City: CANON CITY
LINCOLN PARK

Site Information:

Site Name: LINCOLN PARK
Address: CANON CITY, CO

EPA ID: COD042167858
EPA Region: 08

Site Alias Name(s):

URANIUM MILL
COTTER CORP

Record of Decision (ROD):

ROD Date: 01/03/2002
Operable Unit: 02
ROD ID: EPA/ROD/R08-02/108

Text: Full-text ROD document follows on next page.

EPA/ROD/R08-02/108
2002

EPA Superfund
Record of Decision:

LINCOLN PARK
EPA ID: COD042167858
OU 02
CANON CITY, CO
01/03/2002

INTRODUCTION

LINCOLN PARK STUDY AREA SURFACE SOILS
LINCOLN PARK SUPERFUND SITE
CAÑON CITY, COLORADO

The U.S. Environmental Protection Agency ("EPA"), with the concurrence of the Colorado Department of Public Health and Environment ("CDPHE" or "the State"), presents this Record of Decision ("ROD") for the surface soils within the Lincoln Park Study Area of the Lincoln Park Superfund Site in Cañon City, Colorado. The ROD is based on the Administrative Record for the Lincoln Park Study Area, including the Remedial Investigation/Feasibility Study ("RI/FS"), the Remedial Action Plan ("RAP"), the human and ecological risk assessments, the Lincoln Park Study Area Proposed Plan ("Proposed Plan"), public comments received, and EPA/CDPHE responses to those comments.

The ROD contains a brief summary of the studies performed and actions taken at the site, actual and potential risks to human health and the environment, and the selected remedy. EPA followed the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, ("CERCLA"), the National Oil and Hazardous Substances Pollution Contingency Plan (the National Contingency Plan, or the "NCP"), and EPA guidance (EPA, 1999) in preparation of the ROD. The three purposes of this ROD are to:

1. Certify that the remedy selection process was carried out in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. 9601 *et seq.*, as amended by the Superfund Amendments and Reauthorization Act ("SARA"), and, to the extent practicable, the NCP;

2. Outline the remediation requirements of the selected remedy for the surface soils; and

3. Provide the public with a concise source of information about the history, characteristics, and risks posed by conditions present in the Lincoln Park Study Area, the rationale behind the selected remedy for the surface soils, and the agencies' consideration of, and responses to, the comments received.

This ROD is organized into three sections:

1. The **Declaration** section contains a brief description of the selected remedy for the surface soils and the formal authorizing signature page for the ROD.

2. The **Decision Summary** section provides an overview of the Lincoln Park Study Area site history and enforcement activities, site characteristics, and a summary of the human health and ecological risks. The Decision Summary also identifies the selected remedy for the surface soils and explains how the remedy fulfills statutory and regulatory requirements.

3. The **Responsiveness Summary** section serves the dual purpose of: (a) presenting the public's concerns about the site and the preferred remedy identified in the Proposed Plan; and (b) explaining how the public's concerns were addressed and how the concerns were factored into the remedy selection process.

DECLARATION FOR THE RECORD OF DECISION

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Lincoln Park Study Area (Operable Unit 2), Surface Soils
Lincoln Park Superfund Site; Cañon City, Colorado (CERCLIS # COD042167858)

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy for the surface soils within the Lincoln Park Study Area, which is a part of the Lincoln Park Superfund Site in Cañon City, Colorado. EPA and CDPHE selected the remedy in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the NCP.

This decision is based on the Administrative Record for the Lincoln Park Study Area portion of the Lincoln Park Superfund Site. The Administrative Record (on microfilm) and copies of key documents are available for review at the Cañon City Public Library, located at 516 Macon Avenue in Cañon City, Colorado, and at the Colorado Department of Public Health and Environment, Laboratory Building, Laboratory and Radiation Services Division, 8100 Lowry Boulevard, Denver, Colorado. The Administrative Record for this decision may also be reviewed at the EPA Superfund Records Center, located at 999 18th Street, 5th Floor, North Terrace in Denver, Colorado.

