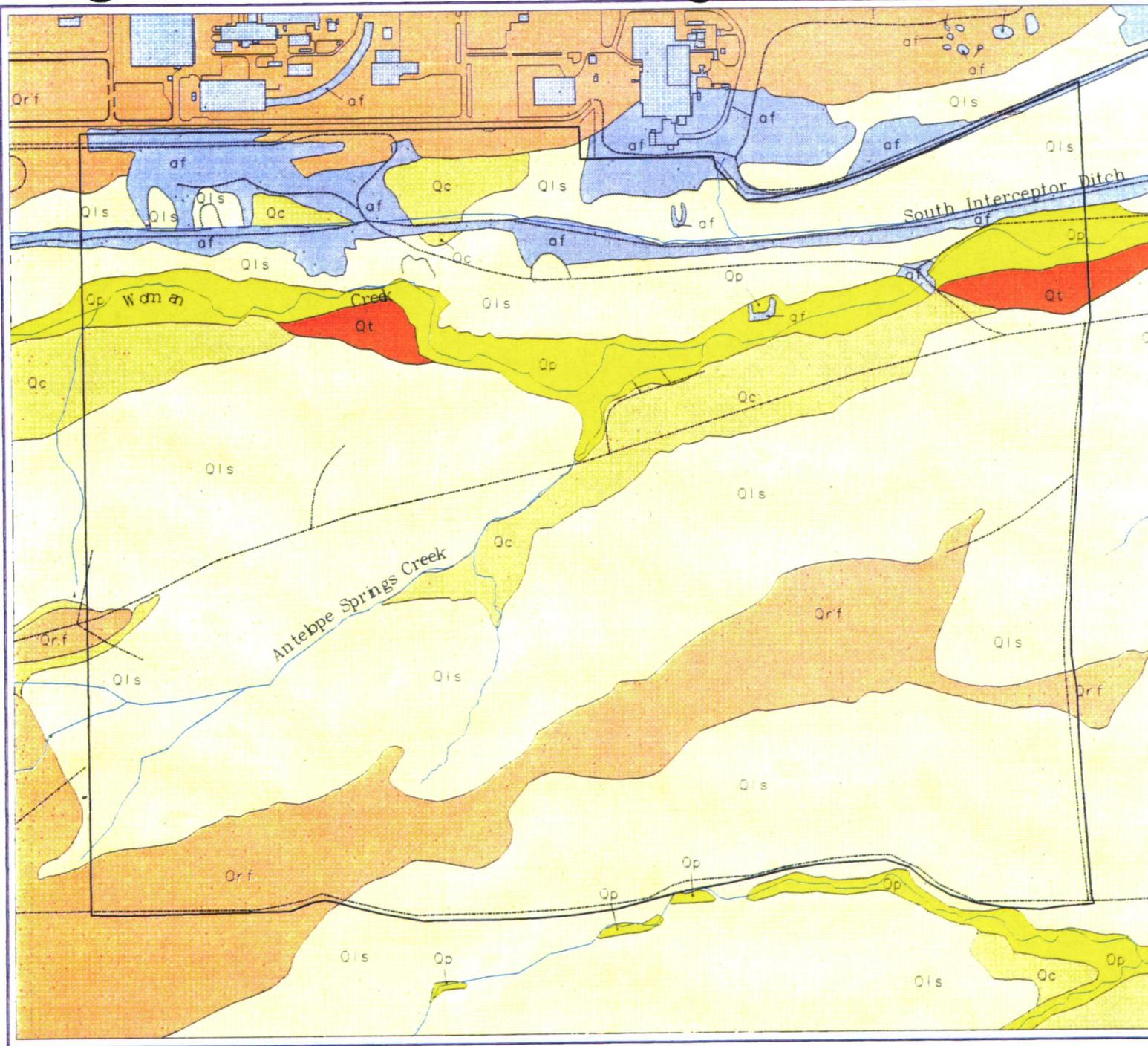
DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Dept.,
 ERDC Study File, Jan - 1981.
 Hydrology provided by
 USGS (data unverified)
 Soil Characteristics provided from
 University of Idaho Area Soil Survey
 Soil mapping outline originated by Jim Walling



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

Prepared by
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 464
 Golden, Colorado 80423-0464

II-1 MS



SW1 GEOLOGIC UNITS



- af - Artificial fill
- Qp - Post-Piney Creek Alluvium
- Qa - Terrace alluvium
- Qs - Bloom alluvium
- Qc - Colluvium
- Qv - Landslide deposits
- Qv - Verdeo alluvium
- Qf - Rocky Flats Alluvium
- Ka - Arapahoe Formation
- K - Laramie Formation
- Kfh - Fox Hills Sandstone

- Shallow closed depression
- Sharp of young landslide
- Area of vegetation around springs
- Boundary of gravel and clay pit
- o Spring
- f Bedding strike and dip
- Crest with crest size
- Capital Mine

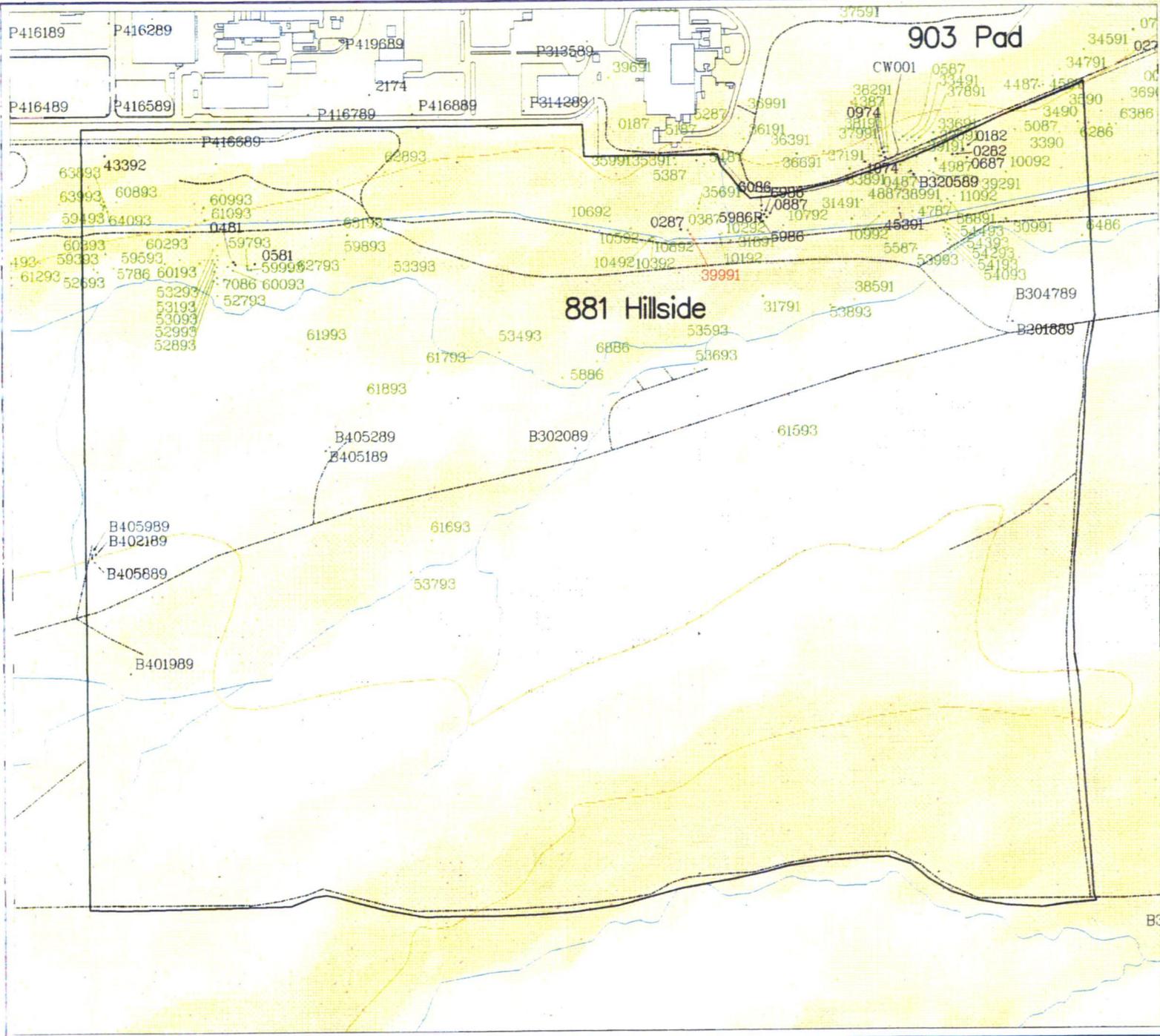
2004 2005000
 Building, road, and fence symbols by
 Jeffrey Day,
 2004. Source: Day, Jan. - 1995.
 Symbols provided by
 USGS - Data referenced
 National Mapping - Clark, RL, and Brown, RL, 2004
 National Mapping - Clark, RL, and Brown, RL, 2004
 Also used and modified: Williams and Butler
 Geologic, Colorado 100 Geological Survey
 Open-File Report 84-145, Date 1/8/87



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

Prepared by
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 404
 Golden, Colorado 80402-0404

SW 1-17



SW1 GROUNDWATER MONITORING WELL LOCATIONS MAP

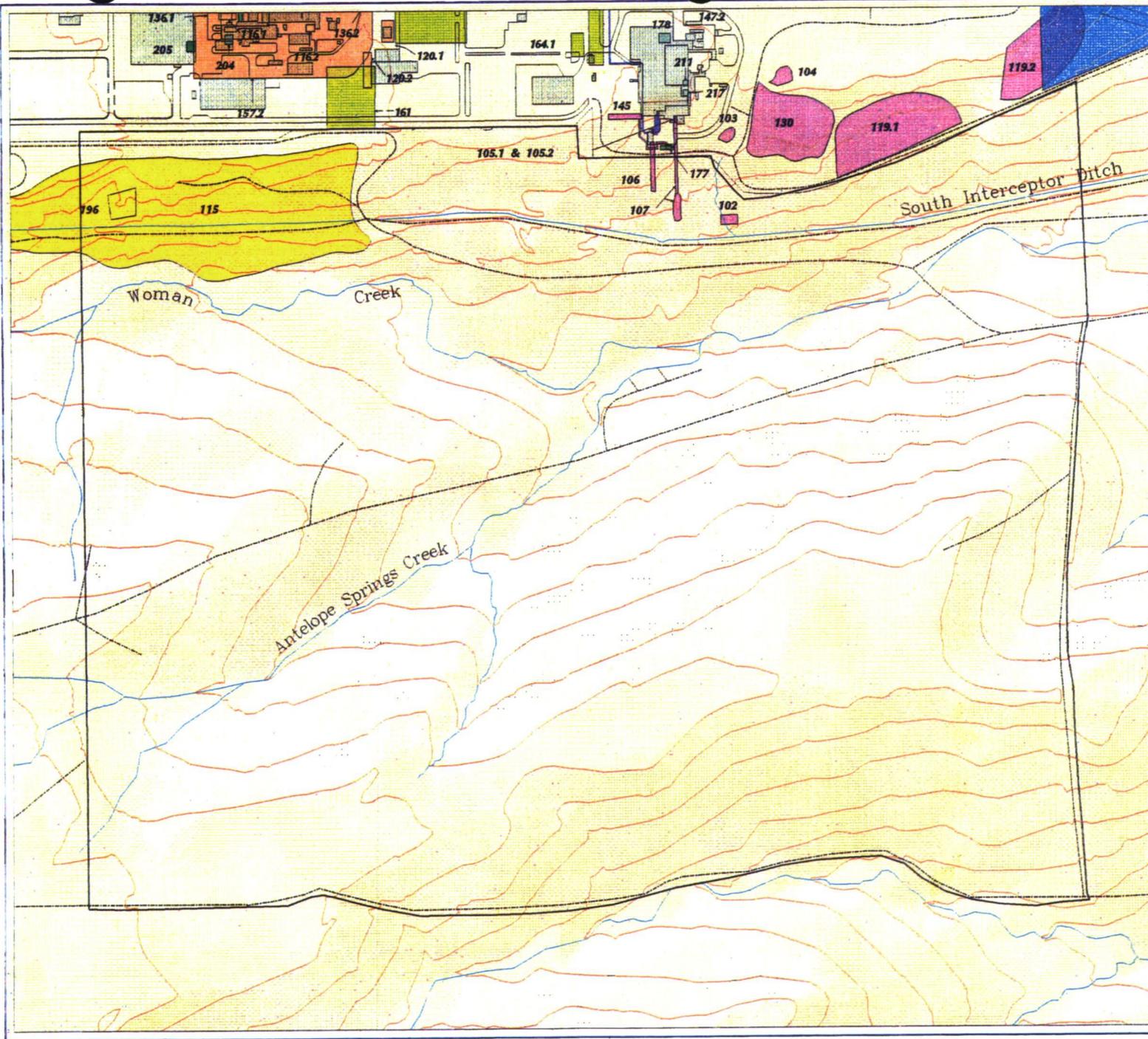
- Boundary Wells
 - CERCLA Characterization Wells
 - RCRA Regulatory
 - RCRA Characterization Wells
 - Special Purpose Wells
- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock
- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ◆ Abandoned Groundwater Monitoring Wells
- Other**
- ▨ Buildings and other structures
 - Ponds and Lakes
 - ~ Extent of Rocky Flats Alluvium
- Standard Map Features**
- Fences
 - - - Rocky Flats boundary
 - Paved roads
 - - - Dirt roads
- DATA SOURCE:**
Well locations from Groundwater spreadsheet, 4/94
Building, roads, and fences provided by Facilities Dept.
ES&E Rocky Flats, Inc. - 1991.
Hydrology provided by USDOE - (data unknown)



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

Prepared by:
ES&E ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464

SW 1-21



SW1 INDIVIDUAL HAZARDOUS SUBSTANCE SITES

- Operable Unit 1
- Operable Unit 2
- Operable Unit 4
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7
- Operable Unit 8
- Operable Unit 9
- Operable Unit 10
- Operable Unit 11
- Operable Unit 12
- Operable Unit 13
- Operable Unit 14
- Operable Unit 15
- Operable Unit 18

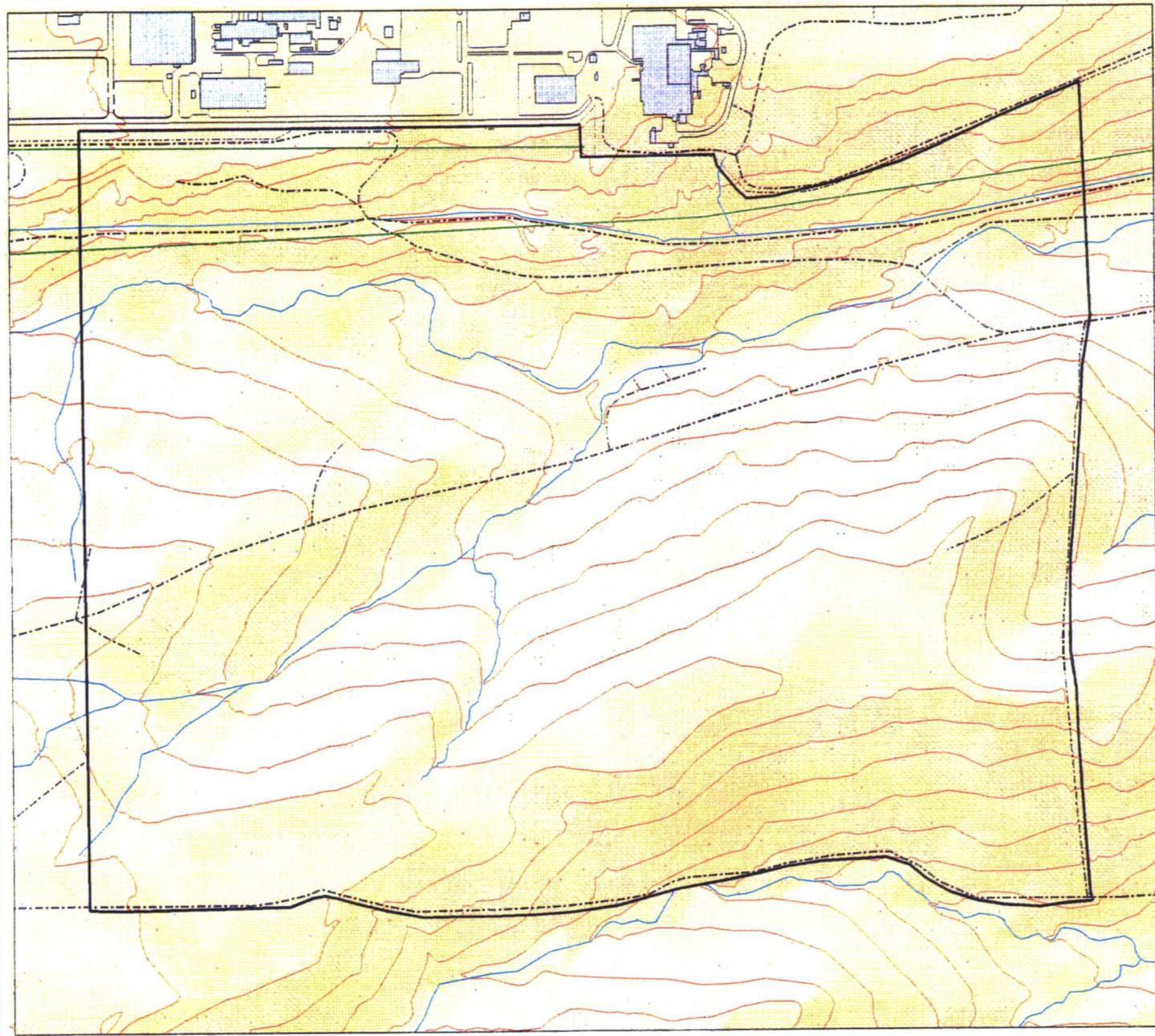
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

DATA SOURCE:
 Building, road, and fence provided by Facilities Dept.
 1988 Rocky Flats, Inc. - 1989.
 Hydrology provided by USGS - data collected Individual Hazardous Substance Sites (IHSS) are identified by the following: OUY - Rocky Flats II Report OUYL, 4, 7, 11, & 15 - 1989
 The remaining OUYs are defined by their respective Question List Worksheet.



U.S. Department of Energy
 Rocky Flats Environmental Technology Site
 Prepared by
STANLEY ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 464
 Golden, Colorado 80402-0464

SW 1-23



SW1 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)



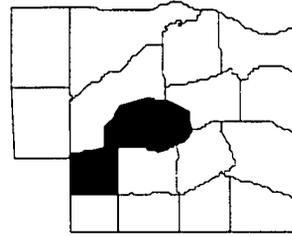
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464

MAP ID: Util04-0001

August 22, 1994

From: F:\18105\proj\env\0005\util\1\04\util04-0001.mxd



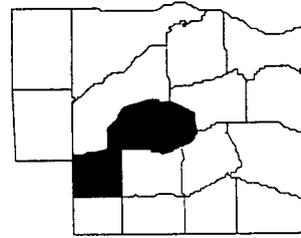
Quadrant: SW 2

Boundaries: North - West RFETS Access Road and inner security fence.
South - Road running E-W along original Buffer Zone boundary fence.
East - Line running N-S from RFETS water tower to original Buffer Zone boundary fence.
West - RFETS Buffer Zone west perimeter boundary fence (barbed wire).

Vegetation: The vegetation in this quadrant is very diverse. Quadrant SW 2 is primarily classified as Mesic Mixed Grassland, with small areas of Xeric Mixed Grassland present in some western portions of the quadrant. Areas of Bottomland Shrub and Riparian Woodland, intermixed with areas of Wet Meadow and Marsh, are present along Woman Creek as it flows through the quadrant. The drainages in this quadrant support some low shrubs and trees. The dominant species of vegetation are: June Grass, (*Koeleria pyramidata*), Western Wheatgrass (*Agropyron smithii*), Little Bluestem (*Andropogon scoparius*), Sandbar Willow (*Salix exigua*), Winter-Cress (*Orthocera barbarea*), Canada Bluegrass (*Poa compressa*), Snowberry (*Symphoricarpos occidentalis*), and Cheat Grass (*Bromus tectorum*).

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland throughout the quadrant, and Bottomland Shrub and Riparian Woodland along Woman Creek.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Poocetes gramineus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

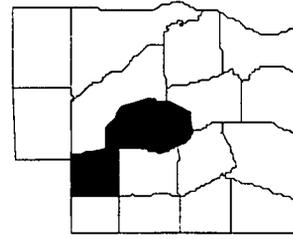


In the Bottomland Shrub and Riparian Woodland areas, many species of arthropods are present, although they are too numerous to list. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Mallards (*Anas platyrhynchos*), Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), Red-winged Blackbirds (*Agelaius phoeniceus*), and Great Horned Owls (*Bubo virginianus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Desert Cottontails (*Sylvilagus audubonii*), Meadow Voles (*Microtus pennsylvanicus*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973.

Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: Two branches of Woman Creek flow through the quadrant. The branches meet near the center of the quadrant forming Woman Creek. There are flow data available for water flows in this portion of the creek. Antelope Springs are located in the hillsides in the Woman Creek drainage. These seeps typically have a low flow and are dependent upon groundwater. The larger seeps flow year-round while the smaller ones are dependant upon seasonal precipitation. The largest seep in the area forms the headwaters of the southern branch of Woman Creek.



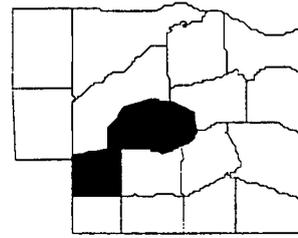
Jurisdictional Wetlands: Wetlands exist along Woman Creek and the small tributary south of the creek. Additional wetlands exist in the seeps located on the hillsides south of the creek, and the small tributary. The USFWS has classified the area of wetlands along Woman Creek and its south tributary as emergent seasonal wetlands.

Floodplain: There is an area of 100-year floodplain surrounding Woman Creek and Woman Creek Tributary E as they flow through the northern portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: There is a nearly equal distribution of soils from the great groups Argiustolls and Paleustolls in this quadrant. Argiustolls, which are mostly fine-textured clay loams associated with hill and valley slopes, are located in the north-central portion of the quadrant. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

Clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces, are present in the southern and extreme northern sections of the quadrant. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

In addition, there is a band of Torrifuvents in the northern portion of the quadrant along Woman Creek. Torrifuvents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and they are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.



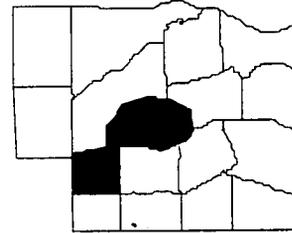
Surface Geology: Approximately 80 percent of the surface geology is comprised of Rocky Flats Alluvium. This alluvium covers the "flats" found throughout the RFETS, particularly on the western side. In this quadrant the alluvium is found southwest of the Woman Creek drainage area. The remaining 20 percent of the surface geology is equally divided between the upper unit of the Laramie Formation and the Arapahoe Formation. Both formations are found along the Woman Creek and its southern tributary. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays. The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. The upper unit of the Laramie formation is approximately 500 feet thick and composed of claystone. The claystone is predominately light to medium gray and kaolinitic.

Utilities: A power line runs E-W across the northern end of the quadrant and branches north crossing the west RFETS access road. An abandoned 8-inch natural gas line lies directly beneath the power line. The new natural gas line, owned by the PSC of CO, lies along the west RFETS access road.

Archaeology: State Site 5JF79 - Stone Features. A group of eight stone cairns and rings is located on a hilltop just south of the southern branch of Woman Creek. It is not known if the features are of American Indian or Euro-American origin.

State Site 5JF477 - Isolated Find Record. A possible projectile midsection fragment or tool fragment, but most likely a cutting implement, is located at the northern end of the quadrant beneath the power lines.

The aforementioned sites are not included in the NRHP because they are in poor condition, exhibit no rare construction, and have no historical value.



Archaeological maps for the RFETS were omitted from this document to protect the integrity of the cultural resources. If the location of archaeological sites must be known, contact the Environmental Policy Implementation Division.

Future Plans: The Woman Creek drainage will be remediated in accordance with plans for OU 5.

Mineral Rights: Unknown.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the north, south and east sides. The land adjoining it to the west is currently zoned institutional and is used for grazing cattle.

Contamination Profile

Soil Sites: 1-234 and 1-216

Sediment Sites: Reference the Sediment Sampling Locations map.

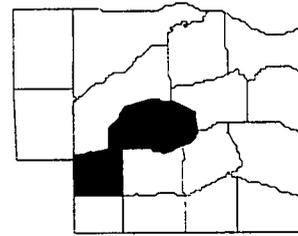
Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: IHSS 133.1 - 133.6 are former sites of an incinerator and four ash pits that operated from 1952 to 1968, and a concrete wash pad area. An estimated 100 grams of depleted uranium are present in the ash pits.

IHSS 115 is the site of the original RFETS landfill, operational from 1952 to 1968. The original landfill, located in the hillside immediately south of the RFETS was the disposal site for general RFETS waste. Twenty kilograms of depleted uranium ash were inadvertently dumped into the landfill and are the major pollutants in the IHSS.



Both sites are covered by the plans to remediate OU 5.

Surface water site GS05, found in the northwest corner of the quadrant on Woman Creek at the west RFETS boundary, recorded the following flows during the 1993 water year:

Average Spring Flow: 0.16 cubic feet per second (cfs)

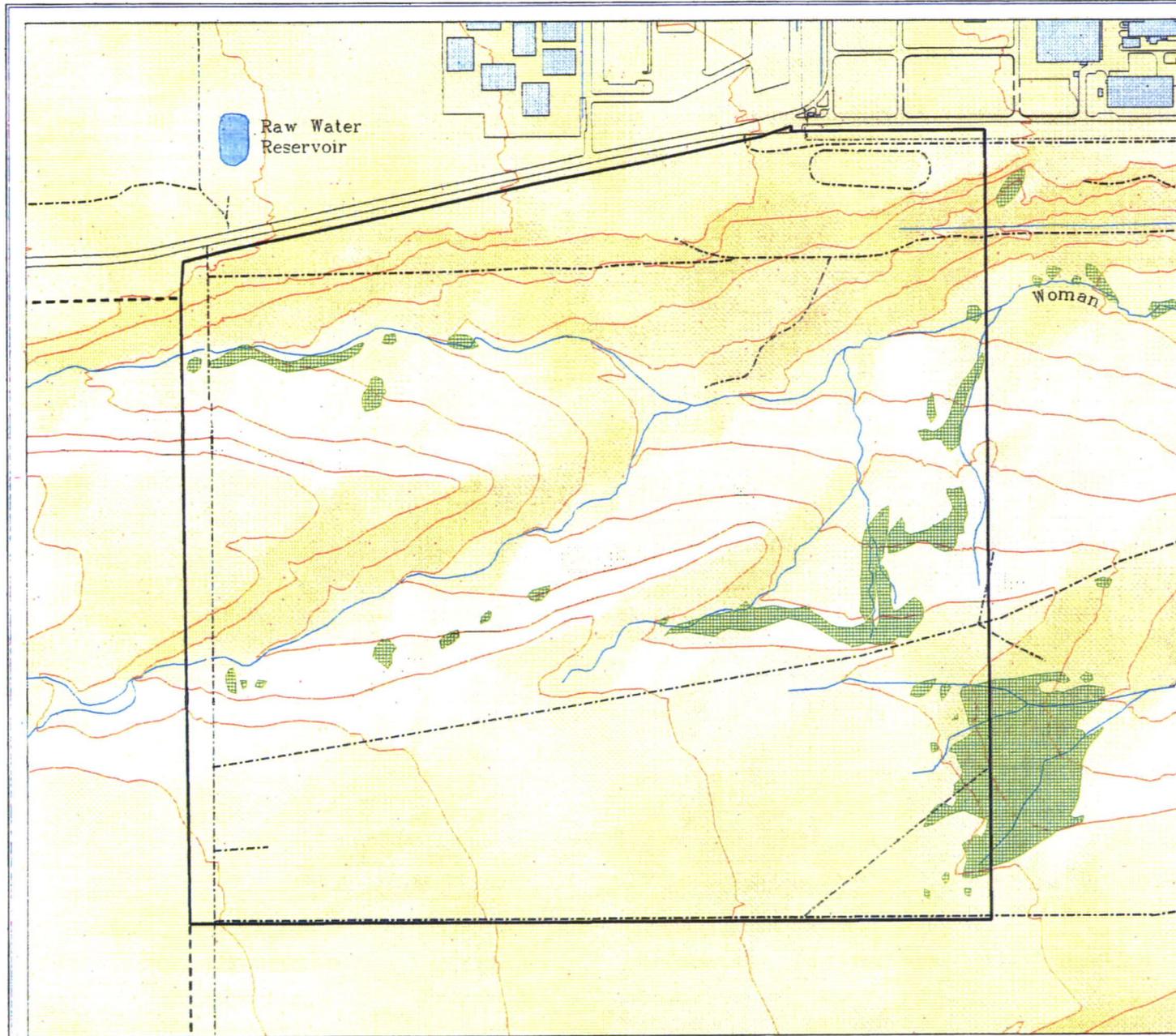
Average Summer Flow: 0.015 cfs

Average Winter/Fall Flow: 0.038 cfs

The flow data listed above should be used as analytical data with the qualification that the flows were computed using theoretical ratings for a culvert. The data are suspected to have +/- 20% accuracy.

Current data for soil sites, sediment sites, and groundwater wells are accessible through RFEDS.

SW 2-7



SW2 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Dept.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (files unknown)



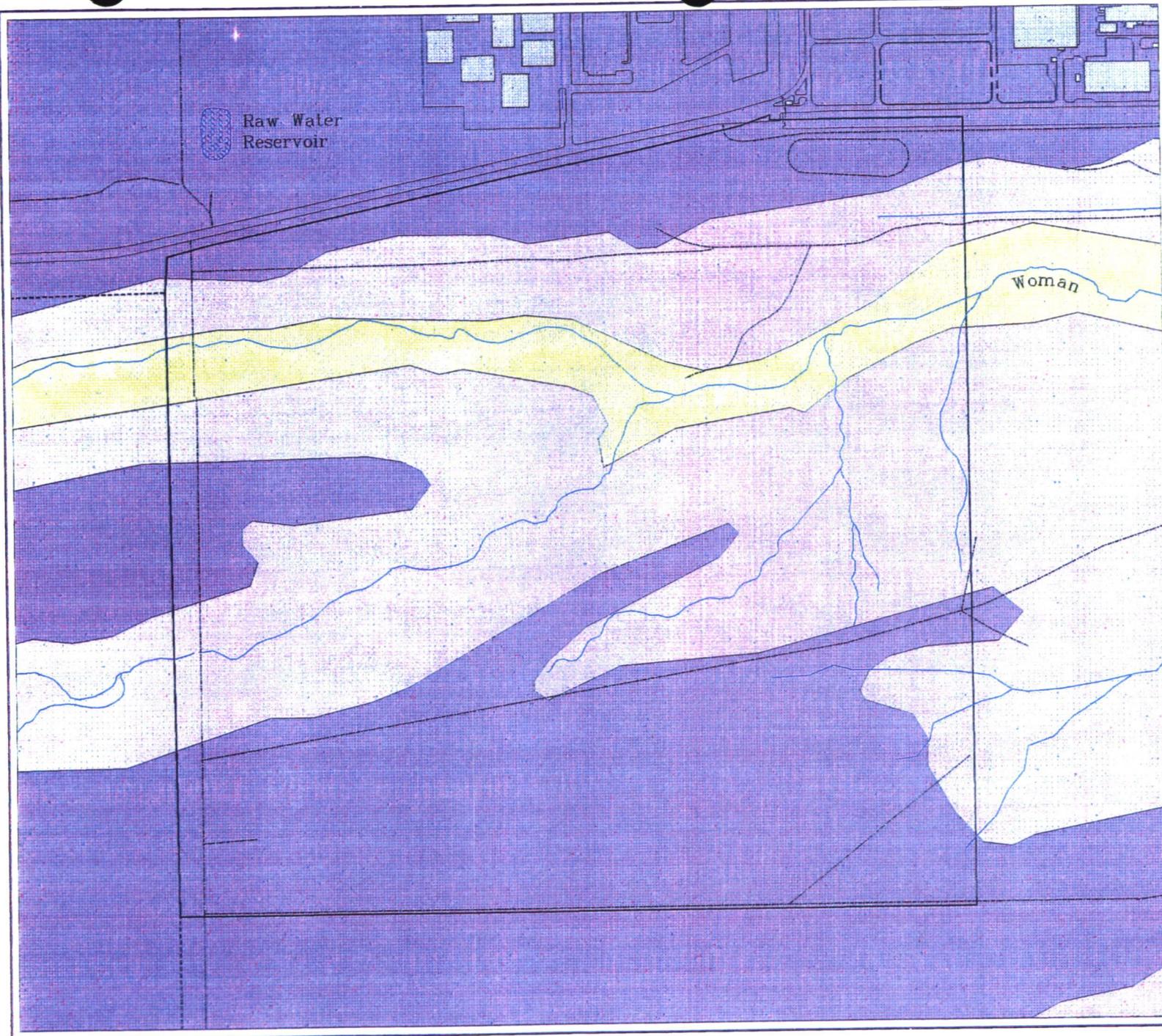
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Wet84-0001

August 22, 1994

SW2 SOIL TYPES



- Argiustolls
- Paleustolls
- Haplargids
- Mollisol/Rock Outcrop complex
- Torrifluvents
- Haplustolls
- Torrorthents
- Camborthide
- Haplustolls
- Cryofluvents
- Haploquolls
- Netrogids
- Argiborolls
- Gravel and Clay Pit
- Rock Outcrop
- DAM
- WATER
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

DATA SOURCES:
 Buildings, roads, and fences provided by
 Paulinus Engle,
 1989 Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - John Anderson
 and Christopher Shuler under
 Unrestricted Geologic Area and Survey
 and mapping assistance suggested by Jim Welling

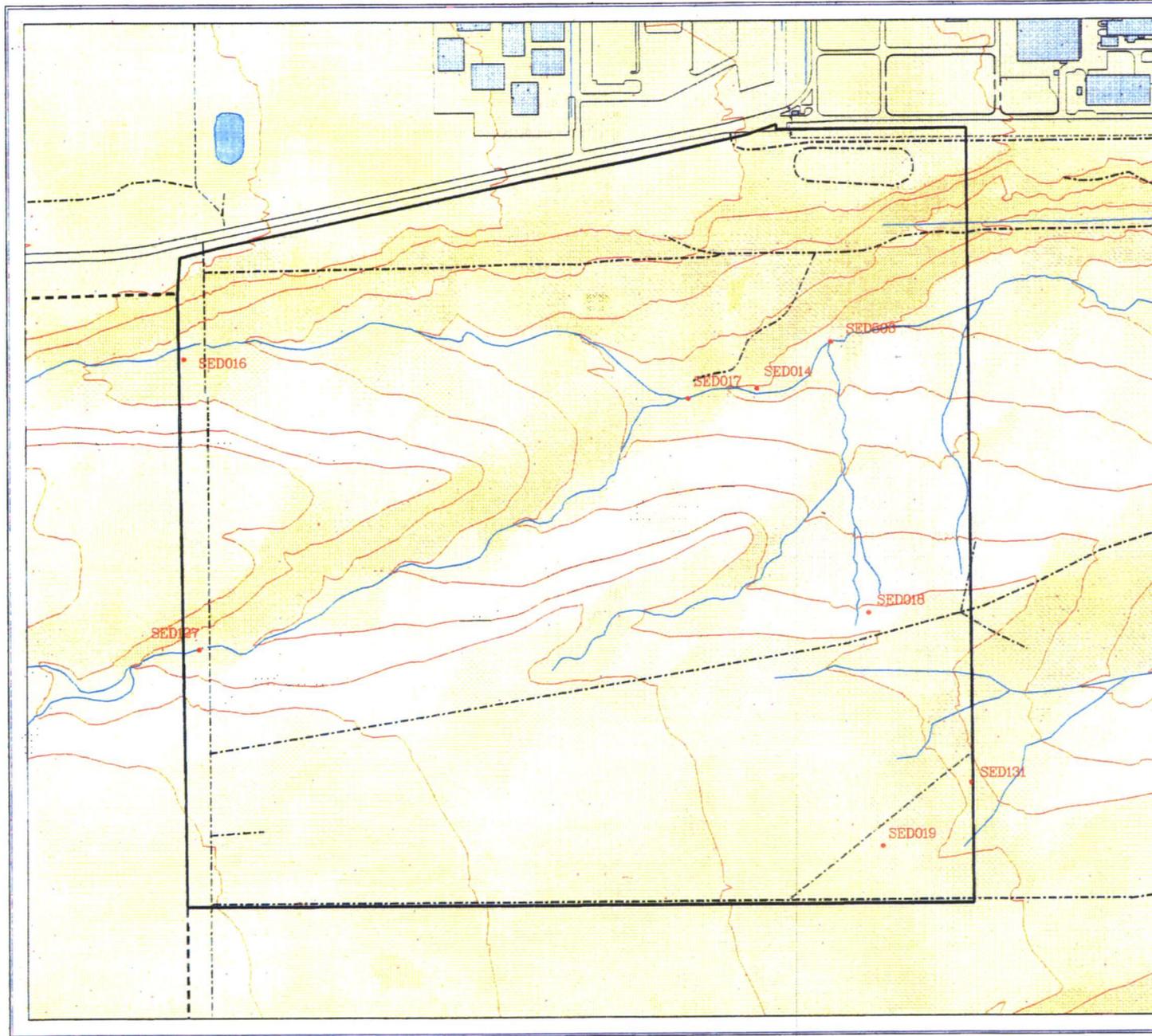


U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by
EB&B ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 404
 Golden, Colorado 80423-0404

SW 2-9

SW 2-13



SW2 SEDIMENT SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Sediment sampling locations

DATA SOURCE:
Buildings, roads, and fences provided by
Foothills Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)

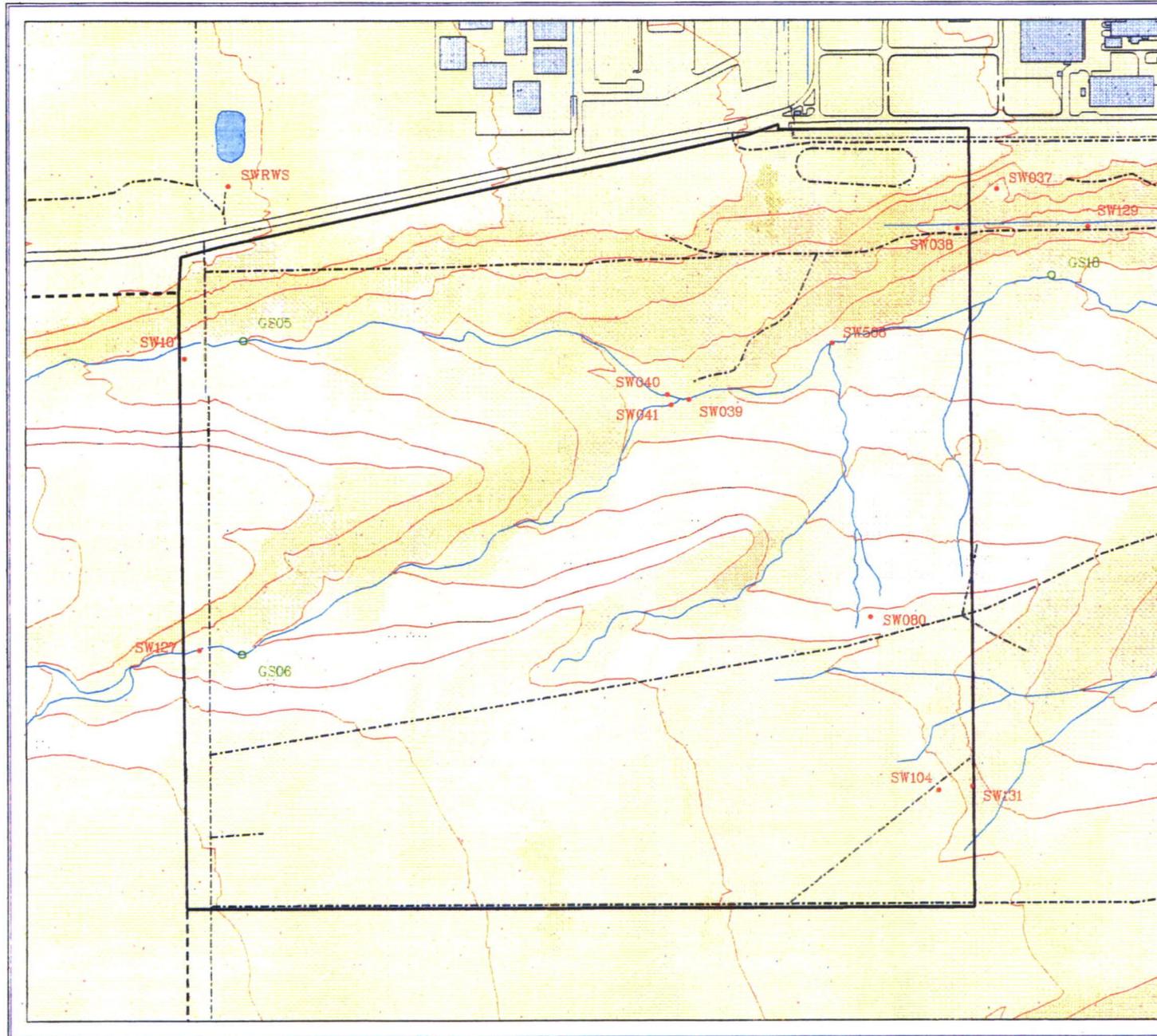


U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: bh94-0001 August 28, 1994

SW 2-15



SW2 SURFACE WATER SAMPLING LOCATIONS

- Buffer Zone Quadrants
- Surface water stations
- Routine operational sites
- NPDES/FFCA permit monitoring sites
- Gaging stations
- NPDES storm water permit sampling sites
- ▣ Buildings or other structures
- ▣ Lakes and ponds
- Streams, ditches, or other drainage features
- - - Fences
- Contours (20' Intervals)
- - - Rocky Flats boundary
- ▬ Paved roads
- - - Dirt roads

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Eng.-
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)



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

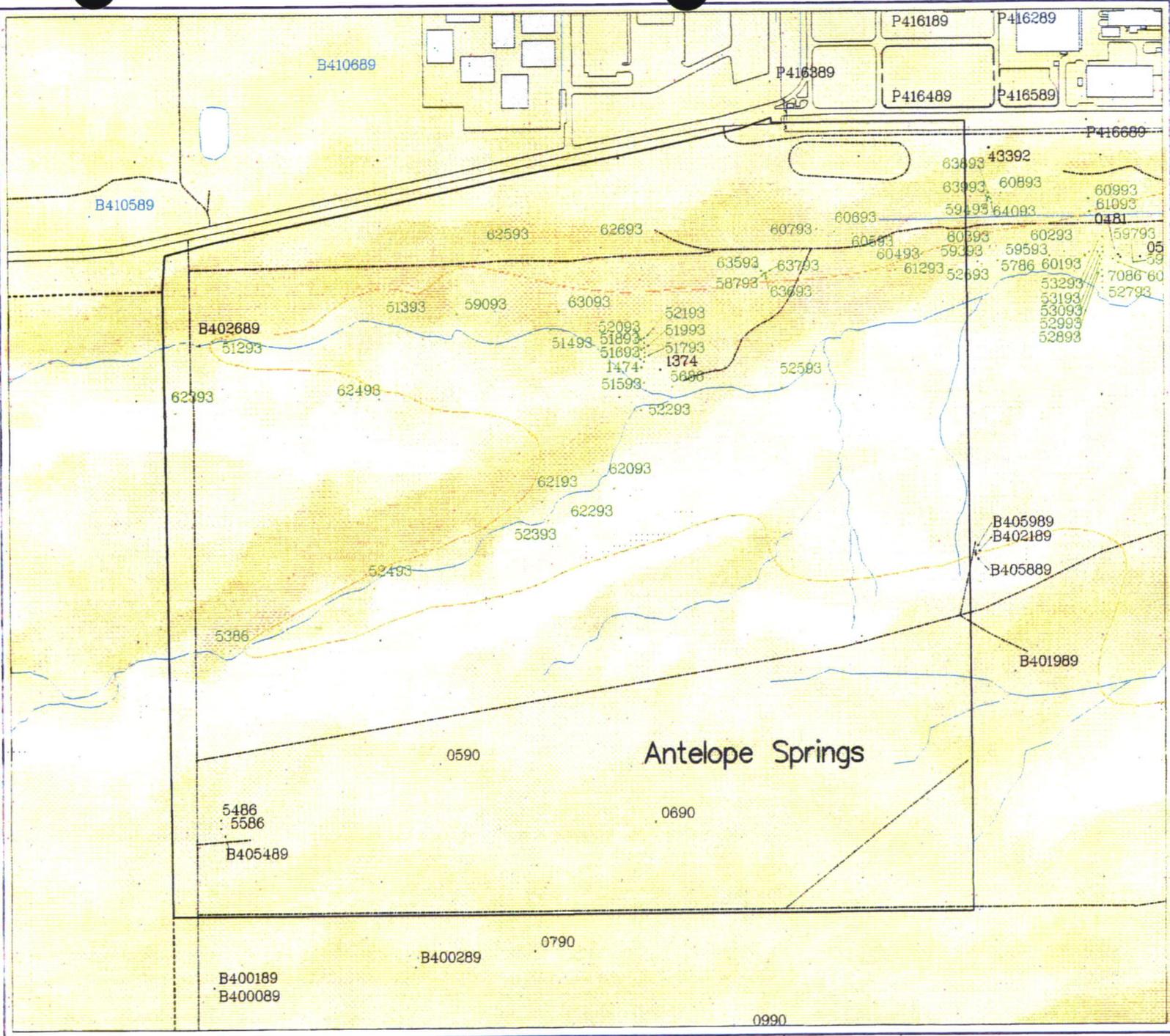
Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: sw94-0001

August 28, 1994

SW2 GROUNDWATER MONITORING WELL LOCATIONS MAP

- Boundary Wells
 - CERCLA Characterization Wells
 - RCRA Regulatory
 - RCRA Characterization Wells
 - Special Purpose Wells
- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - ◐ Alluvium/Bedrock
- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ✦ Abandoned Groundwater Monitoring Wells
- Other**
- ▨ Buildings and other structure
 - Ponds and Lakes
 - ~ Extent of Rocky Flats Alluvium
- Standard Map Features**
- Fences
 - - - Rocky Flats boundary
 - Paved roads
 - - - Dirt roads
- DATE: 02/20/99
Map location from Geographic coordinates, 404
Buildings, roads, and names provided by
Fossiltec Corp.
ES&S Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - data uncorrected



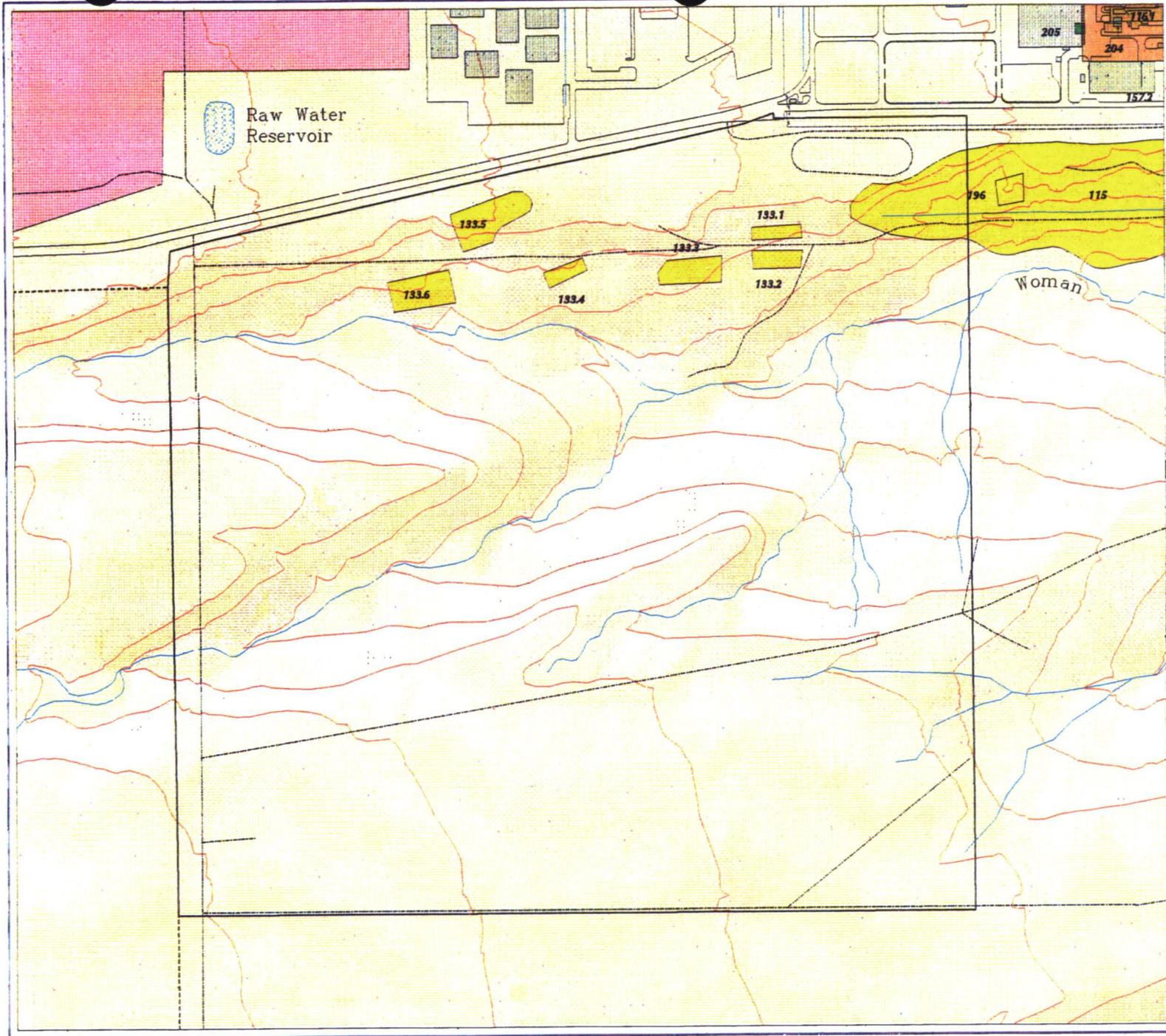
SW 2-17



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

Prepared by:
ES&S ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 404
Golden, Colorado 80402-0404

SW 2-21



SW2 INDIVIDUAL HAZARDOUS SUBSTANCE SITES

- Operable Unit 1
 - Operable Unit 2
 - Operable Unit 4
 - Operable Unit 5
 - Operable Unit 6
 - Operable Unit 7
 - Operable Unit 8
 - Operable Unit 8
 - Operable Unit 9
 - Operable Unit 10
 - Operable Unit 11
 - Operable Unit 12
 - Operable Unit 13
 - Operable Unit 14
 - Operable Unit 15
 - Operable Unit 16
- Buildings or other structures
 - Lakes and ponds
 - Streams, ditches, or other drainage features
 - Fences
 - Contours (20' Intervals)
 - Rocky Flats boundary
 - Paved roads
 - Dirt roads
 - Buffer Zone Quadrants

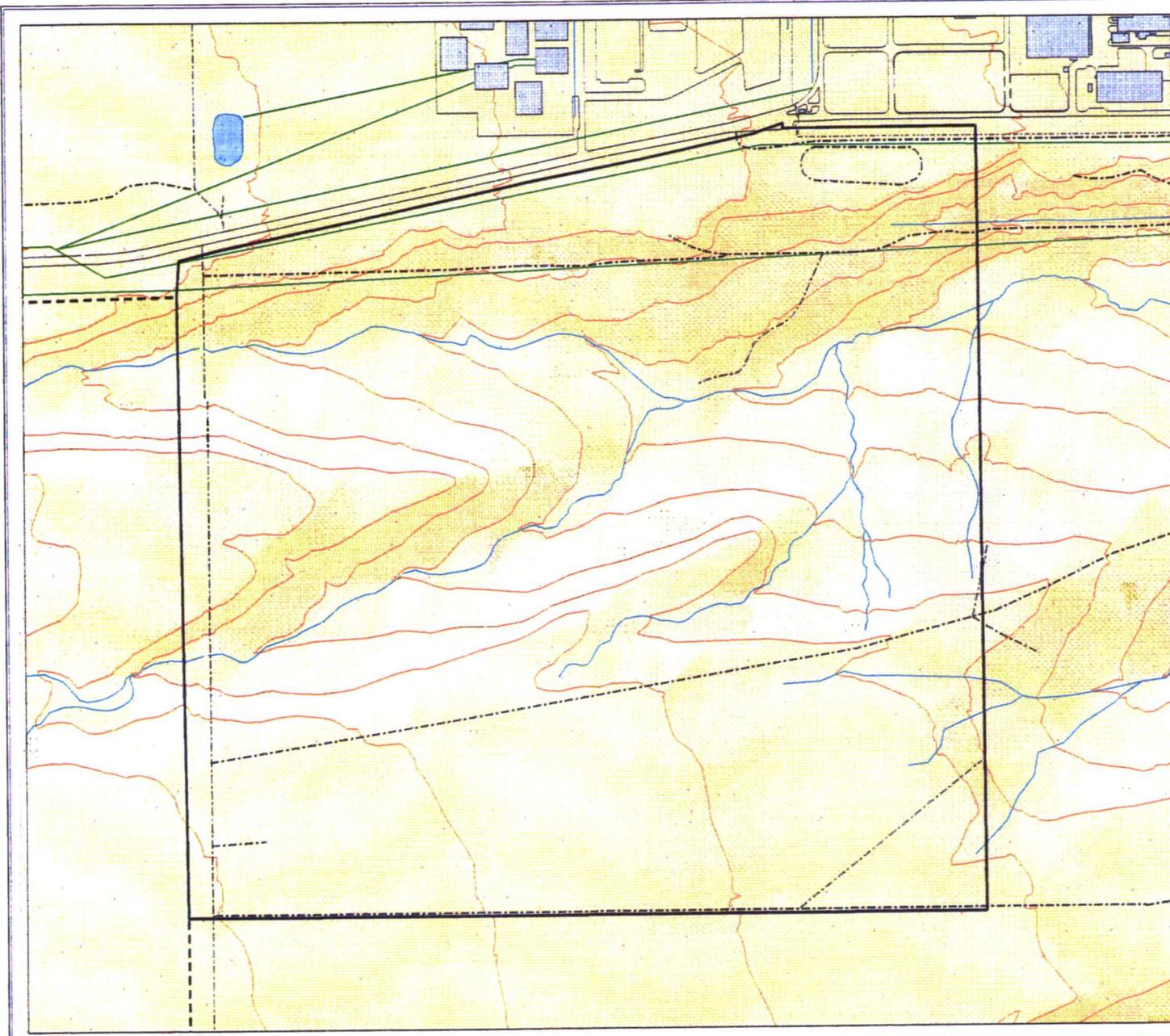
DATA SOURCES:
 Buildings, roads, and fences provided by Frontier Eng.
 2000 Rocky Flats, Inc. - 1991.
 Hydrology provided by USGS - data unreviewed.
 Individual Hazardous Substance Sites (IHSS) are identified by the following:
 OUI - IHSS Phase II Report
 OUI - 2, 15, & 16 - 1990
 The remaining OUIs are defined by their respective Operable Unit Maps.



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

Prepared by
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 400
 Golden, Colorado 80402-0400

SW 2-23



SW2 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)

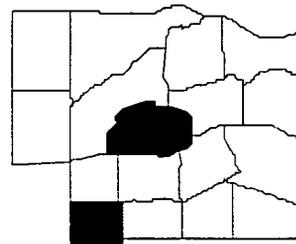


U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util94-0001

August 22, 1994



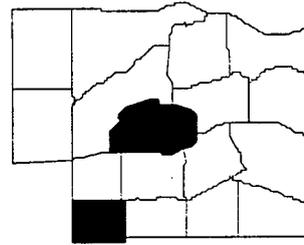
Quadrant: SW 3

Boundaries: North - Road following original Buffer Zone boundary fence.
South - RFETS Buffer Zone south perimeter fence (barbed wire).
East - Line running N-S along the drainages that run east approximating the 6,050 foot contour line.
West - RFETS Buffer Zone west perimeter boundary fence (barbed wire).

Vegetation: Quadrant SW 3 is classified as Mesic Mixed Grassland and Xeric Mixed Grassland. An area of Short Marsh is present along Smart Ditch as it flows through the central portion of the quadrant. The drainages in the quadrant support some low shrubs. The dominant species of vegetation are: Needle and Thread (*Stipa comata*), Red Threeawn (*Aristida purpurea*), Blue Grama (*Bouteloua gracilis*), Western Wheatgrass (*Agropyron smithii*), and June Grass (*Koeleria pyramidata*).

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland and Xeric Mixed Grassland, and Short Marsh along Smart Ditch.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*), Prairie Rattlesnake (*Crotalis viridis*), and Short-horned Lizard (*Phrynosoma douglassi*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Prairie Voles (*Microtus ochragaster*), Desert Cottontails (*Sylvilagus audubonii*), White-tailed Jackrabbits (*Lepus townsendii*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

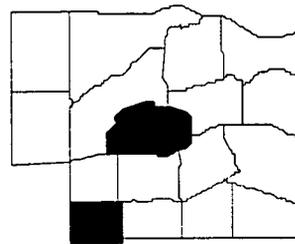


In the Short Marsh areas, many species of arthropods are present, but are too numerous to list. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Red-winged Blackbirds (*Agelaius phoeniceus*), Meadowlarks (*Sturnella neglecta*), House Finches (*Carpodacus mexicanus*), and Mallards (*Anas platyrhynchos*). Red-tailed Hawks (*Buteo jamaicensis*) are common. The mammal population is made up of Meadow Voles (*Microtus pennsylvanicus*), Deer Mice (*Peromyscus maniculatus*), Muskrats (*Ondatra zibethicus*), and Mule Deer (*Odocoileus hemionus*).

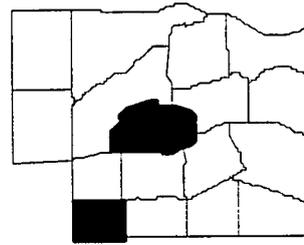
The entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: Smart Ditch flows east through the quadrant. There is no flow data available for the ditch. The ditch carries water from Rocky Flats Lake to the Standley Lake Reservoir and is neither controlled nor affected by the RFETS.

Jurisdictional Wetlands: Wetlands exist along Smart Ditch and the drainage immediately to the south. The USFWS has classified the area of Smart Ditch and its tributary to the south as emergent seasonal wetlands.



- Floodplain:** There is an area of 100-year floodplain that surrounds Smart Ditch as it flows through the southern portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."
- Soil:** The majority of soils in this quadrant are clayey-skeletal soils of the great group Paleustolls, which are very cobbly clay loams located on pediment surfaces. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.
- There are two small areas that contain Argiustolls located on the eastern border of the quadrant. Argiustolls are mostly fine-textured clay loams associated with hill and valley slopes, and they are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.
- Surface Geology:** The entire surface geology of the quadrant is comprised of Rocky Flats Alluvium. This alluvium covers the "flats" found throughout the RFETS, particularly in the western quadrants. Rocky Flats Alluvium is comprised of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays.
- Utilities:** None.
- Archaeology:** None.
- Future Plans:** None.
- Mineral Rights:** Tract 36 S 1/2 of Section 15 and SW 1/4 of Section 14 - 480.00 acres. The Union Pacific Railroad owns coal rights. All coal, oil and gas reserved, without the right to enter upon or over the land. Right of proprietor of a vein or lode to extract and remove ore therefrom.



Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the north and east sides. The adjoining land to the south is vacant, the land to the west is zoned Institutional, and both are currently used for grazing cattle.

Contamination Profile

Soil Sites: 1-198

Sediment Sites: Reference the Sediment Sampling Locations map.

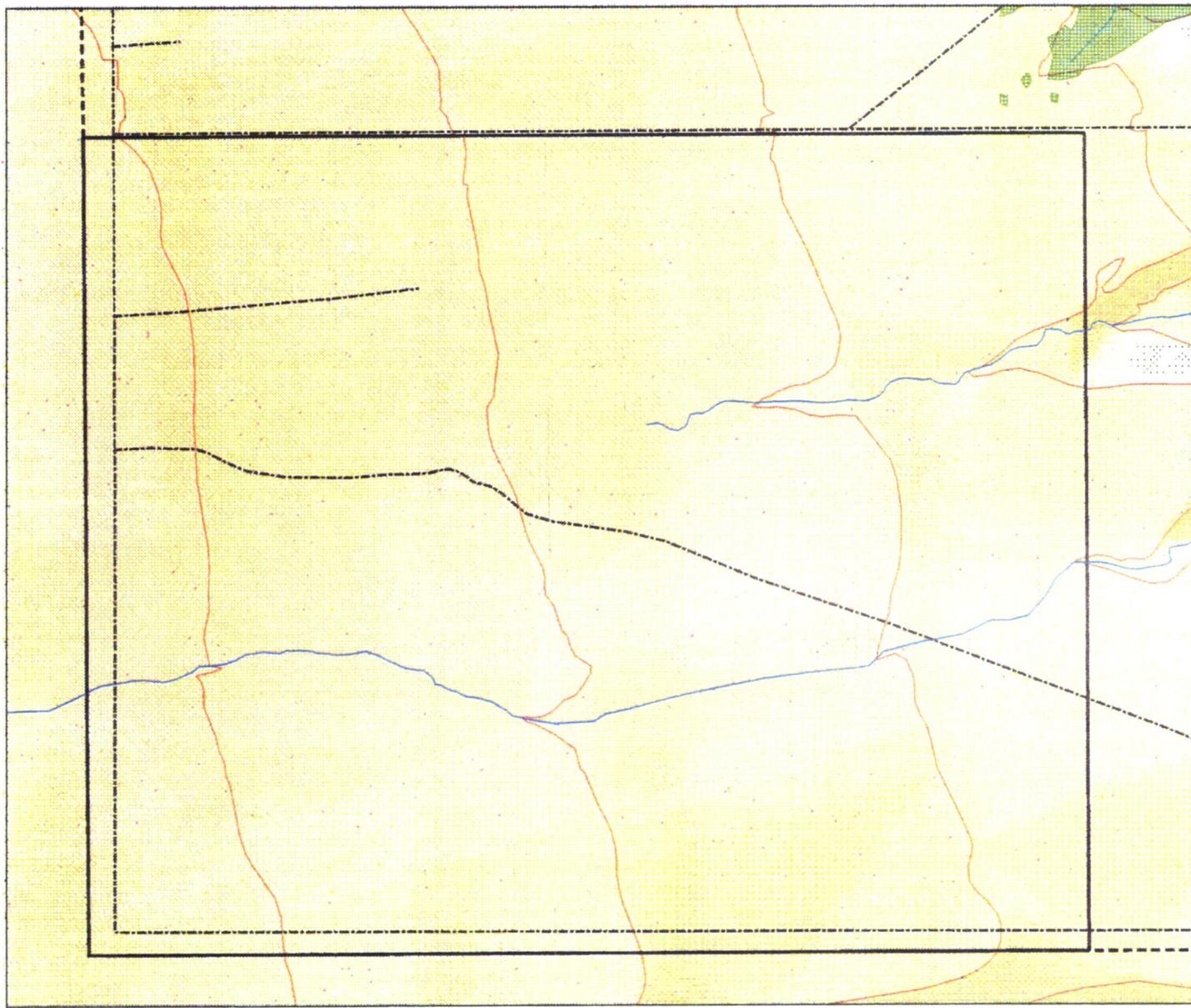
Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: Current data for soil sites and groundwater wells are accessible through RFEDS.

SW 3-5



SW3 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCES
Buildings, roads, and fences provided by
Fossilite Corp.
2000 Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - John Schmalzer



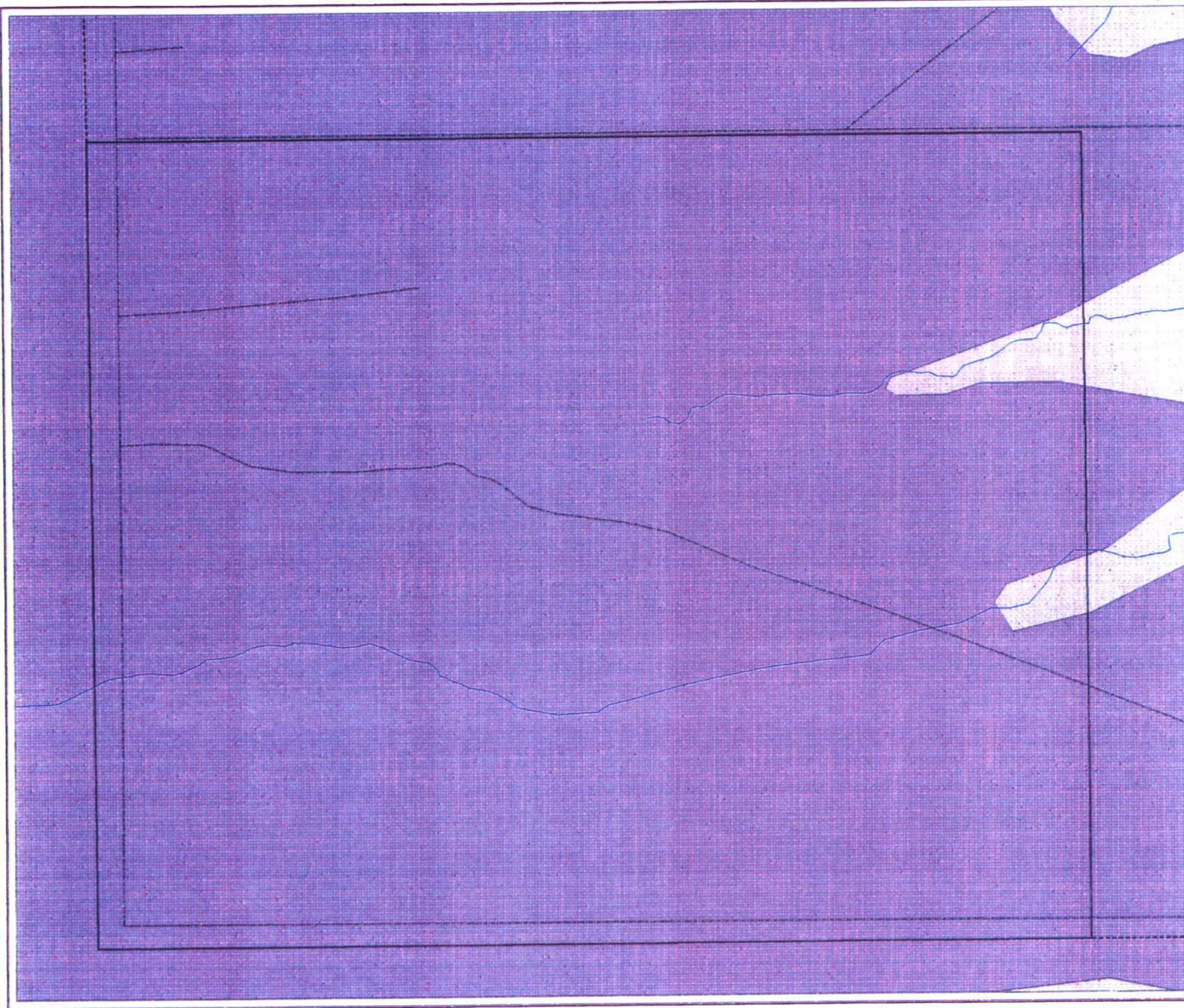
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 404
Golden, Colorado 80402-0404

MAP ID: Wet94-0001

August 22, 1994

SW 3-7



SW3 SOIL TYPES

- Argiustolle
- Paleustolle
- Haplargide
- Mollisol/Rook Outcrop complex
- Torrifuvents
- Haplustolle
- Torriorthents
- Camborthide
- Haplustolle
- Cryofluvents
- Haplaquolle
- Natrargide
- Argiborolle
- Gravel and Clay Pit
- Rook Outcrop
- DAM
- WATER
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Dept.
 1982 Rocky Flats, Inc. - 1981.
 Hydrology provided by
 USGS - State information
 Soil Occurrence/Soil Order maps
 Unpublished Digital Area Soil Survey
 Soil mapping scheme adopted by Jim WIMMIG



Scale: 1 inch = 1000 feet
 North Arrow
 Datum: NAD83

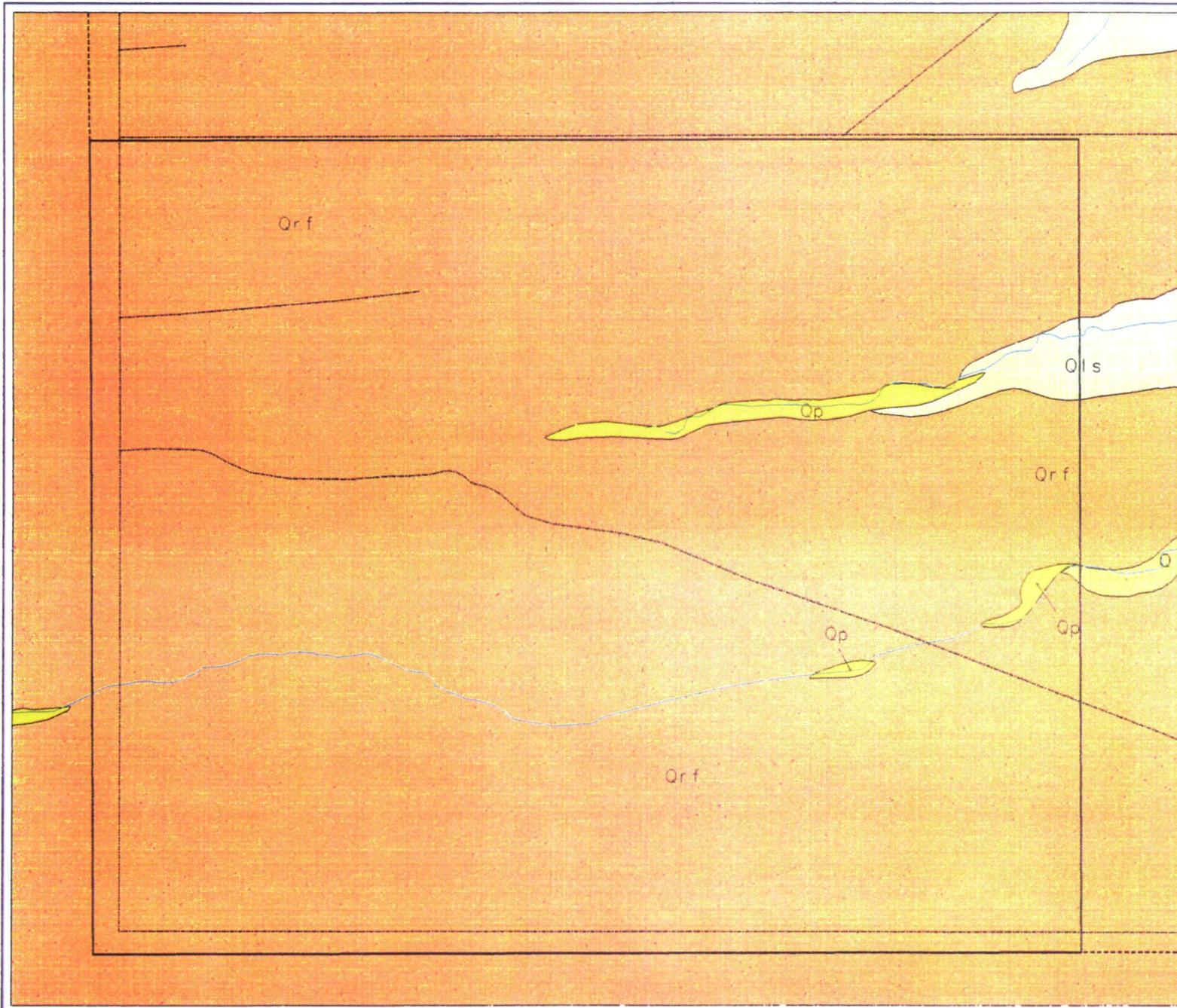
U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by
EG&S ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 464
 Golden, Colorado 80402-0464

SW 3-7 (1982)

August 25, 1982

6-C-9
SM



SW3 GEOLOGIC UNITS



- af - Artificial fill
- Qp - Post-Piney Creek Alluvium
- Qc - Terrace alluvium
- Qs - Stream alluvium
- Qo - Colluvium
- Qd - Landslide deposits
- Qv - Verdes alluvium
- Qr - Rocky Flats Alluvium
- Ka - Arapahoe Formation
- KJ - Laramie Formation
- Kth - Fox Hills Sandstone

- Shallow closed depression
- Scarp of young landslide
- Areas of vegetation around springs
- Boundary of gravel and clay pit
- Spring
- † Bedding strike and dip
- Crest with crest size
- Capital Mine

- ▣ Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

DATA SOURCES
 Building, road, and fence symbols by
 Rocky Flats Environmental Technology Site,
 1997. Rocky Flats, Inc. - 1997.
 Building symbols by
 1997 - State of Colorado
 Geological Survey of Colorado, U.S. Geological Survey, 1997.
 Geological Survey of Colorado, U.S. Geological Survey, 1997.



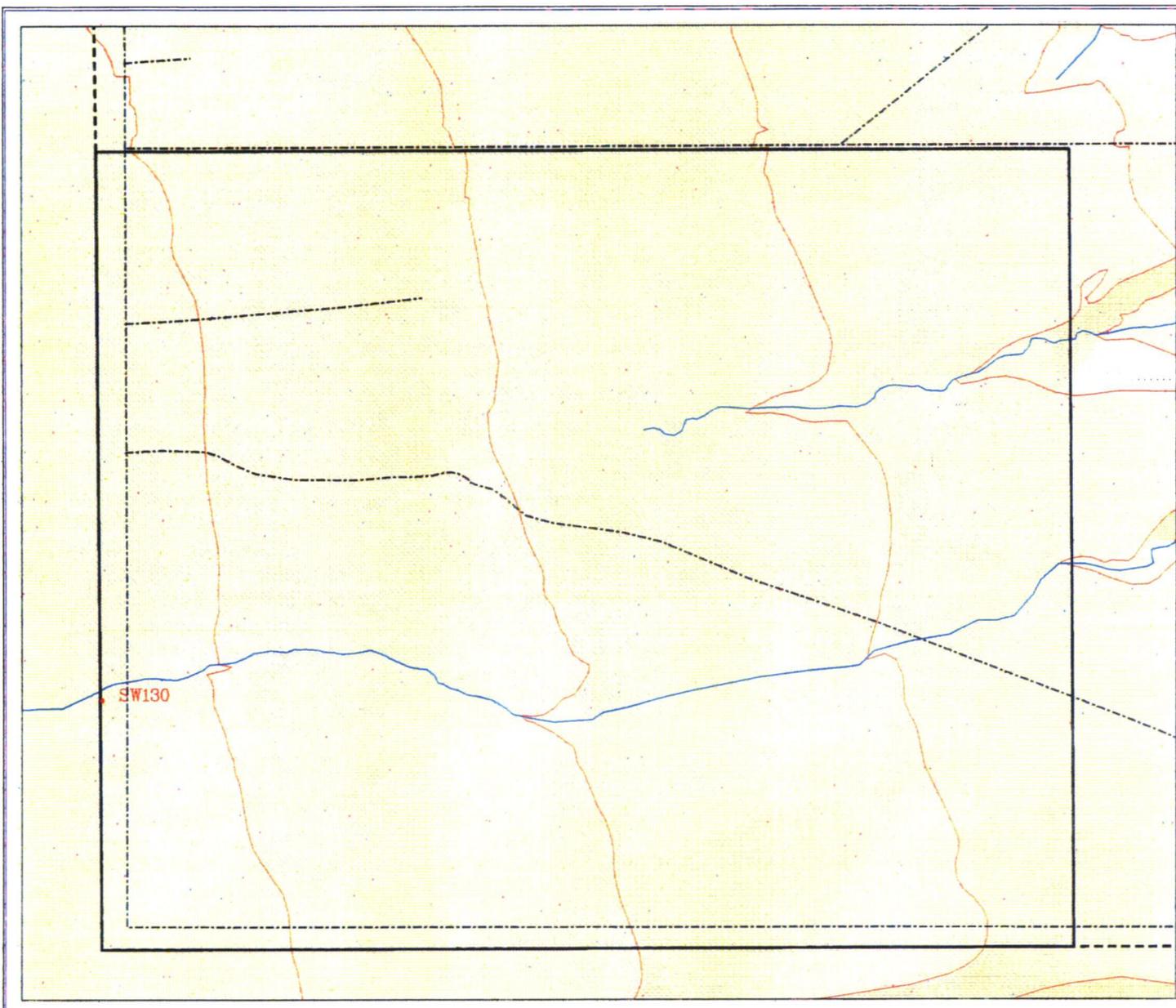
Scale = 1" = 200'
 1 inch represents approximately 200.00 feet

Rocky Flats Environmental Technology Site
 Geologic Map
 1997

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

Prepared by
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 404
 Golden, Colorado 80432-0404

II-3 MS



SW3 SURFACE WATER SAMPLING LOCATIONS

- Buffer Zone Quadrants
- Surface water stations
- Routine operational sites
- NPDES/FFCA permit monitoring sites
- Gaging stations
- NPDES storm water permit sampling sites
- ▒ Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- - - Fences
- Contours (20' Intervals)
- - - Rocky Flats boundary
- == Paved roads
- ... Dirt roads

DATA SOURCE:
 Buildings, roads, and fences provided by
 FortStn Engr.,
 EG&G Rocky Flats, Inc. - 1981.
 Hydrology provided by
 USGS - (data statement)



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

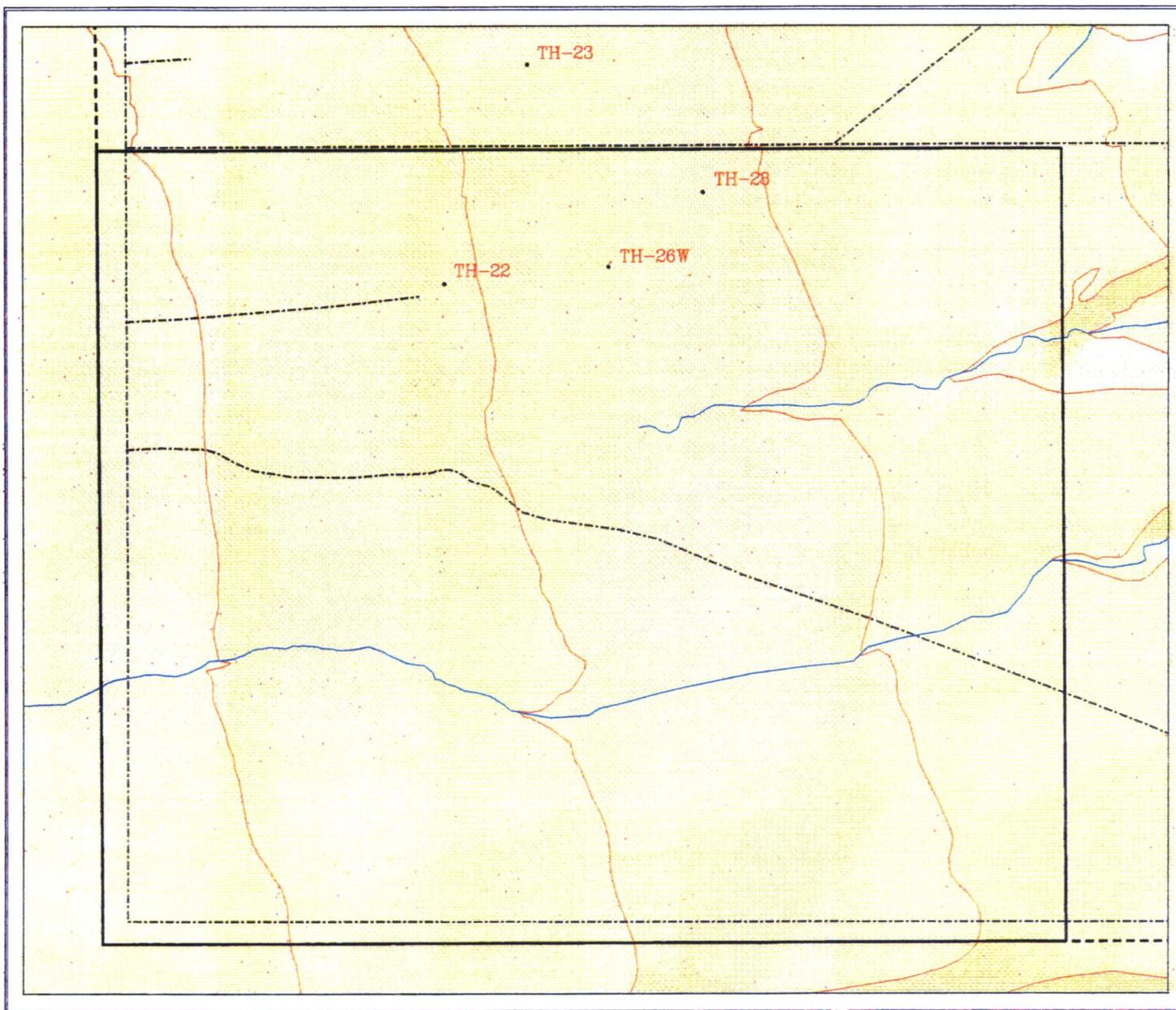
Prepared by:
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: 0094-0001

August 28, 1984

Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

SW 3-15



SW3 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCE:
Buildings, roads, and fences provided by
Franklin Jones
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data abstract)
BOREHOLE LOCATIONS FROM RECORDS/INDEX



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

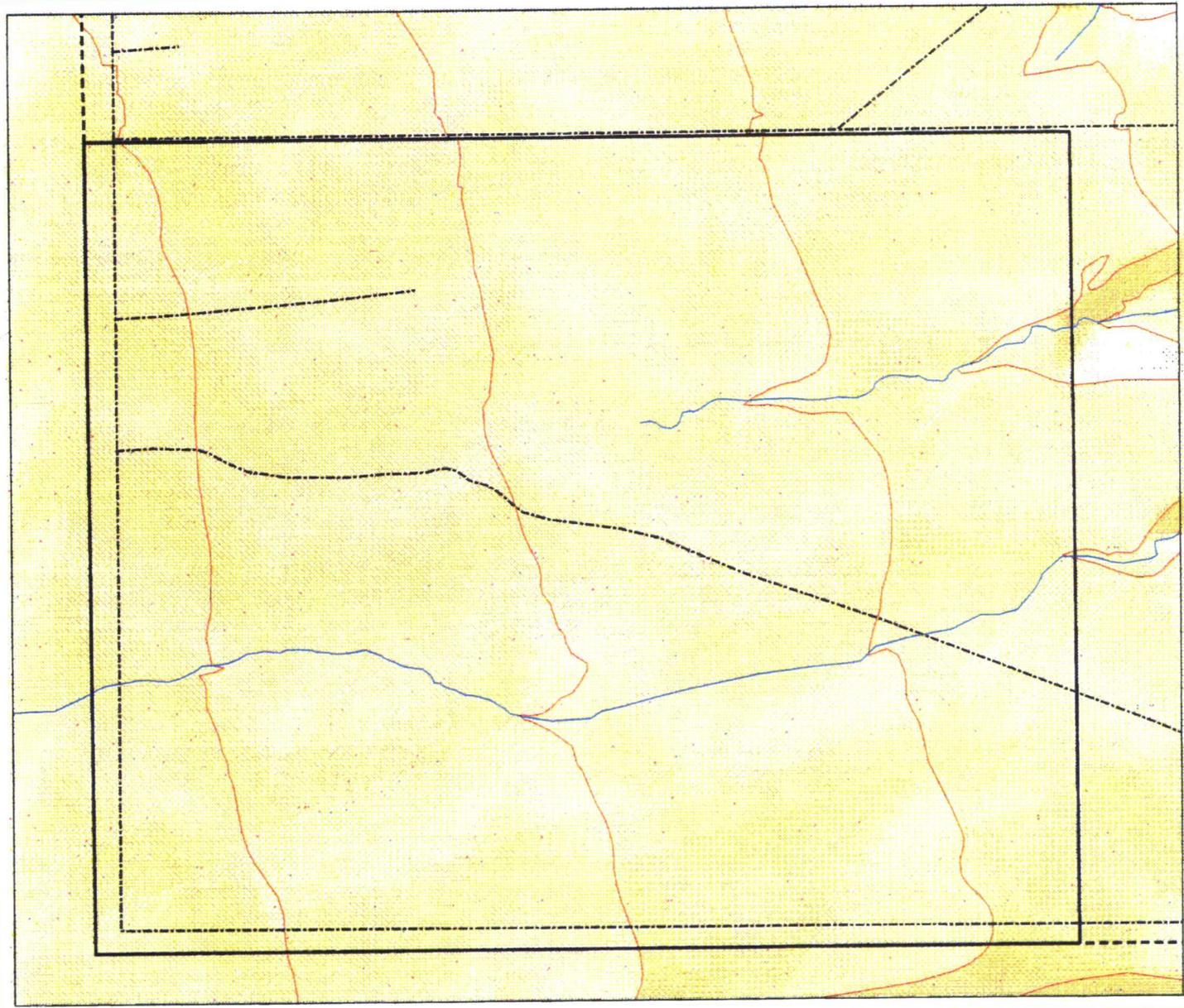
Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 404
Golden, Colorado 80402-0404

MAP ID: bh94-0001

August 22, 1994

\\nms1618182\proj\sw3\end\0001\bh-94-0001\fig\sw3-borehole-map.dwg

SW 3-17



SW3 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, Fences, and fences provided by
Farrille Eng'g,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - Idaho watershed



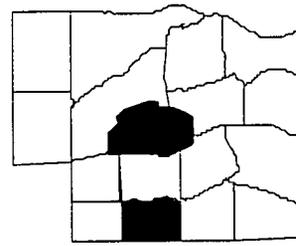
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 404
Golden, Colorado 80402-0404

MAP ID: Uttr94-0001

August 22, 1994

/home/vs1/191102/projects/land/0006/Uttr/1/Equades/uttr-mpg.umt



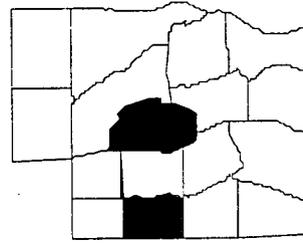
Quadrant: SW 4

Boundaries: North - Road following original Buffer Zone boundary fence.
South - RFETS Buffer Zone south perimeter fence (barbed wire).
East - Line running due South from the end of the road running N-S to original Buffer Zone boundary fence.
West - Line running N-S along the edges of the drainages running east approximating the 6,050 foot contour line.

Vegetation: Quadrant SW 4 is primarily classified as Mesic Mixed Grassland, with small areas of Xeric Mixed Grassland present in the extreme northwest portion of the quadrant. Areas of Riparian Woodland and Short Upland Shrub, intermixed with an area of Marsh, are present along Smart Ditch as it flows through the quadrant. The drainages in this quadrant support some low shrubs and an occasional Cottonwood tree. The dominant species of vegetation are: Buffalo Grass (*Buchloe dactyloides*), Orange Arnica (*Arnica fulgens*), Western Wheatgrass (*Agropyron smithii*), Canada Bluegrass (*Poa compressa*), Needle and Thread (*Stipa comota*), and June Grass (*Koeleria pyramidata*).

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland throughout the quadrant, and Riparian Woodland and Short Upland Shrub along Smart Ditch.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. The reptile species is represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

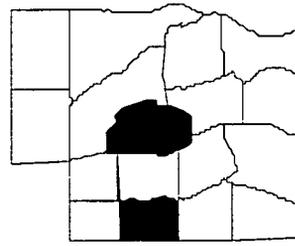


In the Riparian Woodland and Short Upland Shrub areas, many species of arthropods are present. Reptiles include the Racer (*Coluber constrictor*), Bull Snake (*Pituophis melanoleucus*), and Plains Garter Snake (*Thamnophis radix*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), and Red-winged Blackbirds (*Agelaius phoeniceus*). Mallards (*Anas platyrhynchos*) and various raptors, including the Red-tailed Hawk (*Buteo jamaicensis*) and Great Horned Owl (*Bubo virginianus*) are also present. The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Desert Cottontails (*Sylvilagus audubonii*), Porcupines (*Erethizan dorsatum*), Mule Deer (*Odocoileus hemionus*), and various carnivores, including Coyotes (*Canis latrans*) and Striped Skunks (*Mephitis mephitis*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: Smart Ditch flows W-E through the quadrant. There are flow data available for water flows in the ditch. The ditch carries water from Rocky Flats Lake to the Standley Lake Reservoir and is neither controlled nor affected by the RFETS.

Jurisdictional Wetlands: Wetlands are present along Smart Ditch and the drainage immediately to the south. Another wetland exists in a seep on the south side of the hillside directly north of Smart Ditch. The USFWS has classified the area of Smart Ditch and its tributary to the south as emergent seasonal wetlands.



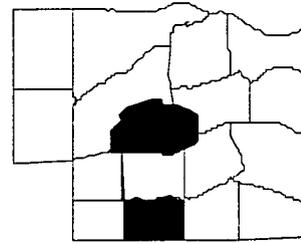
Floodplain: There is an area of 100-year floodplain surrounding Smart Ditch, Smart Ditch A, and Smart Ditch B as they flow through the central portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

Clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces, are located in the south-western corner of the quadrant. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

In addition, there is a small area of Torrifluvents in the extreme north-eastern corner of the quadrant. Torrifluvents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

Surface Geology: An outcrop of the Arapahoe formation comprises approximately one-half of the surface geology. The remaining portion is covered by Rocky Flats Alluvium. This alluvium is found in the higher areas along the ridges that run W-E through the quadrant. The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays.



Utilities: Aboveground PSC of CO power lines run NE-SW across the southern part of the quadrant.

Archaeology: None.

Future Plans: None.

Mineral Rights: Tract 36 - S 1/2 of Section 15 and SW 1/4 of Section 14 - 480.00 acres. The Union Pacific Railroad owns coal rights. All coal, oil and gas reserved, without the right to enter upon or over the land. Right of proprietor of a vein or lode to extract and remove ore therefrom.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the north, east, and west. The land adjoining the quadrant to the south is vacant and is currently used for grazing cattle.

Contamination Profile

Soil Sites: 1-180 and 1-162

Sediment Sites: Reference the Sediment Sampling Locations map.

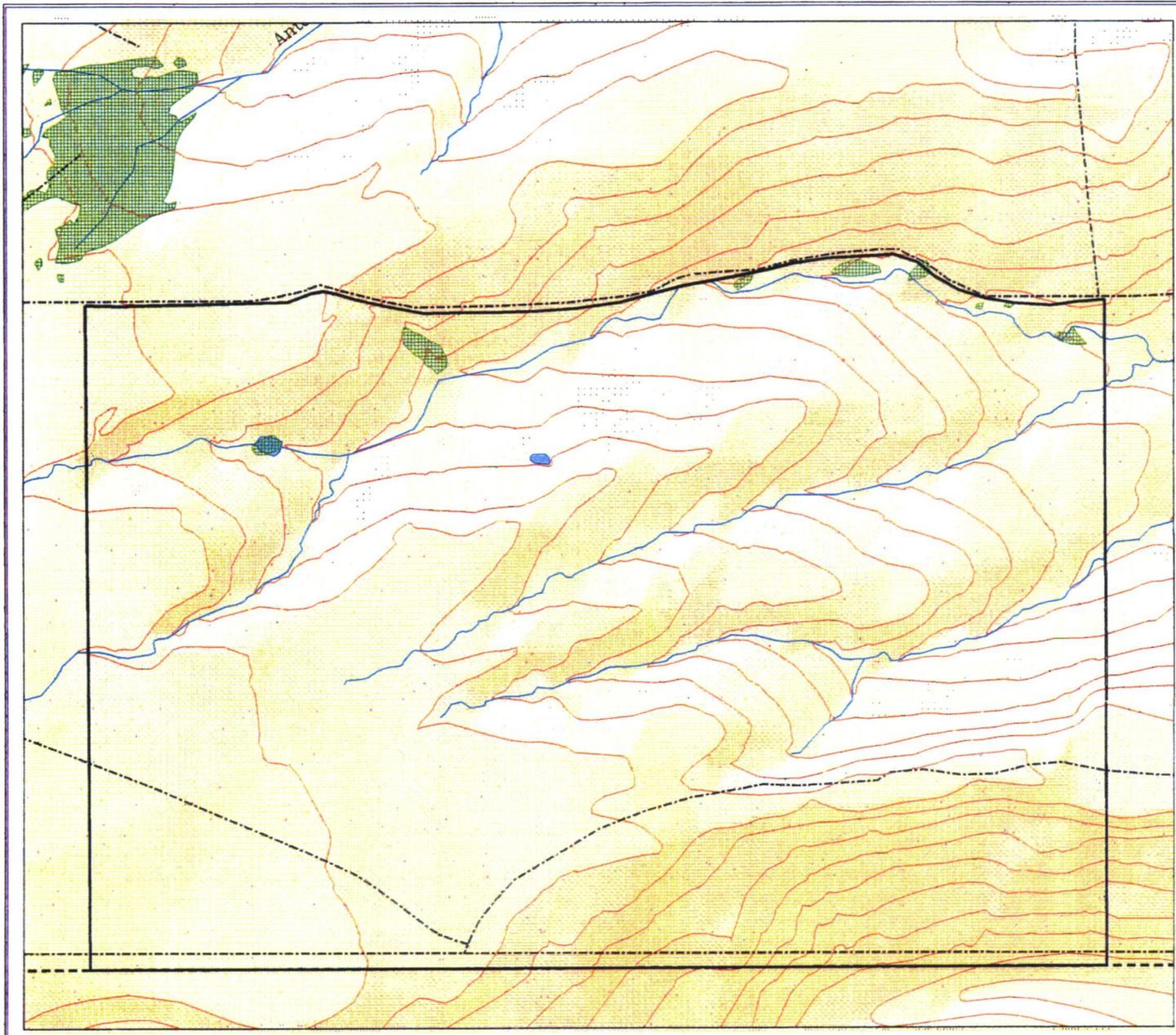
Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: Current data for soil sites are accessible through RFEDS.