DESCRIPTION OF THE SELECTED REMEDY

The Lincoln Park Study Area is one of two operable units ("OUs") at the Lincoln Park Superfund Site. The Lincoln Park Study Area (OU2) includes that portion of the Lincoln Park neighborhood affected by Cotter Corporation's ("Cotter's") Cañon City uranium mill operations. Operable Unit 1, which is defined as a portion of Cotter's Cañon City mill property, is not the subject of this ROD and will be addressed in a subsequent action.

Since 1986, the State has been acting as the lead agency in addressing contamination problems at both operable units. State authorization governing use and disposal of radioactive materials are applicable to Cotter's Cañon City mill; the State has incorporated all legal requirements developed under CERCLA into the Radioactive Materials License.

The cleanup strategies for the Lincoln Park Superfund Site are to isolate and/or reduce the mobility of contaminated materials within source areas at Cotter's Cañon City mill property and to reduce exposure to contaminated soils and ground water, in order to protect human health and the environment. The action necessary to achieve the cleanup strategy for surface soils within the Lincoln Park Study Area has already been completed by Cotter Corporation, as required by CDPHE and EPA. Therefore, no further action is required.

In 1971, the Soil Conservation Service ("SCS") completed construction of an earthen dam across Sand Creek on Cotter's property. The dam was built to control flooding and has also served to prevent downstream movement of surface water and sediment from the mill site. Beginning in 1979, impounded water collected at the SCS dam was pumped back to the main impoundment.

In the early 1980's, millions of cubic yards of tailings (processed ore wastes) were moved from the old, unlined ponds into a new, lined impoundment cell. In the late 1980's, contaminated soils were removed from the old tailings ponds and placed in the impoundment cell. These two actions served to effectively eliminate the source of contamination for the Lincoln Park Study Area.

A hydrologic clay barrier was installed in 1988 to help contain the contaminated ground-water plume emanating from the mill site. This barrier is located upgradient of the SCS dam on Cotter's Cañon City mill site. Ground water and surface water are collected in a sump at the barrier and are pumped back to the lined, main impoundment.

From 1993 through 1999, Cotter implemented what is known as the Sand Creek Soil Cleanup Action within the Lincoln Park Study Area. This action (also known as the Sand Creek Cleanup Project) involved the identification and removal of mill tailings that had moved into the creek bed as the result of surface-water runoff from Cotter's Cañon City mill site. The transport of these contaminated materials into the creek bed and subsequent deposition of sediment occurred prior to the construction of the Soil Conservation Service ("SCS") dam in 1971.

The Sand Creek Cleanup Project involved removal of 9,000 cubic yards of contaminated tailings, soil, and sediment from 1.25 miles of Sand Creek within the Lincoln Park Study Area (see Figure 2). The cleanup objective was to remediate the creek to allow for unrestricted use of the area. To achieve this objective, the cleanup standard was set at 4 picocuries per gram ("pCi/g") for radium-226 as well as for thorium-230. All tailings, soil, and sediment containing levels of radium-226 or thorium-230 above 4 pCi/g were removed. This cleanup project was performed as part of Section 27 - Ephemeral Streams of the Remedial Action Plan (Cotter, 2000b and Cotter, 2000d).

To date, Cotter has performed all necessary cleanup actions for the soils within the Lincoln Park Study Area. The Sand Creek Soil Cleanup Action satisfies the statutory requirements of CERCLA, has eliminated the risks to human health and the environment from contaminated surface soils, and is not inconsistent with the NCP. Therefore, the selected remedy for the surface soils within the Lincoln Park Study Area is No Further Action. The decision to issue a Record of Decision ("ROD") for surface soils only, within the Lincoln Park Study Area, was based on the following factors:

- public comments received during the comment period for the Proposed Plan;
- recent publication of the new EPA drinking water standard for uranium in ground water;

- ongoing evaluation of the effectiveness of the permeable reactive treatment wall ("PRTW"); and

- additional evaluation of the appropriateness of issuing a "No Further Action" decision under existing circumstances for the Lincoln Park Superfund Site.

For these same reasons, EPA has decided to address the ground-water portion of the Lincoln Park Study Area at a later date.

Because previous surface soil cleanup activities have eliminated or reduced risks to acceptable levels, EPA and CDPHE have chosen No Further Action as the selected remedy for the surface soils within the Lincoln Park Study Area. Implementation of the conditions and terms of Cotter's Cañon City mill Radioactive Materials License will continue to ensure the protection of human health and the environment.