SW 4-5



SW4 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCES:
 Buildings, ponds, and fences provided by
 Facilities Dept.,
 EG&G Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - John Armstrong



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

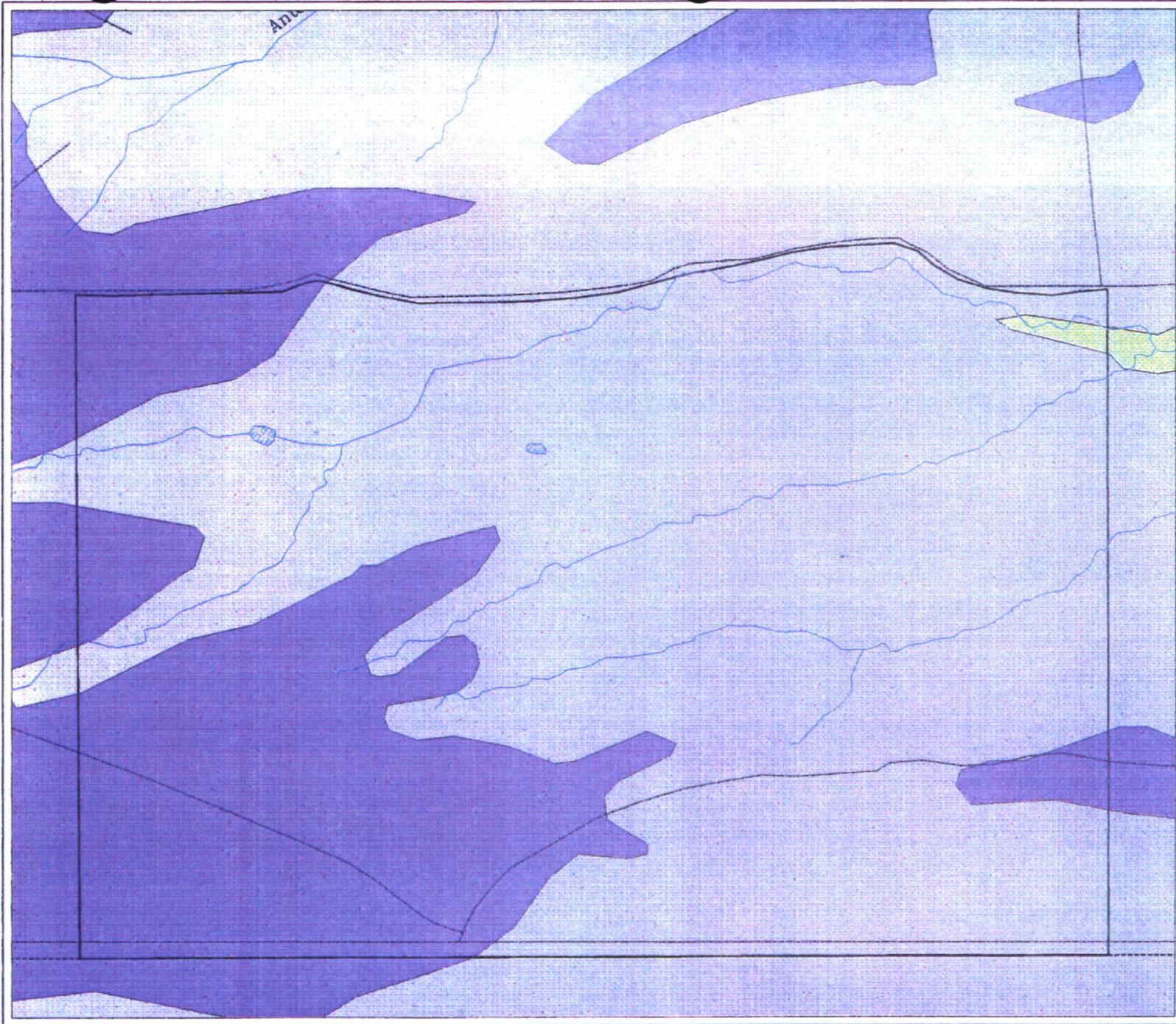
Prepared by:
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 464
 Golden, Colorado 80402-0464

MAP ID: Wet94-0001

August 22, 1994

\\nms\MS181\EG2\proj\sw4\sw4\0005\wetlands\1\02\sw4\wetlands-map.mxd

SW 4-7



SW4 SOIL TYPES

- Argiustolls
- Palaustolls
- Haplargids
- Mollisol/Flock Outcrop complex
- Torrifluvents
- Haplustolls
- Torrorthents
- Camborthids
- Haplustolls
- Cryofluvents
- Haploquolls
- Netraqids
- Argiborolls
- Gravel and Clay Pit
- Rock Outcrop
- DAM
- WATER
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quarants

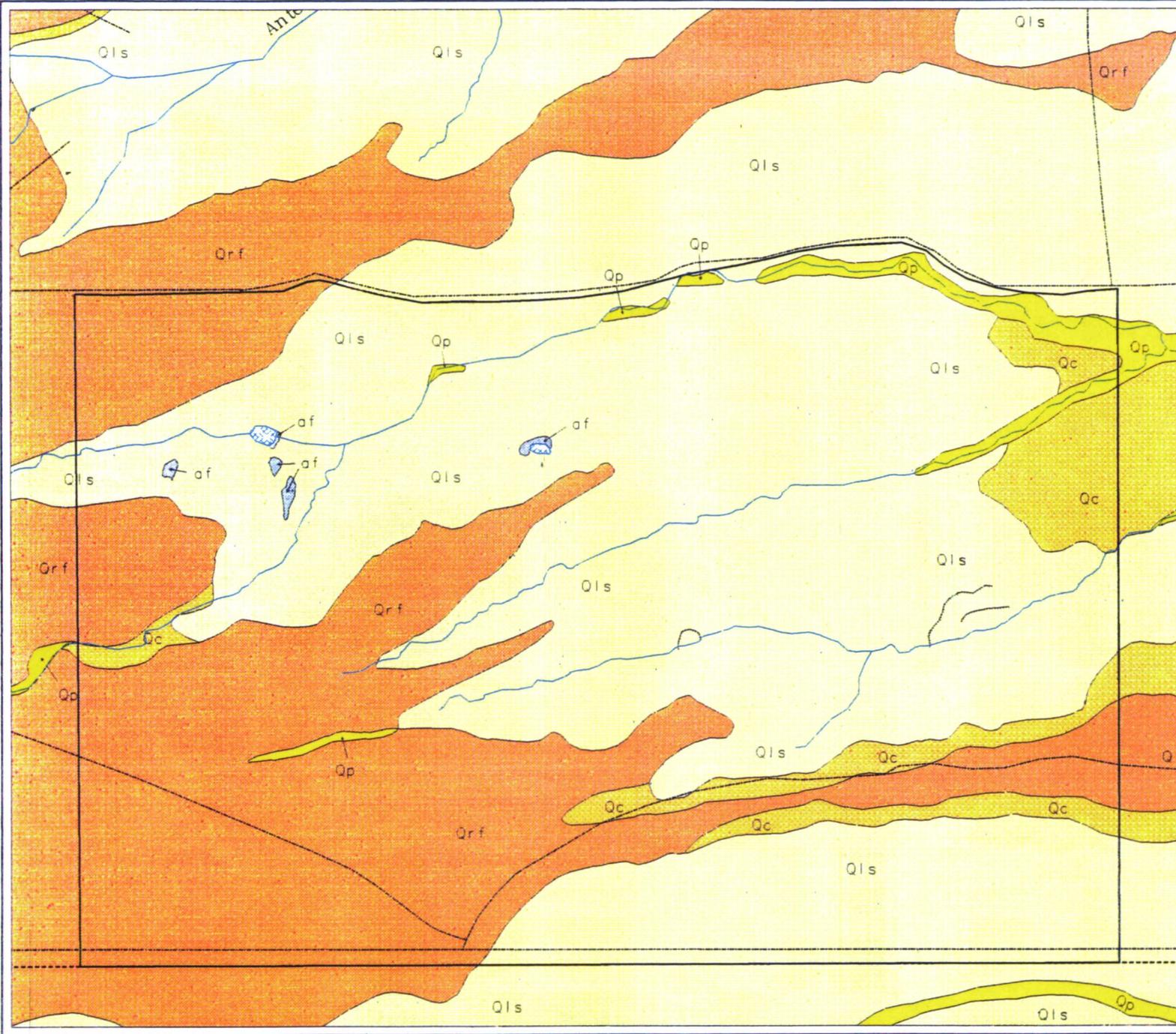
DATA SOURCES:
 Soil type maps and names provided by
 Pauline Dyer,
 USDA Rocky Flats, Inc. - 1991.
 Hydrology provided by
 1992 - 1996 surveys
 and Comprehensive Studies Center
 Unaffiliated Rocky Flats Area Soil Survey
 Soil mapping names suggested by Jim Winkler



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

Prepared by
RTI ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 480
 Golden, Colorado 80402-0480

SW 4-9



SW4 GEOLOGIC UNITS



- af - Artificial fill
- Qp - Post-Piney Creek Alluvium
- Qc - Terrace alluvium
- Qs - Slocum alluvium
- Qa - Columbian
- Qd - Landslide deposits
- Qe - Verdes alluvium
- Qr - Rocky Flats Alluvium
- Qf - Arapahoe Formation
- Qg - Laramie Formation
- Qh - Fox Hills Sandstone
- Shallow closed depression
- Scarp of young landslides
- Areas of vegetation around springs
- Boundary of gravel and clay pit
- Spring
- ↳ Bedding strike and dip
- ↳ Clast with clast size
- Capitol Mine

- ▣ Buildings or other structures
- ▣ Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

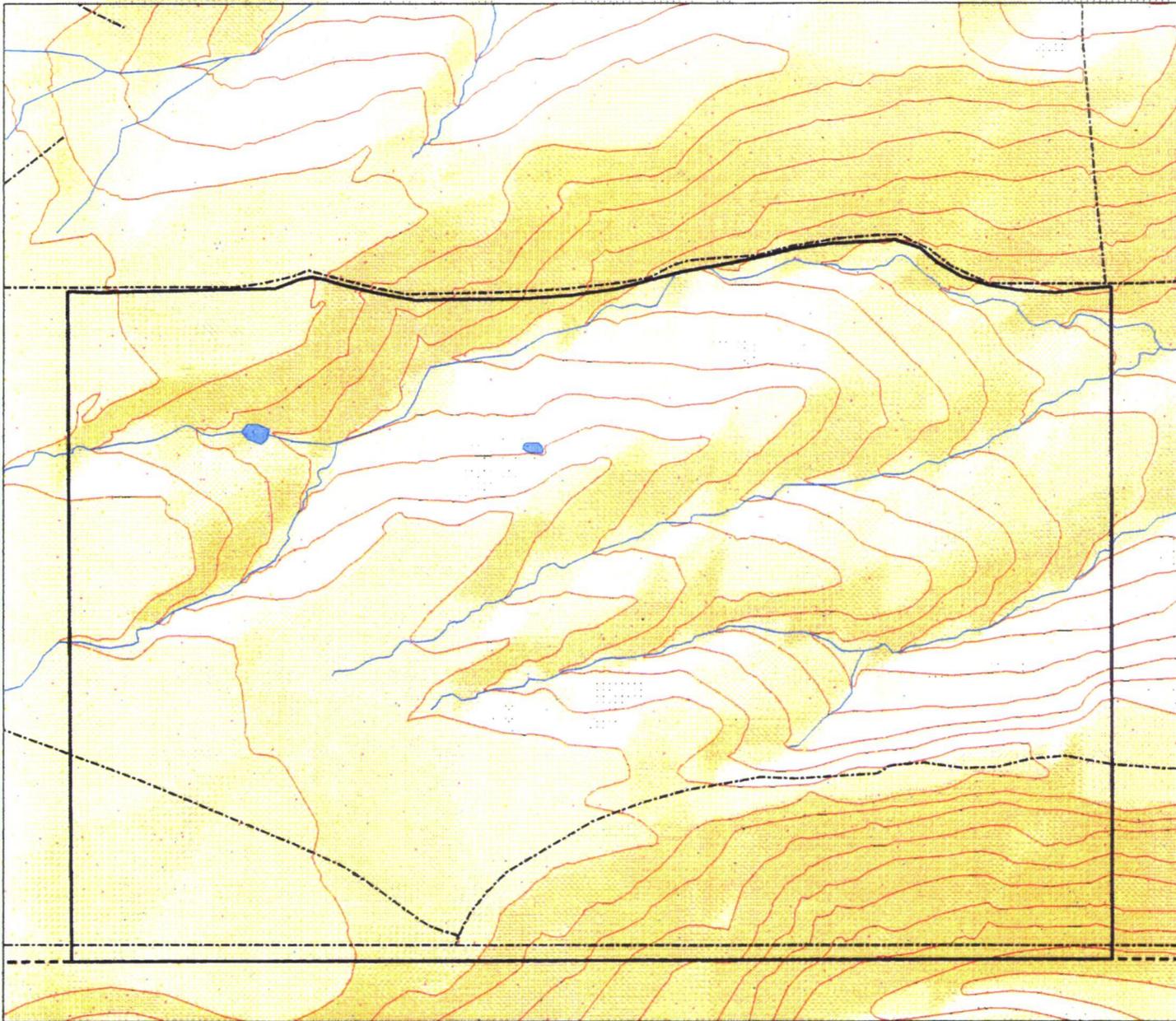
BASE MAPS:
 All maps used, unless otherwise noted, are based on:
 1958 Survey, U.S. G.S. 1:250,000
 1960 Survey, U.S. G.S. 1:250,000
 1962 Survey, U.S. G.S. 1:250,000
 1964 Survey, U.S. G.S. 1:250,000
 1966 Survey, U.S. G.S. 1:250,000
 1968 Survey, U.S. G.S. 1:250,000
 1970 Survey, U.S. G.S. 1:250,000
 1972 Survey, U.S. G.S. 1:250,000
 1974 Survey, U.S. G.S. 1:250,000
 1976 Survey, U.S. G.S. 1:250,000
 1978 Survey, U.S. G.S. 1:250,000
 1980 Survey, U.S. G.S. 1:250,000
 1982 Survey, U.S. G.S. 1:250,000
 1984 Survey, U.S. G.S. 1:250,000
 1986 Survey, U.S. G.S. 1:250,000
 1988 Survey, U.S. G.S. 1:250,000
 1990 Survey, U.S. G.S. 1:250,000
 1992 Survey, U.S. G.S. 1:250,000
 1994 Survey, U.S. G.S. 1:250,000
 1996 Survey, U.S. G.S. 1:250,000
 1998 Survey, U.S. G.S. 1:250,000
 2000 Survey, U.S. G.S. 1:250,000
 2002 Survey, U.S. G.S. 1:250,000
 2004 Survey, U.S. G.S. 1:250,000
 2006 Survey, U.S. G.S. 1:250,000
 2008 Survey, U.S. G.S. 1:250,000
 2010 Survey, U.S. G.S. 1:250,000
 2012 Survey, U.S. G.S. 1:250,000
 2014 Survey, U.S. G.S. 1:250,000
 2016 Survey, U.S. G.S. 1:250,000
 2018 Survey, U.S. G.S. 1:250,000
 2020 Survey, U.S. G.S. 1:250,000



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

Prepared by
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 404
 Golden, Colorado 80402-0404

SW 4-11



SW4 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)



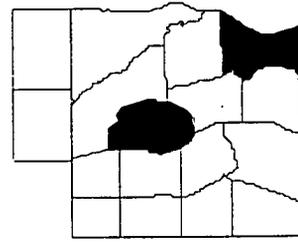
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464

MAP ID: Util94-0001

August 22, 1994

Rocky Flats Environmental Technology Site



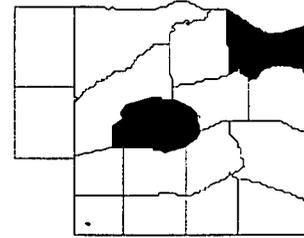
Quadrant: NE 1

Boundaries: North - Colorado 128.
South - Road running ENE from the south end of Pond A-4 dam along Walnut Creek to Indiana Street (Jefferson County 17).
East - Indiana Street (Jefferson County 17).
West - Road running N-S along the east old Buffer Zone boundary. Where the road turns to the west the boundary continues north to Colorado 128.

Vegetation: Quadrant NE 1 is primarily classified as Mesic Mixed Grassland, with small areas of Short Grassland and Reclaimed Grassland (artificially produced grassland communities) also present. Areas of Short Upland Shrub, intermixed with areas of Riparian Woodland, Bottomland Shrub and Marsh, are present along the Church and McKay Ditches as they flow through the northern portion of the quadrant, and Walnut Creek as it flows through the southern portion. The dominant species of vegetation in the quadrant are: Canada Bluegrass (*Poa compressa*), Kentucky Bluegrass (*Poa pratensis*), Western Wheatgrass (*Agropyron smithii*), and Blue Grama (*Bouteloua gracilis*).

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland, as well as Short Upland Shrub along the Church and McKay Ditches and Walnut Creek.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Desert Cottontail (*Sylvilagus audubonii*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

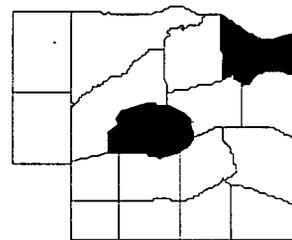


In the Short Upland Shrub areas, many species of arthropods are present but too numerous to list. Reptiles include the Bull Snake (*Pituophis melanoleucus*) and Racer (*Coluber constrictor*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), and Red-winged Blackbirds (*Agelaius phoeniceus*). Also present is the Mallard (*Anas platyrhynchos*), Red-tailed Hawk (*Buteo jamaicensis*), and Great Horned Owl (*Bubo virginianus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*). The foliage along the creek and ditch also provides habitat for Mule Deer (*Odocoileus hemionus*) and Coyotes (*Canis latrans*).

A Black-tailed Prairie Dog (*Cynomys ludovicianus*) colony (part of a larger colony that exists north of Colorado 128) is located in the north central portion of the quadrant. Currently, the colony does not appear to support any Black-footed Ferrets (*Mustela nigripes*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS Policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: McKay Ditch and an unnamed tributary flow through the western half of the quadrant. The tributary and the ditch flow into Walnut Creek in the west central area of the quadrant. These tributaries join Walnut Creek approximately 1,875 feet ENE of the Pond A-4 dam. From this point Walnut Creek follows the southern border of the quadrant until its intersection with Indiana Street (Jefferson County 17). Dry Creek flows across the SW corner of the quadrant and joins Walnut Creek approximately 600 feet NE of Pond A-4 dam. Church Ditch flows across the northern edge of the quadrant.



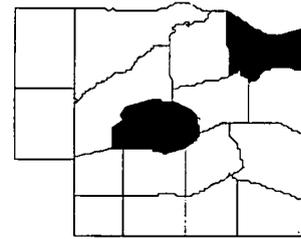
Jurisdictional Wetlands: Wetlands exist along McKay Ditch, Dry Creek, Northern Walnut Creek, Southern Walnut Creek and the main branch of Walnut Creek. Wetlands are also present along the unnamed tributary north of McKay Ditch. The wetlands along Dry and Walnut Creeks are classified as emergent, intermittently flooded, temporary wetlands by the USFWS.

Floodplain: There is an area of 100-year floodplain surrounding Walnut Creek, Walnut Creek Tributary C, and Walnut Creek Tributary D as they flow through the central portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in the southern portion of the quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

Loamy-skeletal Argiustolls, containing greater than or equal to 35% gravels or cobbles in the soil volume, are located on pediment surfaces in the northern portion of the quadrant. Loamy-skeletal Argiustolls contain less clay in the soil matrix than clayey-skeletal Paleustolls, which are located on most of the pediment surfaces.

There is a band of Torrifluvents in the south-eastern portion of the quadrant along Walnut Creek. Torrifluvents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and they are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.



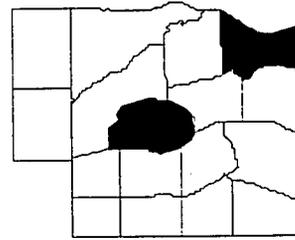
In addition, there is a area of Torriorthents along the east-central border of the quadrant. Torriorthents are poorly developed soils with the claystone bedrock exposed or very near the surface, and they are generally characterized by high shrink-swell potential, slow permeability, and severe erosion potential.

Surface Geology: An outcrop of the Arapahoe formation covers approximately 90 percent of the surface. Valley-fill Alluvium along the Walnut Creek Drainage constitutes 5 percent of the area. The remaining 5 percent of the quadrant is covered by an outcrop of Rocky Flats Alluvium. The outcrop is found at the north end of the quadrant on the "flats" along Colorado 128. The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. Valley-fill Alluvium deposits are represented by well graded mixtures of reworked Rocky Flats Alluvium, colluvium, and weathered bedrock found in drainages. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays.

Utilities: Several aboveground PSC of CO power lines cross the quadrant. Two lines, running NE and SE meet in the north central part of the quadrant and continues east along Colorado 128. A third line runs N-S along the western edge of the quadrant. Power lines also run along the eastern side of the quadrant at Indiana Street (Jefferson County 17). A fiber optic line is buried along the eastern edge of the quadrant along Indiana Street (Jefferson County 17). A buried 12-inch natural-gas line owned by the Coors Energy Company runs N-S along the N-S power lines that cross the western edge of the quadrant.

Archaeology: State Site 5JF482 - Isolated Find Record located in the north central portion of the quadrant; an American Indian stone tool, most probably an abrader. The site was not included in the NRHP because it is in poor condition, exhibits no rare construction, and has no historic interest.

Future Plans: None.



Mineral Rights: Tract 29 - The majority of Section 1 - 446.36 acres. The Union Pacific Railroad owns coal rights.

Tract 30 - The western edge of Section 29 - 27.61 acres. The Union Pacific Railroad owns coal rights. Reservation of coal, iron, and mineral rights and 1/2 of oil and gas with right of ingress and egress for gas and oil production, including coal, iron and other minerals to Andrew M. Patten.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the south and west sides. The land east of Indiana Street (Jefferson County 17) is zoned as Jefferson County Parks and Open Space and is vacant. Adjacent land north of Colorado 128 is pasture land.

Contamination Profile

Soil Sites: 2-154 and 2-036

Sediment Sites: Reference the Sediment Sampling Locations map.

Surface Water: Reference the Surface Water Sampling Locations map.

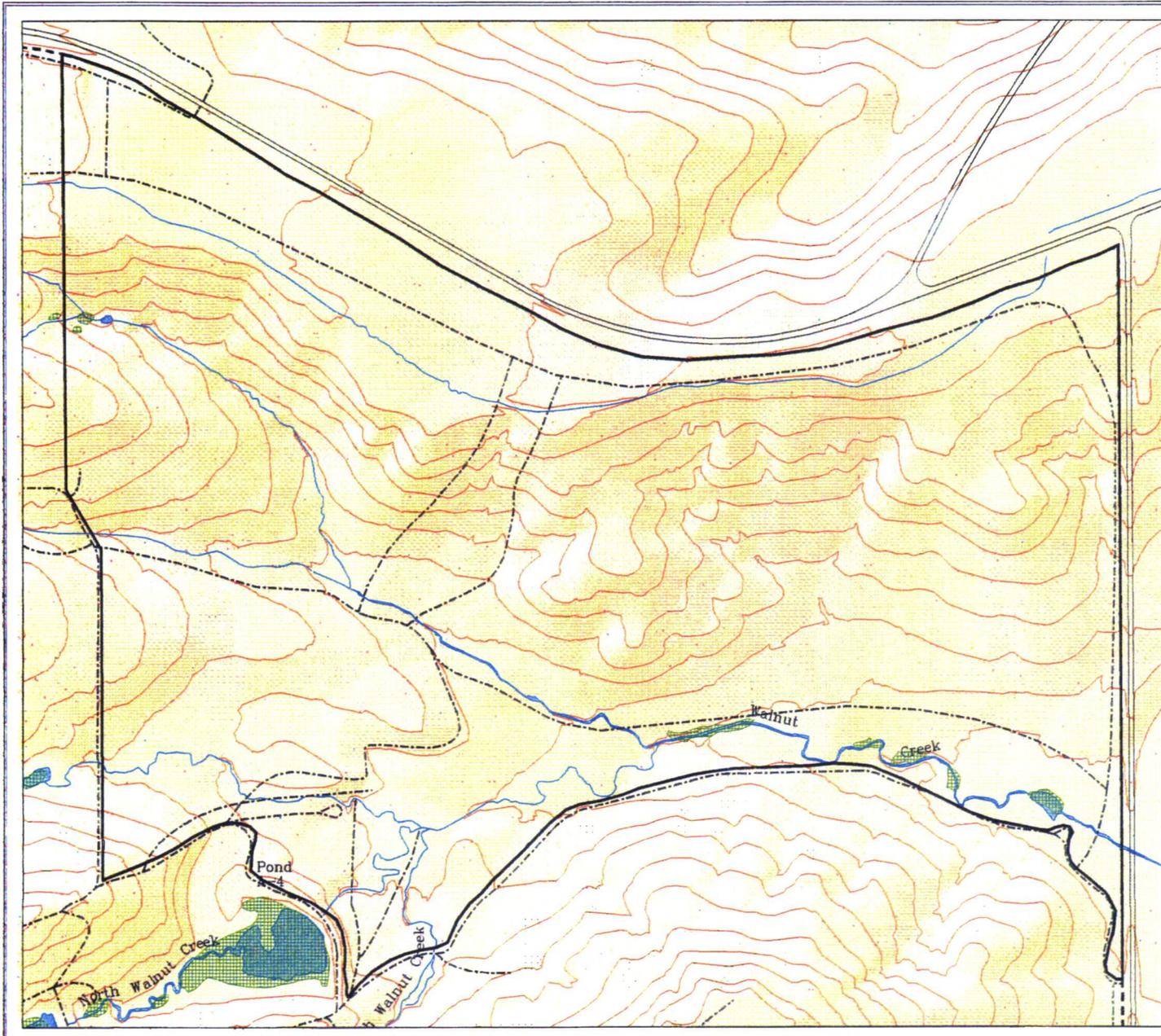
Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: IHSS 142.12 is located in the far southeastern corner of the quadrant. The IHSS is the flume pond which has been in operation from the fall of 1978 to the present. The primary purpose of the pond is flow measurements from the Walnut Creek drainage. Two Parshall flumes are used to make the measurements. The pond was identified as an IHSS during IAG negotiations.

The quadrant is relatively unaffected by operation of the RFETS. Very little contamination in this area can be directly attributed to RFETS operations. Well data is currently accessible through RFEDS.

NE 1-7



NE1 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Dept.
 EG&G Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - John Williams



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

Prepared by:
 **EG&G ROCKY FLATS**
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: Wet94-0001

August 22, 1994

\\home\15182\project\wet\0001\wetlands\1\fig\wetlands.mxd

NE 1-9



NE1 SOIL TYPES

- Argiustolls
- Palaeustolls
- Haplargids
- Mollisol/Rook Outerop complex
- Torrifluvents
- Hapluustolls
- Torrorthents
- Camborthids
- Hapluustolls
- Cryofluvents
- Haplaquolls
- Netraquids
- Argiborolls
- Gravel and Clay Pit
- Rook Outerop
- DAM
- WATER
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

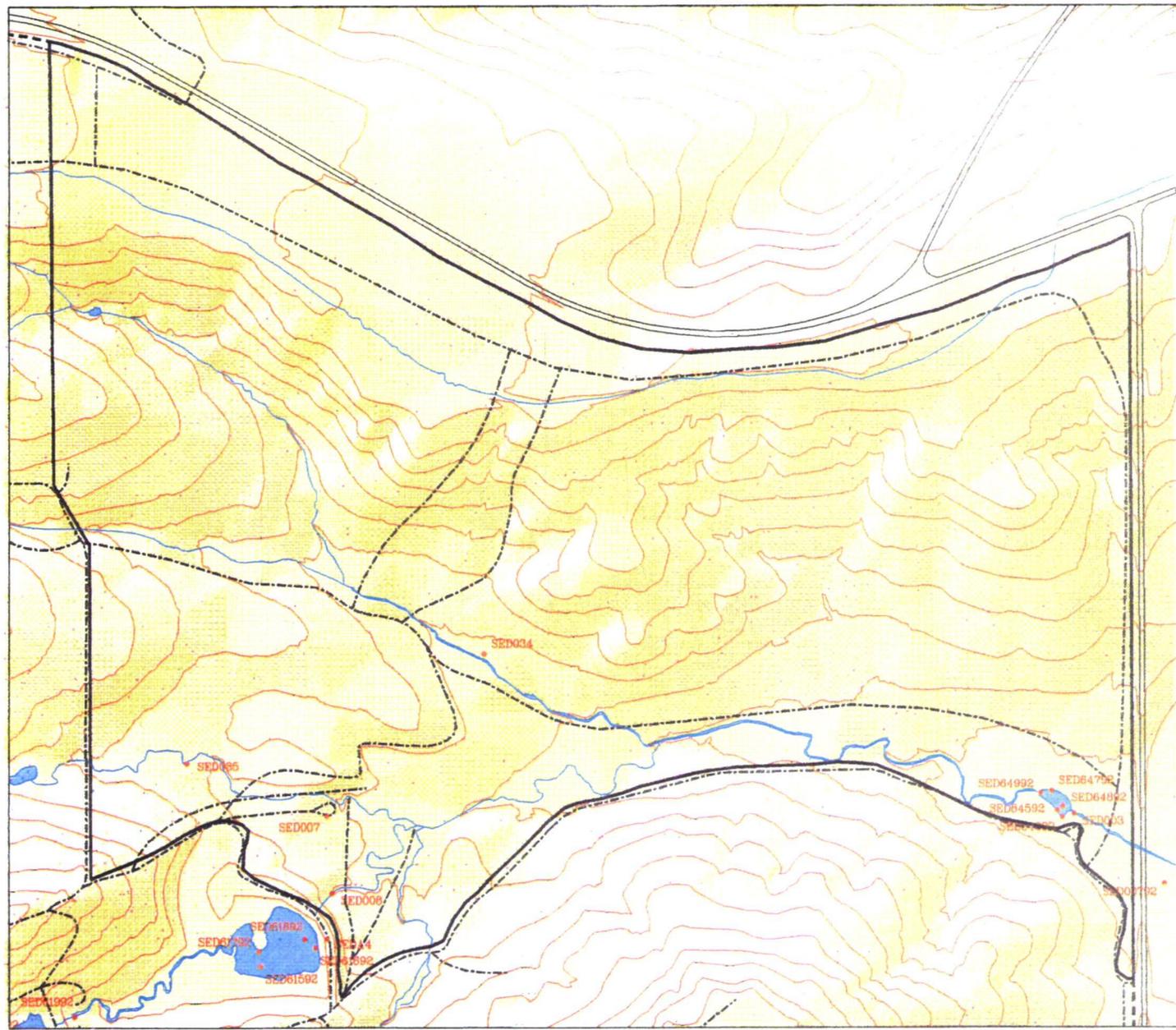
DATA SOURCES
 Building results and fences provided by
 Pauline Eng.
 1980 Rocky Flats, Inc. - 1981.
 Hydrology provided by
 USGS - plus unknown
 and Commercial Service users
 Chemical Safety Area Soil Survey
 Soil mapping scheme originated by the USGS



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

Prepared by
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 904
 Golden, Colorado 80402-0904

NE 1-13



NE1 SEDIMENT SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Sediment sampling locations

DATA SOURCES:
Buildings, roads, and fences provided by
Foothills Exp.,
2000 Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - 1986 statement



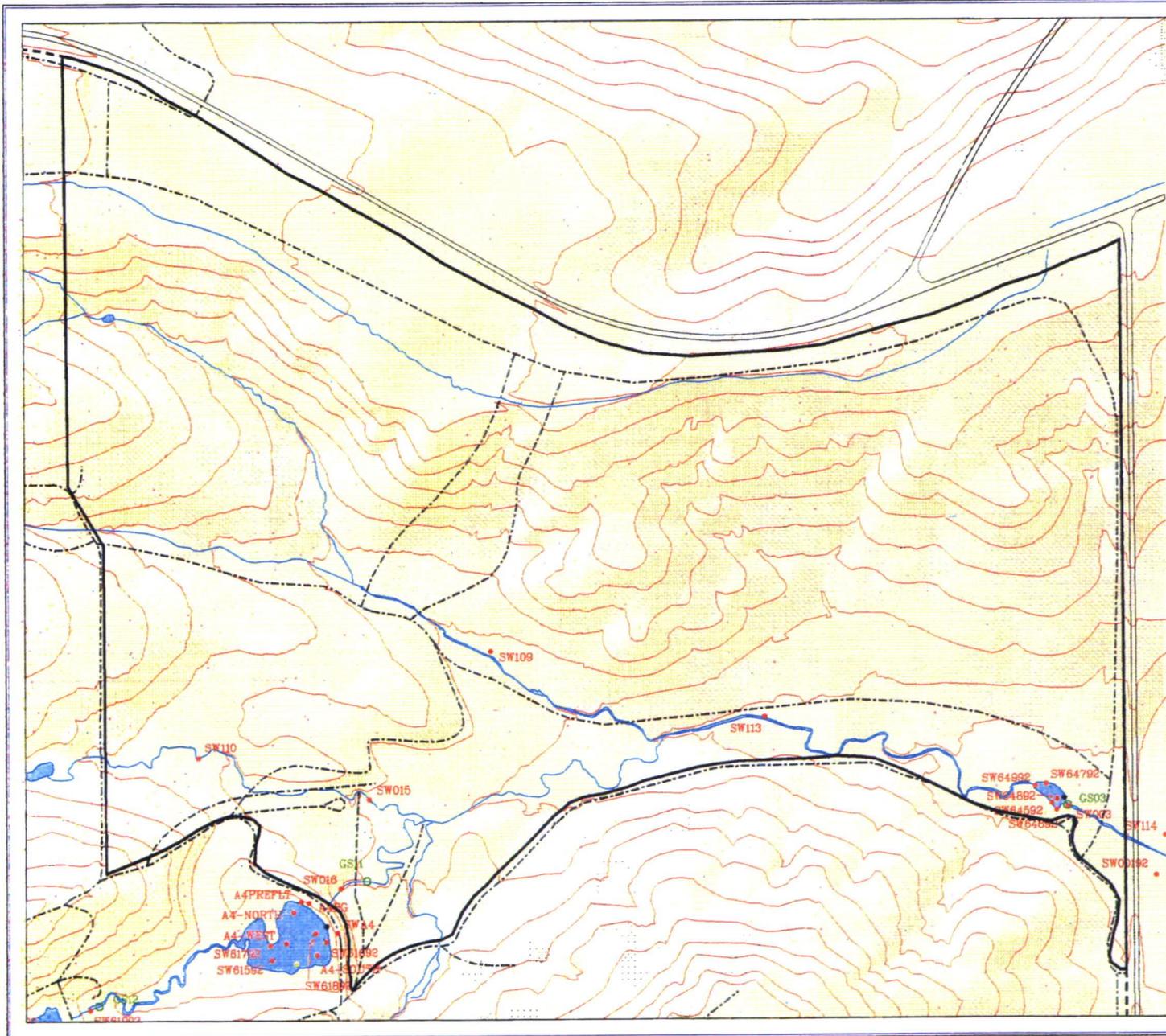
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: bh94-001

August 22, 1994

Rocky Flats Environmental Technology Site - 1994-08-22



NE1 SURFACE WATER SAMPLING LOCATIONS

- Buffer Zone Quadrants
- Surface water stations
- Routine operational sites
- NPDES/FFCA permit monitoring sites
- Gaging stations
- NPDES storm water permit sampling sites
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' Intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Dept.
 EG&G Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - (data unknown)



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

Prepared by:
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 464
 Golden, Colorado 80402-0464

NE1 GROUNDWATER MONITORING WELL LOCATIONS MAP

- Boundary Wells
- CERCLA Characterization Wells
- RCRA Regulatory
- RCRA Characterization Wells
- Special Purpose Wells

- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - ◐ Alluvium/Bedrock

- Inactive Groundwater Monitoring Wells**
- △ Bedrock
 - △ Alluvium
 - △ Alluvium/Bedrock

- ✦ Abandoned Groundwater Monitoring Wells

- Other**
- ▨ buildings and other structure
 - Ponds and Lakes
 - Extent of Rocky Flats Alluvium

- Standard Map Features**
- Fences
 - - - Rocky Flats boundary
 - Paved roads
 - - - Dirt roads

DATE REVISED:
 1997 (includes Base Coordinates spreadsheet, 404 buildings, roads, and fences provided by Pacific Slope, 41042 Rocky Flats, Inc. - 1997.
 Hydrology provided by 1997 - (data unknown)



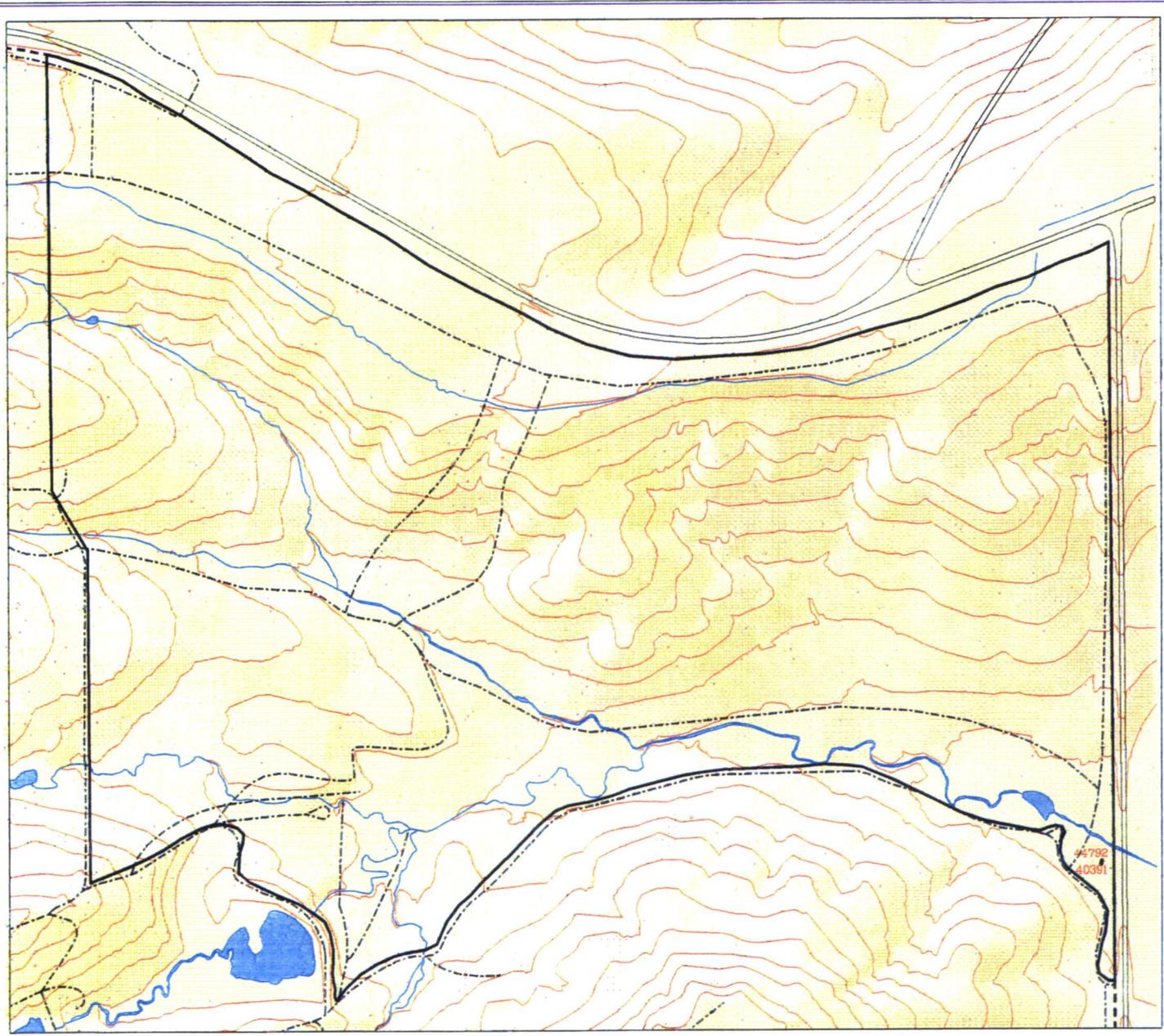
U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by:
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 494
 Golden, Colorado 80402-0494



NE1-17

NE 1-19



NE1 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCE:
Buildings, roads, and fences provided by
Foothill Eng.,
1984 Rocky Flats, Inc. - 1981.
Hydrology provided by
USGS - John Johnson
BOREHOLE LOCATIONS FROM GEOSCANNER



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

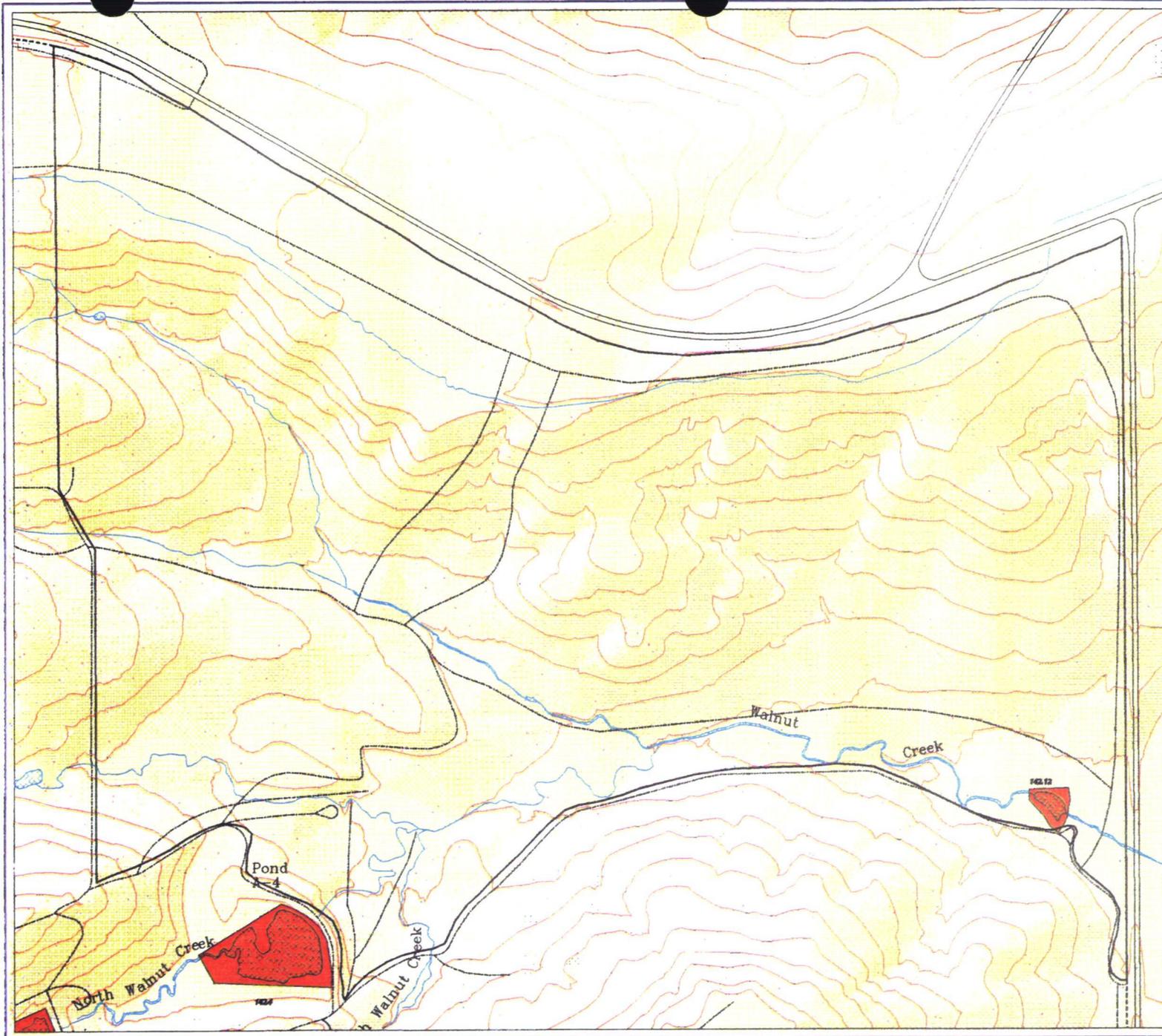
Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: bh94-0001

August 22, 1994

A:\mms\191182\proj\env\0000\bh-ev-ec\SH-1\egads\new\boh-hole-map.dwg

NE 1-21



**NE1 INDIVIDUAL HAZARDOUS
SUBSTANCE SITES**

- Operable Unit 1
- Operable Unit 2
- Operable Unit 4
- Operable Unit 5
- Operable Unit 8
- Operable Unit 7
- Operable Unit 8
- Operable Unit 9
- Operable Unit 10
- Operable Unit 11
- Operable Unit 12
- Operable Unit 13
- Operable Unit 14
- Operable Unit 15
- Operable Unit 16

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' Interval)
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

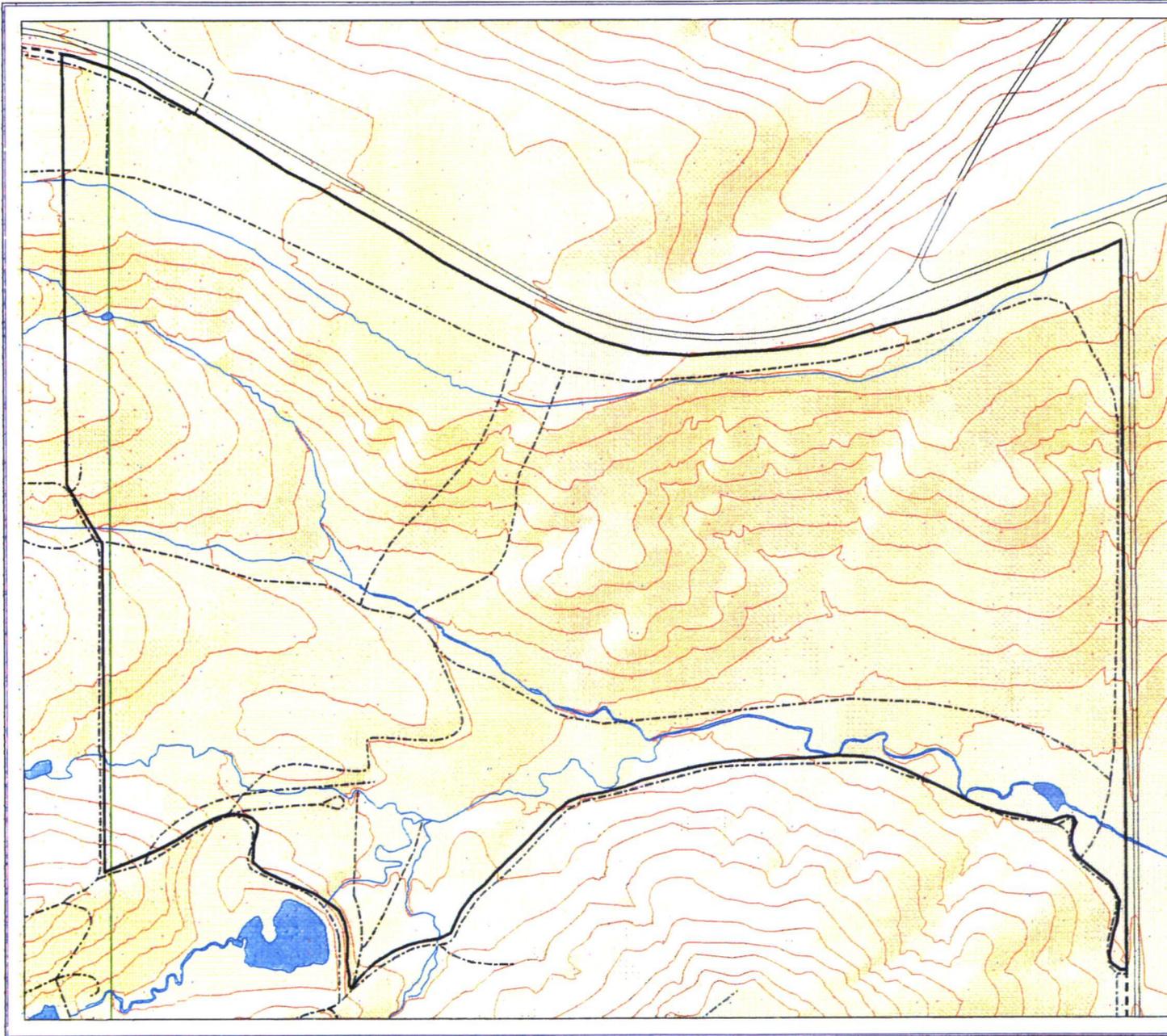
DATA SOURCES
 Buildings, roads, and fences provided by
 Fugro Inc.
 2000 Rocky Flats, Inc. - 1999.
 Hydrology provided by
 USGS - Site unknown
 Individual Hazardous Substance Sites (IHSS) are
 delineated by the following
 OUI - 1999 Phase II Report
 OUI 4, 7, 11, & 16 - 1999
 The remaining OUIs are defined by their
 respective Operable Unit Maps.



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

Prepared by
EB&B ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 404
 Golden, Colorado 80402-0404

NE 1-23



NE1 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)



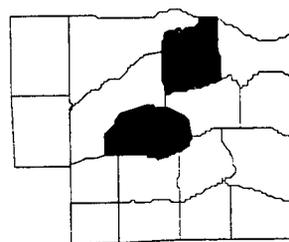
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util04-0001

August 22, 1994

/home/151122/projects/ewd/0005/Util04/Util04.mxd



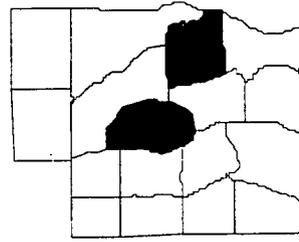
Quadrant: NE 2

Boundaries: **North** - Colorado 128.
South - Road running ENE along the top of the ridge to the south of the Dry Creek.
East - Road running N-S along the east old Buffer Zone boundary. Where the road turns to the west the boundary continues north to Colorado 128.
West - Line running N-S just to the east of the landfill pond. This line runs from the south boundary north to the ridge south of the Rock Creek drainage. Boundary line contours east along the top of this ridge until the ridge is intersected by Colorado 128.

Vegetation: Quadrant NE 2 is primarily classified as Mesic Mixed Grassland, with small areas of Xeric Mixed Grassland also present. Areas of Bottomland Shrub, intermixed with areas of Marsh, are present along the Church and McKay Ditches as they flow through the central portion of the quadrant. The dominant species of vegetation are: Western Wheatgrass (*Agropyron smithii*), Canada Bluegrass (*Poa compressa*), Kentucky Bluegrass (*Poa pratensis*), and June Grass (*Koeleria pyramidata*) with fewer stands of Blue Grama (*Bouteloua gracilis*)...

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland as well as Short Upland Shrub along the Church and McKay Ditches.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Poocetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Rabbits (*Lagomorpha*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

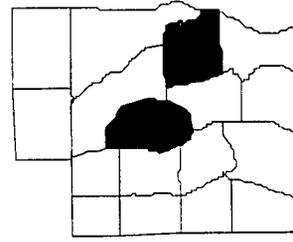


In the Bottomland Shrub areas, different species of arthropods are present and too numerous to list. Reptiles include the Bull Snake (*Pituophis melanoleucus*), Prairie Rattlesnake (*Crotalis viridis*), and the Western Painted Turtle (*Chrysemys pictys*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), Red-winged Blackbirds (*Agelaius phoeniceus*), Red-tailed Hawks (*Buteo jamaicensis*), and various species of Waterfowl (*Anatidae*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), and Muskrats (*Ondatra zibethicus*). The foliage along the creek and ditch also provides habitat for Mule Deer (*Odocoileus hemionus*) and Coyotes (*Canis latrans*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: The Church Ditch flows ENE across the northern portion of the quadrant. McKay Ditch and the McKay Bypass Canal flow ENE through the middle of the quadrant. Dry Creek flows east from the landfill pond in the south end of the quadrant. Three small unnamed tributaries join Dry Creek as it flows east. Two unnamed tributaries flow off the "flats" in the NE corner and down the hillside and joins with McKay Ditch in quadrant NE1.

Jurisdictional Wetlands: Wetlands exist along the main branch of Dry Creek and a portion of the McKay Ditch. One of the tributaries in the NE corner of the quadrant is also classified as a wetland by the USFWS.

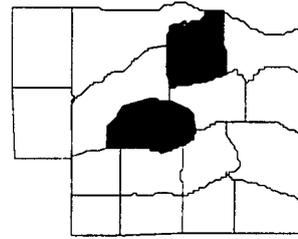


Floodplain: There is an area of 100-year floodplain surrounding the McKay ditch as it flows through the central portion of the quadrant, and Rock Creek as it flows through the northern portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE, report "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

Clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces, are present along the southern border and in the north-western corner of the quadrant. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

Surface Geology: An outcrop of Rocky Flats Alluvium comprises approximately 75 percent of the surface geology. The "flats" along the western edge of the quadrant constitute the area covered by the Alluvium. The hillsides on the eastern half of the quadrant are a mix of the Arapahoe and Laramie Formation with Arapahoe near the tops of the hillsides and the Laramie near the bottom. The combination of these two formations account for the remaining 25 percent of the surface geology in the quadrant.



Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays. The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. The upper unit of the Laramie Formation is approximately 500 feet thick and composed of claystone. The claystone is light to medium gray and kaolinitic.

Utilities: Two aboveground PSC of CO power lines cross the quadrant, one running to the NE across the SE corner of the quadrant and the other running NW across the NE corner.

Archaeology: None.

Future Plans: None.

Mineral Rights: Tract 31 - N 1/2, NE 1/4, SE 1/4, and the NW 1/4, SW 1/4 Section 2 - 352.46 acres. The Union Pacific Railroad owns coal rights. Proprietor of vein or lode to extract and remove ore, should it penetrate or intersect. Coal, gas, oil and other minerals reserved by A. M. Patten and granted by A. M. Patten to A. Reamer Patten, Margaret Musgrove, and Ivan M. Patten.

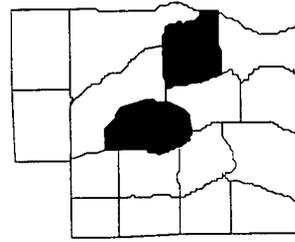
Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the south, east, and west sides. The land north of Colorado 128 is currently pasture land.

Contamination Profile

Soil Sites: 1-036, 1-018, and 2-018

Sediment Sites: Reference the Sediment Sampling Locations map.

Surface Water: Reference the Surface Water Sampling Locations map.

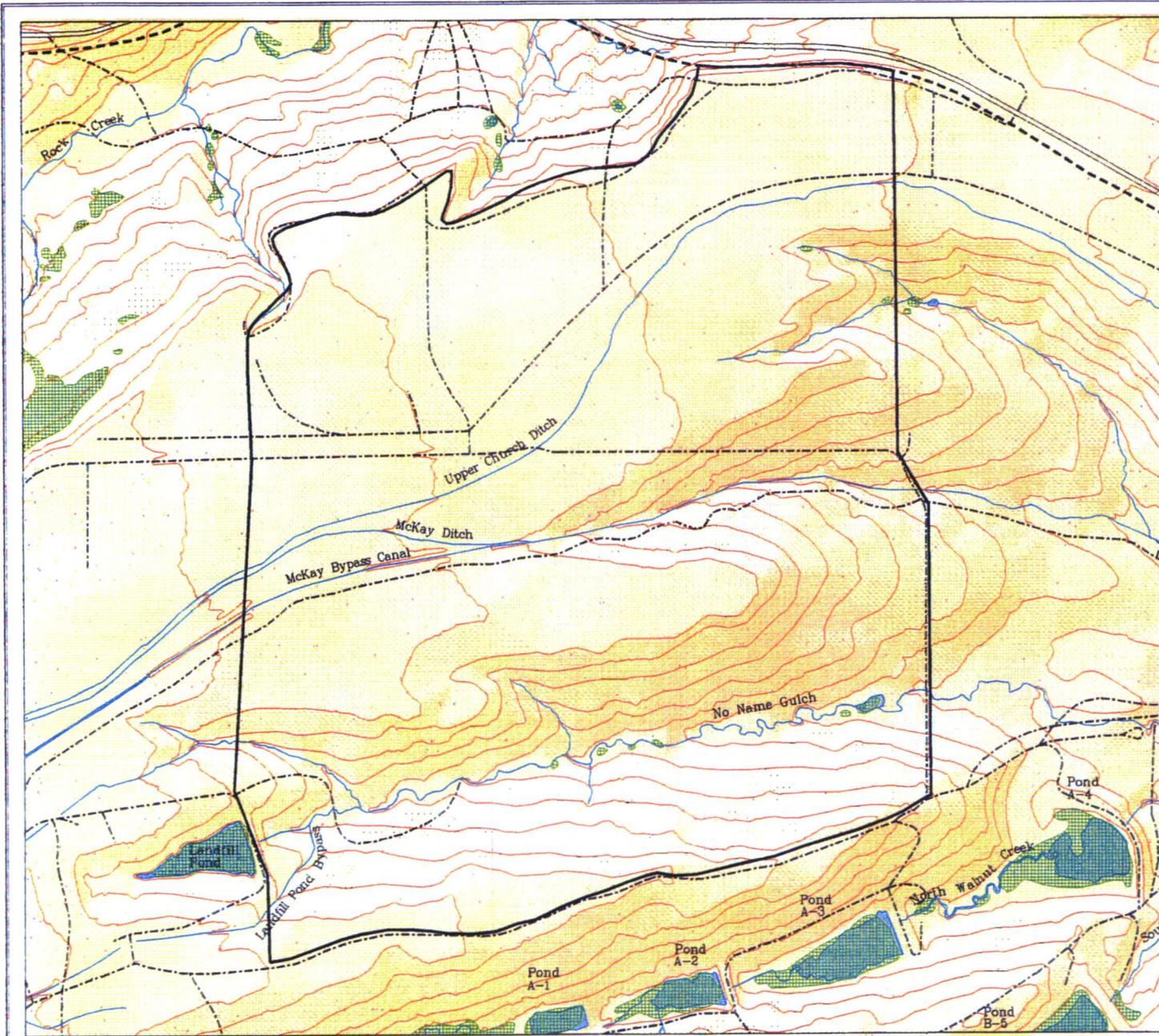


Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: Soil sampling, sediment sites, surface water and groundwater well data is currently accessible through RFEDS.

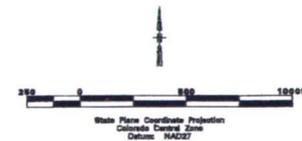
NE 2-7



NE2 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)

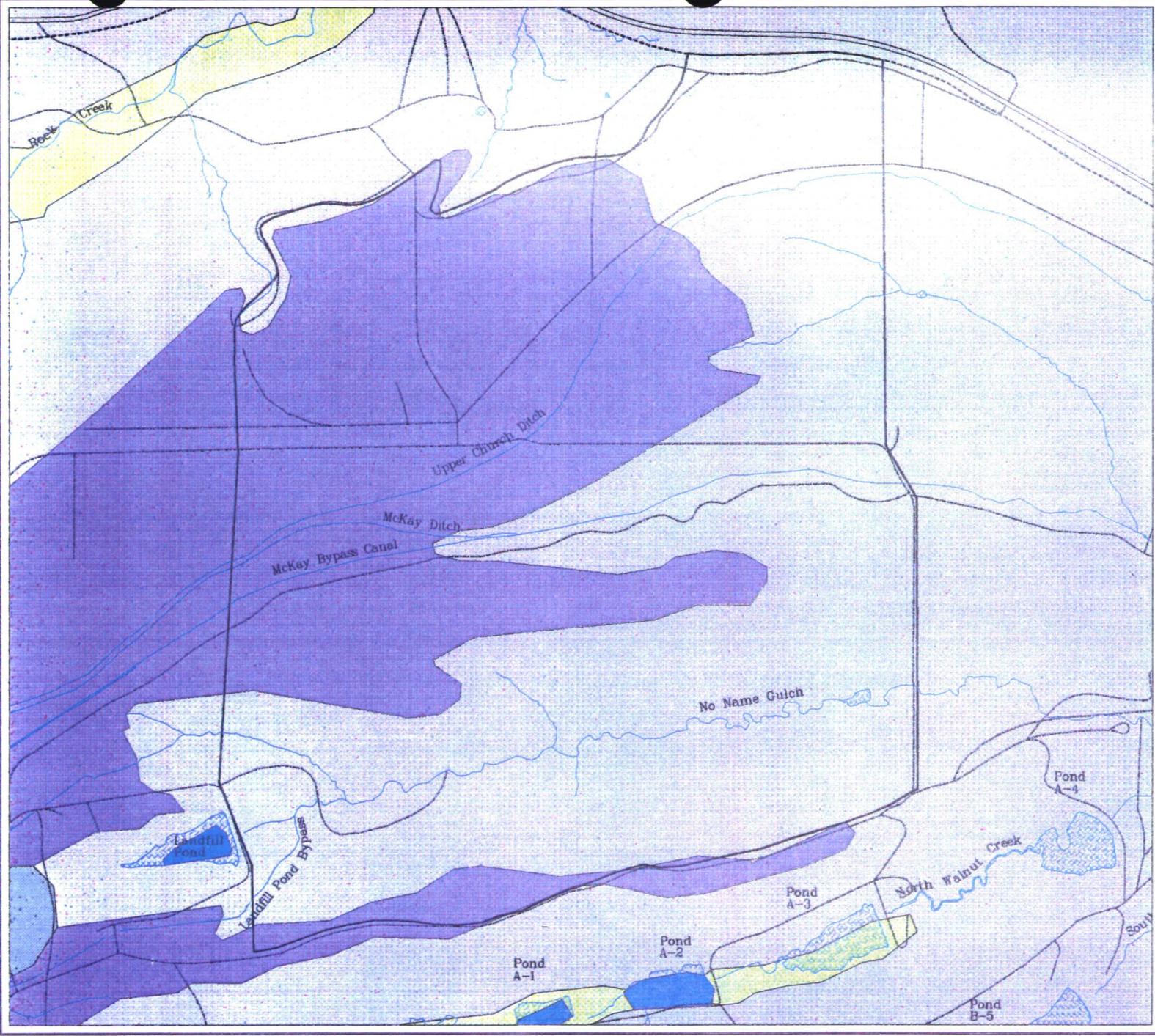


U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 454
Golden, Colorado 80402-0454

MAP ID: Wet94-0001

August 22, 1994



NE2 SOIL TYPES

- Argiustolls
- Paleustolls
- Haplargids
- Mollisol/Rock Outcrop complex
- Torrifluvents
- Haplustolls
- Torrorthents
- Camborthids
- Hepfluvents
- Cryofluvents
- Heploquolls
- Netrangids
- Argiborolls
- Gravel and Clay Pit
- Rock Outcrop
- DAM
- WATER

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

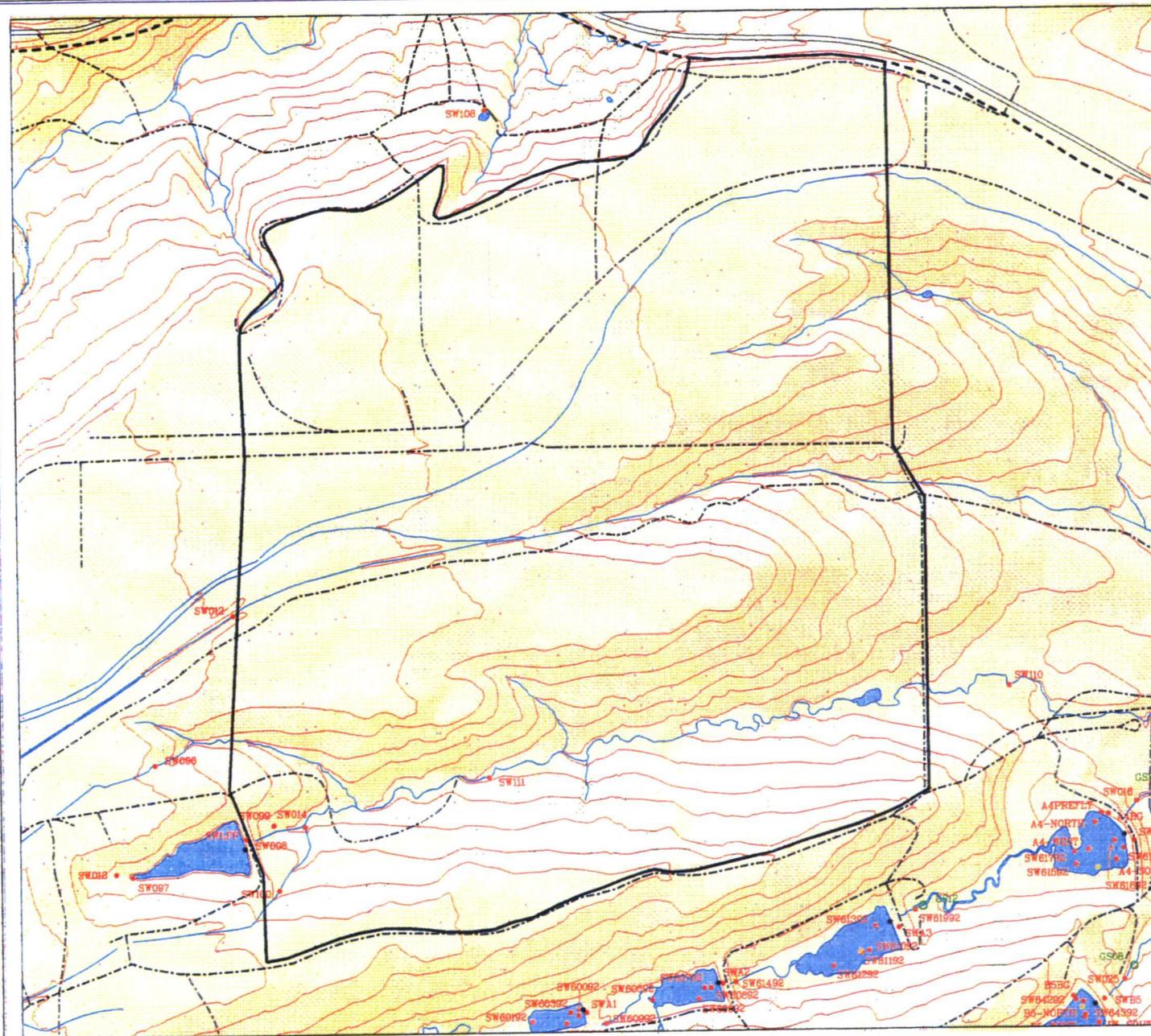
BASE SOURCE:
 Buildings, roads, and fences provided by
 Foothills Dept.
 1980 Rocky Flats Inv. - 1981.
 Hydrology provided by
 USGS - (data abstracted)
 and Colorado State Univ.
 University of Colorado and Survey
 and mapping abstracted by Jim Waddy



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

Prepared by
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 464
 Golden, Colorado 80402-0464

NE 2-15



NE2 SURFACE WATER SAMPLING LOCATIONS

- Buffer Zone Quadrants
- Surface water stations
- Routine operational sites
- NPDES/FFCA permit monitoring sites
- Gaging stations
- NPDES storm water permit sampling sites
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' Intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)



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

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: sw94-0001

August 29, 1994

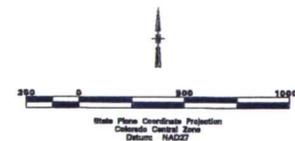
D:\rockyflats\sw94-0001\sw94-0001.dwg

NE 2-19

NE2 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Eng.
 EG&G Rocky Flats, Inc - 1991.
 Hydrology provided by
 USGS - (date unknown)
 BOREHOLE LOCATIONS FROM GEOSCIENCES



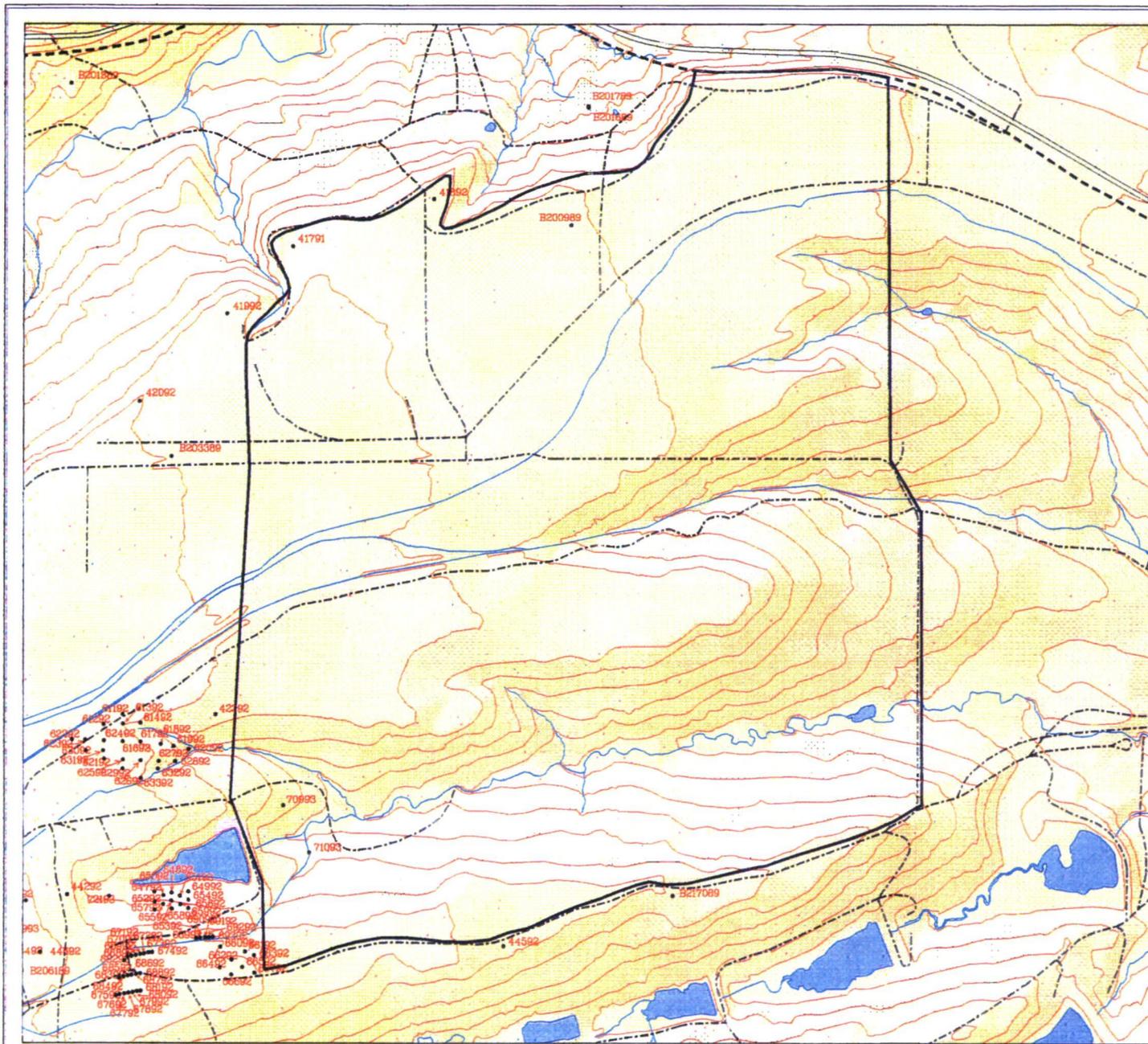
U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS

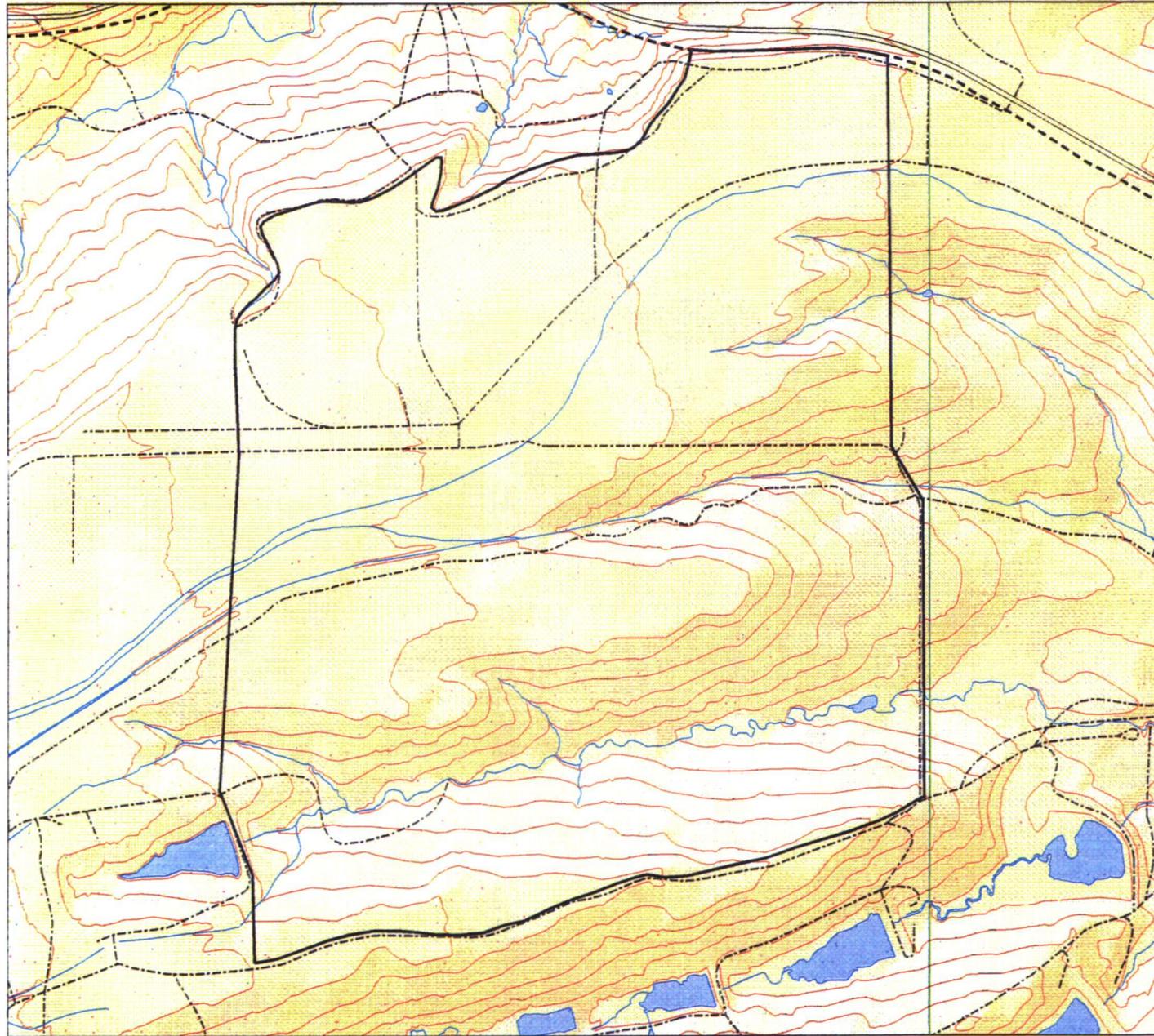
Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: bh94-0001

August 22, 1994



NE 2-21



NE2 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)

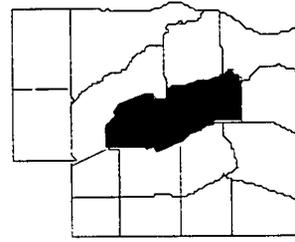


U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util94-0001

August 22, 1994



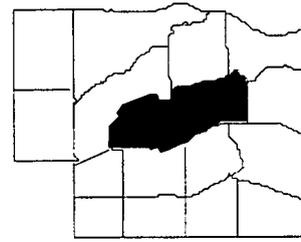
Quadrant: NE 3

Boundaries: **North** - Road running ENE along the top of the ridge north of the Walnut Creek drainage. The road curves south at Pond A-4 forming the NE corner of the quadrant.
South - Inner security fence and east RFETS Access Road.
East - Line running N-S from the east side of Pond A-4 dam to the east RFETS Access Road.
West - Inner security fence and a line running N-S just east of the landfill pond.

Vegetation: Quadrant NE 3 is primarily classified as Mesic Mixed Grassland, with small areas of Reclaimed Grassland also present. Areas of Marsh are present along Walnut Creek as it flows through the northern portion of the quadrant. The dominant species of vegetation in the quadrant are: Western Wheatgrass (*Agropyron smithii*), Canada Bluegrass (*Poa compressa*), Kentucky Bluegrass (*Poa pratensis*), Smooth Brome (*Bromus inermis*), Cheatgrass (*Bromus tectorum*), Cottonwood (*Populus*), and Willow (*Salix*).

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland, as well as Marsh along Walnut Creek.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles include the Bull Snake (*Pituophis melanoleucus*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Rabbits (*Lagomorpha*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*). The Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*), a Colorado Species of Special Concern, is also known to inhabit this area.

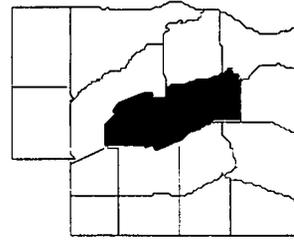


In the Marsh areas, many species of arthropods are present and too numerous to list, and these areas are considered among the most productive arthropod habitats at the plant. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*) and Western Painted Turtle (*Chrysemys picta*). The bird population consists of Red-winged Blackbirds (*Agelaius phoeniceus*), the Common Yellowthroat (*Geothlypis trichas*), various species of Waterfowl (*Anatidae*), and the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), and Muskrats (*Ondatra zibethicus*). The foliage along the creek and ditch also provides habitat for Mule Deer (*Odocoileus hemionus*) and Coyotes (*Canis latrans*).

The detention ponds comprise different aquatic habitats that support a variety of wildlife. Several species of water fowl as well as turtles and fish are present. Bass and other sport fish exist in the A series detention ponds. Pond B-5 contains little aquatic wildlife due to fluctuations in the chemical composition of the pond water.

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: Two main drainages exist across the quadrant to the NE. North Walnut Creek flows from Pond A-1 and A-2 into Pond A-3. Pond A-4 dam is in the eastern edge of the quadrant. The second drainage is formed by South Walnut Creek. The northern most branch flows from the Protected Area around Ponds B-1, B-2 and B-3 into B-4 and then into B-5. Two other tributary drainages enter the northern branch of South Walnut Creek between Ponds B-4 and B-5.



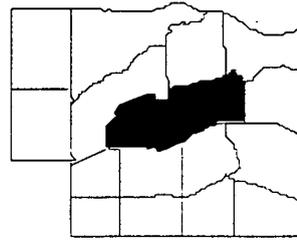
Stream flow through both the A-series and B-series ponds is controlled by the RFETS. The main purpose of the ponds is to serve as catching basins for accidental releases of material from the RFETS. The watershed of North and South Walnut Creek drainages encompasses the majority of the developed plant site.

Jurisdictional Wetlands: All nine detention ponds in the quadrant are classified as open water, artificial, semipermanent wetlands. Seeps south of Pond B-5 are classified as flat, saturated/semipermanent/seasonal wetlands by the USFWS. Small areas of wetlands exist between the ponds in both North and South Walnut Creeks.

Floodplain: There is an area of 100-year floodplain surrounding Walnut Creek, Walnut Creek Tributary B, and the A and B-series ponds as they flow through the center portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

Clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces, are mostly located along the northern and southern borders of the quadrant. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.



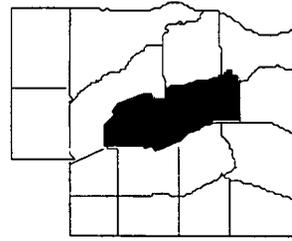
In addition, there is a band of Torrfluents in the northern portion of the quadrant along the A series Ponds and associated drainages. Torrfluents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and they are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

Surface Geology: An outcrop of Rocky Flats Alluvium comprises approximately 30 percent of the surface geology. The "flats" along the southern and northern edges of the quadrant constitute the areas covered by the quadrant. The hillsides along North and South Walnut Creek are a mix of the Arapahoe and Laramie Formations with Arapahoe near the tops of the hillsides and the Laramie near the bottom and under the ponds. The combination of these two formations account for the remaining 70 percent of the surface in the quadrant.

Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays. The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. The upper unit of the Laramie Formation is approximately 500 feet thick and composed of claystone. The claystone is light to medium gray and kaolinitic.

Utilities: An aboveground PSC of CO power line runs N-S along the eastern edge of the quadrant. A 12-inch natural gas line owned by Coors Energy Company runs N-S across the eastern edge of the quadrant. A buried conduit runs E-W just north of the East Access Road. This conduit contains a 2-inch water line, an alarm line, telephone lines, and a 13.8 KV electrical line. All of these utilities serve the east security guard post. A buried fiber optic line follows this conduit east to Indiana Street (Jefferson County 17).

Archaeology: None.



Future Plans: Remediation of the Walnut Creek drainage in accordance with plans to remediate OU 6.

Mineral Rights: Tract 30 - SW corner of Section 1 - 27.61 acres. The Union Pacific Railroad owns coal rights. Reservation of coal, iron, and mineral rights and 1/2 of oil and gas with right of ingress and egress for gas and oil production, including coal, iron and other minerals to Andrew M. Patten.

Contamination Profile:

Soil Sites: 1-054 and 1-072

Sediment Sites: Reference the Sediment Sampling Locations map.

Surface Water: Reference the Surface Water Sampling Locations map.

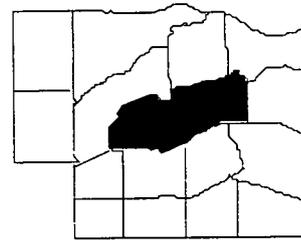
Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: IHSS Nos. 110 , 111.1, 111.7, and 111.8 are trenches that were in service from 1954 to 1968 for the disposal of sanitary sewer sludge and flattened drums contaminated with uranium and plutonium. The concentrations of radioactivity in the sludge range from 8.4×10^5 dpm/kg to 7.9×10^6 dpm/kg. The plutonium concentrations in IHSS 111.8 range from 4.5 to 50 pCi/g, and the concentration of uranium-238 is present at 0.9 to 158 pCi/g.

IHSS 141 is a sludge dispersal area. The area is contaminated with radioactive sanitary sewer sludge from the RFETS sanitary treatment plant. IHSS Nos. 142.1 - 142.9 are the A and B series detention ponds. The ponds may be contaminated with nitrates, plutonium, and uranium from the RFETS.

IHSS 156.2 is a soil dump that may have been used for disposing of plutonium-contaminated soil collected near Building 774.



IHSS 216.1 was opened in 1989 because the spray irrigation areas were smaller than necessary to prevent all offsite discharge of water. Water from Pond B-3, which receives treated sanitary wastewater flows, was applied to this spray field. Use of this field stopped shortly after it opened due to excessive runoff problems.

IHSS 216.2 is the Center Area of the East Spray Fields. The Center Area operated from 1979 to the early 1980s. The area was closed due to erosion and soil slipping problems on the hillside to the south of the field.

Surface water site GS09, located at the Pond B-4 outfall on South Walnut Creek, recorded the following flows during the 1993 water year:

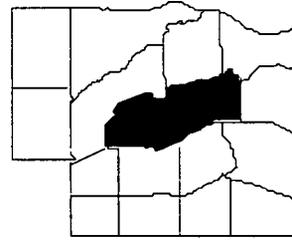
Average Spring Flow: 0.31 cubic feet per second (cfs)
Average Summer Flow: 0.29 cfs
Average Winter/Fall Flow: 0.39 cfs

Surface water site GS10, located upstream of the Pond B-1 bypass on South Walnut Creek, recorded the following flows during the 1993 water year:

Average Spring Flow: 0.10 cfs
Average Summer Flow: 0.05 cfs
Average Winter/Fall Flow: 0.04 cfs

Surface water site GS11, located at the Pond A-4 outfall on Walnut Creek, recorded the following flows during the 1993 water year:

Average Spring Flow: 0.74 cfs
Average Summer Flow: 0.61 cfs
Average Winter/Fall Flow: 0.285 cfs



Surface water site GS12, located at the Pond A-3 outfall on North Walnut Creek, recorded the following flows during the 1993 water year:

Average Spring Flow: 0.228 cfs
Average Summer Flow: 0.09 cfs
Average Winter/Fall Flow: 0.04 cfs

Surface water site GS13, located upstream from the Pond A-1 bypass on North Walnut Creek, recorded the following flows during the 1993 water year:

Average Spring Flow: 0.21 cfs
Average Summer Flow: 0.05 cfs
Average Winter/Fall Flow: 0.11 cfs

The flow data listed above for, GS09, GS10, and GS13 should be used with the qualification that the flows were computed using theoretical ratings for weirs and culverts which are suspected of providing data that are +/- 20% accurate.

Soil sampling, sediment sites and groundwater well data are currently accessible through RFEDS.

Other: A CDPHE Air Sampling Station is located in the quadrant. The sampling platform is located just NE of the unused security guard post (900), in the SW corner of the quadrant.

The GWEN tower is located in the southeast corner of the quadrant. This tower is part of the national emergency communications system maintained and operated by the United States Air Force and is not related to the RFETS or its operations. The land immediately surrounding the tower is an easement maintained by the U. S. Air Force.

Several granulated activated carbon (GAC) units and support buildings are located along the western edge of the quadrant north of the east access road. These GAC units are the Operable Unit 2 treatability units. Other buildings support personnel and equipment associated with operation of the units.

NE3 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCES:
Buildings, roads, and fences provided by
Rockwell Corp.,
EG&G Rocky Flats, Inc. - 1981.
Hydrology provided by
USGS - data unknown

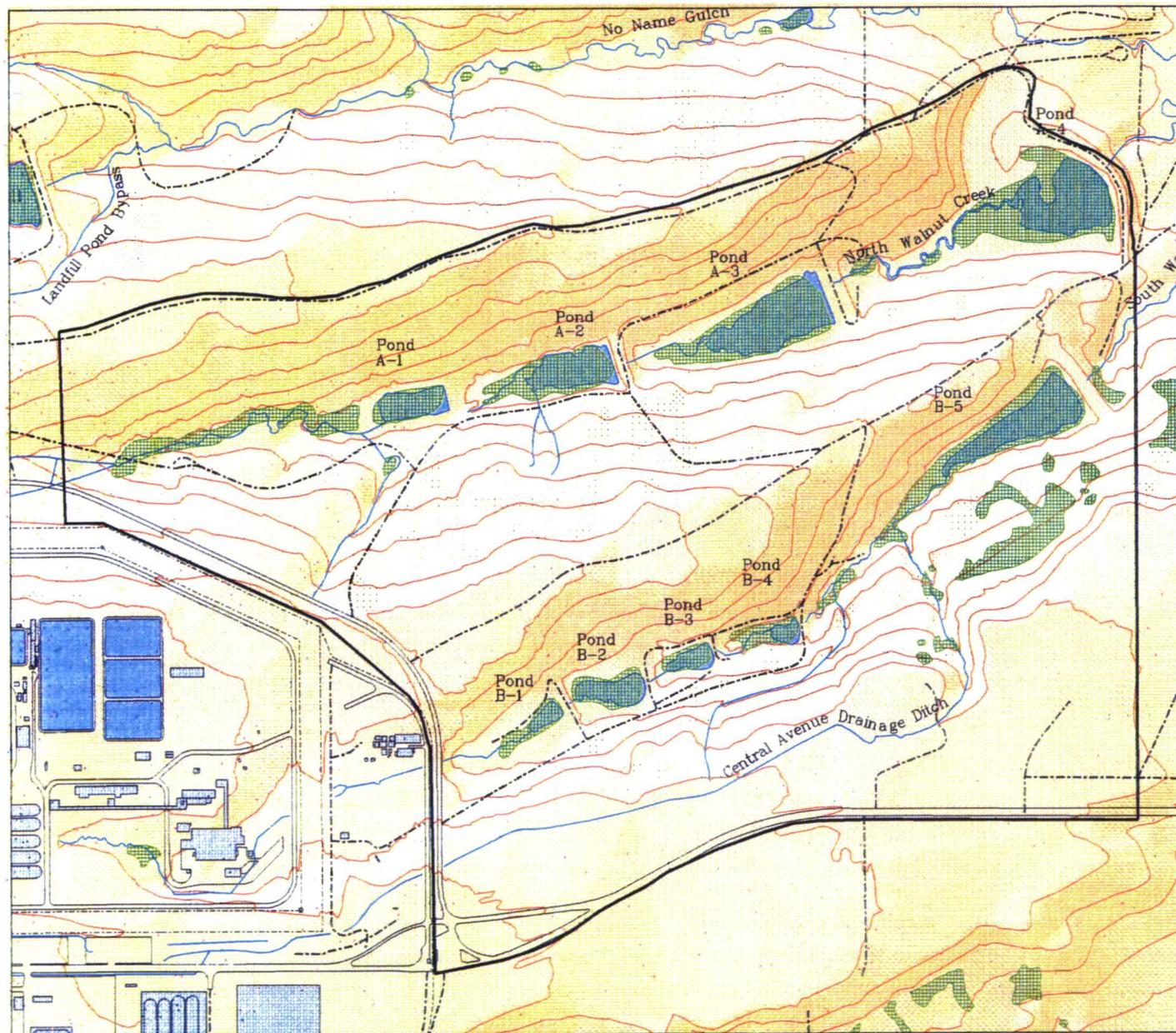


U.S. Department of Energy
Rocky Flats Environmental Technology Site

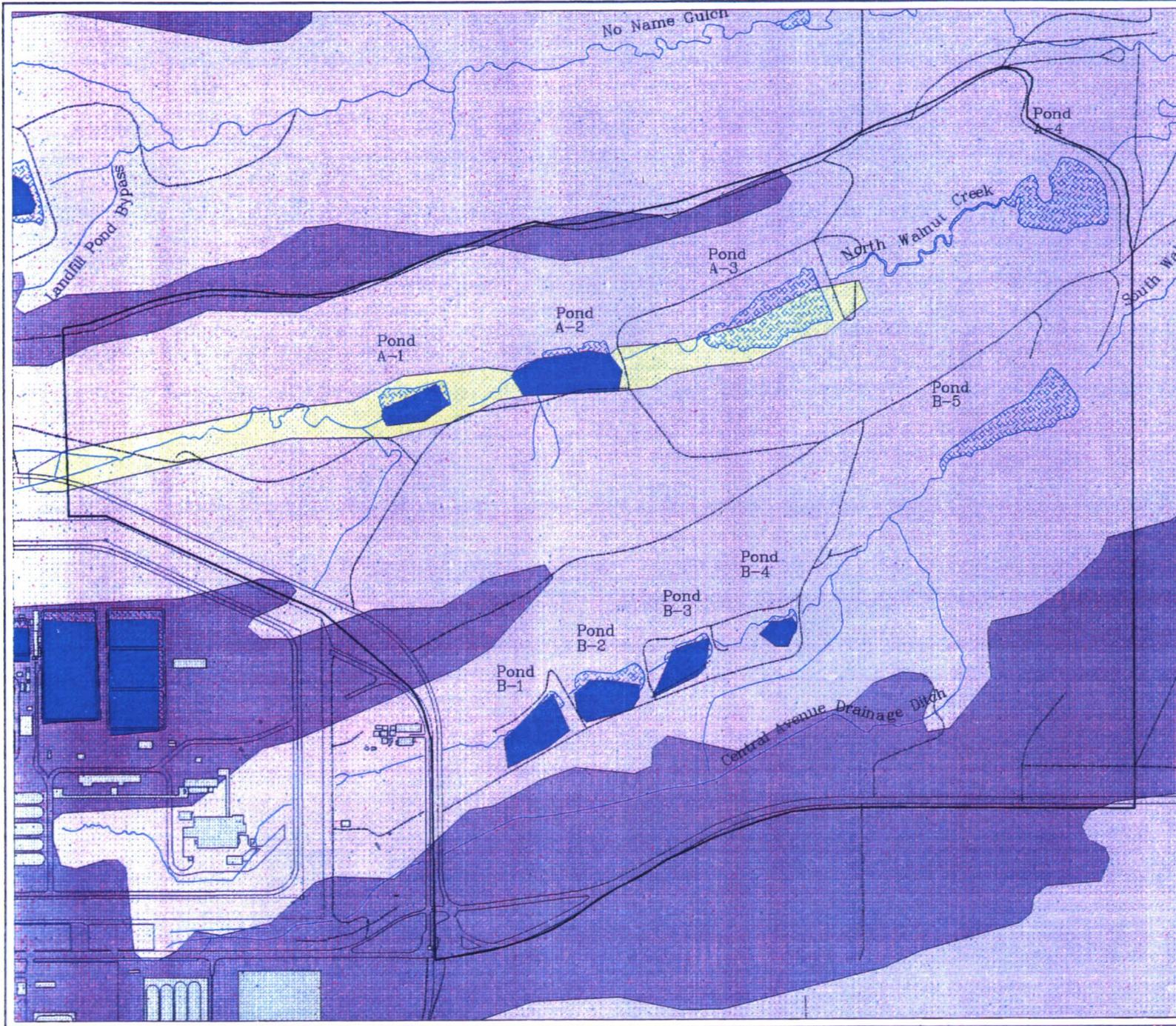
Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Wet94-0001

August 22, 1994



NE 3-11



NE3 SOIL TYPES

- Argiustolls
- Peloustolls
- Haplargids
- Mollic/Rook Outerop complex
- Torrifuvents
- Hapluustolls
- Torriorthents
- Camborthids
- Hapluustolls
- Cryofuvents
- Haplaquolls
- Natrargids
- Argiborolls
- Gravel and Clay Pit
- Rook Outerop
- DAM
- WATER
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

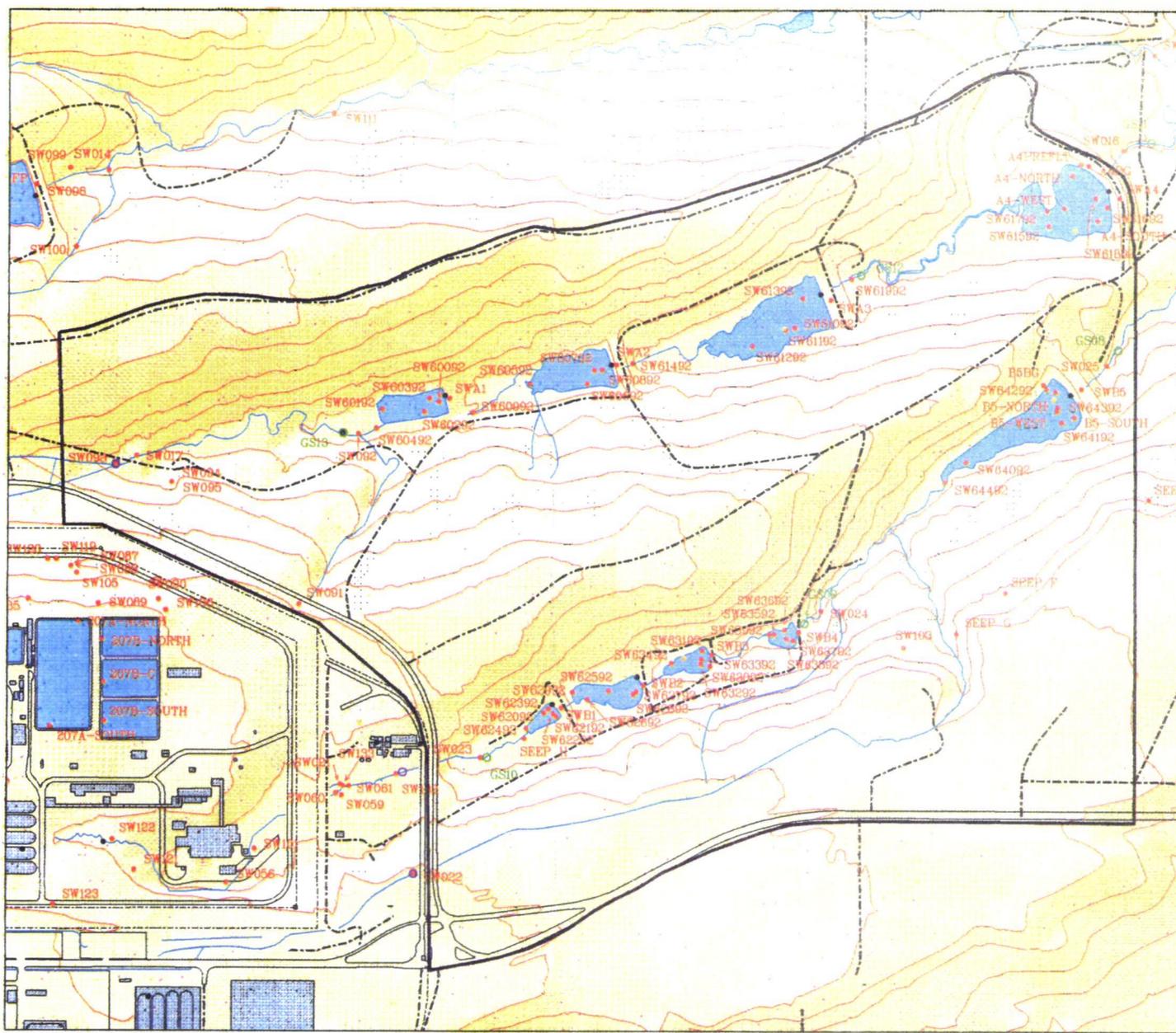
DATA SOURCE:
 Buildings, roads, and fences provided by
 Lockheed Corp.,
 1990 Rocky Flats, Jan - 1991.
 Hydrology provided by
 USGS - data collected
 Old Construction Records from
 Quantified Geologic Area Soil Survey
 Soil mapping scheme adapted by Jim Wadding



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

Prepared by
ES&S ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 494
 Golden, Colorado 80402-0494

NE3-17



NE3 SURFACE WATER SAMPLING LOCATIONS

- Buffer Zone Quadrants
- Surface water stations
- Routine operational sites
- NPDES/FFCA permit monitoring sites
- Gaging stations
- NPDES storm water permit sampling sites
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' Intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCES:
Buildings, roads, and fences provided by
Facilities Dept.
©1994 Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - data returned



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

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464

NE3 GROUNDWATER MONITORING WELL LOCATIONS MAP

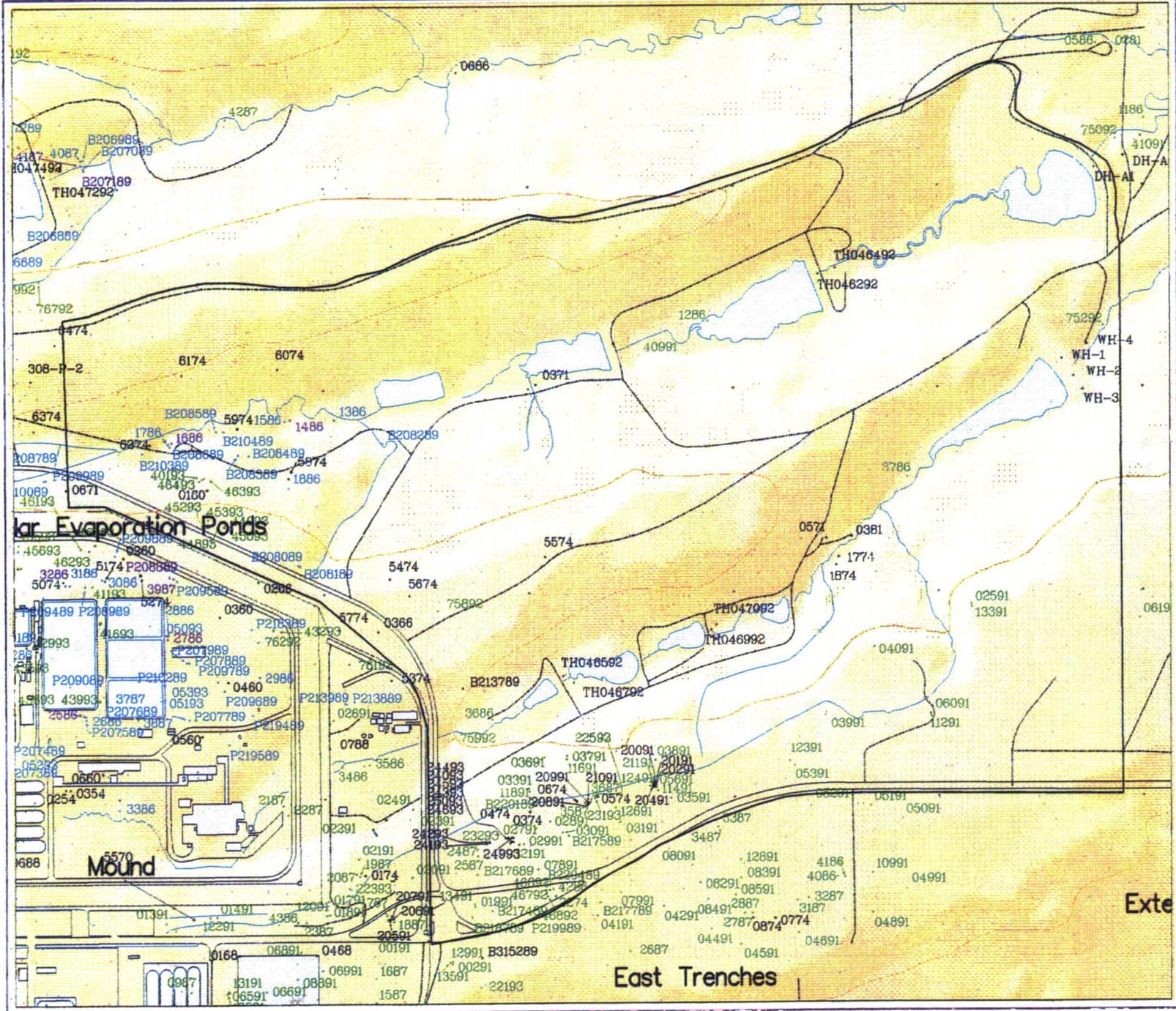
- Boundary Wells
 - CERCLA Characterization Wells
 - RCRA Regulatory
 - RCRA Characterization Wells
 - Special Purpose Wells
- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock
- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ◆ Abandoned Groundwater Monitoring Wells
- Other**
- ▤ Buildings and other structures
 - Ponds and Lakes
 - ~ Extent of Rocky Flats Alluvium
- Standard Map Features**
- Fences
 - Rocky Flats boundary
 - Paved roads
 - Dirt roads

DATE REVISED: 10/19/98
 Well locations from Groundwater Operational, 4/94
 Buildings, roads, and fences provided by
 Facilities Dept.
 1998 Rocky Flats, Inc. - 1991.
 Hydrology provided by
 10/98 - Mike Johnson



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

Prepared by:
ES&S ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 494
 Golden, Colorado 80402-0494

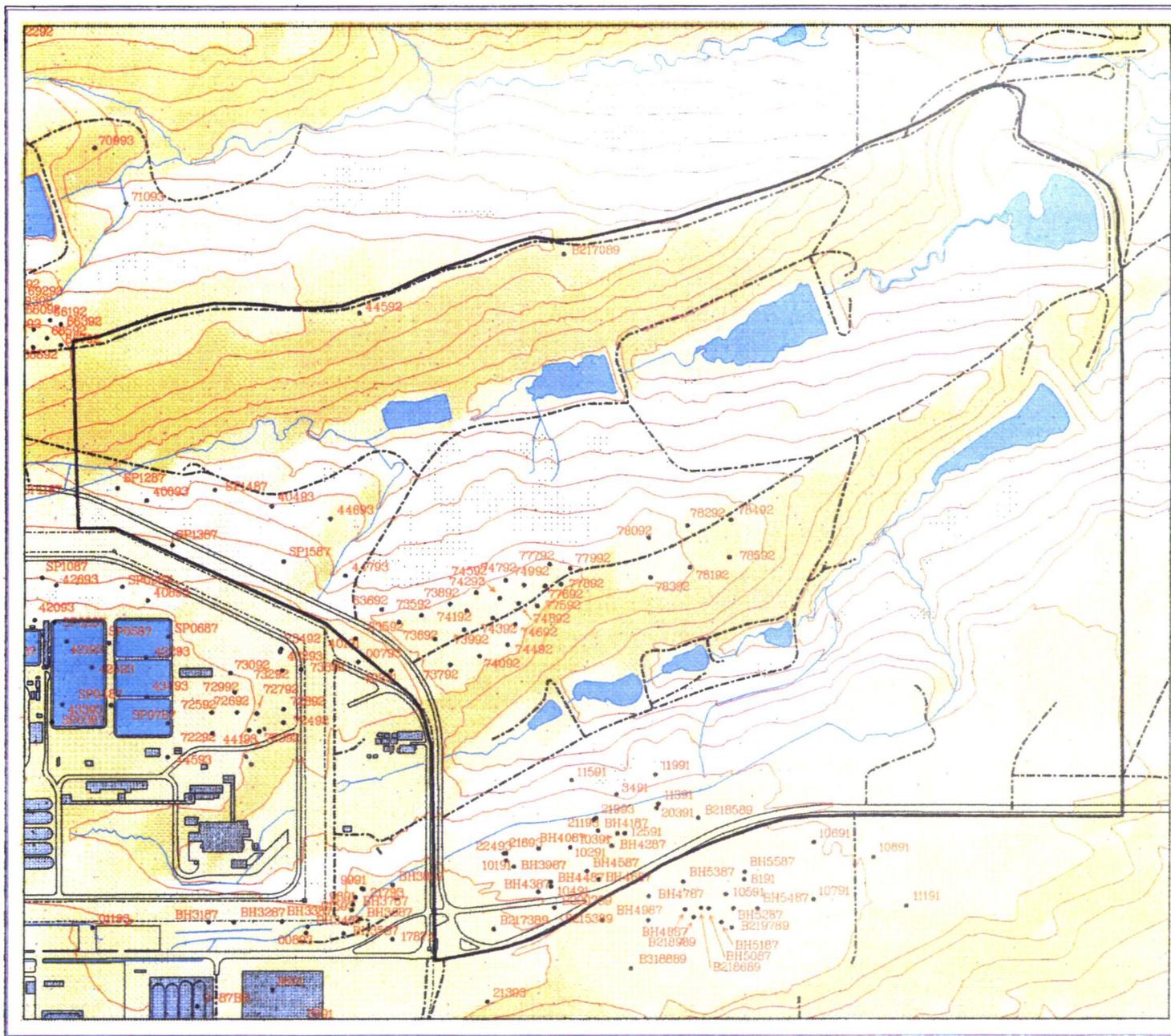


NE 3-19

East Trenches

Ext

NE 3-21



NE3 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCES:
 Buildings, roads, and fences provided by
 Fluoride Corp.,
 1980 Rocky Flats, Inc. - 1981.
 Hydrology provided by
 USGS - (Data unknown)
 BOREHOLE LOCATIONS FROM DOCUMENTS



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

Prepared by:
EG&G ROCKY FLATS

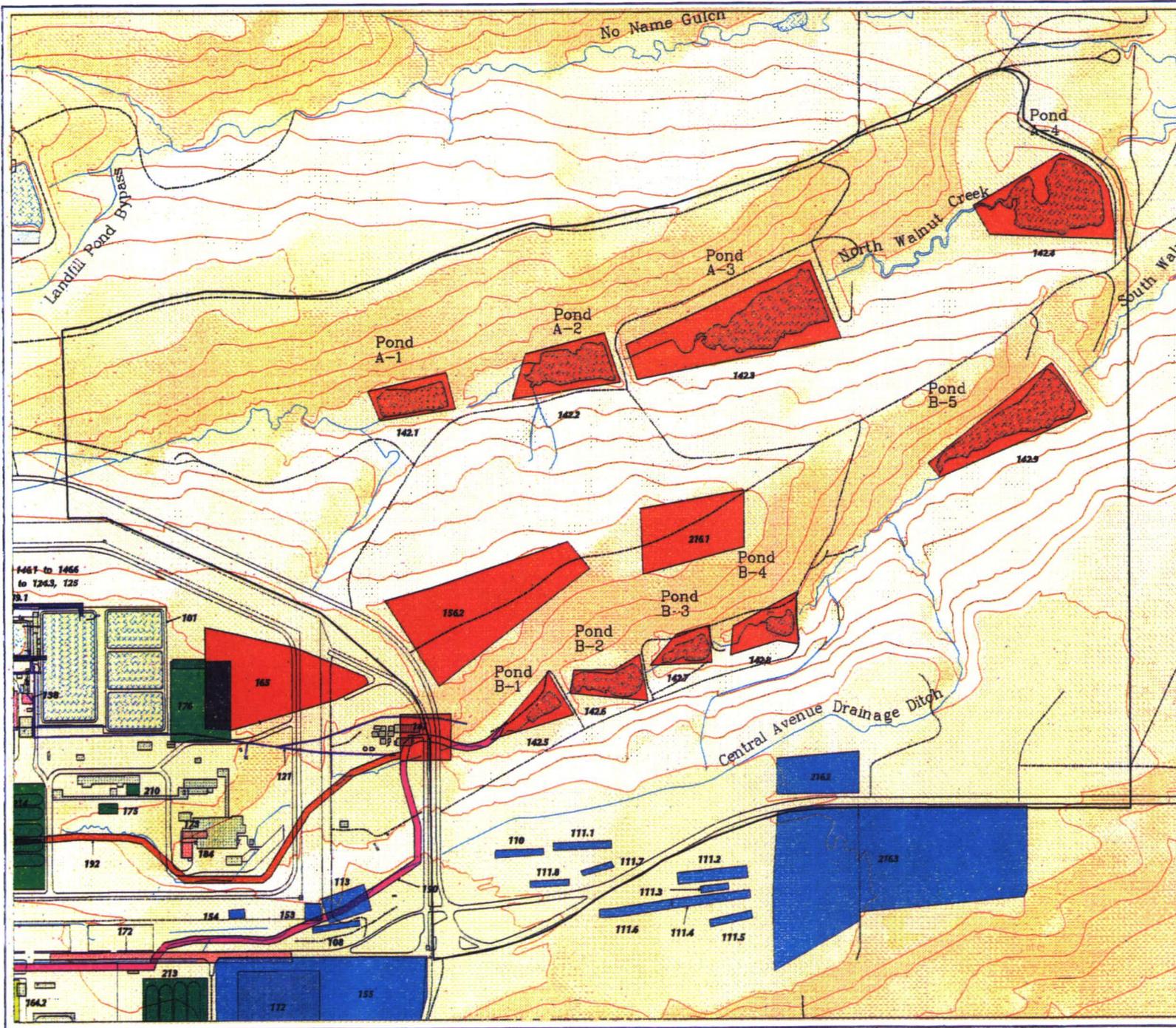
Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: bh94-0001

August 22, 1994

A:\maps\94\181822\pmap\940001.bh-see-4d18h-1-fig\csh\rocks\rocks-181822.dwg

NE3-23



NE3 INDIVIDUAL HAZARDOUS SUBSTANCE SITES

- Operable Unit 1
- Operable Unit 2
- Operable Unit 4
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7
- Operable Unit 8
- Operable Unit 9
- Operable Unit 10
- Operable Unit 11
- Operable Unit 12
- Operable Unit 13
- Operable Unit 14
- Operable Unit 15
- Operable Unit 16

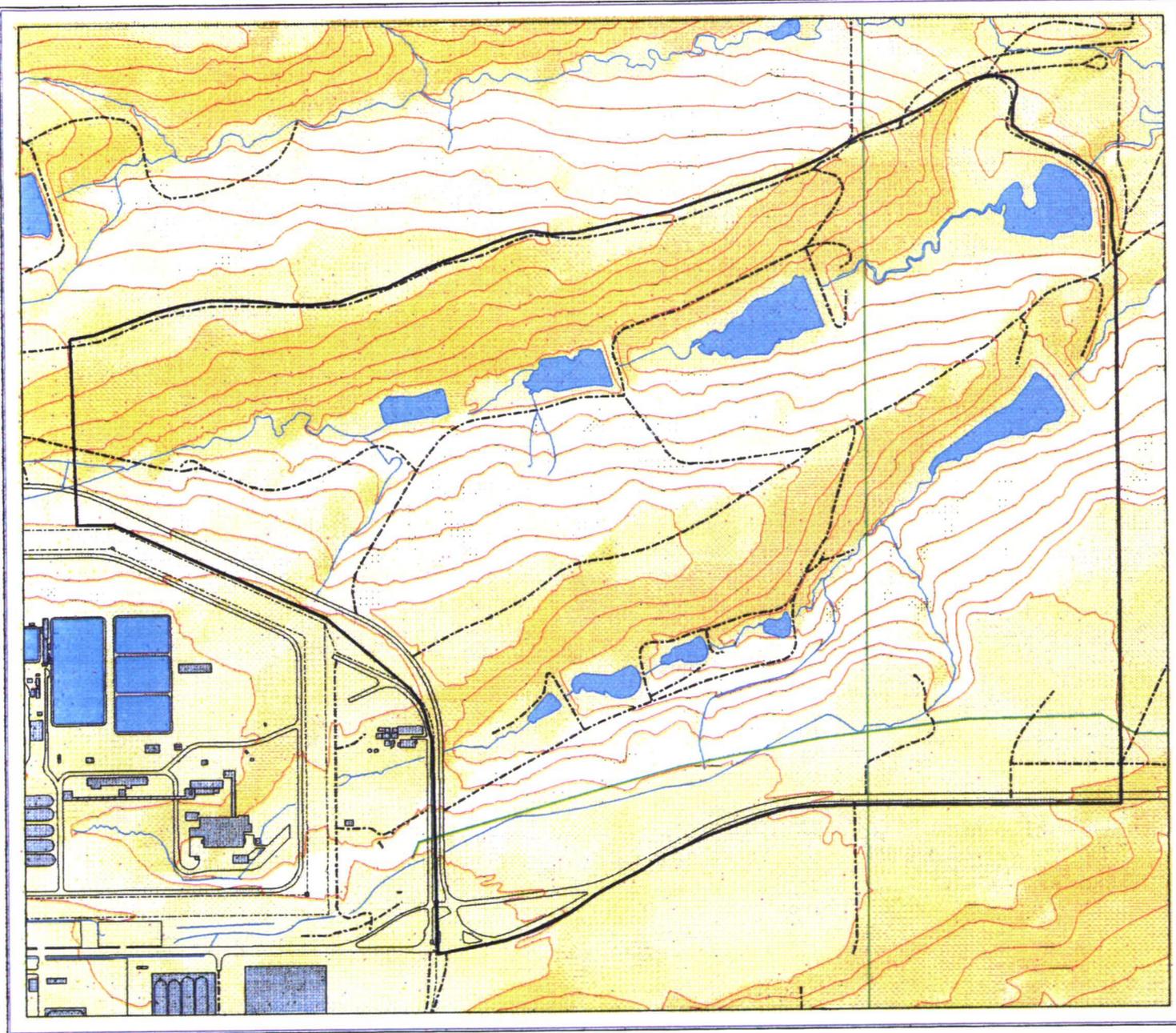
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' Intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Dept.
 EG&G Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - Data collected
 Individual Hazardous Substances Sites (IHSS) data
 as established by the following
 OUI - 1988 Phase II Report
 OUI, 4, 7, 15, & 16 - 1988
 The resulting OUIs are defined by their
 respective Operable Unit boundaries.