STATUTORY DETERMINATIONS

The selected remedy attains the mandates of CERCLA §121, and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective.

Previous surface soil cleanup actions for the Lincoln Park Study Area have eliminated the need to conduct further actions. Because the selected remedy will not result in hazardous substances, pollutants, or contaminants remaining onsite above health-based levels that allow for unlimited use and unrestricted exposure, a five-year review will not be required for the soil cleanup actions.

AUTHORIZING SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF REMEDY

-signed- *January 2002*

Max H. Dodson Date
Assistant Regional Administrator
Office of Ecosystems Protection and Remediation
U.S. Environmental Protection Agency, Region VIII

-signed- *January 2002*

Douglas Benevento, Director Date
Environmental Programs
Colorado Department of Public Health and Environment

DECISION SUMMARY

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LIST OF ACRONYMS AND ABBREVIATIONS

Avg	Average
BTAG	Biological Technical Assistance Group
CDM Federal	CDM Federal Programs Corporation
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
COCs	Chemicals of Concern
Cotter	Cotter Corporation
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
Fed C.O.	Federal Court Order
FS	Feasibility Study
GeoTrans	GeoTrans, Inc.
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
HRAP	Health Risk Assessment Panel
MCL	Maximum Contaminant Level
mg/kg-d	milligrams per kilogram per day
mg/L	milligrams per liter
µg/L	micrograms per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priority List
OU	Operable Unit
pCi	picoCurie
pCi/g	picoCuries per gram
PRP	Potentially Responsible Party
PRTW	Permeable Reactive Treatment Wall
RAG	Remedial Action Goal
RAP	Remedial Action Plan
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SCS	Soil Conservation Service
State	State of Colorado
Stoller/Schafer	The S.M. Stoller Corporation and Shafer & Associates, Inc.
TRV	Toxicity Reference Value
Weston	Roy F. Weston

1.0 SITE NAME, LOCATION, AND DESCRIPTION

Lincoln Park Study Area (Operable Unit 2), Surface Soils
Lincoln Park Superfund Site; Cañon City, Colorado
CERCLIS # COD042167858