U.S. Department of Energy
 Rocky Flats Environmental Technology Site
 Prepared by
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 944
 Golden, Colorado 80402-0944

NE 3-25



NE3 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Eng.
 EG&G Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - data unknown



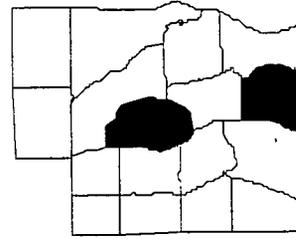
U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
 Rocky Flats Environmental Technology Site
 P.O. Box 404
 Golden, Colorado 80402-0404

MAP ID: Ut1e04-0001

August 22, 1994

Prepared by EG&G Rocky Flats, Inc. for the U.S. Department of Energy, August 22, 1994.



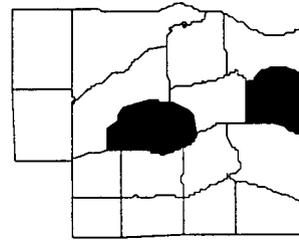
Quadrant: NE 4

Boundaries: **North** - Road running ENE from the south end of Pond A-4 dam along Walnut Creek to Indiana Street (Jefferson County 17).
South - East RFETS Access Road.
East - Indiana Street (Jefferson County 17).
West - Line running N-S from the east side of Pond A-4 dam to the east RFETS Access Road.

Vegetation: Quadrant NE 4 is primarily classified as Mesic Mixed Grassland, with small areas of Short Grassland and Xeric Mixed Grassland in the southern portion of the quadrant, also present. Areas of Short Upland Shrub, intermixed with areas of Marsh, are present along Walnut Creek as it flows through the northern portion of the quadrant. An area of Reclaimed Grassland (artificially produced grassland community) exists in the southeastern corner of the quadrant north of the east security guard post. The dominate species of vegetation are: Western Wheatgrass (*Agropyron smithii*), Canada Bluegrass (*Poa compressa*), Kentucky Bluegrass (*Poa pratensis*), Rush (*Juncus*), and June Grass (*Koeleria pyramidata*), with fewer stands of Blue Grama (*Bouteloua gracilis*).

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland, Xeric Mixed Grassland, and Short Grassland, as well as Short Upland Shrub along Walnut Creek.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Prairie Rattlesnake (*Crotalis viridis*) and Short Horned Lizard (*Phrynosoma douglassi*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Rabbits (*Lagomorpha*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

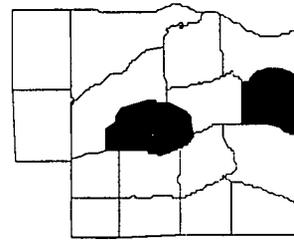


In the Short Upland Shrub areas, many species of arthropods are present too numerous to list, and the number of individuals per species is fairly high. Reptiles include the Bull Snake (*Pituophis melanoleucus*) and Racer (*Coluber constrictor*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), and Red-winged Blackbirds (*Agelaius phoeniceus*). Also present is the Mallard (*Anas platyrhynchos*), Red-tailed Hawk (*Buteo jamaicensis*), and Great Horned Owl (*Bubo virginianus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*). The foliage along the creek and ditch also provides habitat for Mule Deer (*Odocoileus hemionus*) and Coyotes (*Canis latrans*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: Two unnamed drainages flow out of seeps on the east facing hillsides in the middle of the quadrant. The seep forms a gulch that flows east under Indiana Street (Jefferson County 17) and into the Great Western Diversion Ditch. South Walnut Creek flows NE across the NW corner of the quadrant.

Jurisdictional Wetlands: Wetlands exist along South Walnut Creek to the NW, and along the two unnamed creeks located in the eastern half of the quadrant. Several seeps on the hillside in the western half of the quadrant are classified as flat, saturated, semipermanent, seasonal wetlands by the USFWS.



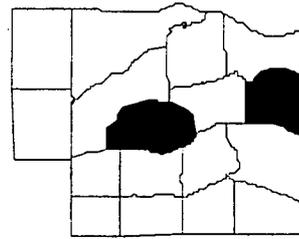
Floodplain: There is a small area of 100-year floodplain that surrounds Walnut Creek Tributary B as it flows through the northwest corner of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

Clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces, are mostly located south-western corner of the quadrant. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

There is a small area of Torrifuvents in the northern portion of the quadrant along Walnut Creek. Torrifuvents are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and they are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

In addition, there is a area of Torriorthents in the central portion of the quadrant. Torriorthents are poorly developed soils with the claystone bedrock exposed, or very near the surface, and they are generally characterized by high shrink-swell potential, slow permeability, and severe erosion potential.



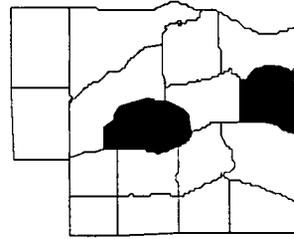
Surface Geology: An outcrop of the Arapahoe Formation comprises approximately 75 percent of the surface geology. The area covered by the Arapahoe Formation is located on the hillside and "flats" located in the eastern half of the quadrant. The hillside in the northern end of the quadrant is an outcrop of the Laramie Formation. This formation covers approximately 10 percent of the quadrant. The remaining 15 percent of the quadrant is covered by an outcrop of Rocky Flats Alluvium. The outcrop is found at the southwestern end of the quadrant on the "flats" that head west to the main facility.

The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. The upper unit of the Laramie Formation is approximately 500 feet thick and composed of claystone. The claystone is light to medium gray and kaolinitic. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays.

Utilities: A buried conduit runs E-W just north of the east access road. This conduit contains a 2-inch water line, an alarm line, telephone lines, and a 13.8 KV electrical line. These utilities serve the east security guard post. A buried fiber optic line follows this conduit east to Indiana Street (Jefferson County 17) where it turns north and runs along Indiana Street and the eastern border of the quadrant. Aboveground PSC of CO power lines run NS the full length of the quadrant along Indiana Street (Jefferson County 17).

Archaeology: None.

Future Plans: Remediation of the Walnut Creek drainage in accordance with plans to remediate OU 6.



Mineral Rights: Tract 29 - the majority of Section 1 - 446.36 acres. The Union Pacific Railroad owns coal rights.

Tract 30 - the western edge of Section 29 and 12 - 27.61 acres. The Union Pacific Railroad owns coal rights. Reservation of coal, iron, and mineral rights and 1/2 of oil and gas with right of ingress and egress for gas and oil production, including coal, iron and other minerals to Andrew M. Patten.

Tract 43 - E 1/2 NW 1/4 Section 12 - 150.76 acres. Grantor has oil and gas. Union Pacific Railroad owns coal rights.

Tract 42 - NE 1/4 Section 12 - 160 acres. Mineral interests reserved to grantor. Right of proprietor of a vein or lode to remove his ore therefrom, should the same be found to penetrate or intersect premises hereby said.

Adjoining Lands: The quadrant is surrounded by the RFETS Buffer Zone on the north, south, and west sides. The land across Indiana Street (Jefferson County 17) east is zoned as Jefferson County Parks and Open Space. It is currently vacant and unused.

Contamination Profile:

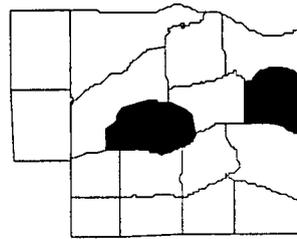
Soil Sites: 2-072 and 2-090

Sediment Sites: Reference the Sediment Sampling Locations map.

Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.



Comments: Surface water site GS03, located on Walnut Creek where it flows under Indiana Street, registered the following flows during the 1993 water year:

Average Spring Flow: 0.7 cubic feet per second (cfs)

Average Summer Flow: 0.384 cfs

Average Winter/Fall Flow: 0.207 cfs

The flow data listed above should be used as analytical data with a +/- 10 % accuracy.

Soil sampling, sediment sites, and groundwater well data is currently accessible through RFEDS.

NE4 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Group
 EG&G Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - files unknown



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

Prepared by:
 **EG&G ROCKY FLATS**
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: Wet94-0001

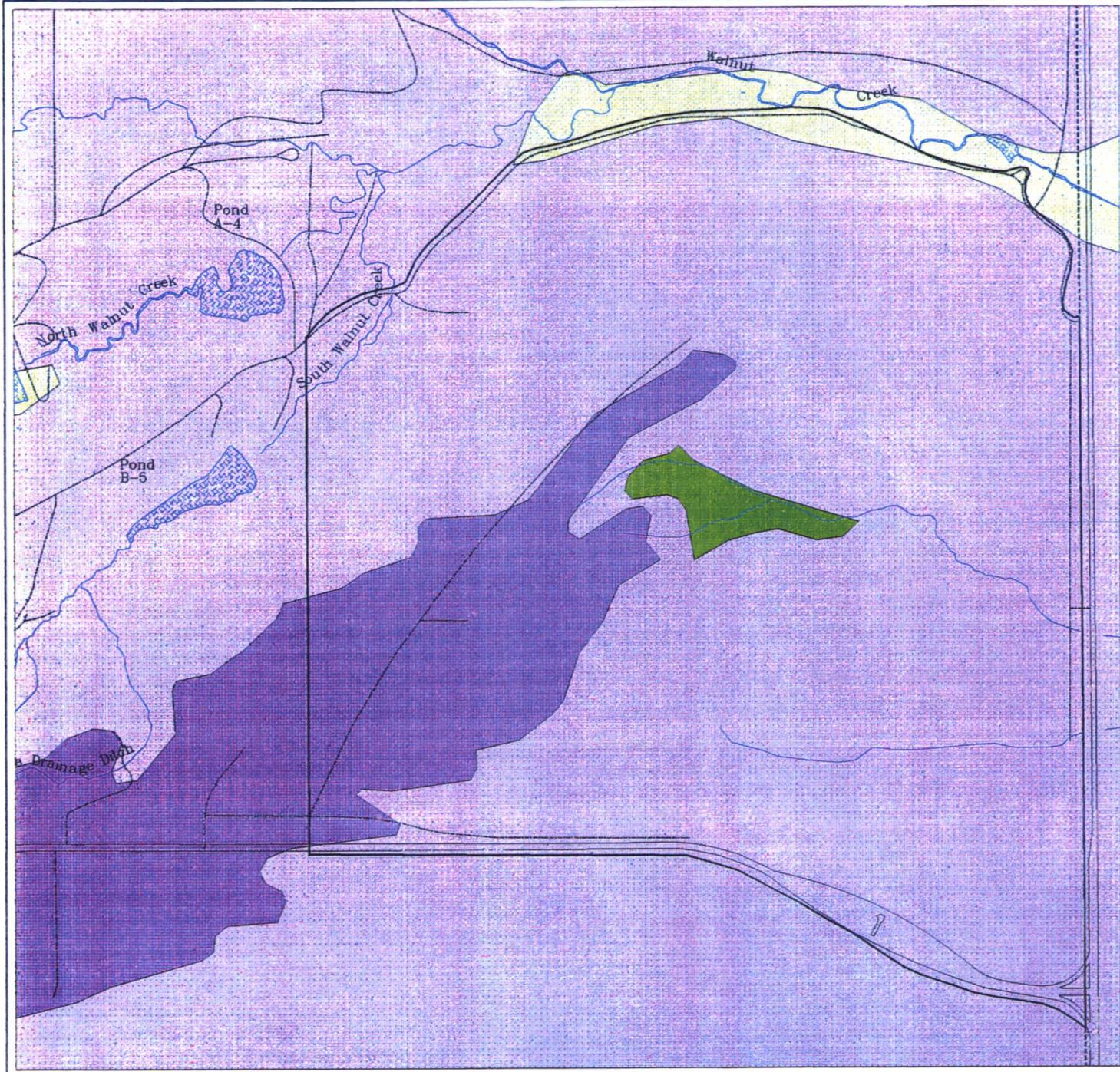
August 22, 1994

NE 4-7



A:\maps\181102\proj\wetlands\0001\wetlands1.dwg

NE 4-9



NE4 SOIL TYPES

- Argluctolls
- Palaeutolls
- Haplergids
- Mollisol/Rook Outcrop complex
- Torrifluvents
- Hapluetolls
- Torrorthents
- Camborthids
- Hepiutolls
- Cryofluvents
- Haplaquolls
- Netrergids
- Argiborolls
- Gravel and Clay Pit
- Rook Outcrop
- DAM
- WATER
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

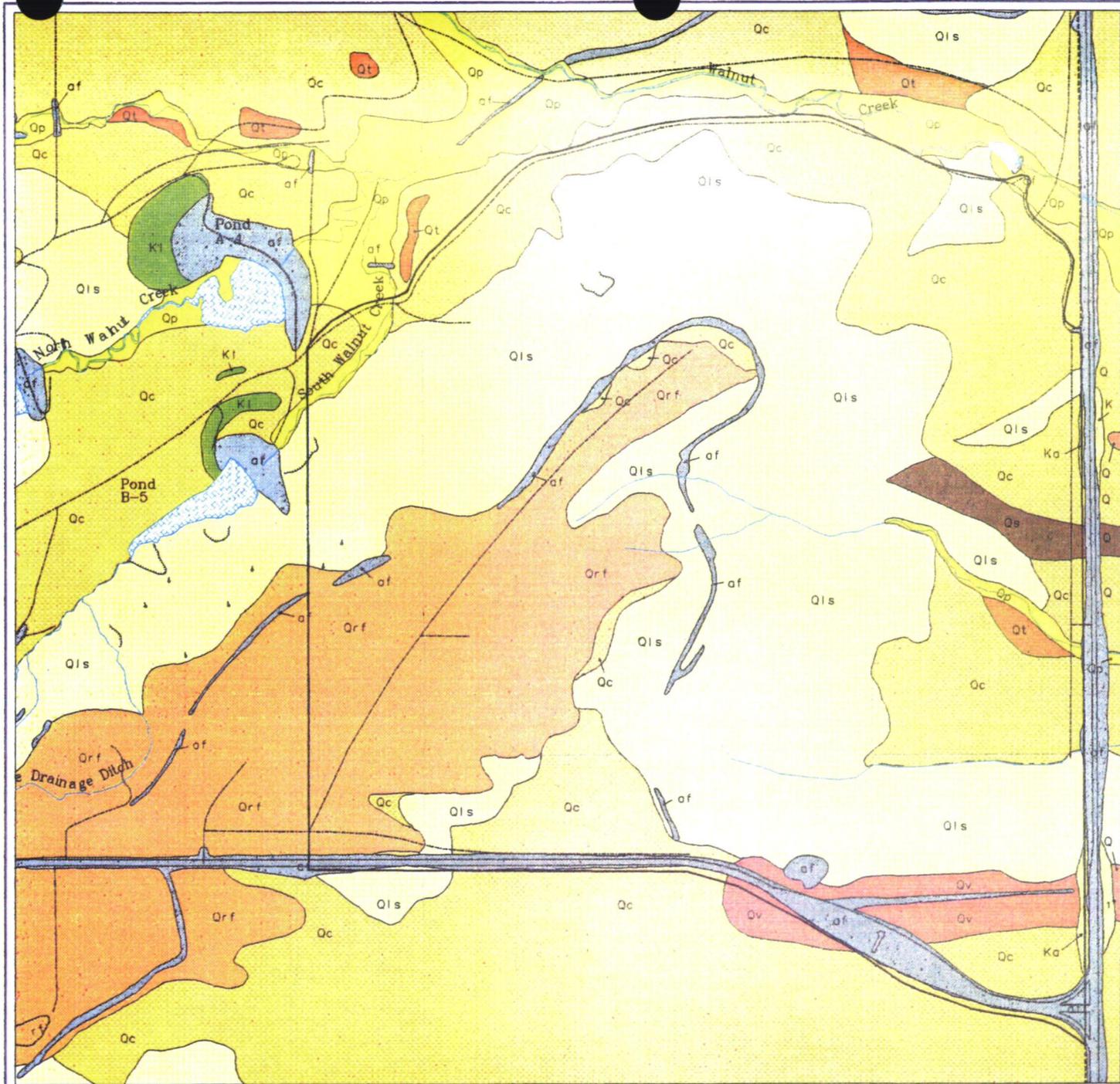
DATA SOURCE:
 Soil data, maps, and fences provided by
 Jennifer Sims
 ESRG Rocky Flats, Inc. - 1997.
 Hydrology provided by
 USGS - (data unknown)
 Soil Classification Service source
 Unpublished Rocky Flats Soil Survey
 Soil mapping software prepared by Jim Whiting



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

Prepared by
ES&S ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 404
 Golden, Colorado 80402-0404

NE4-11



NE4 GEOLOGIC UNITS



- af - Artificial fill
- Qp - Post-Piney Creek Alluvium
- Qs - Terrace alluvium
- Qc - Columbium
- Qa - Alluvium
- Qv - Verde alluvium
- Qr - Rocky Flats Alluvium
- Qf - Artificial fill
- Qd - Dismal alluvium
- Qk - Arapahoe Formation
- Qh - Fox Hills Sandstone
- Shallow closed depression
- Scarp of young landslide
- Areas of vegetation around springs
- Boundary of gravel and clay pit
- o Spring
- † Bedding strike and dip
- Chest with chest size
- Capitol Mine

- ▣ Buildings or other structures
- ▣ Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

NOTE
 All data used on this project by Rocky Flats Environmental Technology Site, Inc. - 1993.
 All data used on this project by Rocky Flats Environmental Technology Site, Inc. - 1993.
 All data used on this project by Rocky Flats Environmental Technology Site, Inc. - 1993.
 All data used on this project by Rocky Flats Environmental Technology Site, Inc. - 1993.



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

Prepared by
BE&B ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 464
 Golden, Colorado 80402-0464

NE4 GROUNDWATER MONITORING WELL LOCATIONS MAP

- Boundary Wells
- CERCLA Characterization Wells
- RCRA Regulatory
- RCRA Characterization Wells
- Special Purpose Wells

- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock

- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ◆ Abandoned Groundwater Monitoring Wells

- Other**
- ▨ Buildings and other structures
 - Ponds and Lakes
 - ▲ Extent of Rocky Flats Alluvium

- Standard Map Features**
- Fences
 - - Rocky Flats boundary
 - Paved roads
 - - Dirt roads

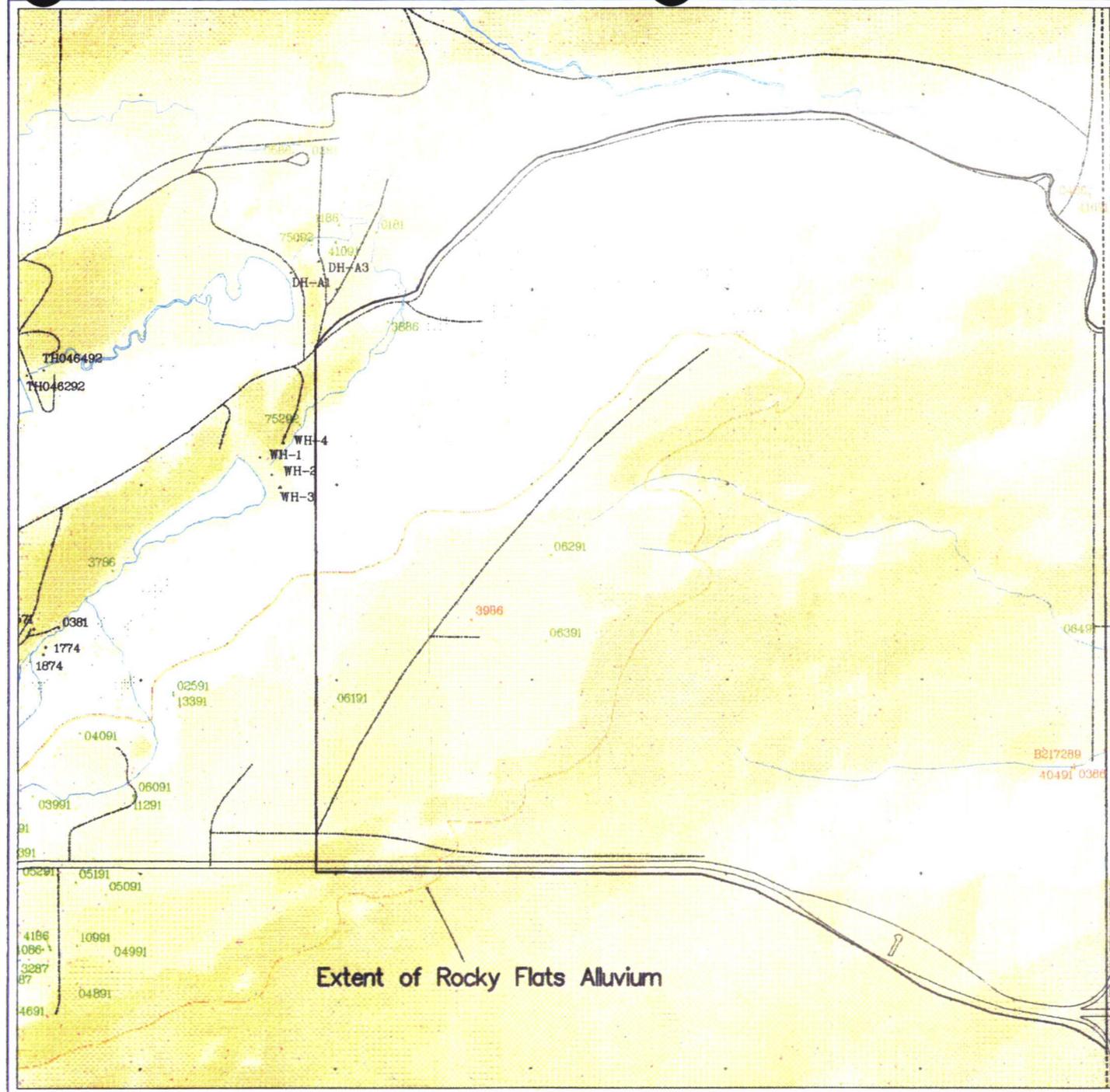
BASE SOURCE:
Well locations from Department, 404
Buildings, roads, and fences provided by
Public Data
©1991 Rocky Flats, Inc. - 1991.
Hydrology provided by
1997 - (data updated)



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

Prepared by:
Rocky Flats

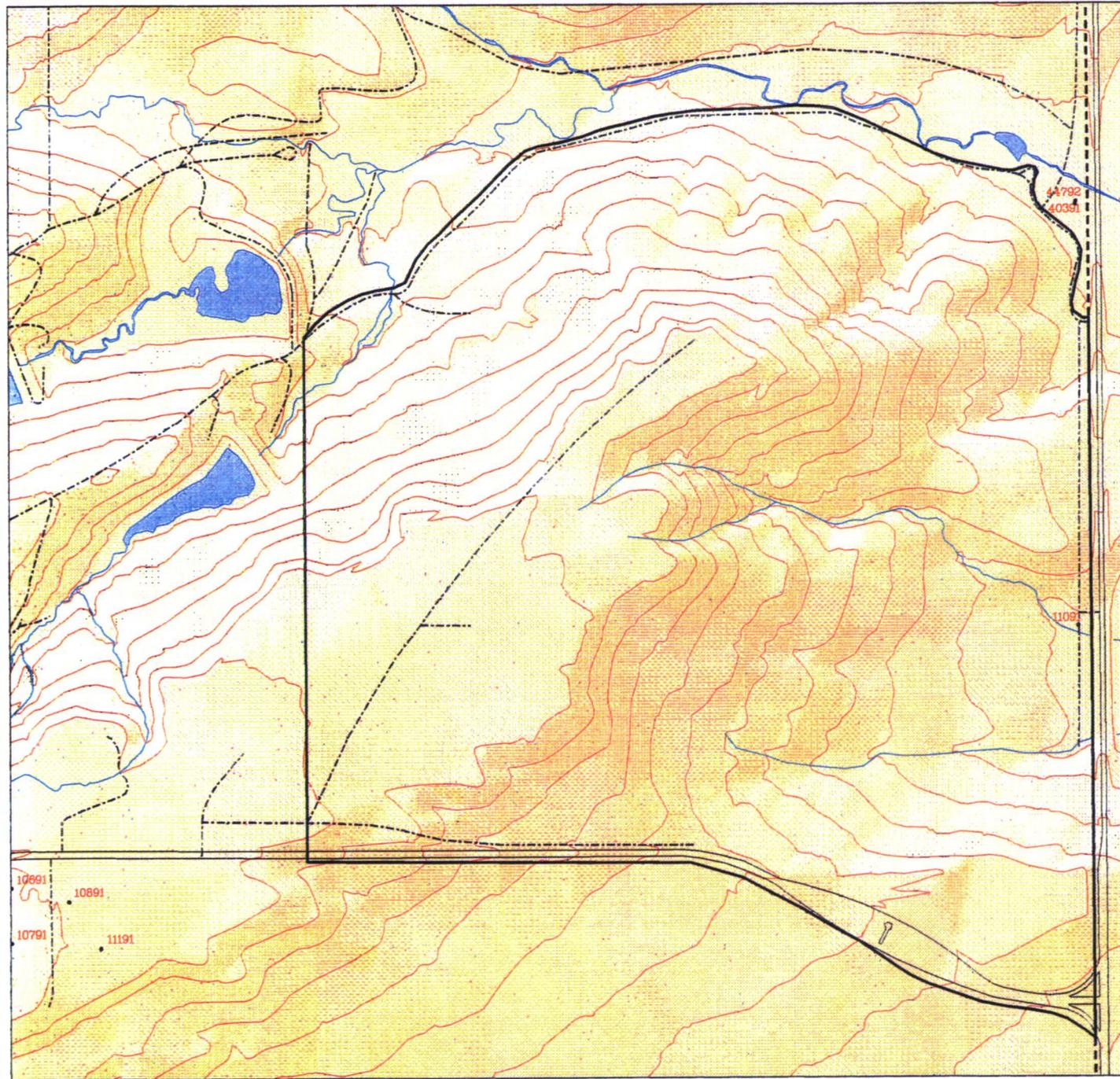
Rocky Flats Environmental Technology Site
P.O. Box 494
Greeley, Colorado 80433-0494



NE 4-15

Indiana Street

NE 4-17



NE4 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Eng.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)
BOREHOLE LOCATIONS FROM GEOSCIENCES



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

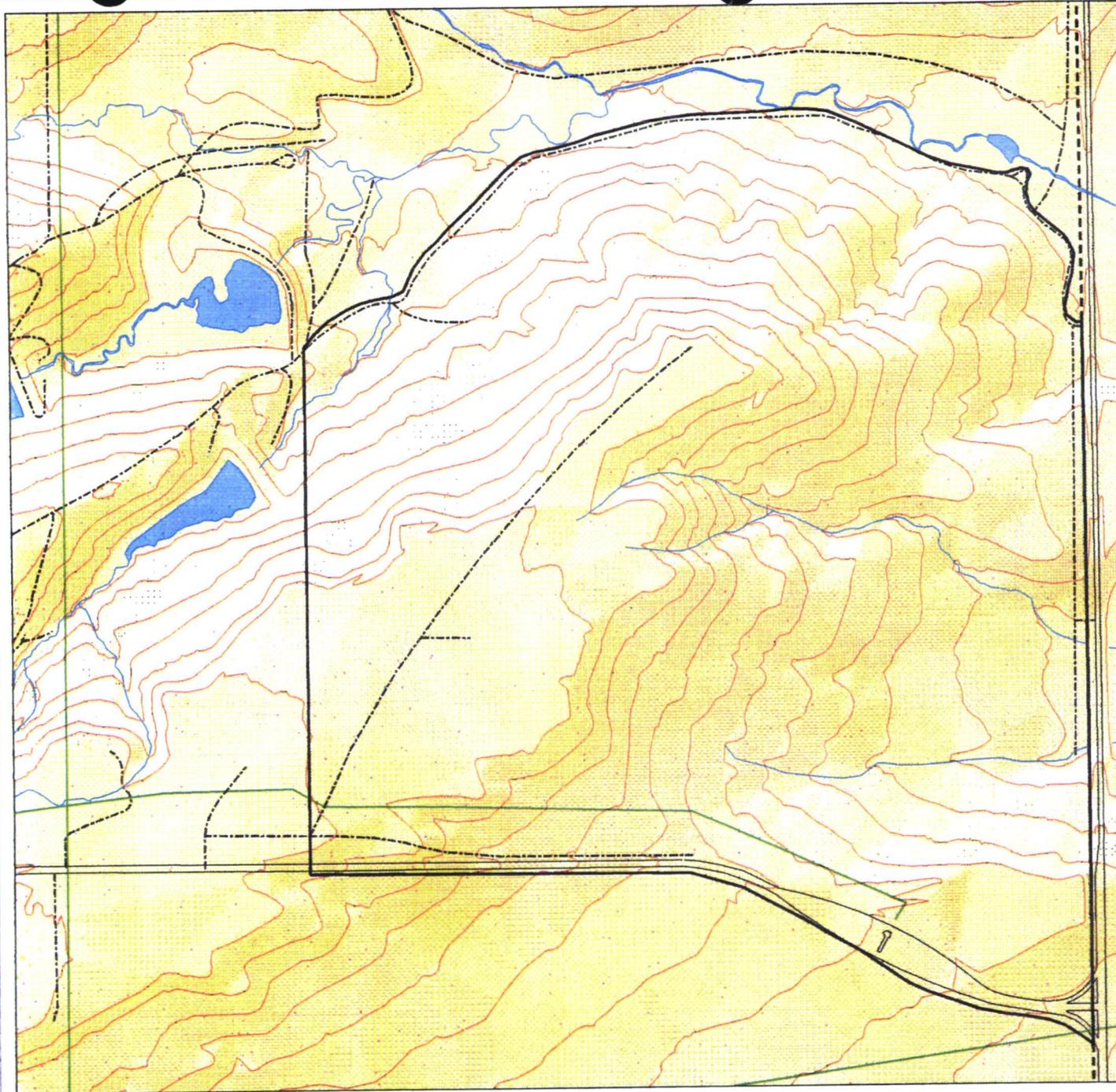
Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: bh94-0001

August 22, 1994

Armed&181182/program/level/0001/bh-xxx-xx/01-1/Equation/borehole-sampling

NE 4-19



NE4 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)



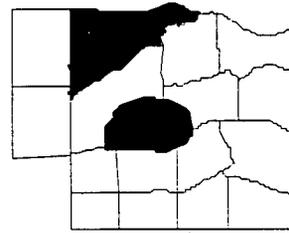
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS

Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util94-0001

August 22, 1994



Quadrant: NW 1

Boundaries:

North - RFETS Buffer Zone north perimeter fence and Colorado Route 128.

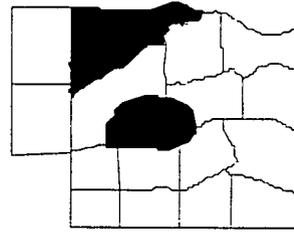
South - Road running NE along the top of the ridge to the south of the Rock Creek drainage. Boundary continues east along the road following the old north Buffer Zone boundary fence. Boundary follows this road for approximately 1,125 feet before turning north to form the eastern boundary.

East - Line continuing due north from the end of the southern border to the edge of the ridge located south of the Rock Creek drainage. Boundary line contours to the east along the top of this ridge until the ridge is intersected by Colorado 128.

West - Road running north along the old Buffer Zone boundary fence. Where the road turns to the east, the boundary line continues north to Colorado 128.

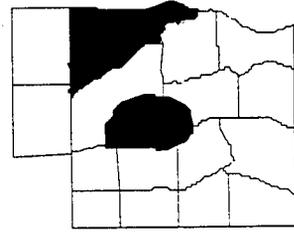
Vegetation: Quadrant NW 1 is classified as Mesic Mixed Grassland and Xeric Mixed Grassland, with areas of "Riparian Woodland, Ponderosa Pine Woodland, Tall and Short Upland Shrub, and Marsh present along Rock Creek as it flows through the northern portion of the quadrant. The drainage supports one of the largest areas of woodlands. The vegetation is considered to be unaffected by the RFETS operation and is used for baseline studies of native vegetation and habitat. The dominant species of vegetation in the quadrant are: Canada Bluegrass (*Poa compressa*), Kentucky Bluegrass (*Poa pratensis*), Western Wheatgrass (*Agropyron smithii*), Big Bluestem (*Andropogon gerardii*), Little Bluestem (*Andropogon scoparius*), Willow (*Salix*), Cottonwood (*Populus*) and Blue Grama (*Bouteloua gracilis*).

Wildlife Habitat: The major wildlife habitats are quite diverse, consisting of areas of Mesic Mixed Grassland and Xeric Mixed Grassland, as well as Riparian Woodland, Ponderosa Pine Woodland, Tall and Short Upland Shrub and Marsh along Rock Creek.



In the grassland areas, native grasses and forbs provide limited habitat for arthropods. Reptiles include the Bull Snake (*Pituophis melanoleucus*), Prairie Rattlesnake (*Crotalis viridis*), Racer (*Coluber constrictor*), and Short Horned Lizard (*Phrynosoma douglas*). The bird population consists of Meadowlarks (*Sturnella neglecta*), House Finches (*Carpodacus mexicanus*) and Vesper Sparrows (*Pooecetes gramineus*) throughout the quadrant, with Green-tailed Towhees (*Pipilo chlorurus*), Song Sparrows (*Melospiza melodia*), and American Robins (*Turdus migratorius*) found in the Ponderosa Pine Woodland areas. Black-billed Magpies (*Pica pica*) and Great Horned Owls (*Bubo virginianus*) are found in the Riparian Woodland environment, as are Great Blue Herons (*Ardea herodias*), and various species of waterfowl, including the Mallard (*Anas platyrhynchos*). Various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*) are also present throughout the quadrant. The small mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Mexican Wood Rats (*Neotoma mexicana*), Rabbits (*Lagomorpha*), and Porcupines (*Erethizon dorsatum*).

In the Rock Creek areas, many species of arthropods are present but too numerous to list, and the number of individuals per species is fairly high. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*) and Racer (*Coluber constrictor*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), Red-winged Blackbirds (*Agelaius phoeniceus*), Mallards (*Anas platyrhynchos*), and Great Horned Owls (*Bubo virginianus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*). The Western Jumping Mouse (*Zapus princeps*) is also known to inhabit this area.



The foliage along the creek provide habitat for Mule Deer (*Odocoileus hemionus*), and raptors. A pair of Red-tailed Hawks (*Buteo jamaicensis*) nested in a tree along the creek in the north central portion of the quadrant in 1991. The Rock Creek drainage is the most pristine and undisturbed area in the RFETS Buffer Zone. The area supports the largest population of deer in the Buffer Zone. Deer in the area bed down in the low brush along the creek and under the scrub brush along the north facing hillsides in the quadrant. Coyotes (*Canis latrans*) and Bobcats (*Lynx rufus*) frequent the area. Elk (*Cervus elaphus*) remains and scat have been found along the creek.

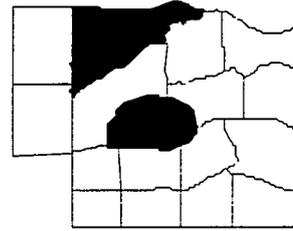
Rock Creek supports a variety of aquatic wildlife. Several species of waterfowl are found throughout the area. Additionally, the entire quadrant is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 3-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters:

The quadrant encompasses most of the Rock Creek drainage. The creek and five tributaries (A, B, C, D, F) flow from hillsides NE through the quadrant. Several small ponds exist along the tributaries. Two small seeps are found in the far northeast corner of the quadrant on the hillside facing Colorado 128. The Rock Creek drainage is considered to be unaffected by the RFETS operation and is therefore used for background testing of aquatic environments.

Jurisdictional Wetlands:

Some of the tributaries to Rock Creek are classified as emergent, seasonal wetlands by the USFWS. Rock Creek proper is classified as riverine, intermittent, streambed, intermittently flooded/temporary. Several seeps present in the area are classified as open water, semipermanent wetlands by the USFWS.



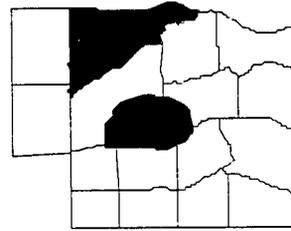
Floodplain: There is an area of 100-year floodplain that surrounds Rock Creek and Rock Creek Tributaries A, B, C, D, and F as they flow through the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are fine-textured soils of the great group Argiustolls, which are mostly clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

There are two bands of Torrifluvents in the quadrant along Rock Creek. They are mostly stratified clay loams and gravelly loams formed by fluvial processes along drainage bottoms, and are generally characterized by low shrink-swell potential, moderately slow permeability, and slight-to-moderate erosion potential.

In addition, there are several areas of clayey-skeletal Paleustolls, which are very cobbly clay loams located on pediment surfaces, along the western boundary of the quadrant. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

Surface Geology: An outcrop of Rocky Flats Alluvium covers approximately 30 percent of the surface geology. The "flats" along the western edge of the quadrant constitute the area covered by the Alluvium. The hillsides along the rock Creek drainage are a mix of the Arapahoe and Laramie formations with Arapahoe near the tops of the hillsides, and the Laramie near the bottom. The bottom land in the Rock Creek drainage is covered by the Laramie Formation exclusively. This outcrop of the Laramie Formation accounts for approximately 60 percent of the surface geology in the quadrant. The remaining 10 percent is the mix of the Arapahoe and Laramie Formations found on the hillsides in the quadrant.



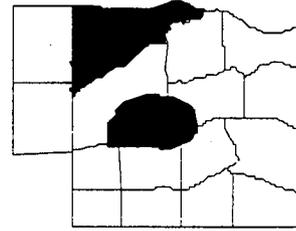
Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays. The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. The upper unit of the Laramie Formation is approximately 500 feet thick and composed of claystone. The claystone is light to medium gray and kaolinitic.

Utilities: An aboveground telephone line runs NNW across the western half of the quadrant. This line runs from the main facility towards the NREL Wind Energy Test Center where it turns due west toward Colorado 93.

Archaeology: Twelve archeological sites are found in this quadrant: 5JF217 - Stone Alignments, 5JF480 - Horseshoe Fragment (Isolated Find), 5JF478 and 5JF479 - Stone Cairns (Isolated Finds), 5JF485 - Ranch Complex, 5JF761 and 5JF762 - Stock Ponds, 5JF728 - Spring House, 5JF729 - Probable Coral, 5JF757 - Glass Fragments, 5JF760 - Rock Piles, and 5JF730 - Stock Tanks/Feeders.

Only 5JF485 and 5JF729, are in satisfactory condition to be considered noteworthy. State Site 5JF485 - Ranch Complex is the Lindsay Ranch. Historic features at the site include the main ranch house, barn, stock chute, corrals, fences, and a stock pond. The ranch first operated in 1907 as cattle and horse ranch. After WW II the ranch operated as a horse boarding facility. The site was completely rebuilt post-1940s thus losing its pre-1920s construction and eligibility for inclusion in the NRHP.

State Site 5JF729 - Probable Coral is a site consisting of numerous hand-sawn logs, barbed wire strands, and nails and bolts. All of the artifacts indicate that the site was probably a corral that was in use in the early 1900s. The site is ineligible for inclusion in the NRHP because of its decrepit state and the lack of association with historic events or people.

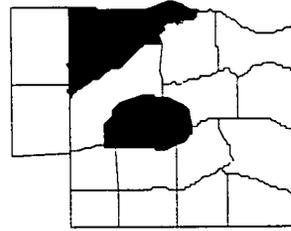


The aforementioned sites were not included in the NRHP because they are in poor condition, exhibit no rare construction, and have no historic interest.

Archaeological maps were omitted from this document to protect the integrity of the cultural resources. If the location of specific sites must be known, contact the Environmental Policy Implementation Division.

Future Plans: Western Aggregate, Inc. has leased the mineral rights in the E 1/2, E 1/2 Section 4 south of the road to the NREL Wind Energy Test Center, and the W 1/2, NW 1/4 Section 3. These rights are in conjunction with current mining activities immediately west of the RFETS boundary. Western Aggregates, Inc. submitted a proposal to the DOE requesting access to mine the above rights. The proposed mining would take place in Tract 32. Among the propositions included in the mining plan are that: 1) The major surface water runoff drainages to Rock Creek will not be mined, 2) the side slopes of the mine pit will be irregular to simulate a natural terrain, 3) the bottom of the pits will be undulated to create wetlands and marsh areas, 4) where feasible, certain sections of the pit will be diked to collect and hold water in the pit to allow for seepage into the ground, 5) certain sections of the pit may be designed to provide a direct flow into one of the Rock Creek drainages, and 6) the slopes of the pits will be seeded to native grass species and planted with shrub/tree species to simulate a condition similar to existing conditions within Rock Creek. The Rock Creek drainage will continue to be used extensively for aquatic and terrestrial background studies.

Western Aggregates, Inc. has filed an amendment application with the State of Colorado (AM-001) to add 425 acres to the Conda/McKay sand and gravel pit, Permit No. M-91-035. The proposed addition includes most of the northern half of the quadrant.



Mineral Rights: Tract 31 - N 1/2, NE 1/4, SE 1/4, and the NW 1/4, SW 1/4 Section 2 - 352.46 acres. The Union Pacific Railroad owns coal rights. Proprietor of vein or lode to extract and remove ore, should it penetrate or intersect. Coal, gas, Oil and other minerals reserved by A. M. Patten and granted by a. M. Patten to A. Reamer Patten, Margaret Musgrove, and Ivan M. Patten.

Tract 32 - N 1/2 Section 3, E 1/2, NE 1/4, SE 1/4, E 1/2 and SW 1/4 Section 4 - 619.09 acres. The Union Pacific Railroad owns coal rights. Grantors received all coal, oil, gas, clay and gravel. Proprietor of vein or lode to extract should the same penetrate or intersect the premises. Many 19/120th interest for coal, oil and other mineral rights.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the south, east, and west sides. The land north of Colorado 128 is part of Boulder County and is zoned for parks and open space. The land is currently being used for livestock pasture.

Contamination Profile

Soil Sites: 1-324, 1-342, 1-360, 1-306, and 2-018

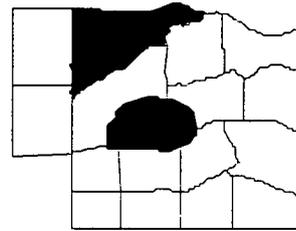
Sediment Sites: Reference the Sediment Sampling Locations map.

Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: Soil samples taken from the above locations show less than 0.24 ± 0.03 pCi/g of plutonium radioactivity.



Surface water site GS04, located on Rock Creek where it flows under Highway 128, recorded the following flows during the 1993 water year:

Average Spring Flow: 0.549 cubic feet per second (cfs)

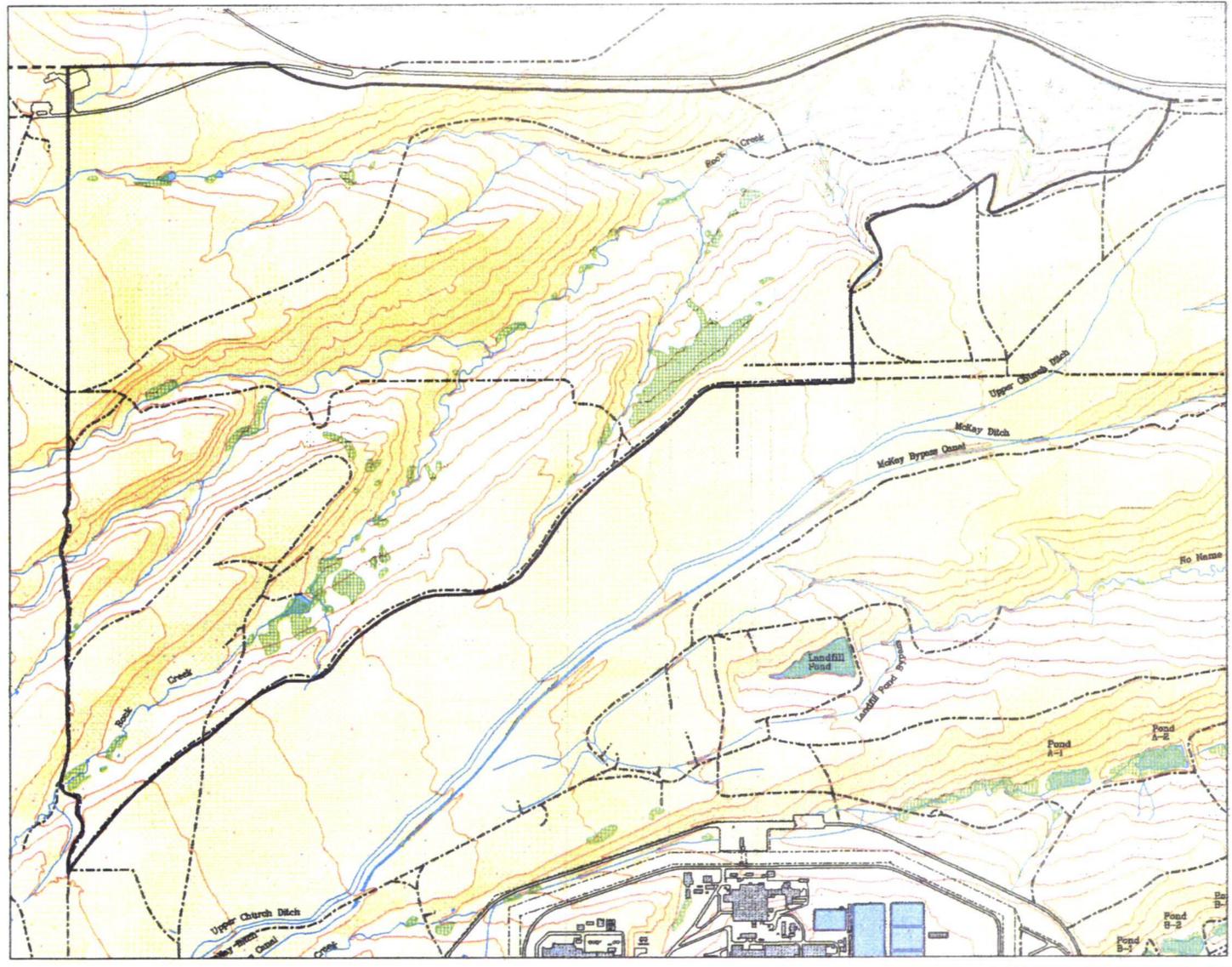
Average Summer Flow: 0.018 cfs

Average Winter/Fall Flow: 0.164 cfs

The flow data listed above should only be regarded as qualitative and should not be used as analytical data.

Groundwater well data and surface water data are currently accessible through RFEDS.

6-L MN



NW1 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Dept.
 2000 Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - data submitted



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

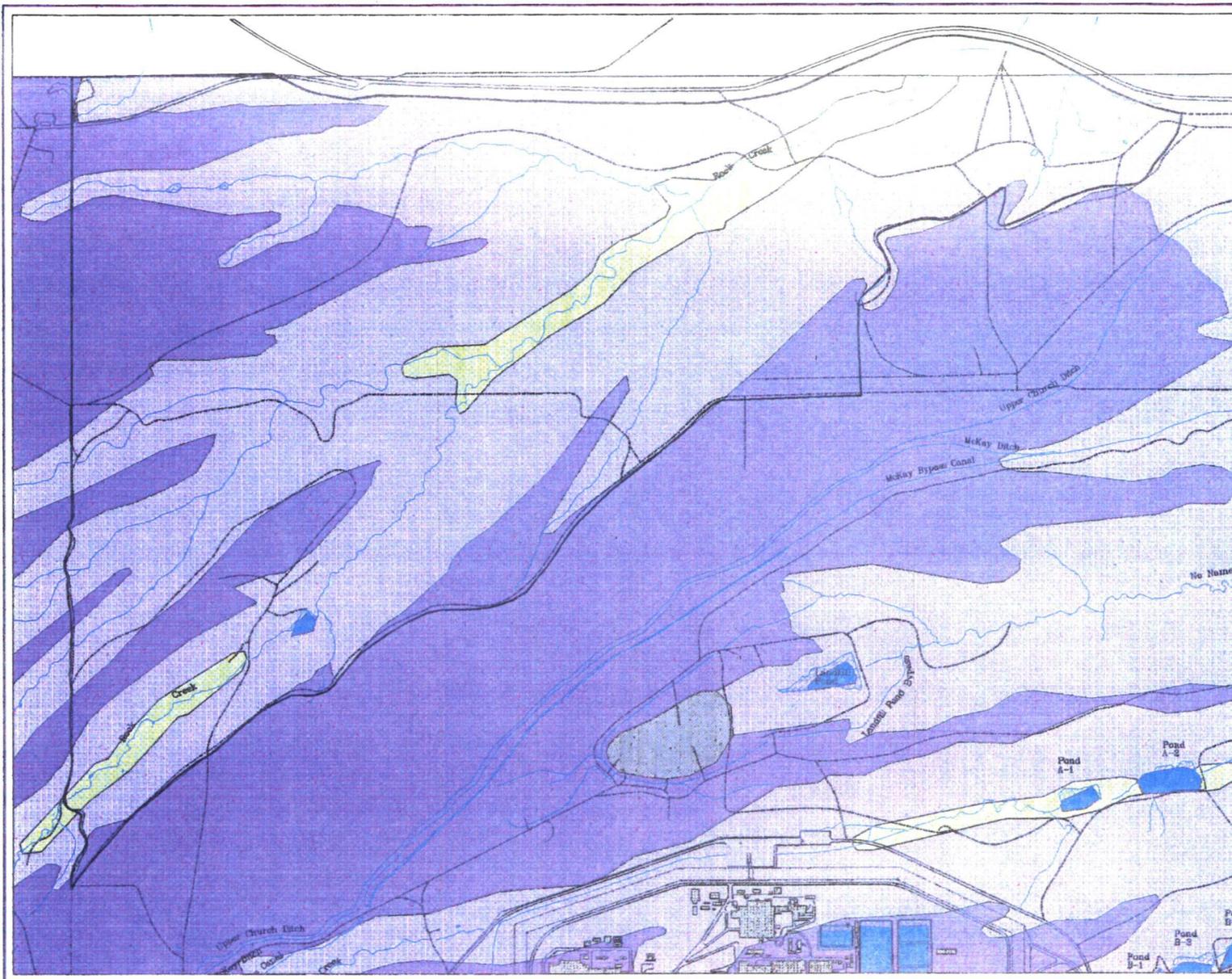
Prepared by:
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: Wet94-0001

August 22, 1994

Filename: F:\18163\proj\wetland\00006\wetland\07\EG&G\wetlands\map\map.dwg

NW 1-11



NW1 SOIL TYPES

- Argustolls
 - Peleistolls
 - Hepiargids
 - Mollisol/Rock Outcrop complex
 - Torrifluvents
 - Hepustolls
 - Torrorthents
 - Camberthids
 - Hepustolls
 - Cryofluvents
 - Hepiequolls
 - Netrargids
 - Argborolls
 - Gravel and Clay Pt
 - Rock Outcrop
 - DAM
 - WATER
-
- Buildings or other structures
 - Lakes and ponds
 - Streams, ditches, or other drainage features
 - Fences
 - Rocky Flats boundary
 - Paved roads
 - Dirt roads
 - Buffer Zone Quadrants

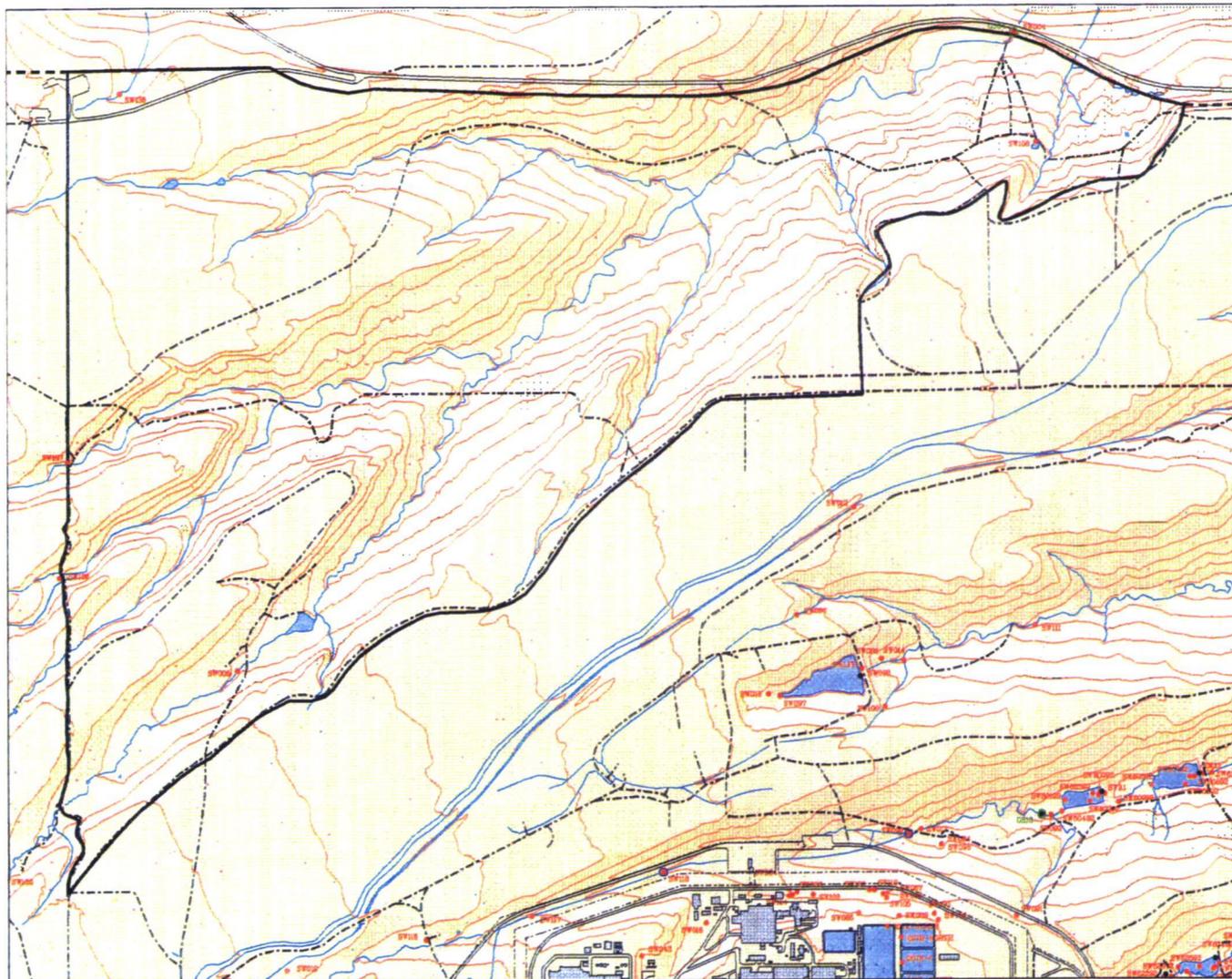
DATA SOURCES
 Buildings, roads and fences provided by
 Rocky Flats
 Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - data unknown
 Soil Classification derived from
 Geospatial Science Area Soil Survey
 Soil mapping scheme designed by the WABR



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

Prepared by:
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 480
 Golden, Colorado 80602-0480

NW 1-17



NW1 SURFACE WATER SAMPLING LOCATIONS

- Buffer Zone Quadrants
- Surface water stations
- Routine operational sites
- NPDES/FFCA permit monitoring sites
- Gaging stations
- NPDES storm water permit sampling sites
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- - - Fences
- - - Contours (20' Intervals)
- - - Rocky Flats boundary
- Paved roads
- - - Dirt roads

DEGS SOURCE:
Buildings, roads, and fences provided by
Facilities Dept.
2000 Study File, Jan. - 1991.
Hydrology provided by
GWSR - (data submitted)



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

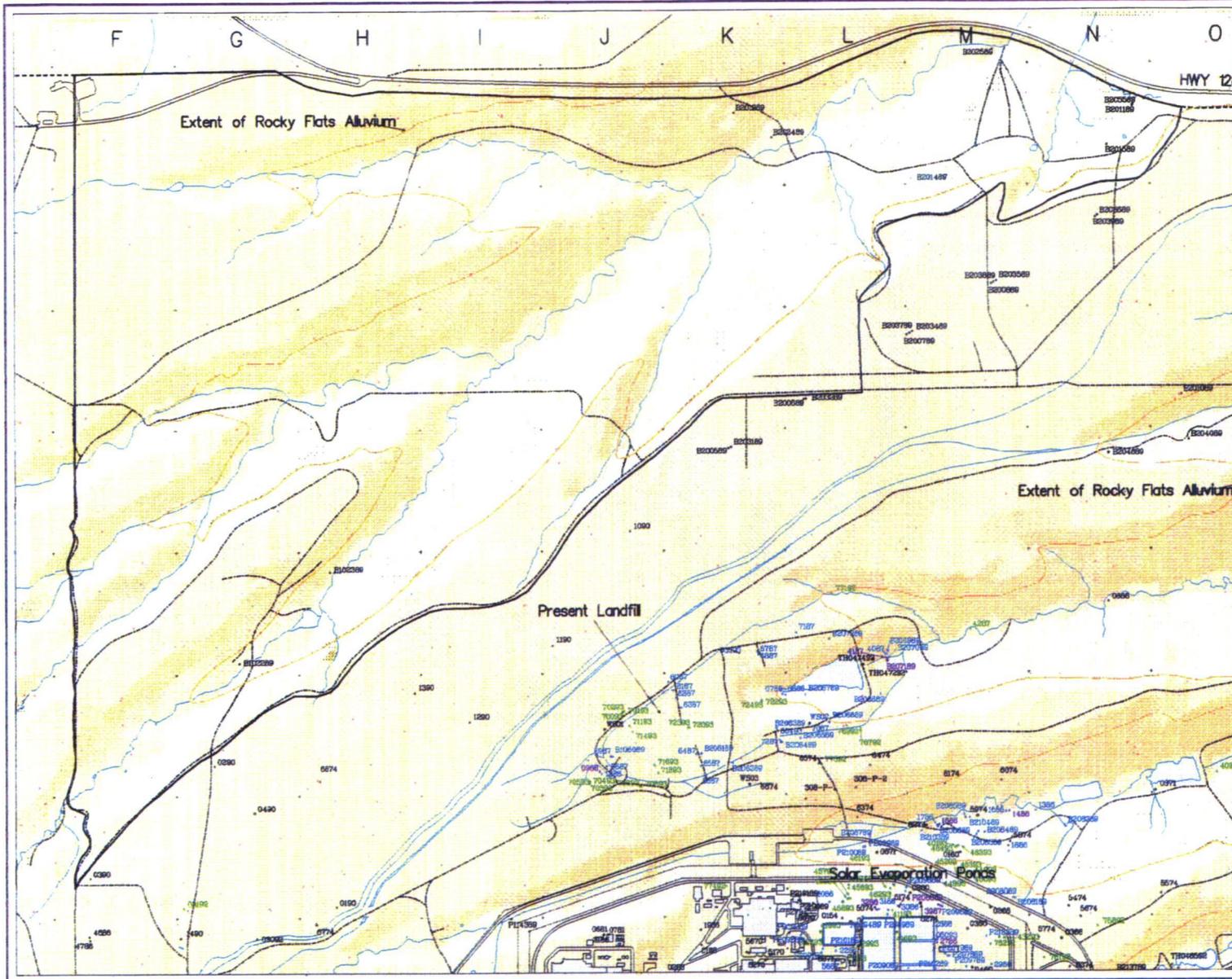
Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 404
Golden, Colorado 80402-0404

MAP ID: 8994-0001

August 25, 1994

flatsmwt111103projgwsr\mwf100002\01-17-94-0001-11\equatd11e-100001.dwg

NW 1-19



NW1 GROUNDWATER MONITORING WELL LOCATIONS MAP

- Boundary Wells
 - CERCLA Characterization Wells
 - RCRA Regulatory
 - RCRA Characterization Wells
 - Special Purpose Wells
- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock
- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ✦ Abandoned Groundwater Monitoring Wells

- Other**
- Buildings and other structures
 - Ponds and Lakes
 - Extent of Rocky Flats Alluvium

- Standard Map Features**
- Fences
 - - - Rocky Flats boundary
 - - - Paved roads
 - - - Dirt roads

DATE: 05/02/00
 100% Accuracy from Groundwater monitoring, 40%
 Hydrology, soils, and stream provided by
 1998 Rocky Flats, Inc. - 1997.
 Heritage provided by
 CERCLA - Data unknown

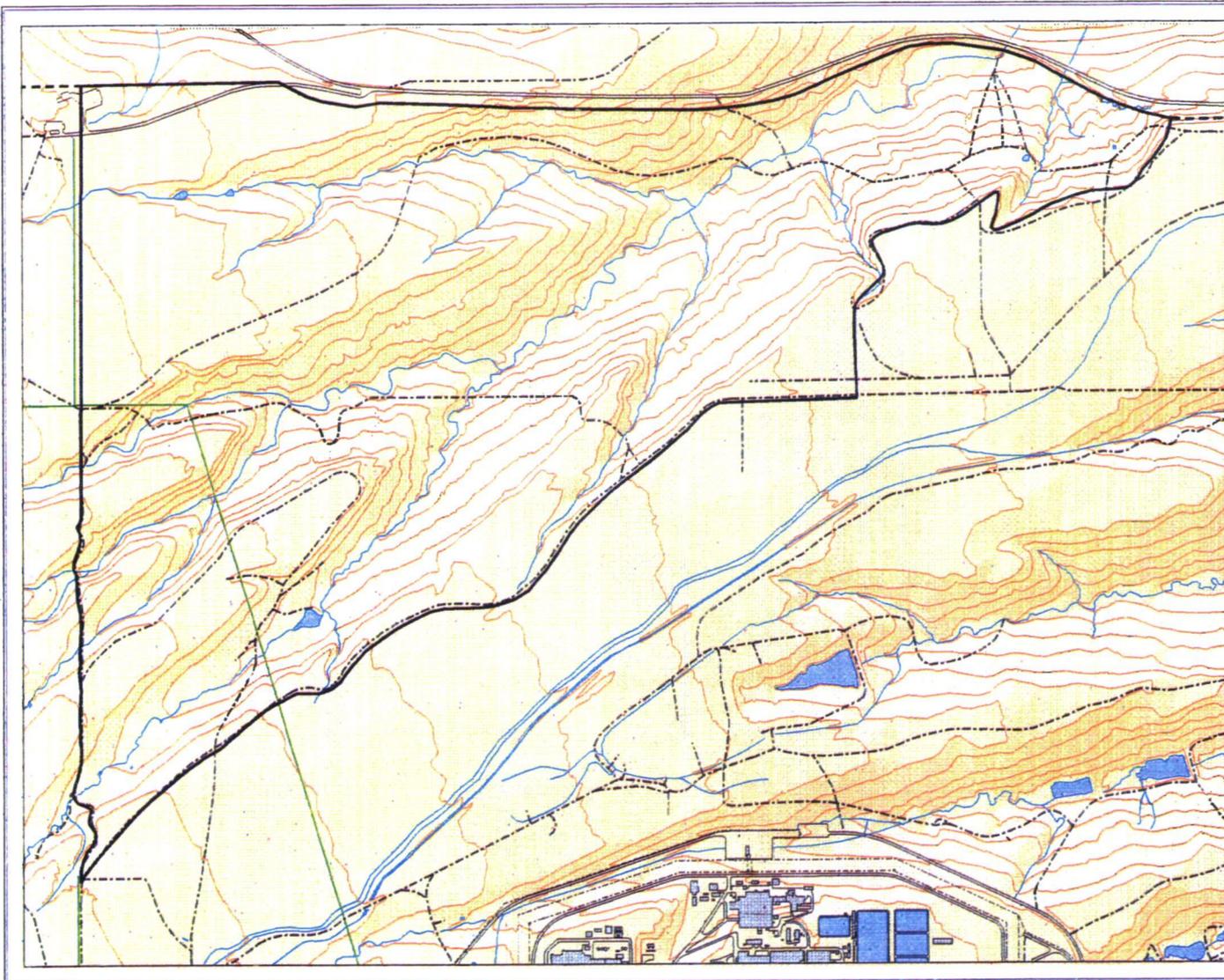


U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by
ES&S ROCKY FLATS

Rocky Flats Environmental Technology Site
 P.O. Box 494
 Greeley, Colorado 80639-0494

NW 1-23



NW1 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Eng.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)



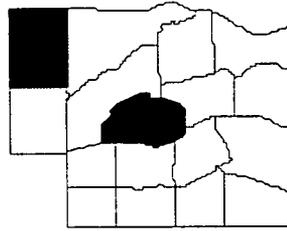
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Utile94-0001

August 22, 1994

From: \S1\BT\proj\gen\w\0000\util\1\09\rocks\utlle-0001.dwg

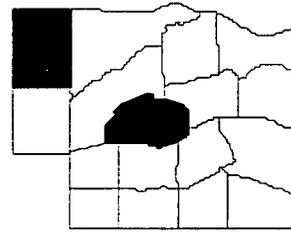


Quadrant: NW 2

Boundaries: **North** - RFETS Buffer Zone north perimeter fence.
South - Line running due east from the point on the west perimeter road where the road first bends to the NNE towards the National Renewable Energy Laboratory (NREL) Wind Energy Test Center.
East - Road running north along the old west Buffer Zone boundary fence. Where the road turns east, the boundary line continues north Colorado 128.
West - RFETS Buffer Zone west perimeter fence.

Vegetation: Quadrant NW 2 is primarily classified as Xeric Mixed Grassland, with small areas of Short Grassland and Mesic Mixed Grassland also present. Areas of Bottomland and Short Upland Shrub, intermixed with small areas of Marsh and Ponderosa Pine Woodland, are present along Rock Creek as it flows through the southern portion of the quadrant. The majority of the vegetation is considered to be undisturbed by activities at the RFETS. However, a large area in the southwestern corner of the quadrant was disturbed by activities at the NREL Wind Energy Test Center and is classified as Disturbed/Barren. The dominant species of vegetation are: Western Wheatgrass (*Agropyron smithii*), Canada Bluegrass (*Poa compressa*), Red Three-awn (*Aristida purpurea*), Junegrass (*Koeleria pyramidata*), Ponderosa pine (*Pinus ponderosa*), and Snowberry (*Symphoricarpos occidentalis*).

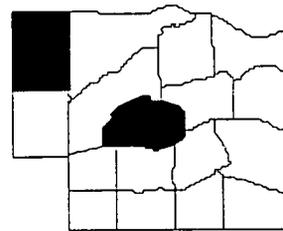
Wildlife Habitat: The major wildlife habitats consist of areas of Xeric Mixed Grassland, Mesic Mixed Grassland, and Short Grassland as well as Bottomland and Short Upland Shrub along Rock Creek.



In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*), Prairie Rattlesnake (*Crotalis viridis*) and Short Horned Lizard (*Phrunosoma douglassi*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), House Finches (*Carpodacus mexicanus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Rabbits (*Lagomorpha*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

In the Rock Creek areas, many species of arthropods are present and too numerous to list, and the number of individuals per species is fairly high. The amphibian and reptile species are represented by the Bull Snake (*Pituophis melanoleucus*) and Racer (*Coluber constrictor*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), and Red-winged Blackbirds (*Agelaius phoeniceus*). Also present is the Mallard (*Anas platyrhynchos*), Red-tailed Hawk (*Buteo jamaicensis*), and Great Horned Owl (*Bubo virginianus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*). The foliage along the creek also provides habitat for Mule Deer (*Odocoileus hemionus*), Coyotes (*Canis latrans*), and a Badger (*Taxidea taxus*).

Additionally, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*), and should be treated in accordance with USFWS policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.



Surface Waters: Surface water in the quadrant mainly consists of the four tributaries to Rock Creek. Three of the tributaries are located in the southeastern corner of the quadrant. The fourth originates near the eastern boundary of the NREL Wind Energy Test Center. All of the tributaries flow NE. Additional surface water bodies are located in the gravel pits due south of the NREL Wind Energy Test Center.

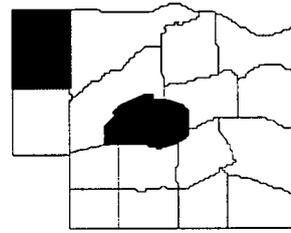
Jurisdictional Wetlands: The two largest tributaries flowing across the quadrant are classified as emergent, seasonal, wetlands by the USFWS. The seep that forms the headwaters of the tributary directly south of the NREL Wind Energy Test Center is also classified as an emergent seasonal wetland.

Floodplains: There is an area of 100-year floodplain that surrounds Rock Creek and Rock Creek Tributaries C and D as they flow through the southern portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are clayey-skeletal soils of the great group Paleustolls, which are very cobbly clay loams located on pediment surfaces. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

There are three bands of Argiustolls located in the southeastern corner of the quadrant. Argiustolls are mostly fine-textured clay loams associated with hill and valley slopes, and they are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

In addition, there are two areas characterized as Rock Outcrops in the north-western corner of the quadrant, and a Gravel and Clay Pit located in the west-central area.

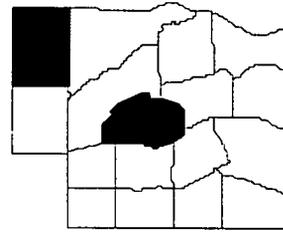


Surface Geology: Approximately 80 percent of the surface geology is composed of Rocky Flats Alluvium. This alluvium covers the "flats" found throughout the RFETS, particularly on the western side. The remaining 20 percent of the surface geology is comprised of the upper unit of the Laramie Formation, Fox Hills Sandstone, and Pierre Shale. The formations are located in the drainages leading to Rock Creek in the southeastern corner of the quadrant. In addition to this outcrop, two small outcrops are found in the western half of the quadrant. One is in the far northwestern corner of the quadrant and the other is to the south of the NREL Wind Energy Test Center. The outcrop south of the Test Center has been extensively mined out for gravel. The Pierre Shale is found in a small outcrops in the far northwestern corner of the quadrant.

Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays. The upper unit of the Laramie Formation is approximately 500 feet thick and composed of claystone. The claystone is light to medium gray and kaolinitic. The Fox Hills Sandstone is approximately 75 to 125 feet thick and grayish-orange to light gray in color. It is composed of calcareous, fine-grained feldspathic sandstone with thin beds of siltstone and claystone present. Pierre Shale is over 800 feet thick and is predominantly a medium to dark gray, non-calcareous shale. The presence of numerous fossils indicates that the formation was deposited in a marine environment.

Utilities: Two telephone lines cross the quadrant. One line runs N-S along the eastern border of the quadrant while the other runs E-W along the southern edge of the NREL Wind Energy Test Center. Additional utilities are also present in this area of the quadrant; underground power and telephone lines to the trailers were installed in 1977. Additional aboveground wiring exists at each individual test site.

Archaeology: State Site 5JF486 - possible survey cairn. There are seven small cobbles with three fragments of milled wood.



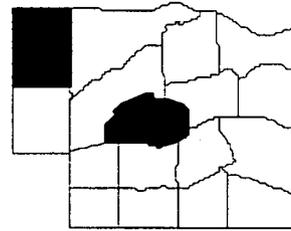
State Site 5JF735 - concrete foundation. A 11 x 9-foot poured concrete foundation with walls approximately 1-foot thick. There is no evidence of the super structure that the foundation may have supported in the past.

State Site 5JF738 - three sections of barbed wire fence. Three segments of barbed wire fence associated with the operation of Lindsey Ranch in the early 1900s. These fences have deteriorated extensively and some sections have been replaced with modern metal posts and barbed wire.

State Site 5JF742 - abandoned Denver, Utah & Pacific Railroad grade circa 1881 and 1882. In 1883, financial problems caused construction to cease. The track was never laid and the grade was abandoned. The total length of the grade is approximately 8,200 feet across the RFETS.

State Sites, 5JF754 and 5JF755. No information was available. None of the sites are eligible for the NRHP because of their decrepit states, and the lack of association with historic events or people.

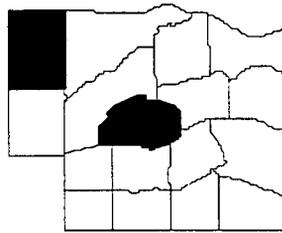
Archaeological maps were omitted from this document to protect the integrity of the cultural resources. If the location of specific sites must be known, contact the Environmental Policy Implementation Division.



Future Plans: Western Aggregate, Inc. has leased the mineral rights in the E 1/2, E 1/2 Section 4 south of the road to the NREL Wind Energy Test Center, and the W 1/2, NW 1/4 Section 3. These rights are in conjunction to current mining activities immediately west of the RFP boundary. Western aggregate, Inc. has submitted a proposal to the DOE requesting access to mine the above rights. The proposed mining would take place in Tract 32. Among the propositions included in the mining plan are that: 1) The major surface water runoff drainages to Rock Creek will not be mined, 2) the side slopes of the mine pit will be irregular to simulate a natural terrain, 3) the bottom of the pits will be undulated to create wetlands and marsh areas, 4) where feasible, certain sections of the pit will be diked to collect and hold water in the pit to allow for seepage into the ground, 5) certain sections of the pit may be designed to provide a direct flow into one of the Rock Creek drainages, and 6) the slopes of the pits will be seeded to native grass species and planted with shrub/tree species to simulate a condition similar to existing conditions within Rock Creek. This mining would be twenty to thirty years in duration and would render the land unusable for other purposes during that time.

The NREL Wind Energy Test Center is located in the northern end of the quadrant. Its test sites are located throughout the quadrant. On July 1, 1993, the Center was turned over to the NREL which is planning to refurbish the facilities in the upcoming years and to commence large scale research at that facility. The Department of Energy envisions the Center as a showcase of alternative energy research. NREL has 15 more years of wind testing to conduct and has asked Western Aggregates Inc. to slow the process of mining on the northern end. In response, Western Aggregate has acquired a mining lease on the State School Section which will place construction and increased traffic south of the plant's west access road.

Western Aggregates, Inc. has filed an amendment application with the State of Colorado (AM-001) to add 425 acres to the Conda/McKay sand and gravel pit, Permit No. M-91-035. The proposed addition includes most of the eastern third of the quadrant.



Mineral Rights: Tract 32 - N 1/2 Section 3, E 1/2, NE 1/4, SE 1/4, E 1/2, SW 1/4 Section 4 - 619.09 acres. The Union Pacific Railroad owns coal rights. Grantors received all coal, oil gas clay and gravel. Proprietor of vein or lode to extract should the same penetrate or intersect the premises. Many 19/120th interest for coal, oil and other mineral rights.

Tract 33 - E 1/2 NW 1/4 and W 1/2 NE 1/4 Section 4 - 160.00 acres. Grantor reserved oil, gas and other minerals. T. N. Jordan, Jr. from the Rocky Mountain Fuel Company.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the south and east sides. The land north of the quadrant is zoned as Boulder County parks and open space and is currently vacant. The land west of the quadrant is zoned as industrial and is currently occupied by Western Aggregate, Inc. Western Aggregate operates a quarry and aggregate operation on the land. A small commercial sawmill also operates in this area.

In addition, a spur of the Denver and Rio Grande West (D&RGW) railroad parallels the plant boundary and serves the Western Aggregate plant.

Contamination Profile

Soil Sites: 2-324 and 2-306

Sediment Sites: Reference the Sediment Sampling Locations map.

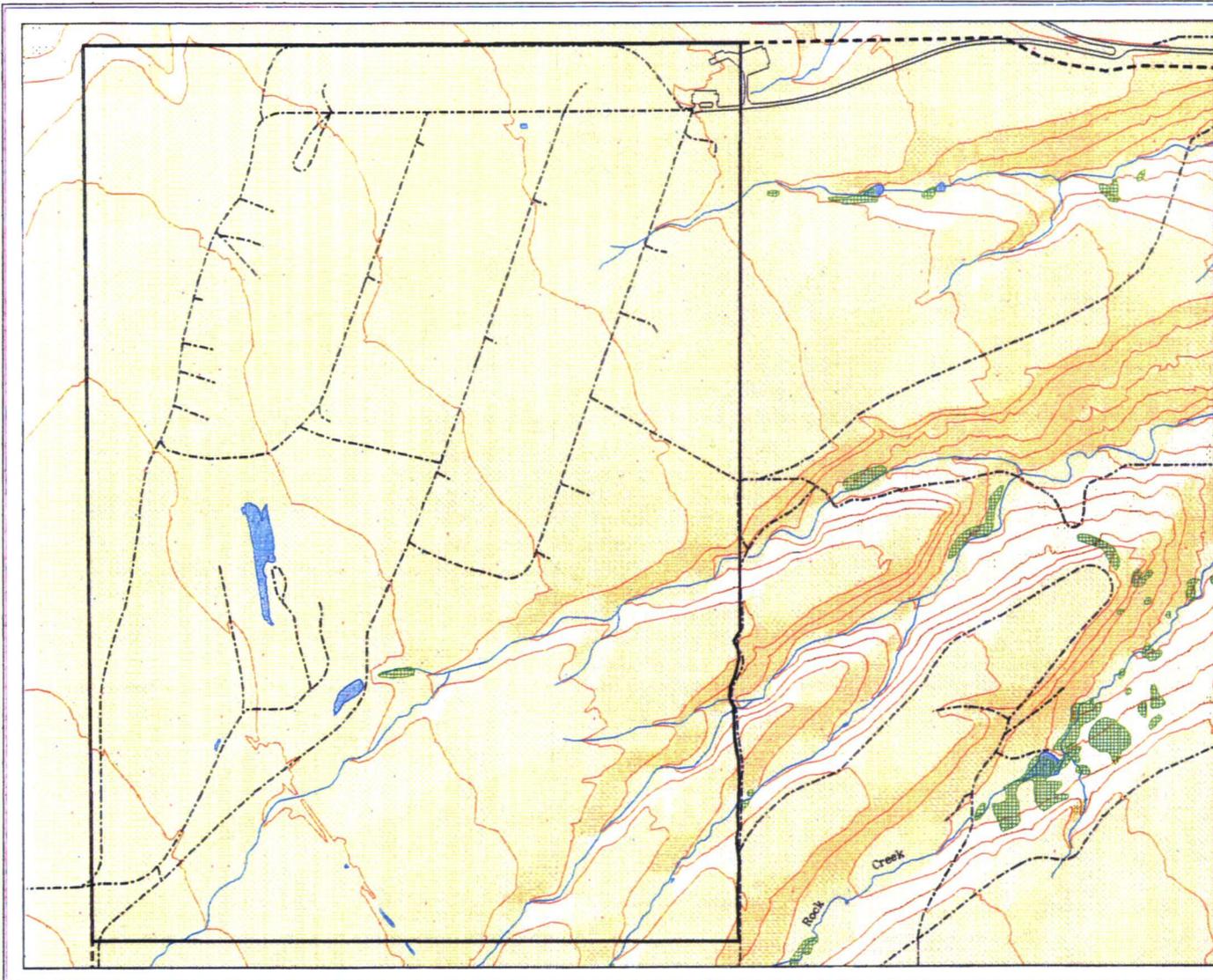
Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: The quadrant is relatively unaffected by operation of the RFETS. Soil sampling data is currently accessible through RFEDS.

NW 2-9



NW 2 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Rockwell International, Inc. - 1981.
Wetland Study Data, Inc. - 1981.
Hydrology provided by
USACE - Data unknown



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

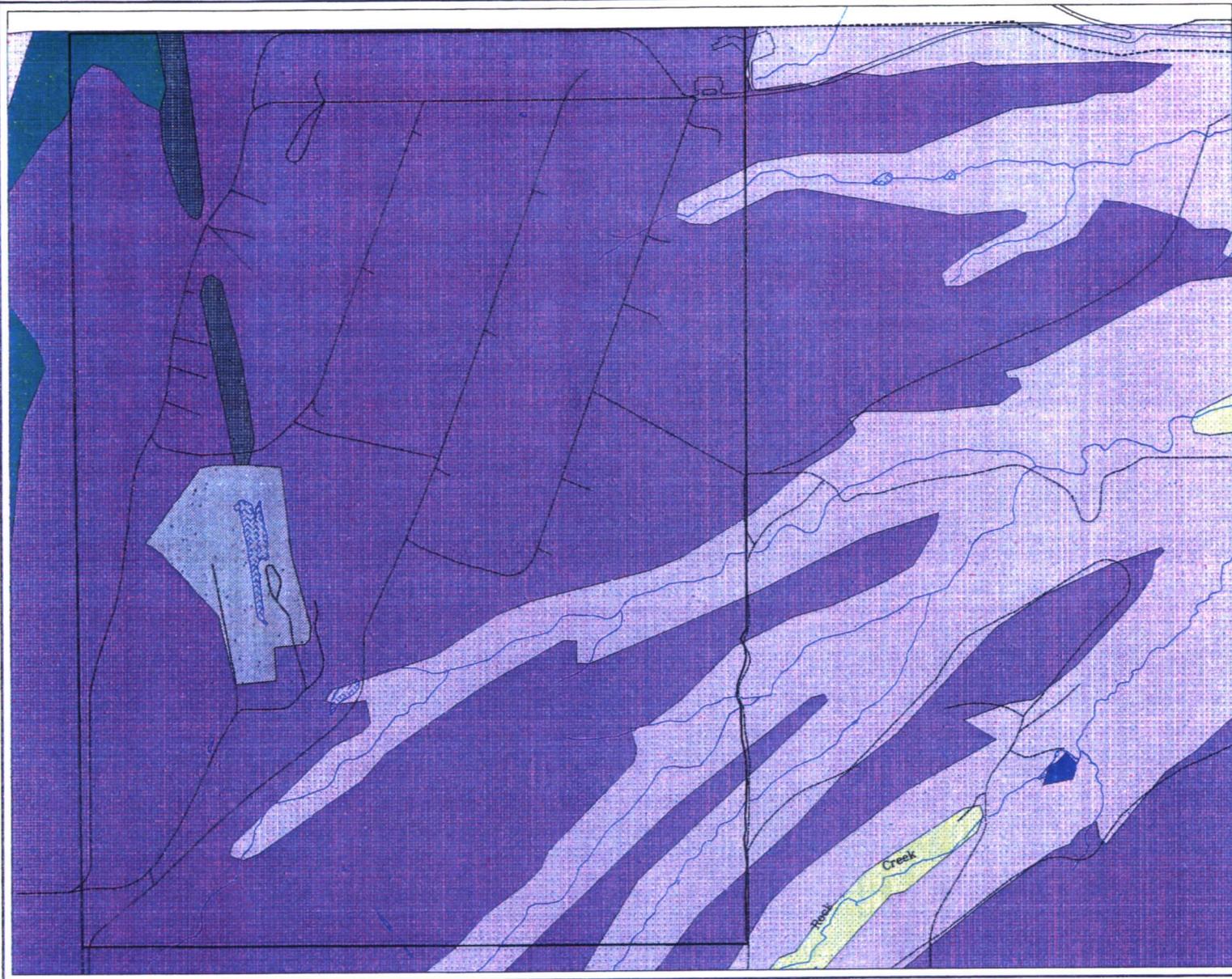
Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Wet94-0001

August 22, 1994

Armed/F181182/Project/Env/0001/Wetlands/1/EG&G/wetlands/0001.mxd

NW 2-11



NW2 SOIL TYPES

- Argiustolls
- Paleustolls
- Haplertolls
- Mollisol/Rock Outcrop complex
- Torrifluvents
- Haplertolls
- Torrorthents
- Camborthids
- Haplertolls
- Cryofluvents
- Haploquolls
- Netrargids
- Argiborolls
- Gravel and Clay Pit
- Rock Outcrop
- DAM
- WATER

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

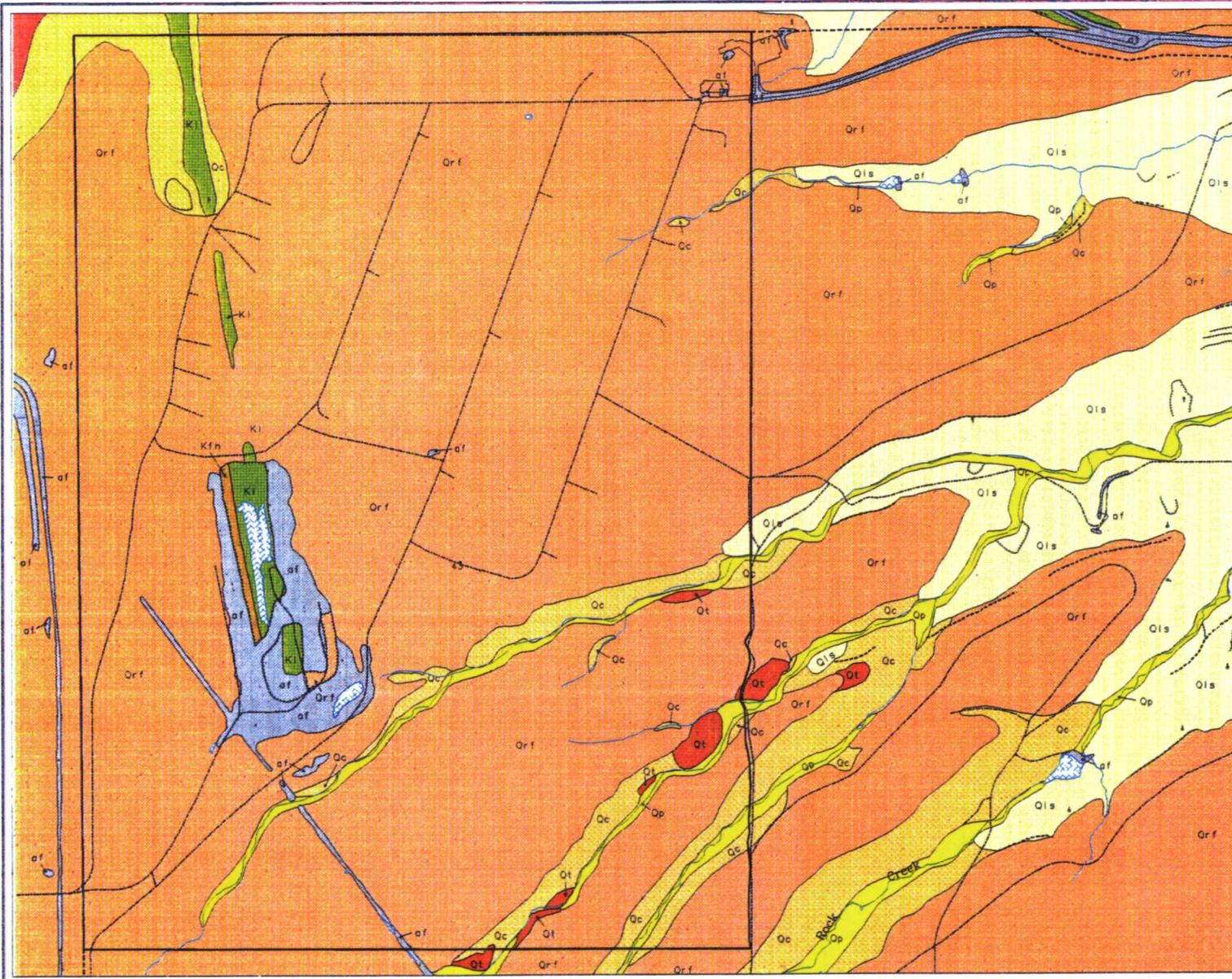
DATA SOURCES:
 Boundaries, roads, and fences provided by
 Rockwell Engineering, Inc. - 1991.
 Soil types provided by
 USDA - State University
 Soil Conservation Service survey
 University of Idaho Soil Survey
 Soil mapping sources digitized by Jim Volking



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

Prepared by
Rockwell Engineering
 Rocky Flats Environmental Technology Site
 P.O. Box 404
 Golden, Colorado 80402-0404

NW 2-13



NW2 GEOLOGIC UNITS



- af - Artificial fill
- Qp - Post-Piney Creek Alluvium
- Qt - Terrace alluvium
- Qs - Siltum alluvium
- Qc - Coluvium
- Qls - Landslide deposits
- Qv - Varves alluvium
- Orf - Rocky Flats Alluvium
- Kf - Arapahoe Formation
- Kl - Laramie Formation
- Kfh - Fox Hills Sandstone

- Shallow closed depression
- Sharp of young landslides
- Areas of vegetation around springs
- Boundary of gravel and clay pit
- Spring
- ! Bedding strike and dip
- Crest with crest size
- Capitol Mine

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

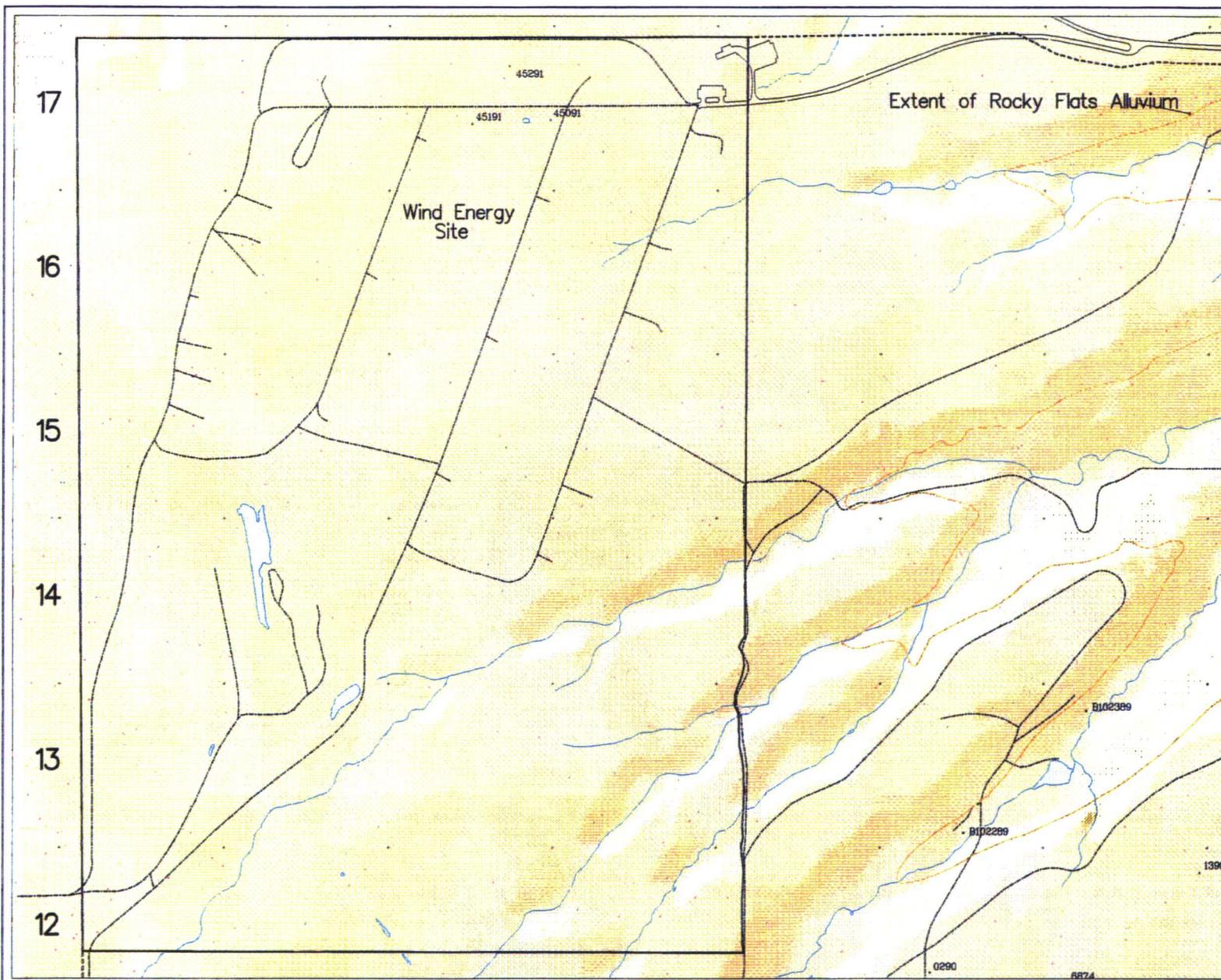
Some symbols are modified from those provided by the following sources:
 U.S. Geological Survey, 1981
 U.S. Geological Survey, 1982
 U.S. Geological Survey, 1983
 U.S. Geological Survey, 1984
 U.S. Geological Survey, 1985
 U.S. Geological Survey, 1986
 U.S. Geological Survey, 1987
 U.S. Geological Survey, 1988
 U.S. Geological Survey, 1989
 U.S. Geological Survey, 1990
 U.S. Geological Survey, 1991
 U.S. Geological Survey, 1992
 U.S. Geological Survey, 1993
 U.S. Geological Survey, 1994
 U.S. Geological Survey, 1995
 U.S. Geological Survey, 1996
 U.S. Geological Survey, 1997
 U.S. Geological Survey, 1998
 U.S. Geological Survey, 1999
 U.S. Geological Survey, 2000
 U.S. Geological Survey, 2001
 U.S. Geological Survey, 2002
 U.S. Geological Survey, 2003
 U.S. Geological Survey, 2004
 U.S. Geological Survey, 2005
 U.S. Geological Survey, 2006
 U.S. Geological Survey, 2007
 U.S. Geological Survey, 2008
 U.S. Geological Survey, 2009
 U.S. Geological Survey, 2010
 U.S. Geological Survey, 2011
 U.S. Geological Survey, 2012
 U.S. Geological Survey, 2013
 U.S. Geological Survey, 2014
 U.S. Geological Survey, 2015
 U.S. Geological Survey, 2016
 U.S. Geological Survey, 2017
 U.S. Geological Survey, 2018
 U.S. Geological Survey, 2019
 U.S. Geological Survey, 2020
 U.S. Geological Survey, 2021
 U.S. Geological Survey, 2022
 U.S. Geological Survey, 2023
 U.S. Geological Survey, 2024
 U.S. Geological Survey, 2025



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

Prepared by
ES&S ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 980
 Golden, Colorado 80402-0980

NW 2-17



NW2 GROUNDWATER MONITORING WELL LOCATIONS MAP

- Boundary Well
 - CERCLA Characterization Wells
 - RCRA Regulatory
 - RCRA Characterization Wells
 - Special Purpose Wells
- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock
- Inactive Groundwater Monitoring Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock
- Abandoned Groundwater Monitoring Wells

- Other**
- Buildings and other structures
 - Ponds and Lake
 - Extent of Rocky Flats Alluvium
- Standard Map Features**
- Fence
 - Rocky Flats boundary
 - Paved roads
 - Dirt roads

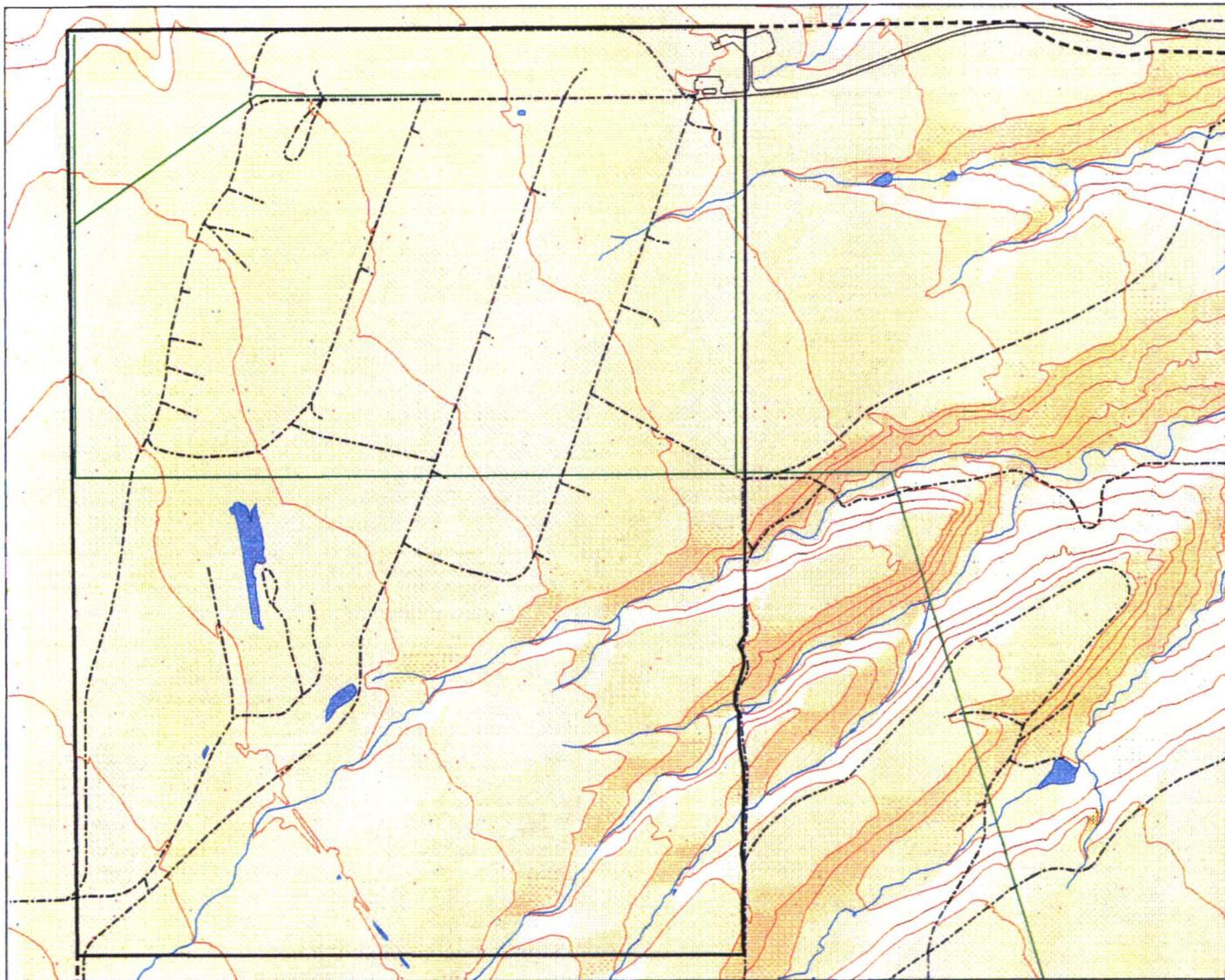
MAP SOURCE:
Well locations from Groundwater monitoring, 404
Buildings, roads, and fences provided by
Facility Group
2000 Rocky Flats, Inc. - TRU
Hydrology provided by
USDOE - (data not shown)



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

Prepared by:
EM&E ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 404
Golden, Colorado 80422-0404

NW 2-19



NW2 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)

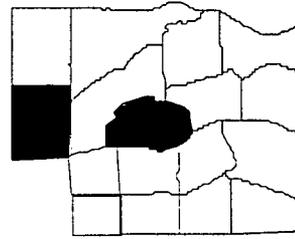


U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util94-0001

August 22, 1994



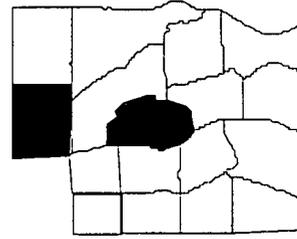
Quadrant: NW 3

Boundaries: **North** - Line running due east from the point in the west perimeter road where the road first bends to the NNE towards the National Renewable Energy Laboratory (NREL) Wind Energy Test Center.
South - West RFETS Access Road.
East - Road running north along the old west Buffer Zone boundary fence.
West - RFETS Buffer Zone west perimeter fence.