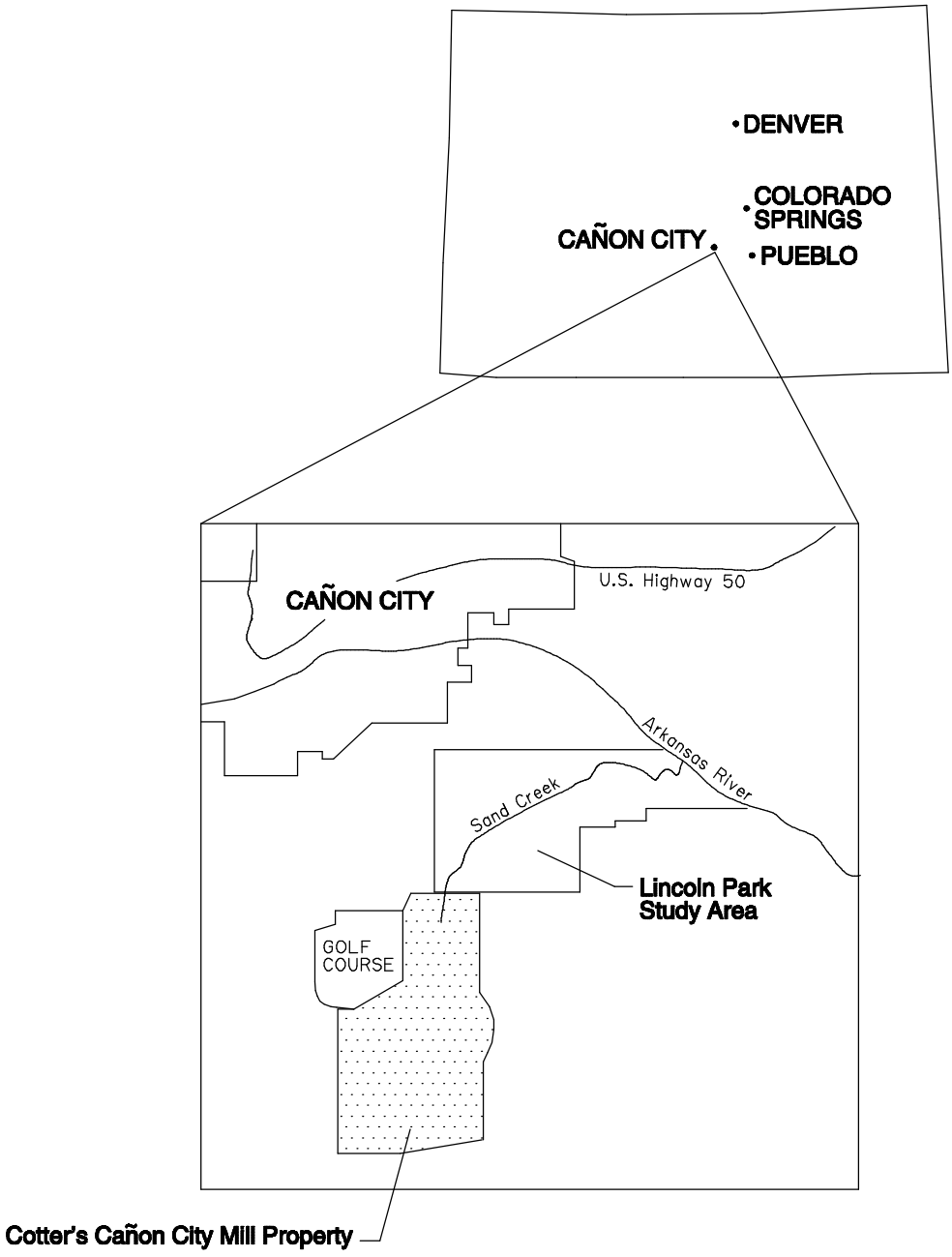
The Lincoln Park Superfund Site is located in Fremont County, Colorado, approximately 1½ miles south of Cañon City, 96 miles south of Denver, and 36 miles northwest of Pueblo (see Figure 1). The Superfund site includes Cotter Corporation's ("Cotter's") Cañon City uranium mill facility and a portion of the surrounding property, and a portion of the unincorporated community of Lincoln Park.

During the time period between 1958 and 1979, liquids from the alkaline-leach uranium milling process at Cotter's Cañon City mill seeped from unlined ponds into the ground water. This contaminated ground water, in turn, migrated toward the Lincoln Park Study Area. Soil contamination is present on the Cotter property itself, also as a result of uranium milling activities. Contamination was also spread in the past, via wind blown material, to soils adjacent to the mill, along the Sand Creek drainage on the mill property (causing contamination of sediment within the drainage), and into the community of Lincoln Park. Cleanup of contamination within the boundaries of Cotter's Cañon City mill property will be addressed during final closure and reclamation of the mill property, and is not the subject of this Record of Decision ("ROD").

The Lincoln Park Superfund Site has been divided into two Operable Units ("OUs"): the Lincoln Park Study Area (OU2); and a defined portion of Cotter's Cañon City mill property (OU1). The location and outline of the Lincoln Park Study Area is shown in Figure 2. The location and outline of the portion of Cotter's Cañon City mill property defined as OU1 is shown in Figure 3. For the purposes of this ROD, the Lincoln Park Study Area has been further divided based on the principal environmental media; soils and ground water.

The Colorado Department of Public Health and Environment ("CDPHE") has been the lead agency for the site, with assistance from the U.S. Environmental Protection Agency ("EPA"). Cotter, the potentially responsible party ("PRP"), has financed the cleanup actions.

Figure 1 (Site Location Map, Lincoln Park Superfund Site, Cañon City, Colorado)