Vegetation: Quadrant NW 3 is primarily classified as Mesic Mixed Grassland in the southeast portion of the quadrant, and Xeric Mixed Grassland in the northwest. Areas of Bottomland Shrub and Riparian Woodland are present along Rock Creek as it flows through the quadrant. The majority of the vegetation is considered to be undisturbed by activities at the RFETS. However, a large area of vegetation in the south area of the quadrant has been disturbed by activities at the Jefferson County clay and gravel pit. Vegetation in the area of the pit has been destroyed. The dominant species of vegetation in the quadrant are: Western Wheatgrass (*Agropyron smithii*), Switchgrass (*Panicum virgatum*), Canada Bluegrass (*Poa compressa*), Three-awn (*Aristida*), June grass (*Koeleria macrantha*), Ponderosa pine, (*Pinus ponderosa*), Sedge (*Carex*), and Red Threeawn (*Aristida purpurea*). There are some larger trees along the abandoned railroad grade.

Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland and Xeric Mixed Grassland, as well as Riparian Woodland and Bottomland Shrub along Rock Creek.

In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*), Prairie Rattlesnake (*Crotalis viridis*) and Short Horned Lizard (*Phrynosoma douglassi*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Poocetes gramineus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*).

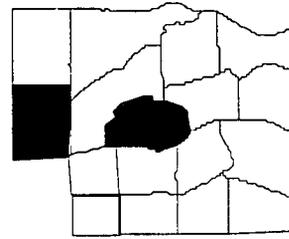


The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Prairie Voles (*Microtus ochrogaster*), Desert Cottontails (*Sylvilagus audubonii*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

In the Bottomland Shrub and Riparian Woodland areas, many species of arthropods are present but too numerous to list, and the number of individuals per species is fairly high. Reptiles include the Bull Snake (*Pituophis melanoleucus*) and Racer (*Coluber constrictor*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes gramineus*), and Red-winged Blackbirds (*Agelaius phoeniceus*). Also present is the Mallard (*Anas platyrhynchos*), Red-tailed Hawk (*Buteo jamaicensis*), and Great Horned Owl (*Bubo virginianus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*). The foliage along the creek and ditch also provides habitat for Mule Deer (*Odocoileus hemionus*) and Coyotes (*Canis latrans*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS policies; particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concern Species" for details.

Surface Waters: The quadrant is part of the Rock Creek drainage. The creek and three tributaries (B, D, E) flow NE through the quadrant. These tributaries are located in the northeastern corner of the quadrant. Several small ponds exist along the tributaries and the creek. Three small seeps are present in the central portion of the quadrant at the headwaters of one of the tributaries. The Church and McKay Ditches cross the southern end of the quadrant. These ditches are associated with local farming and are not related to or controlled by operations at the RFETS.



Additional surface waters are located in the southern end of the quadrant in the Jefferson County gravel pits that have partially filled with water. The Rock Creek drainage is considered to be unaffected by the RFETS operations and is therefore used for background testing of aquatic environments.

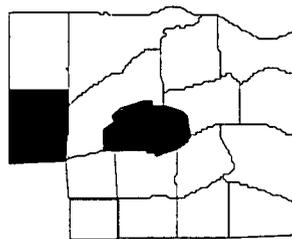
Jurisdictional Wetlands: Rock Creek and its two largest tributaries flowing across the quadrant are classified as emergent, seasonal, wetlands by the USFWS. A portion of the Church Ditch is also classified as a wetland. The seeps that form the headwaters of the tributary directly north of Rock Creek are classified as flat, saturated seasonal wetlands. The two larger ponds located along Rock Creek and its tributary to the north are classified as semipermanent open water wetlands by the USFWS.

Floodplain: There is an area of 100-year floodplain that surrounds Rock Creek and Rock Creek Tributaries B, D, and E as they flow through the northern portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are clayey-skeletal soils of the great group Paleustolls, which are very cobbly clay loams located on pediment surfaces. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

There are four bands of Argiustolls located in the central and northern portions of the quadrant. Argiustolls are mostly fine-textured clay loams associated with hill and valley slopes, and they are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.

In addition, there is a Gravel and Clay Pit located in the southern portion of the quadrant.

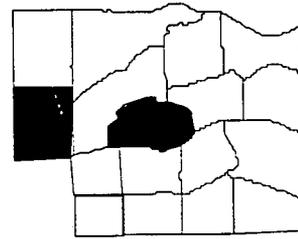


Surface Geology: Approximately 95 percent of the quadrant is composed of Rocky Flats Alluvium. This alluvium covers the "flats" found throughout the RFETS, particularly on the western side. The remaining 5 percent of the surface geology is comprised of the Upper unit of the Laramie Formation and Fox Hills Sandstone. The formation is located in the Rock Creek drainage in the far northeastern corner of the quadrant. In addition to this outcrop, two small outcrops are found in the southwestern quarter of the quadrant. Both outcrops have been extensively mined for gravel and clay. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays. The upper unit of the Laramie Formation is approximately 500 feet thick and composed of claystone. The claystone is light to medium gray and kaolinitic. The Fox Hills Sandstone is approximately 75 to 125 feet thick and grayish-orange to light gray in color. It is composed of calcareous, fine-grained feldspathic sandstone with thin beds of siltstone and claystone present.

Utilities: A buried telephone line runs N-S along the road that forms the eastern boundary of the quadrant. A buried conduit runs E-W just to the north of the West Access Road. This conduit contains a 6-inch domestic cold water line, an alarm line, telephone lines, and a 13.8 KV electrical line. All of these utilities serve the west security gate. An 8-inch natural gas line owned by PSC of CO runs along the West Access Road. The line exits the RFETS near the west security gate. A 10-inch raw water line runs along the conduit that transports the utilities to the west security gate.

Archaeology: State Site 5JF738 - three sections of barbed wire fence. Three segments of barbed wire fence were associated with the operation of Lindsey Ranch in the early 1900s. These fences have deteriorated extensively and some sections were replaced with metal posts and barbed wire.

State Site 5JF742 - abandoned Denver, Utah & Pacific Railroad grade. This railroad grade was constructed in 1881 and 1882. In 1883 financial problems caused construction to cease. The track was never laid and the grade was abandoned. The total length of the grade is approximately 8,200 feet across the RFETS.



State Sites 5JF512 and 5JF513 - Upper Church and McKay Ditches. Both bermed ditches were constructed in 1882 for local ranching. The ditches are approximately 6 feet wide and 3 to 6 feet deep. Many sections have been rebuilt since the original construction.

State Site 5JF475 - small rock cairn (Isolated Find). There is a small rock cairn approximately 3 feet in diameter consisting of 9-10 cobbles.

State Site 5JF476 - small rock cairn (Isolated Find). There is a small rock cairn consisting of 40+ cobbles, approximately 3 feet in diameter.

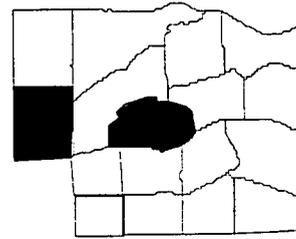
State Sites 5JF736 and 5JF737 - Stock Ponds. Four bermed stock ponds approximately 100 x 75 feet, 75 x 70 feet, 100 x 35 feet, and 35 x 35 feet. Berms around the ponds range up to almost 20 feet in height and currently retain water. These ponds were constructed in the late 1940s for the Lindsey ranch.

State Site 5JF739 - 10 x 16 foot depression. The depression appears to be a former gravel mine covered with wooden planks to protect cattle. Planks currently cover and surround the depression.

The aforementioned sites were not included in the NRHP because they are in poor condition, exhibit no rare construction, and have no historic interest.

Archaeological maps were omitted from this document to protect the integrity of the cultural resources. If the location of specific sites must be known, contact the Environmental Policy Implementation Division.

Future Plans: Remediation of the West Spray Field is anticipated in accordance with plans to remediate OU 11. Mining will continue in the Jefferson County clay and gravel pits.



Mineral Rights: Tract 34 - NE 1/4 Section 9 - 160.00 acres. The Union Pacific Railroad owns coal rights. Oil and gas reserved to Martha Eberharter.

Tract 35 - W 1/2 and portion of SE 1/4 Section 9 - 310.65 acres. The Union Pacific Railroad owns coal rights. Coal, oil, gas, clay, gravel and rock reserved to grantor.

Adjoining Lands: The quadrant is adjoined by the RFETS Buffer Zone on the north, south, and east sides. The land to the west is currently zoned as rangeland and is used for grazing cattle. This land also includes a spur of the D&RGW railroad that serves the RFETS and Western Aggregates Inc. Building 060, an administrative building, and a small warehouse, Building 061, are located just west of the NW 3 quadrant. Building 060 is leased to EG&G Rocky Flats, Inc.

Contamination Profile

Soil Sites: None.

Sediment Sites: Reference the Sediment Sampling Locations map.

Surface Water: Reference the Surface Water Sampling Locations map.

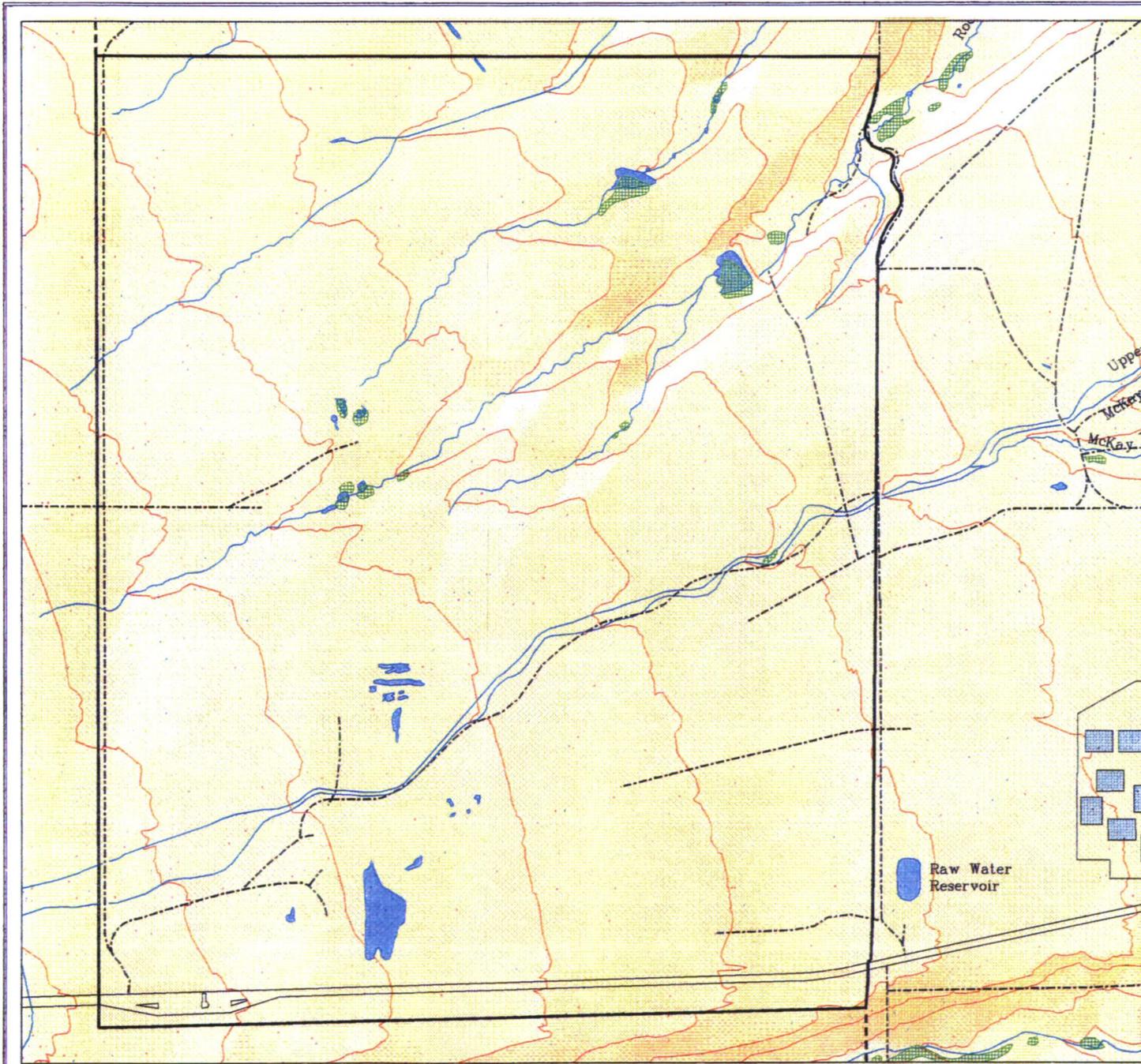
Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: IHSS No. 168 is also known as the West Spray Field. The area was a land treatment facility that was used to dispose of water containing high concentrations of nitrates. The water was sprayed on the area in the form of a mist. The area of the spray field is now contaminated and has high levels of nitrates in the soil. This IHSS will be remediated in accordance with plans to remediate OU 11.

Current data for sediment sites, surface water, and groundwater wells are accessible through RFEDS.

NW 3-7



NW3 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Eng.,
 20402 Rocky Flats, Inc. - 1991.
 Hydrology provided by
 USGS - (date unknown)

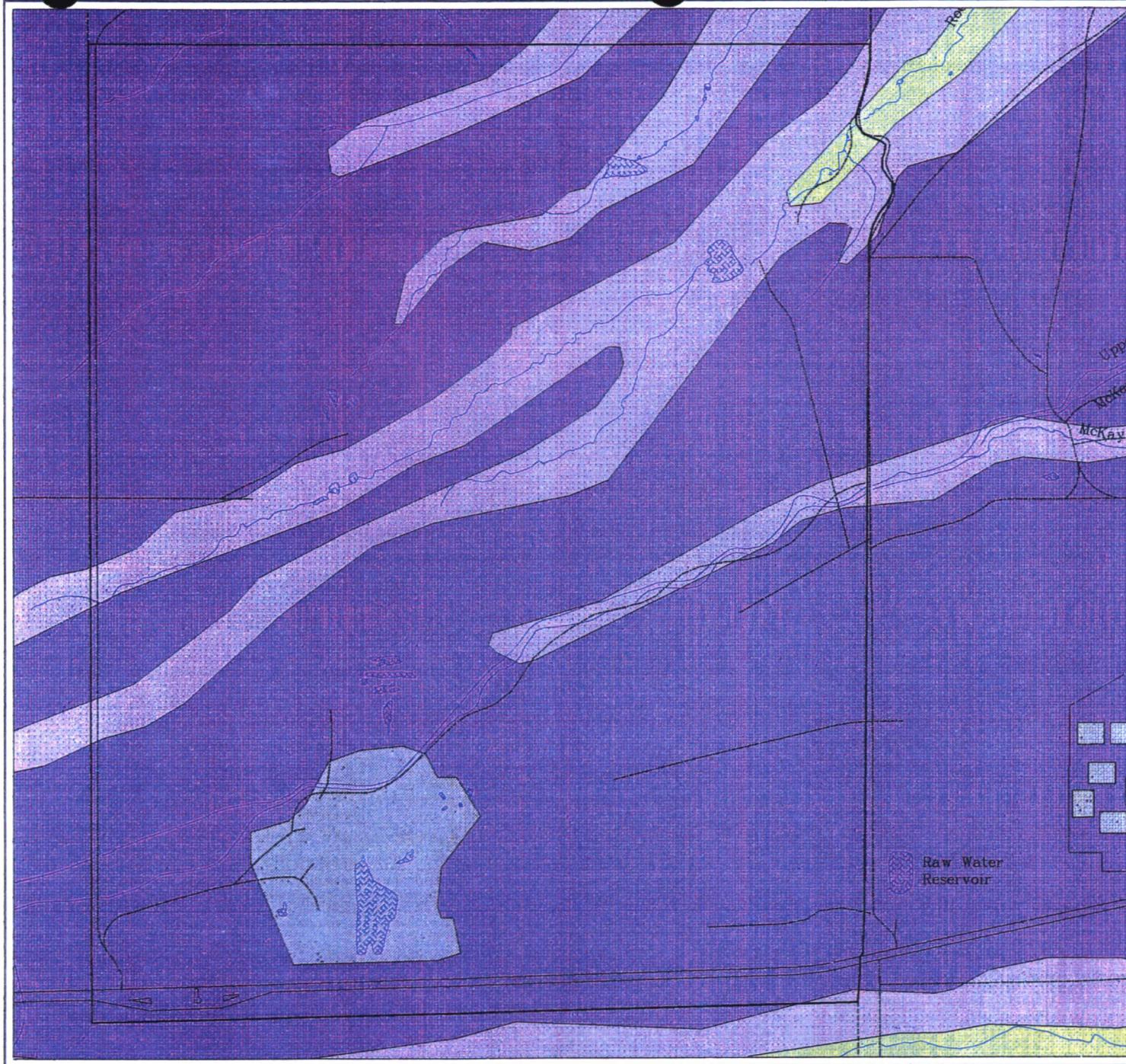


U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

F:\maps\18182\proj\wetland\0005\wetland11\09wetland\wetlands-mapquadrant

6-WN 3-9



NW3 SOIL TYPES

- Argiustolls
- Paleustolls
- Haplogide
- Mollelo/Rock Outcrop complex
- Torrifluvents
- Haplustolls
- Torriorthents
- Camborthide
- Haplustolls
- Cryofluvents
- Haploquolls
- Natrargide
- Argiborolls
- Gravel and Clay Ptt
- Rock Outcrop
- DAM
- WATER

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

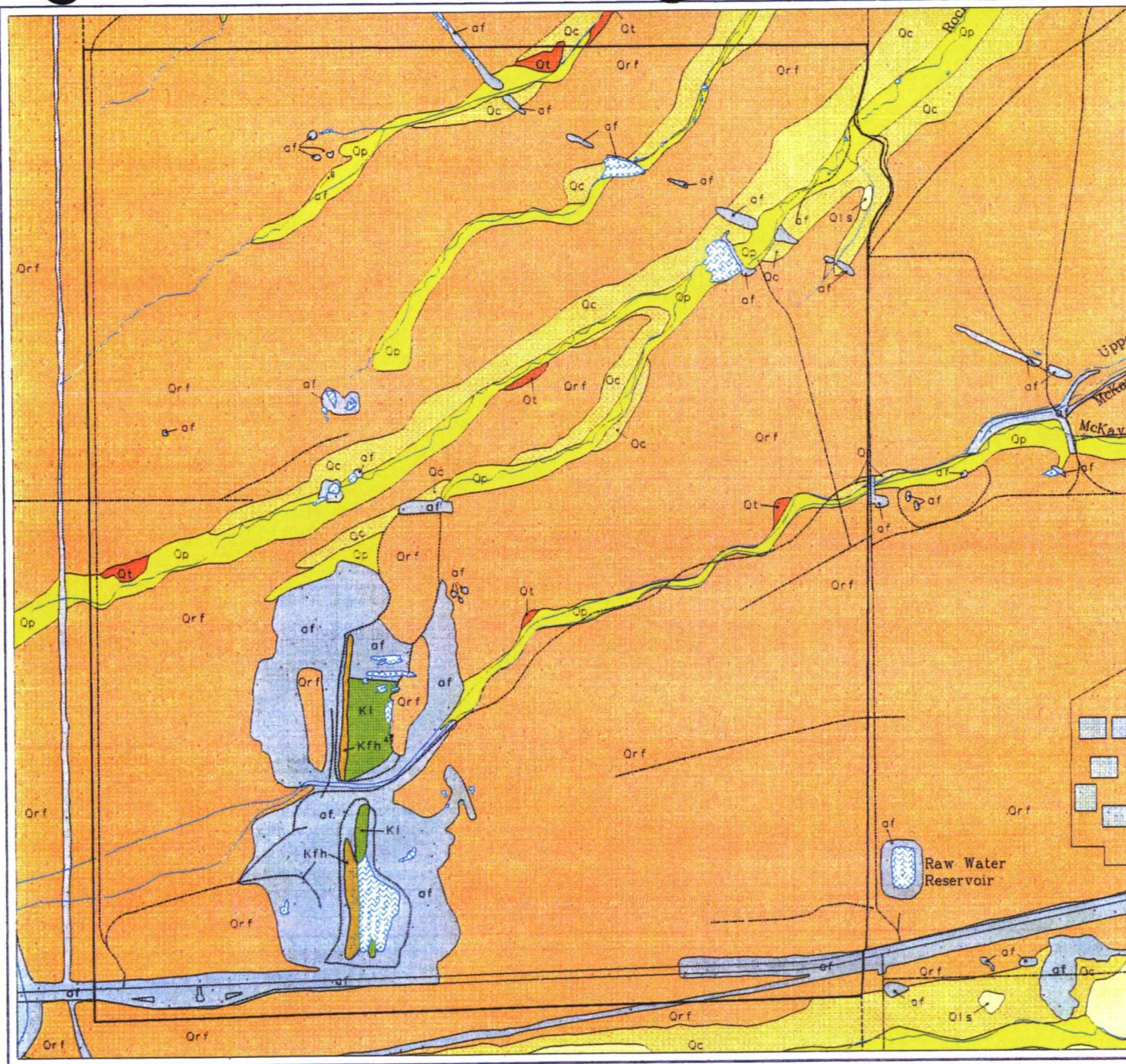
DATA SOURCE:
 Building, ponds, and fences provided by
 Rockwell Eng.
 Rocky Flats, Inc. - 1997.
 Hydrology provided by
 USGS - Map unknown
 Soil Classification provided by
 National Soils Area Soil Survey
 Soil mapping scheme adopted by the USGS



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

Prepared by:
ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 466
 Golden, Colorado 80422-0466

NW3-11



NW3 GEOLOGIC UNITS



- af - Artificial fill
- Qp - Post-Piney Creek Alluvium
- Qt - Terrace alluvium
- Qc - Siouan alluvium
- Qo - Colluvium
- Qla - Landslide deposits
- Qv - Verdeo alluvium
- Qrf - Rocky Flats Alluvium
- Ka - Arapahoe Formation
- Kl - Laramie Formation
- Kfh - Fox Hills Sandstone

- Shallow closed depression
- Soap of young landslide
- Areas of vegetation around springs
- Boundary of gravel and clay pit
- o Spring
- † Bedding strike and dip
- Clay with cleft size
- Capital Mine

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

DATA SOURCES
 Database, maps, and photos provided by:
 Boulder Dept.
 2000 Rocky Flats, Inc. - 1995
 Database provided by:
 2000 - 2001
 Database provided by:
 2000 - 2001
 Database provided by:
 2000 - 2001
 Database provided by:
 2000 - 2001

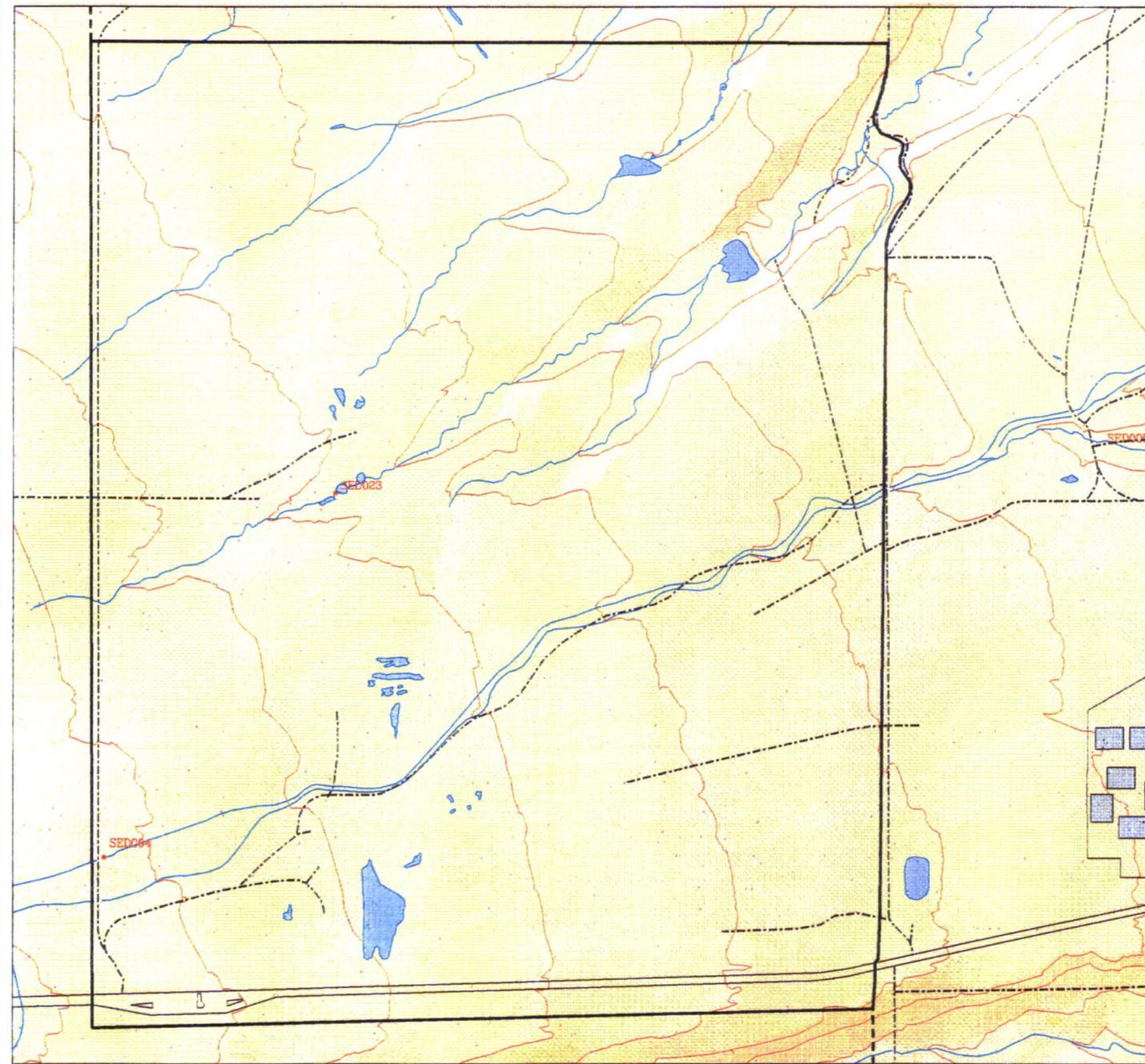


U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by
EB&B ROCKY FLATS

Rocky Flats Environmental Technology Site
 P.O. Box 464
 Boulder, Colorado 80502-0464

NW 3-13



NW3 SEDIMENT SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Sediment sampling locations

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (data unknown)



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

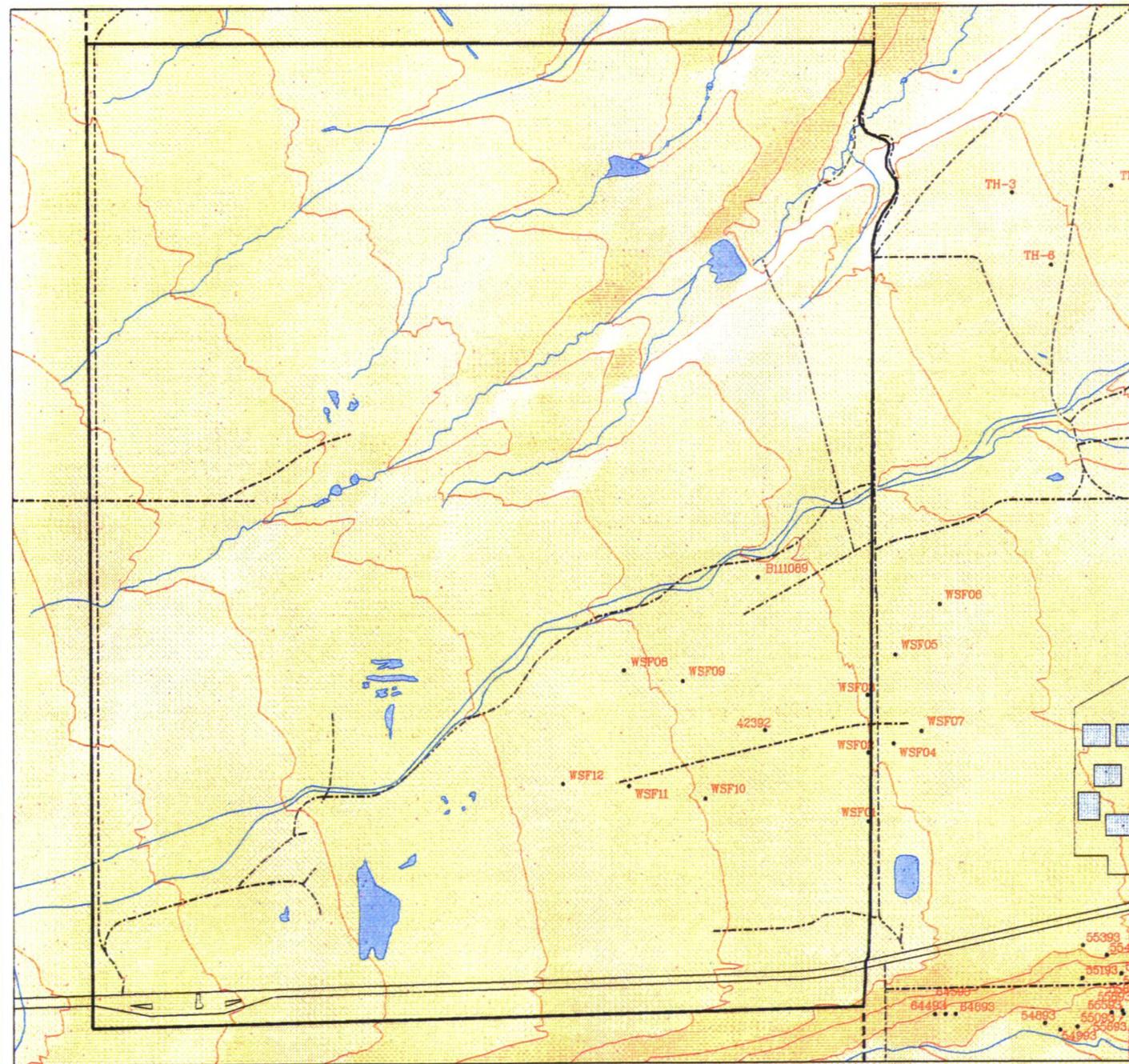
Prepared by:
EG&G ROCKY FLATS

Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: bh94-0001

August 29, 1994

NW 3-19



NW3 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)
BOREHOLE LOCATIONS FROM GEOSCIENCES



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

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464

MAP ID: bh94-0001

August 22, 1994

NW 3-21

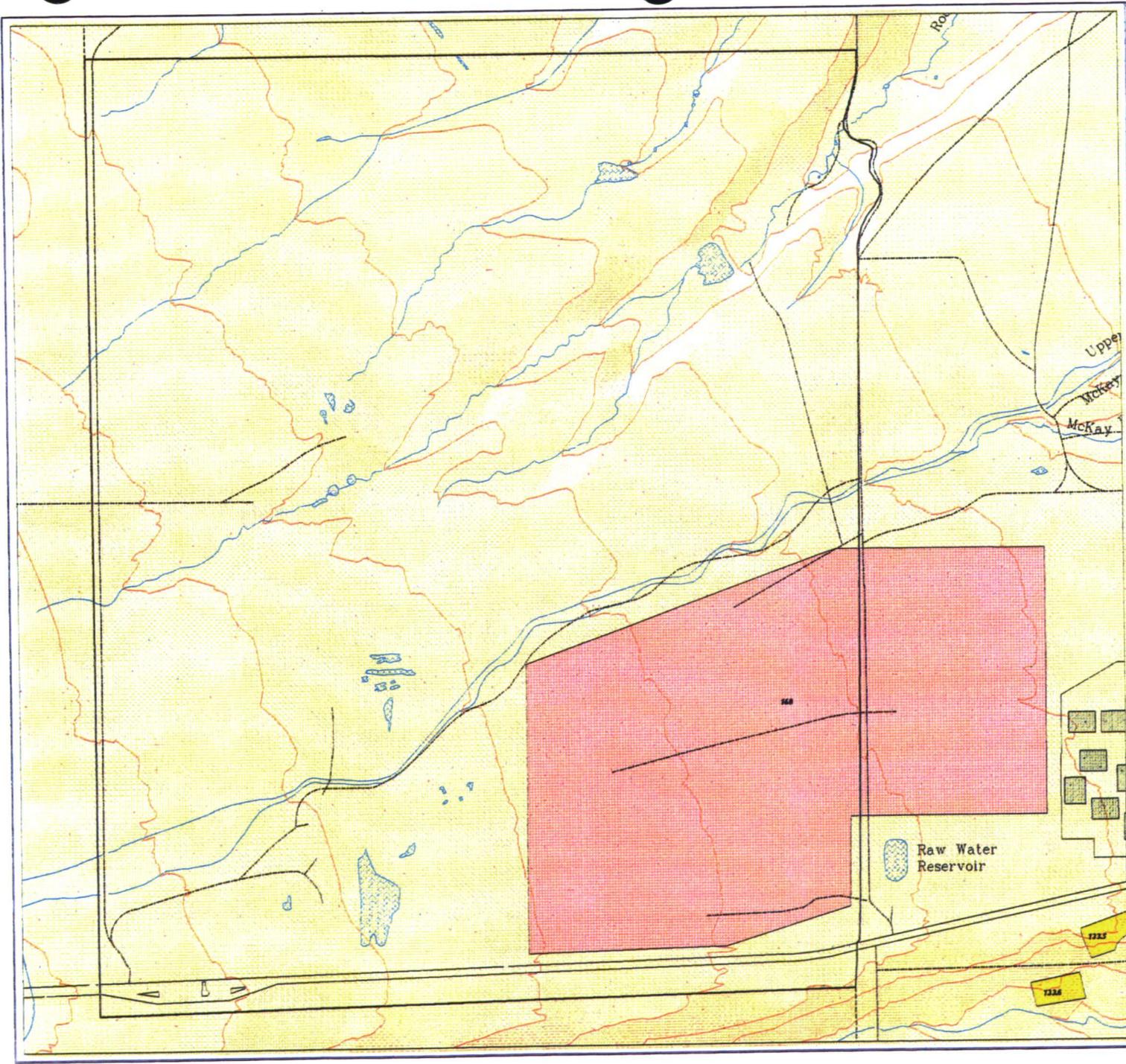
**NW3 INDIVIDUAL HAZARDOUS
SUBSTANCE SITES**

- Operable Unit 1
 - Operable Unit 2
 - Operable Unit 4
 - Operable Unit 5
 - Operable Unit 6
 - Operable Unit 7
 - Operable Unit 8
 - Operable Unit 9
 - Operable Unit 10
 - Operable Unit 11
 - Operable Unit 12
 - Operable Unit 13
 - Operable Unit 14
 - Operable Unit 15
 - Operable Unit 16
- Buildings or other structures
 - Lakes and ponds
 - Streams, ditches, or other drainage features
 - Fences
 - Contours (20' Intervals)
 - Rocky Flats boundary
 - Paved roads
 - Dirt roads
 - Buffer Zone Quadrants

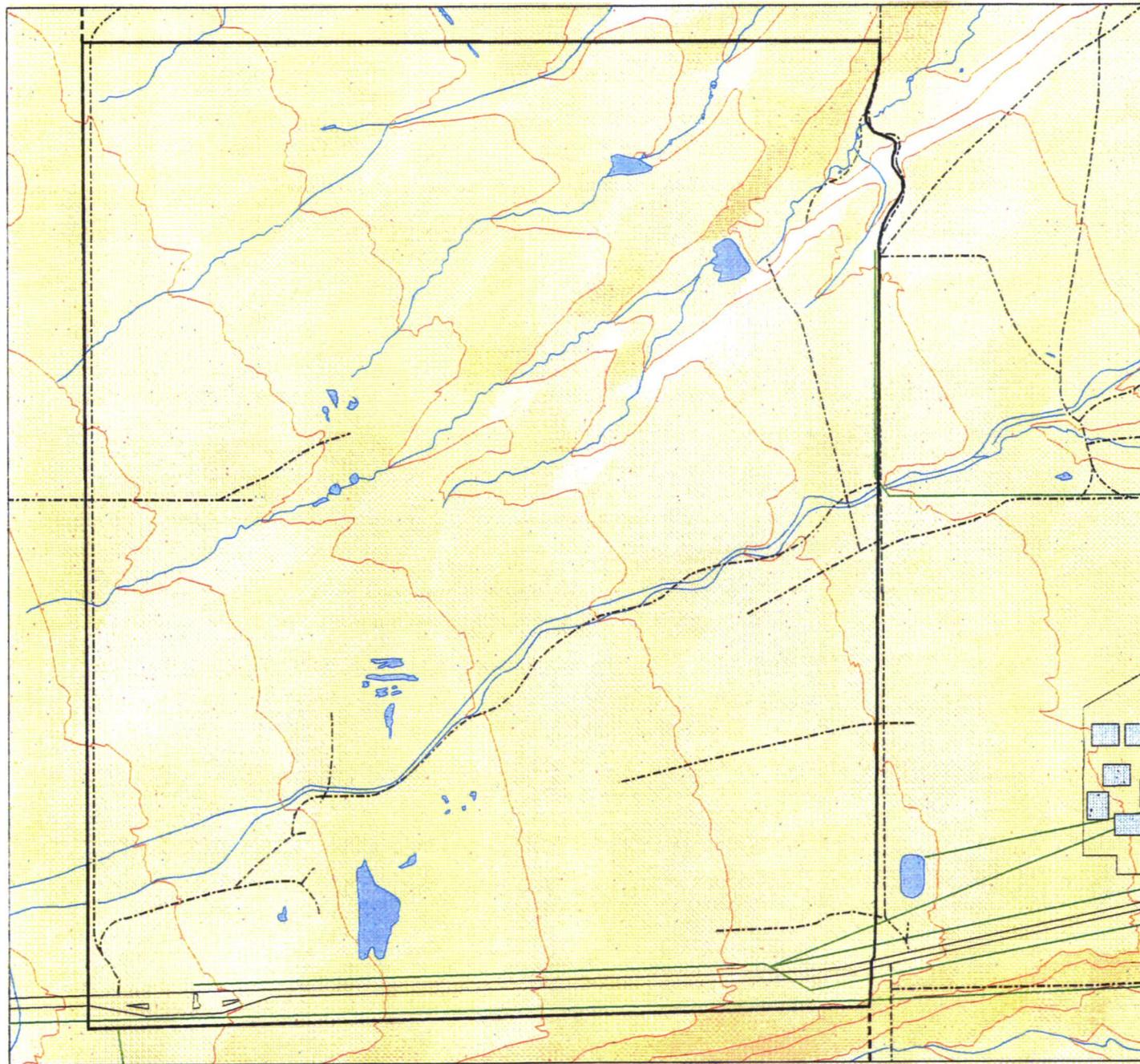
DATA SOURCE:
 Buildings, roads and fences provided by
 Rockwell Corp.,
 1982 Rocky Flats, 200 - 1981.
 Hydrology provided by
 1982 - John Williams
 Individual Structure Assessment Sites (ISAS) as
 delineated by the following
 OUI - 1978 Phase II Report
 OUI - 4, 7, 11, & 12 - 1979
 The remaining OUI's are defined by their
 respective Operable Unit boundaries.



U.S. Department of Energy
 Rocky Flats Environmental Technology Site
 Prepared by
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 454
 Golden, Colorado 80402-0454



NW 3-23



NW3 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Eng.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - Date unknown

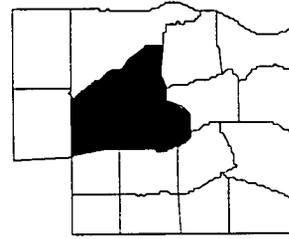


U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464

MAP ID: Util94-0001

August 22, 1994



Quadrant: NW 4

Boundaries

North - Road running NE along the top of the ridge south of the Rock Creek drainage. Boundary continues due east along the road following the old north Buffer Zone boundary fence for approximately 1,125 feet before turning south to form the eastern boundary.

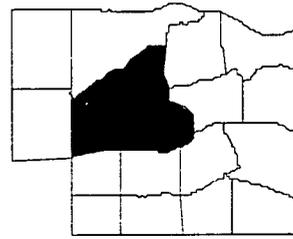
South - West RFETS Access Road and inner security fence.

East - Inner security fence and a line running N-S just east of the landfill pond.

West - Road running N-S along the old west Buffer Zone boundary fence.

Vegetation: Quadrant NW 4 is primarily classified as Mesic Mixed Grassland, with small areas of Ponderosa Pine Woodland and Xeric Mixed Grassland in the southern portion of the quadrant, also present. Areas of Riparian Woodland and Short Upland Shrub, intermixed with areas of Marsh, are present along the Church and McKay Ditches as they flow through the southern portion of the quadrant. A large portion of the vegetation in the quadrant is considered to be disturbed by activities at the RFETS. Vegetation near the North Live-Fire Rifle Range and the Property Utilization and Disposal yard has been greatly disturbed and destroyed. Areas of Disturbed/Barren land exist where the RFETS Buffer Zone meets the northern edge of the RFETS. The dominant species of vegetation in the quadrant are: Western Wheatgrass (*Agropyron smithii*), Canada Bluegrass (*Poa compressa*), Three-awn (*Aristida*), June Grass (*Koeleria pyramidata*), and Sedge (*Carex*).

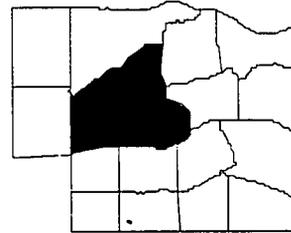
Wildlife Habitat: The major wildlife habitats consist of areas of Mesic Mixed Grassland, Xeric Mixed Grassland, and Ponderosa Pine Woodland, as well as Riparian Woodland and Marsh along the Church and McKay Ditches.



In the grassland areas, native grasses and forbs provide limited habitat for arthropods and waterfowl. Reptiles are represented by the Bull Snake (*Pituophis melanoleucus*), Prairie Rattlesnake (*Crotalis viridis*), and Short Horned Lizard (*Phrynosoma douglassi*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Poocetes gramineus*), and various species of hawks, including the Red-tailed Hawk (*Buteo jamaicensis*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*), Meadow Voles (*Microtus pennsylvanicus*), Rabbits (*Lagomorpha*), Mule Deer (*Odocoileus hemionus*), and Coyotes (*Canis latrans*).

In the Riparian Woodland areas, many species of arthropods are present (too numerous to list). Reptiles include the Bull Snake (*Pituophis melanoleucus*) and Racer (*Coluber constrictor*). The bird population consists of Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Poocetes gramineus*), and Red-winged Blackbirds (*Agelaius phoeniceus*). Also present are the Mallard (*Anas platyrhynchos*), Red-tailed Hawk (*Buteo jamaicensis*), and Great Horned Owl (*Bubo virginianus*). The mammal population is made up of Deer Mice (*Peromyscus maniculatus*) and Meadow Voles (*Microtus pennsylvanicus*). The foliage along the creek also provides habitat for Mule Deer (*Odocoileus hemionus*) and Coyotes (*Canis latrans*).

In addition, the entire area is potential foraging habitat for the Peregrine Falcon (*Falco peregrinus*) and should be treated in accordance with USFWS Policies, particularly the Endangered Species Act of 1973. Refer to Environmental Management Department Operations Procedure 5-21000-OPS-FO.21, "Protection of Threatened and Endangered and Special Concerns Species" for details.



Surface Waters: The Church and McKay Ditches pass through the middle of the quadrant crossing the RFETS to the northeast. The McKay Bypass Canal runs parallel to the ditches as they drain to the northeast, and routes flow around North Walnut Creek. These ditches are associated with local farming and are not related to or controlled by operations at the RFETS.

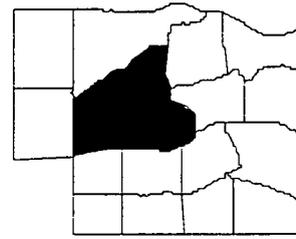
Several small streams are located near the sanitary landfill. These stream are diversion ditches that direct surface water away (northeast) from the landfill. The landfill pond, the largest surface water body in the quadrant, is located due east of the sanitary landfill.

Jurisdictional Wetlands: Wetlands exist along the McKay Bypass Canal. These wetlands are classified as emergent, seasonal, wetlands by the USFWS. There are also several areas of nonlinear wetlands in the quadrant. The landfill pond and several small seeps directly north of the main RFETS facility are classified as wetlands by the USFWS.

Floodplain: There is an area of 100-year floodplain that surrounds the McKay ditch and Walnut Creek as they flow through the central portion of the quadrant. Maps depicting the 100-year floodplain for the major surface water drainages at RFETS have been produced by the USACOE, and are available from the Ecology and Watershed Management Division. Additional information, including water surface profiles for the 10-, 50-, 100-, and 500-year flood events is available in the USACOE report, "Floodplain Delineation - Hydrologic Analysis."

Soil: The majority of soils in this quadrant are clayey-skeletal soils of the great group Paleustolls, which are very cobbly clay loams located on pediment surfaces. Paleustolls are generally characterized by moderate shrink-swell potential, slow permeability, and slight erosion potential.

There are two areas in the quadrant that contain Argiustolls, which are mostly fine-textured clay loams associated with hill and valley slopes. Argiustolls are generally characterized by high shrink-swell potential, slow permeability, and moderate erosion potential.



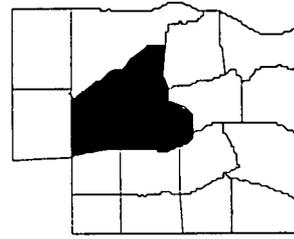
In addition, there is a Gravel and Clay Pit located in the north-eastern section of the quadrant.

Surface Geology: Approximately 95 percent of the surface geology of the quadrant is composed of Rocky Flats Alluvium. This alluvium covers the "flats" found throughout the RFETS, particularly on the western side. The remaining 5 percent of the quadrant is comprised of the upper unit of the Laramie Formation and the Arapahoe Formation. Rocky Flats Alluvium is composed of poorly sorted, angular to rounded, coarse gravel, sand, and gravelly clays.

The Arapahoe formation is approximately 150 feet thick in the central portion of the RFETS and consists mainly of claystones and silty claystones with at least five sandstone intervals in the upper portion of the formation. Stratigraphically, the Laramie Formation lies directly below the Arapahoe Formation. The upper unit of the Laramie Formation is approximately 500 feet thick and is composed of claystone. The claystone is light to medium gray and kaolinitic.

Utilities: A buried telephone line runs N-S along the road that forms the western boundary of the quadrant. A buried conduit runs E-W just to the north of the West Access Road. This conduit contains a 6-inch domestic cold water line, an alarm line, telephone lines, and a 13.8 KV electrical line. These utilities serve the east security gate. A 10-inch raw water line also runs along the conduit.

An additional 8-inch water line runs from the raw water storage pond in the southwestern corner of the quadrant to the main RFETS facility. This line parallels the path of the 10-inch raw water line. Telephone lines run from the northwestern corner of the main facility to the NREL Wind Energy Test Center. These lines run to the NW near the middle of the quadrant. Aboveground PSC of CO power lines run NE across the SE corner of the quadrant.



Archaeology: State Site 5JF731 - Masonry Structure. The 50 x 50-foot ruins of a masonry structure. Portions of the walls are still standing. Square nails found at the site indicate occupation during the year 1900 or earlier. Several pieces of glass were found at the site.

State Site 5JF742 - abandoned Denver, Utah & Pacific Railroad grade circa 1881 and 1882. In 1883 financial problems caused construction to cease. The track was never laid and the grade was abandoned. The total length of the grade is approximately 8,200 feet across the RFETS.

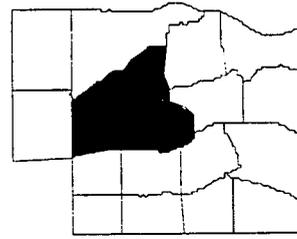
State Sites 5JF512 and 5JF513 - Upper Church and McKay Ditches. Both ditches are of bermed ditches constructed in 1882 to serve local ranchers. The ditches are approximately 6 feet wide and 3 to 6 feet deep. Many sections of the ditches have been rebuilt since the original construction. A large portion of the quadrant was not surveyed because the area has been extensively developed and any potential artifacts have probably been destroyed.

The aforementioned sites were not included in the NRHP because they are in poor condition, exhibit no rare construction, and have no historic interest.

Archaeological maps were omitted from this document to protect the integrity of the cultural resources. If the location of specific sites must be known, contact the Environmental Policy Implementation Division.

Future Plans: Remediation of the West Spray Field will be conducted in accordance with plans for OU 11.

The proposed site for the new RFETS Sanitary Landfill is located in the north-west corner, between Upper Church Ditch and the northern quadrant boundary.



Mineral Rights: Tract 31 - N1/2, NE1/4, SE1/4, and the NW1/4, SW1/4 Section 2 - 352.46 acres. The Union Pacific Railroad owns coal rights. Proprietor of vein or lode to extract and remove ore, should it penetrate or intersect. Coal gas, oil and other minerals reserved by A. M. Patten and grated by A. M. Patted to A. Reamer Pattern, Margaret Musgrove, and Ivan M. Patten.

Adjoining Lands: The quadrant is surrounded by the RFETS Buffer Zone on the north, south, and west sides. The RFETS main facility lies east and southeast.

Contamination Profile

Soil Sites: 1-252, 1-270, and 1-288

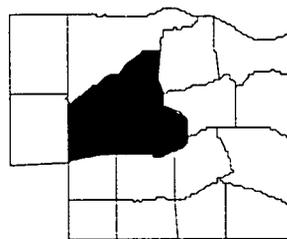
Sediment Sites: Reference the Sediment Sampling Locations map.

Surface Water: Reference the Surface Water Sampling Locations map.

Groundwater Wells: Reference the Groundwater Monitoring Well Location Map.

IHSS: Reference the Individual Hazardous Substance Sites by Operable Unit map.

Comments: IHSS 168 is also known as the West Spray Field. The area was a land treatment facility that was used to dispose of water tainted with high concentrations of nitrates. The water was sprayed on the area in the form of a mist. The area of the spray field is now contaminated, and has high levels of nitrates in the soil. This IHSS is part of OU 11 and will be remediated as part of the OU 11 remediation.



IHSS 174 is the Property Utilization & Disposal Storage Yard. The yard began operation in 1974 and has been used to store containers such as barrels, drums, cargo boxes, spent batteries, empty dumpsters, dumpsters filled with metal shavings coated with lathe coolant, and drums of spent solvents and oils. Releases have occurred from spent batteries, and leaks have occurred from barrels and dumpsters.

IHSS 114 is the present sanitary landfill. Contamination associated with the operation of the landfill will be remediated under OU 7 clean-up activities.

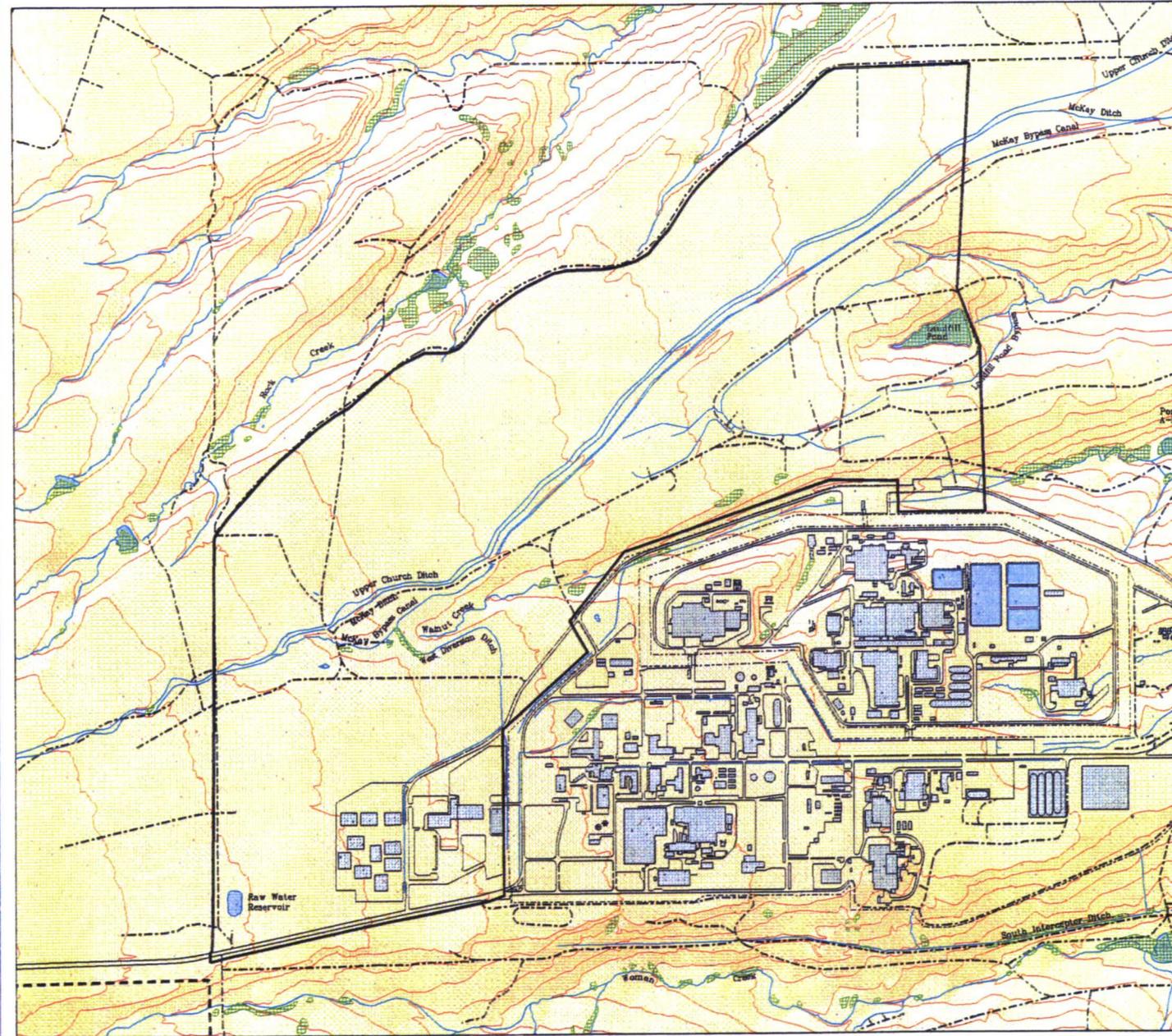
IHSS 166.1 - 166.3 are trenches that were used to dispose of sanitary sewage sludge. The use of the first two trenches has been confirmed. It has still not been verified if the third trench was ever used for sludge disposal. The sludge was contaminated with uranium and possibly plutonium. Other unknown chemicals may also be in the sludge.

IHSS 167.1 - 167.3 are areas where water from the landfill pond was sprayed as a form of land treatment. The site was moved twice and thus three different areas may have been contaminated. It is unknown what, if any, contamination is in the area of the spray fields.

Soil Samples taken from the above locations show less than 0.21 ± 0.03 pCi/g of plutonium radioactivity. Soil site, sediment site, surface water and groundwater well data is currently accessible through RFEDS.

Other: Three Temporary Modular Storage Tanks (TMST) are located in the southeastern corner of the quadrant. These 500,000-gallon tanks store liquids pumped from the Interceptor Trench System. The tank water is then pumped to the Bldg. 910 and 374 evaporators.

NW 4-9



NW4 WETLANDS

-  Buildings or other structures
-  Wetlands
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Eng.
 EG&G Rocky Flats, Inc. - 1981.
 Hydrology provided by
 USGS - (date unknown)



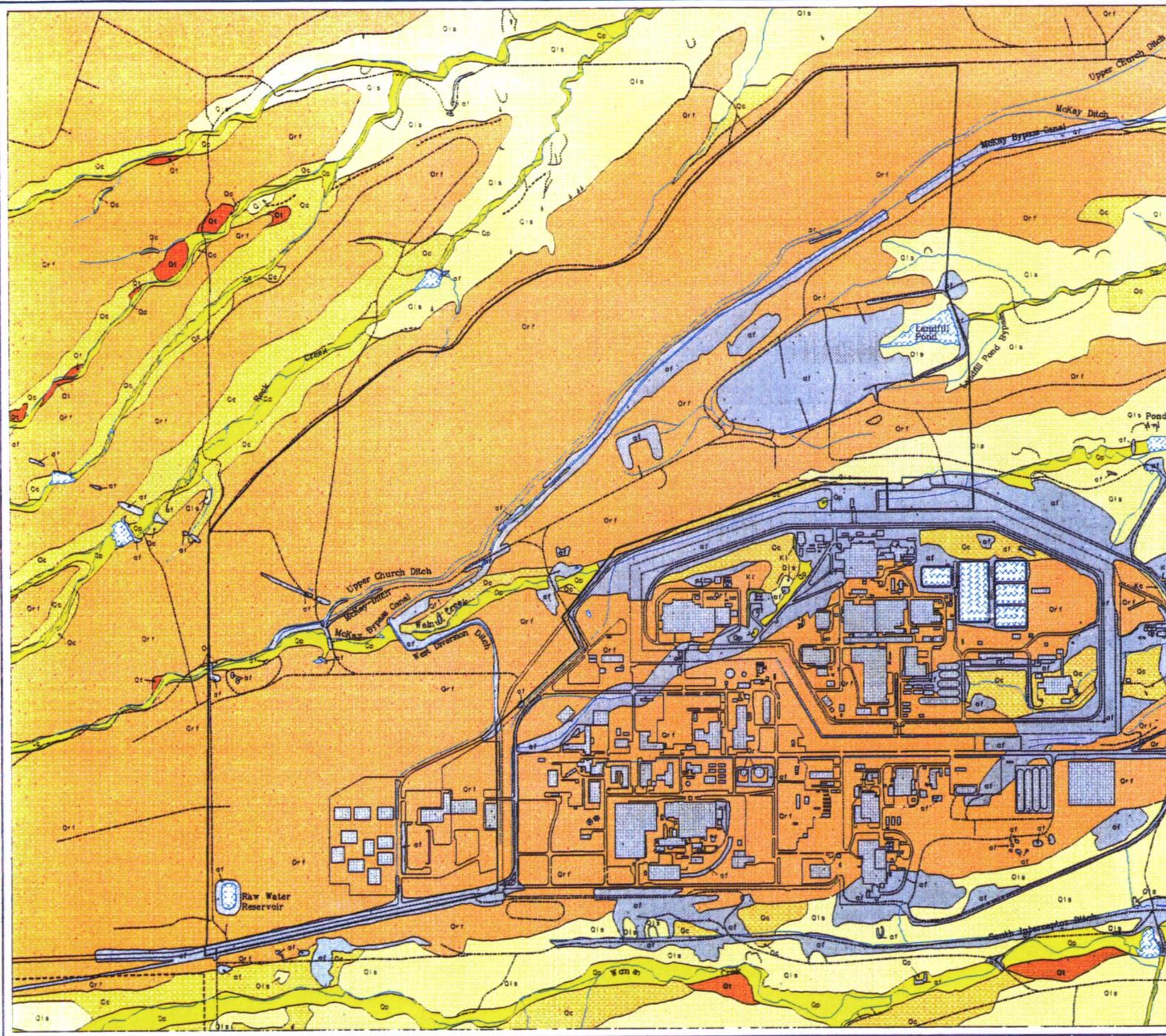
U.S. Department of Energy
 Rocky Flats Environmental Technology Site

Prepared by:
 **EG&G ROCKY FLATS**
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

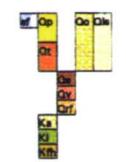
MAP ID: Wet94-0001

August 22, 1994

NW 4-13



NW4 GEOLOGIC UNITS



- ef - Artificial fill
- Op - Post-Flinty Creek Alluvium
- Or - Terrace alluvium
- Oc - Siccum alluvium
- Oa - Colluvium
- Q1s - Landslide deposits
- Or1 - Verdus alluvium
- Orf - Rocky Flats Alluvium
- Ka - Arapahoe Formation
- Kl - Laramie Formation
- Kfh - Fox Hills Sandstone
- Shallow closed depression
- Scarp of young landslide
- Areas of vegetation around springs
- Boundary of gravel and clay pt
- Spring
- † Bedding strike and dip
- Clast with clast size
- Capitol Mine

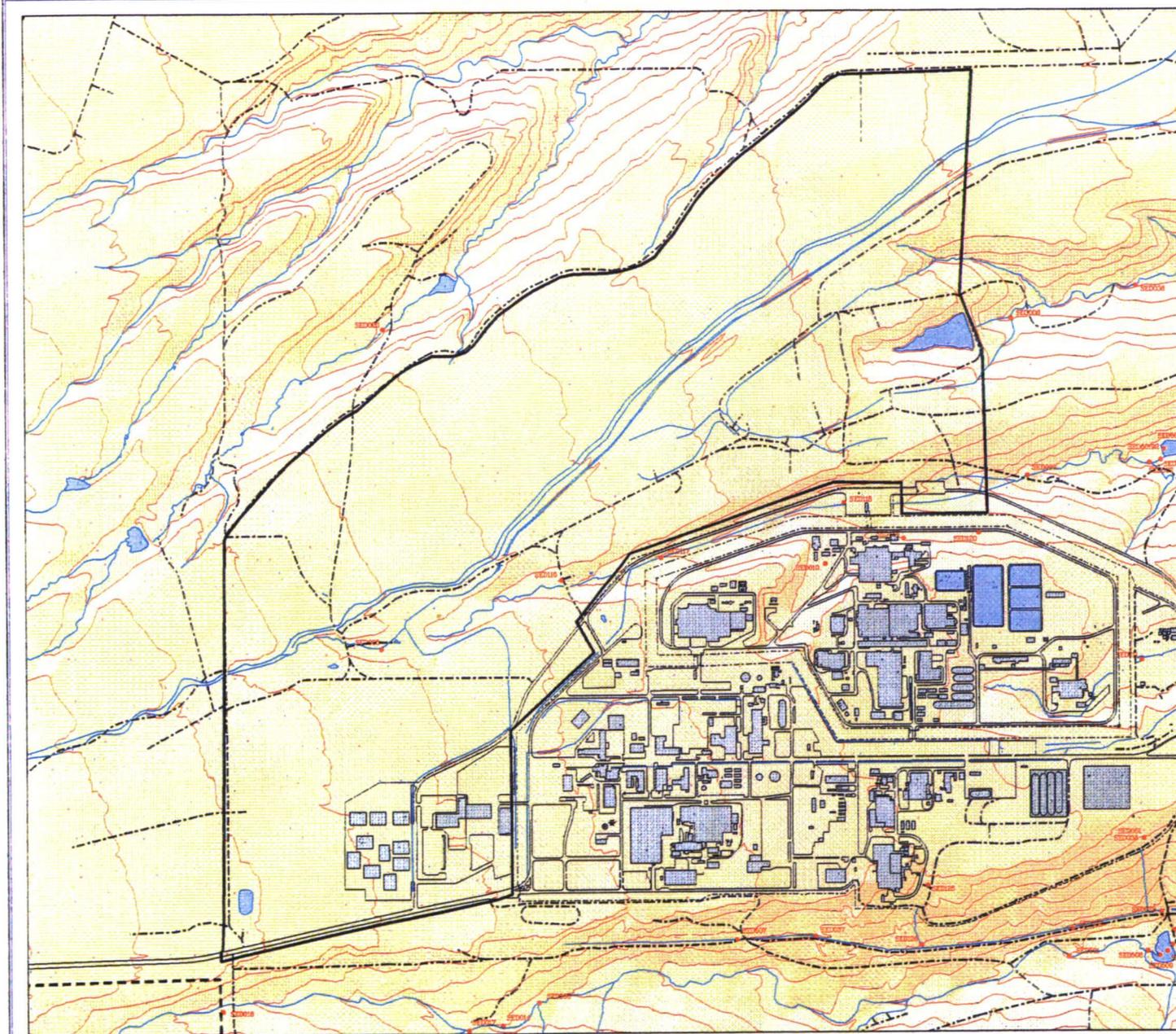
- ▣ Buildings or other structures
- ▢ Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

NOTE:
 Additional units not shown provided by
 Phillips Petroleum Co. - 1981.
 Modified by
 Rocky Flats Environmental Technology Site
 Geologic Map, 1985. All other units, 1984.
 Modified by Phillips Petroleum Co. - 1985.
 Modified by Phillips Petroleum Co. - 1985.
 Modified by Phillips Petroleum Co. - 1985.
 Modified by Phillips Petroleum Co. - 1985.



U.S. Department of Energy
 Rocky Flats Environmental Technology Site
 Prepared by
ES&B ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 400
 Golden, Colorado 80402-0400

NW 4-15



NW4 SEDIMENT SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Sediment sampling locations

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)



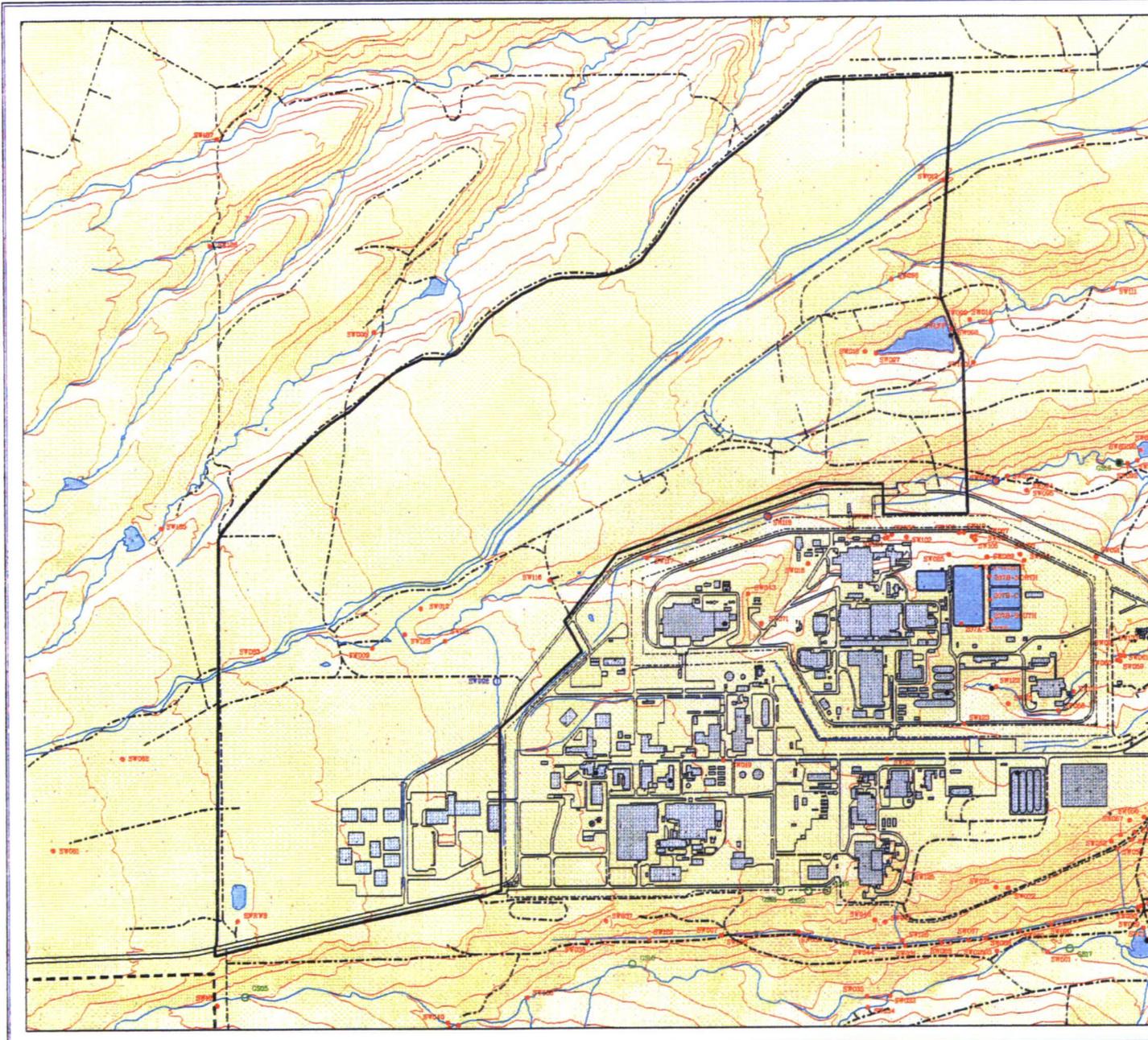
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: bh94-0001

August 25, 1994

NW 4-17



NW4 SURFACE WATER SAMPLING LOCATIONS

- Buffer Zone Quadrants
- Surface water stations
- Routine operational sites
- NPDES/FFCA permit monitoring sites
- Gaging stations
- NPDES storm water permit sampling sites
- ▒ Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- - - Fences
- - - Contours (20' Intervals)
- - - Rocky Flats boundary
- Paved roads
- - - Dirt roads

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Eng.,
EG&G Rocky Flats, Inc. - 1981.
Hydrology provided by
USGS - (date unknown)



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

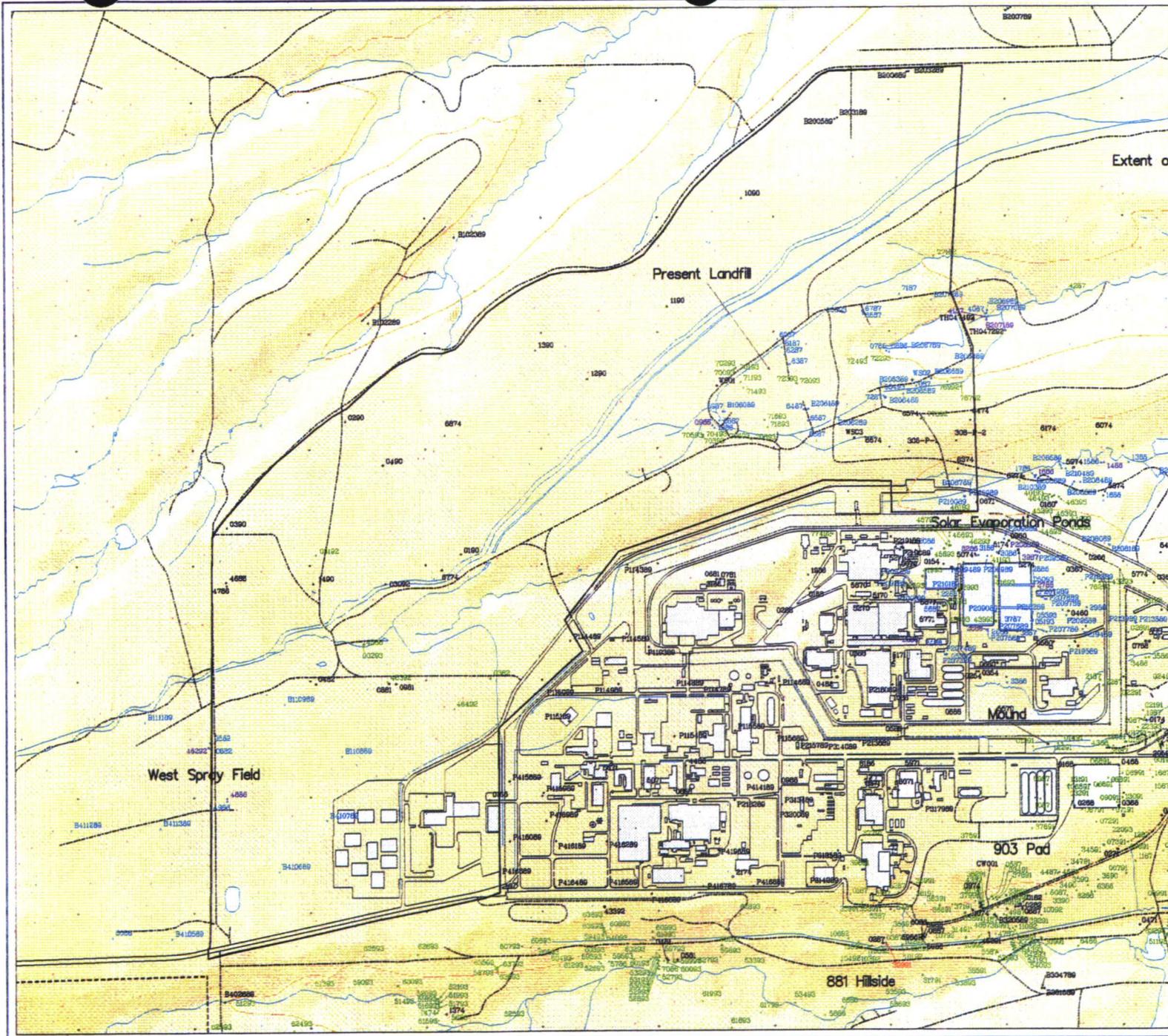
Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: ew94-0001

August 25, 1994

NW 4-19

NW4 GROUNDWATER MONITORING WELL LOCATIONS MAP



- Boundary Wells
- CERCLA Characterization Wells
- RCRA Regulatory
- RCRA Characterization Wells
- Special Purpose Wells

- Groundwater Monitoring Program Wells**
- Bedrock
 - Alluvium
 - Alluvium/Bedrock
- Inactive Groundwater Monitoring Wells**
- ▲ Bedrock
 - ▲ Alluvium
 - ▲ Alluvium/Bedrock
 - ◆ Abandoned Groundwater Monitoring Wells

- Other**
- ▣ Buildings and other structure
 - Ponds and Lakes
 - ~ Extent of Rocky Flats Alluvium

- Standard Map Features**
- Fence
 - Rocky Flats boundary
 - Paved roads
 - Dirt roads

4000 FOOTER
 Map location from continuous groundwater data
 Buildings, roads, and names provided by
 Facilities Dept.
 2000 Study Plan, Inc. - 1997.
 Hydrology provided by
 4000 - Data unknown



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

Prepared by
ES&S ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 444
 Golden, Colorado 80402-0444

NW 4-21

NW4 BOREHOLE SAMPLING LOCATIONS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Buffer Zone Quadrants
-  Borehole locations

DATA SOURCE:
 Buildings, roads, and fences provided by
 Facilities Eng.
 EG&G Rocky Flats, Inc. - 1981.
 Hydrology provided by
 USGS - (data unknown)
 BOREHOLE LOCATIONS FROM GEOSCIENCES

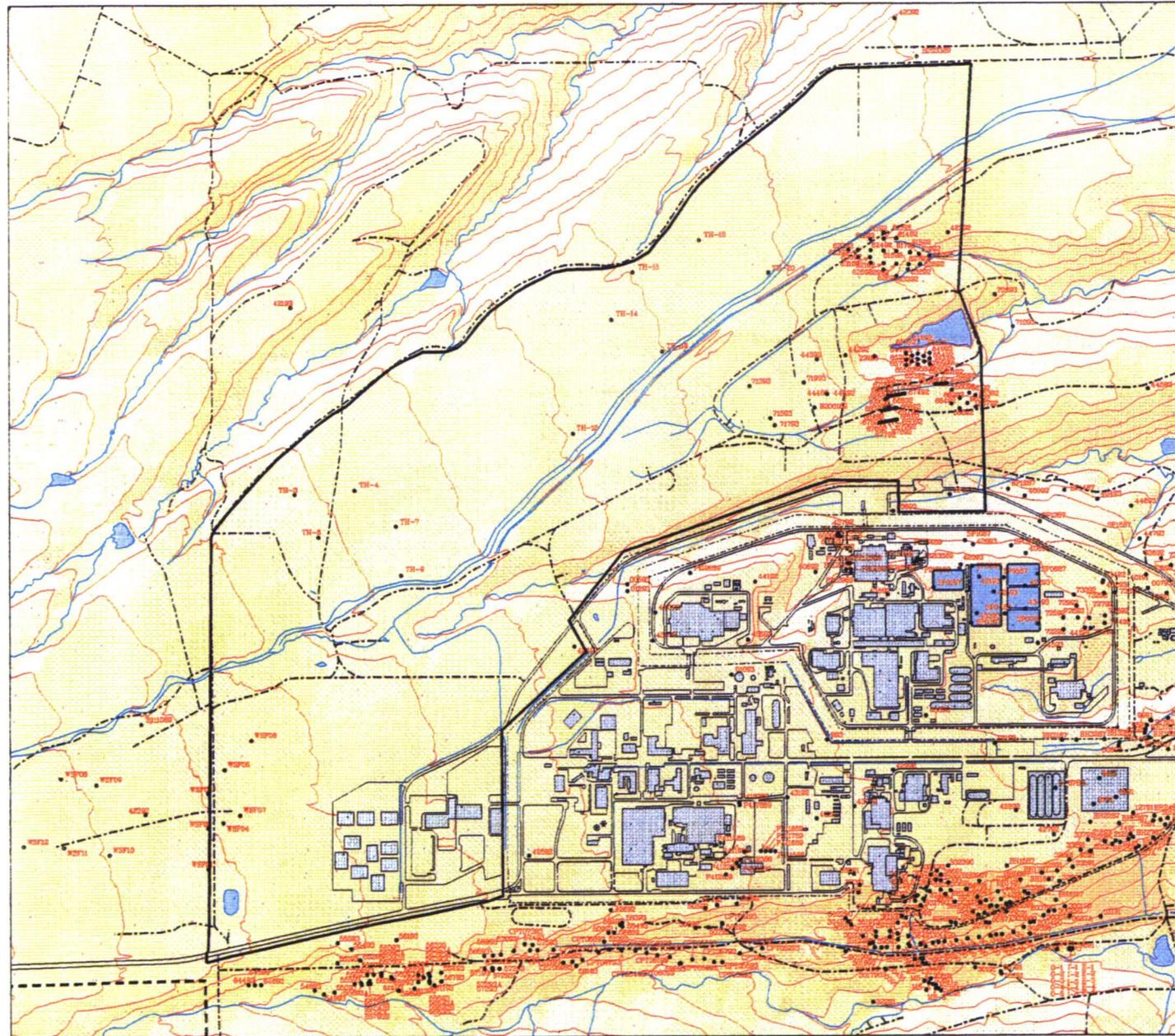


U.S. Department of Energy
 Rocky Flats Environmental Technology Site

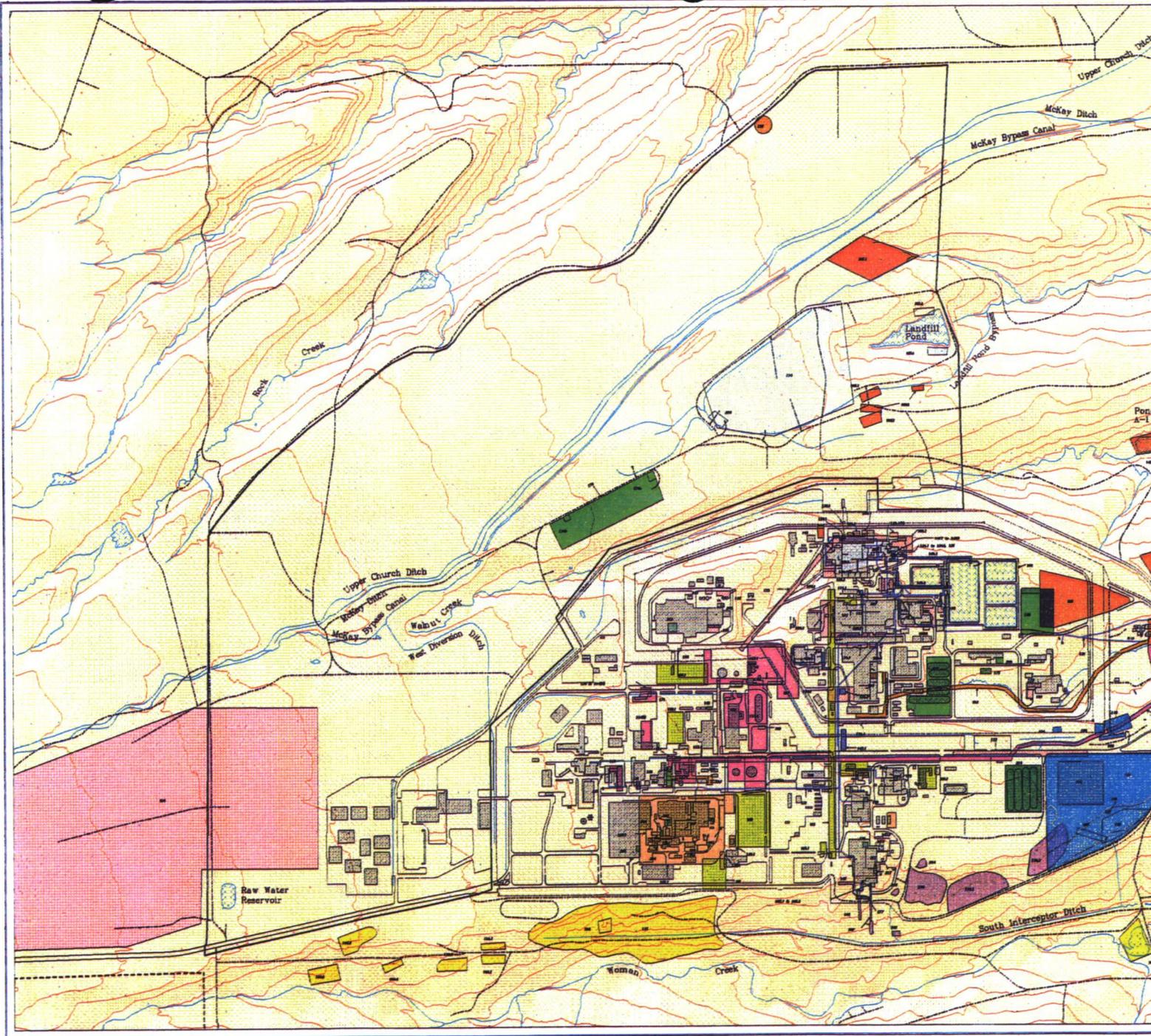
Prepared by:
EG&G ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 484
 Golden, Colorado 80402-0484

MAP ID: bh94-0001

August 22, 1994



NW 4-23



NW4 INDIVIDUAL HAZARDOUS SUBSTANCE SITES

- Operable Unit 1
- Operable Unit 2
- Operable Unit 4
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7
- Operable Unit 8
- Operable Unit 9
- Operable Unit 10
- Operable Unit 11
- Operable Unit 12
- Operable Unit 13
- Operable Unit 14
- Operable Unit 16

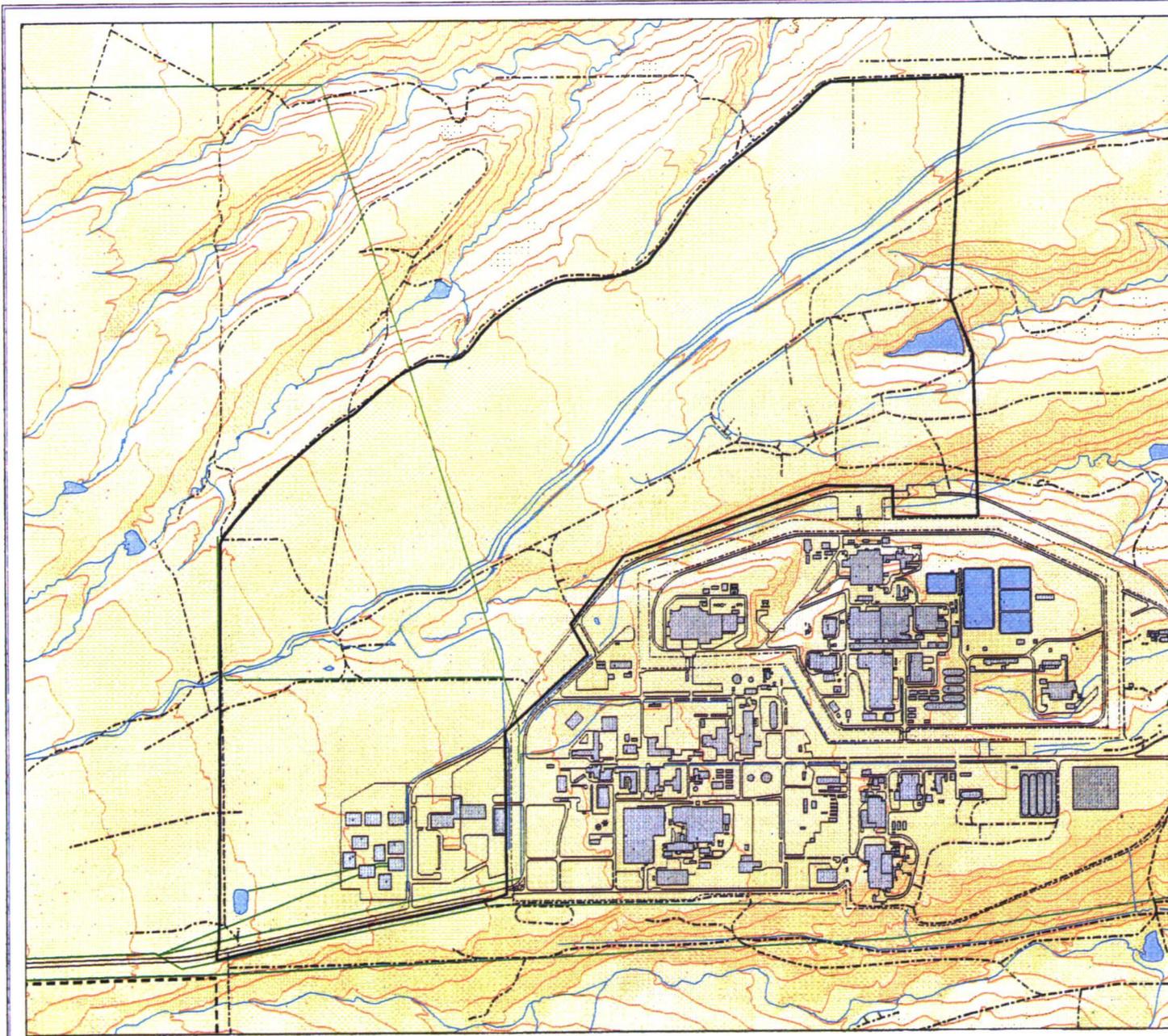
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Buffer Zone Quadrants

DATA SOURCES:
 Buildings, walls, and fences provided by
 Pauline Engle,
 60404 Entry Film, Inc - 1981.
 Hydrology provided by
 USGS - June 1980
 Individual Hazardous Substance Sites (IHSS's)
 are identified by the following
 OUI - 2000 Phase II Report
 OUI, 4, 7, 11, & 15 - 1980
 The remaining OUI's are defined by their
 respective Operating Unit Maps.



U.S. Department of Energy
 Rocky Flats Environmental Technology Site
 Prepared by:
ES&S ROCKY FLATS
 Rocky Flats Environmental Technology Site
 P.O. Box 464
 Golden, Colorado 80402-0464

NW 4-25



NW4 UTILITIES AND VEHICLE ACCESS

-  Buildings or other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences
-  Contours (20' Intervals)
-  Rocky Flats boundary
-  Paved roads
-  Dirt roads
-  Below ground utilities
-  Buffer Zone Quadrants

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1981.
Hydrology provided by
USGS - (data unknown)



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

Prepared by:
EG&G ROCKY FLATS
Rocky Flats Environmental Technology Site
P.O. Box 484
Golden, Colorado 80402-0484

MAP ID: Util84-0001

August 22, 1984

GLOSSARY/ACRONYMS

cfs	cubic feet per second
CDPHE	Colorado Department of Public Health and Environment
CSU	Colorado State University.
E	east
ENE	east northeast
ESE	east southeast
forb	an herb other than grass
grantor	the current owner as listed on a property deed; the person(s) selling property or rights
gpm	gallons per minute
GWEN	Ground Wave Emergency Network
IHSS	Individual Hazardous Substance Site
N	north
NE	northeast
NREL	National Renewable Energy Laboratory
NW	northwest
OU	Operable Unit
PCE	parachloroethylene
pCi/l	picocurie/liter
pCi/g	picocurie/gram
PLS	pure live seed
RFEDS	Rocky Flats Environmental Database System
RFETS	Rocky Flats Environmental Technology Site
SCS	Soil Conservation Service
S	south
SE	southeast
SW	southwest
TCE	trichloroethylene
USACOE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
W	west
WSI	Wackenhut Services, Inc.

SOILS LEGEND

26 -	Denver Clay Loam	2% to 5% slopes
27 -	Denver Clay Loam	5% to 9% slopes
29 -	Denver-Kutch Clay Loam	5% to 9% slopes
30 -	Denver-Kutch Clay Loam	9% to 15% slopes
31 -	Denver-Kutch-Midway Clay Loam	9% to 25% slopes
41 -	Englewood Clay Loam	0% to 2% slopes
42 -	Englewood Clay Loam	2% to 5% slopes
45 -	Flatirons Very Cobbly Sandy Loam	0% to 3% slopes
46 -	Flatirons Very Stony Sandy Loam	0% to 5% slopes
60 -	Haverson Loam	0% to 3% slopes
80 -	Leyden-Primen-Standley Cobbly Clay Loam	15% to 50% slopes
97 -	McClave Clay Loam	0% to 3% slopes
98 -	Midway Clay Loam	9% to 30% slopes
100 -	Nederland Very Cobbly Sandy Loam	15% to 50% slopes
102 -	Nunn Clay Loam	0% to 2% slopes
103 -	Nunn Clay Loam	2% to 5% slopes
111 -	Pits, gravel	
139 -	Rock Outcrop, Sedimentary	
149 -	Standley-Nunn-Gravelly Clay Loam	0% to 5% slopes
168 -	Valmont Clay Loam	0% to 3% slopes
169 -	Veldkamp-Nederland Very Cobbly Sandy Loam	0% to 3% slopes
174 -	Willowman-Leyden Cobbly Loams	9% to 30% slopes

United States Department of Agriculture
Soil Conservation Service
"Soil Survey of Golden Area, Colorado
Parts of Denver, Douglas, Jefferson, and Park Counties"
Denver, CO.: USDA 1980

GEOLOGY LEGEND

Surficial Deposits

af -	Artificial fill
Qa -	Valley-fill alluvium
Qaf -	Alluvial fan
Qls -	Landslide, slump
Qta -	Undifferentiated Terrace Alluvium
Qrf -	Rocky Flats Alluvium
Qpr -	Pre-Rocky Flats Alluvium
Tki-	Alkali Basalt Intrusion

Sedimentary Rocks

Ka -	Arapahoe Formation
Kl -	Laramie Formation
Kfh -	Foxhill Sandstone
Kp -	Pierre Shale
Kn -	Niobra Formation
Kb -	Benton Shale
Kd -	Dakota Group
Jm -	Morrison Formation
Jrc -	Ralston Creek Formation
TrPl -	Lykins Formation..
Ply -	Lyons Sandstone
PPf -	Fountain Formation
PE -	Undivided, interlayered gneisses and mica schist

Final Geologic Map of Rocky Flats Plant and Vicinity
Jefferson and Boulder Counties, Colorado

March 1993

BIBLIOGRAPHY

- Advanced Sciences, Inc. *Wetlands Assessment Rocky Flats Site*. Lakewood, CO.: Advanced Sciences, Inc., 1990.
- Bowen, Brent M. "Meteorology and Climatology," In *Rocky Flats Plant Site Environmental Report for 1992*. Golden, CO.: EG&G Rocky Flats, Inc., 1993.
- Burney, Michael S., Mehls, Steven F., and Grant, Marcus P. *An Archaeological and Historical Survey of Selected Parcels Within the Department of Energy, Rocky Flats Plant, Northern Jefferson County, Colorado*. Boulder, CO.: Burney and Associates, Inc., 1989.
- Clark, S. V., P. J. Webber, V. Komarkova and W. A. Weber. *Map of Mixed Prairie Grassland Vegetation*. (Rocky Flats, Colorado). Institute of Arctic and Alpine Research, Occ. Paper no. 35, 66, Boulder, CO.: University of Colorado, 1980.
- ChemRisk, *Rocky Flats History-Rocky Flats Toxicologic Review and Dose Reconstruction Task 3/4 Report* (Draft). Denver, CO.: Colorado Department of Health, February 1992.
- Costain, David, ed. *Rocky Flats Plant Site Environmental Report, January through December 1989*. Golden, CO.: EG&G Rocky Flats, Inc., 1990.
- Costain, David, ed. *Rocky Flats Plant Site Environmental Report, January through December 1990*. Golden, CO.: EG&G Rocky Flats, Inc., 1991.
- Dames and Moore. *Cultural Resources Class III Survey of the Department of Energy Rocky Flats Plant, Northern Jefferson and Boulder Counties, Colorado*. Denver, CO.: Dames and Moore, 1991.
- EG&G Rocky Flats, Inc. *Rocky Flats Environmental Database System*. (RFEDS). Golden, CO.: EG&G Environmental Restoration Sample Management Office, 1986.
- Guillaume, Michael. "Guidelines for Reclamation of the French Drain Area at Rocky Flats." Golden, CO.: EG&G Rocky Flats, Inc., February 1992.
- Hickey, Margaret, comp. *The Rocky Flats Land Management Plan*. Edited by J. D. Hurley and D. C. Hunt. Golden, CO.: Rockwell International, 1979.
- Jefferson County, Colorado Assessor's Office. *Map of Township 2 South Range 70 West of the 6th Principal Meridian, Colorado*. Golden, CO.: Jefferson County Assessor's Office, 1974.
- 16 U.S.C.A. §470, et. seq., *The National Historic Preservation Act of 1966*. St. Paul MN.: West Publishing Co., 1986a.
- _____. §661, et. seq., *The Fish and Wildlife Coordination Act*. St. Paul, MN., 1986b.
- _____. §1531, et. seq., *The Endangered Species Act of 1973*. St. Paul, MN., 1986c.
- 33 U.S.C.A. §1251, et. seq., *The Federal Disaster Pollution Control Act*. St. Paul, MN., 1986.

Index of Maps

Map Title

1. Wetlands at Rocky Flats
2. Soils map from SCS for Rocky Flats
3. Geologic Units at Rocky Flats
4. Sediment Sampling Locations
5. Surface Water Sampling Locations
6. Groundwater Monitoring Well Location Map
7. Borehole Sampling Locations
8. Individual Hazardous Substance Sites by Operable Unit
9. Utilities & Vehicle Access

Operable Units (OUs) and Individual Hazardous Substance Sites (IHSSs)

The following is a list of OUs and the corresponding IHSSs. This information has been confirmed with the OU Managers (April 1994).

<u>OU Number</u>	<u>Associated IHSSs</u>
1	102, 103, 104, 105.1, 105.2, 106, 107, 119.1, 119.2, 130, 145
2	108, 109, 110, 111.1, 111.2, 111.3, 111.4, 111.5, 111.6, 111.7, 111.8, 112, 113, 140, 153, 154, 155, 183, 216.2, 216.3
3	199, 200, 201, 202
4	101
5	115, 133.1, 133.2, 133.3, 133.4, 133.5, 133.6, 142.10, 142.11, 196, 209
6	141, 142.1, 142.2, 142.3, 142.4, 142.5, 142.6, 142.7, 142.8, 142.9, 142.12, 143, 156.2, 165, 166.1, 166.2, 166.3, 167.1, 216.1
7	114, 167.2, 167.3, 203
8	118.1, 118.2, 123.1, 135, 137, 138, 139.1, 139.2, 144, 150.1, 150.2, 150.3, 150.4, 150.5, 150.6, 150.7, 150.8, 151, 163.1, 163.2, 172, 173, 184, 188
9	121, 122, 123.2, 124.1, 124.2, 124.3, 125, 126.1, 126.2, 127, 132, 146.1, 146.2, 146.3, 146.4, 146.5, 146.6, 147.1, 149, 159, 215
10	129, 170, 174, 175, 176, 177, 181, 182, 205, 206, 207, 208, 210, 213, 214
11	168
12	116.1, 116.2, 120.1, 120.2, 136.1, 136.2, 147.2, 157.2, 187, 189
13	117.1, 117.2, 117.3, 128, 134, 148, 152, 157.1, 158, 169, 171, 186, 190, 191, 197
14	131, 156.1, 160, 161, 162, 164.1, 164.2, 164.3
15	178, 179, 180, 204, 211, 217
16	185, 192, 193, 194, 195

* Note: IHSS 212 has been removed from the IAG schedule for OU 15 because it is an active RCRA storage site.