T:\CADD\3280-RAC8\025-LincolnPark\ROD\CADD\FIG1.DWG

NOT TO SCALE

Figure 1

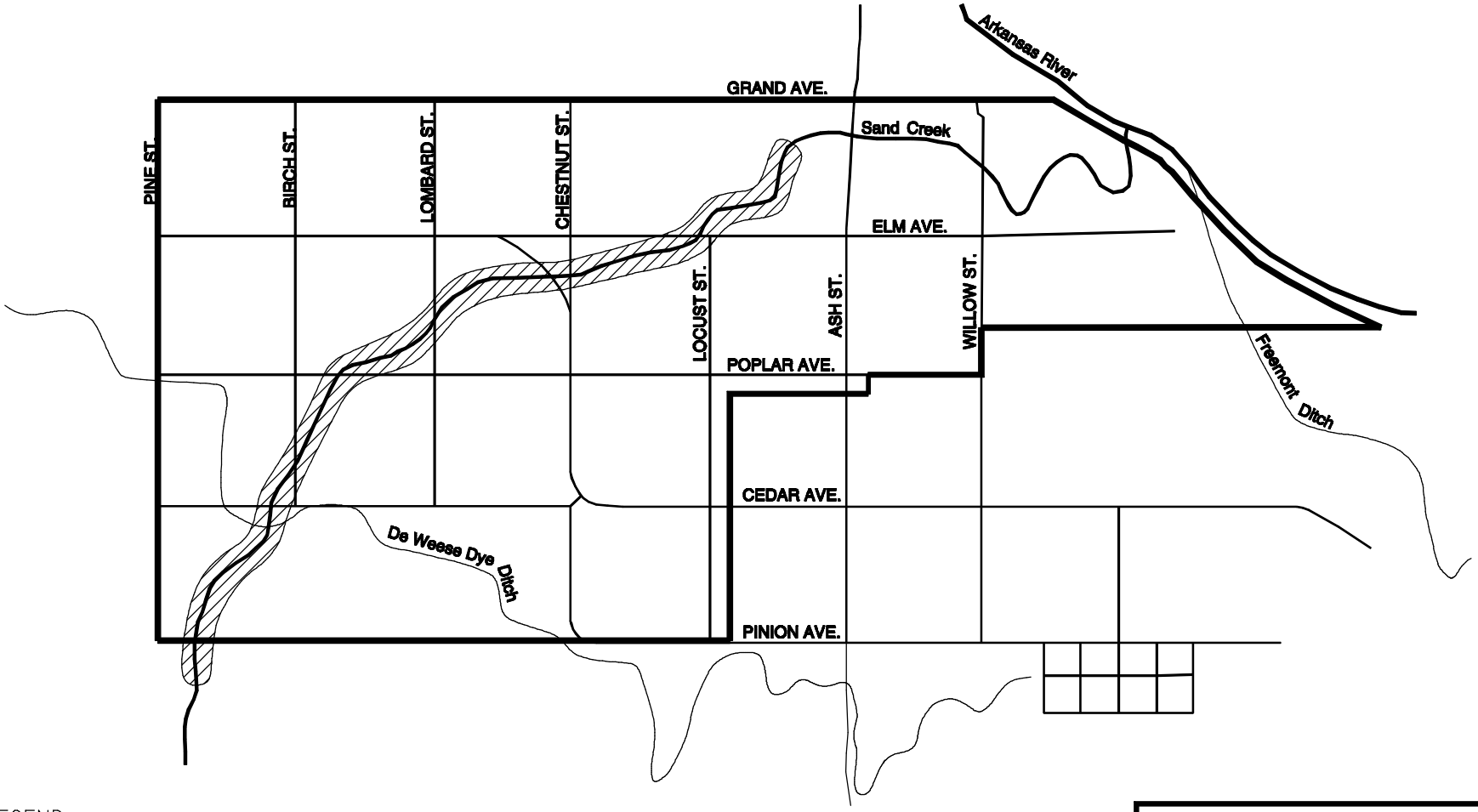
Site Location Map

Lincoln Park Superfund Site
Cañon City, Colorado

Figure 2 (Lincoln Park Study Area, Lincoln Park Superfund Site, Cañon City , Colorado)

T:\CADD\3280-RAC8\025-LincolnPark\ROD\CADD\FIG2.DWG

Lincoln Park Study Area



LEGEND

AERIAL EXTENT OF SAND CREEK RESPONSE ACTION

NOT TO SCALE

Figure 2

Lincoln Park Study Area

Lincoln Park Superfund Site
Cañon City, Colorado

Figure 3 (Cotter Property, Lincoln Park Superfund Site, Cañon City, Colorado)

T:\CADD\3280-RAC8\025-LincolnPark\Cadd\ROD\CADD\FIG3.DWG

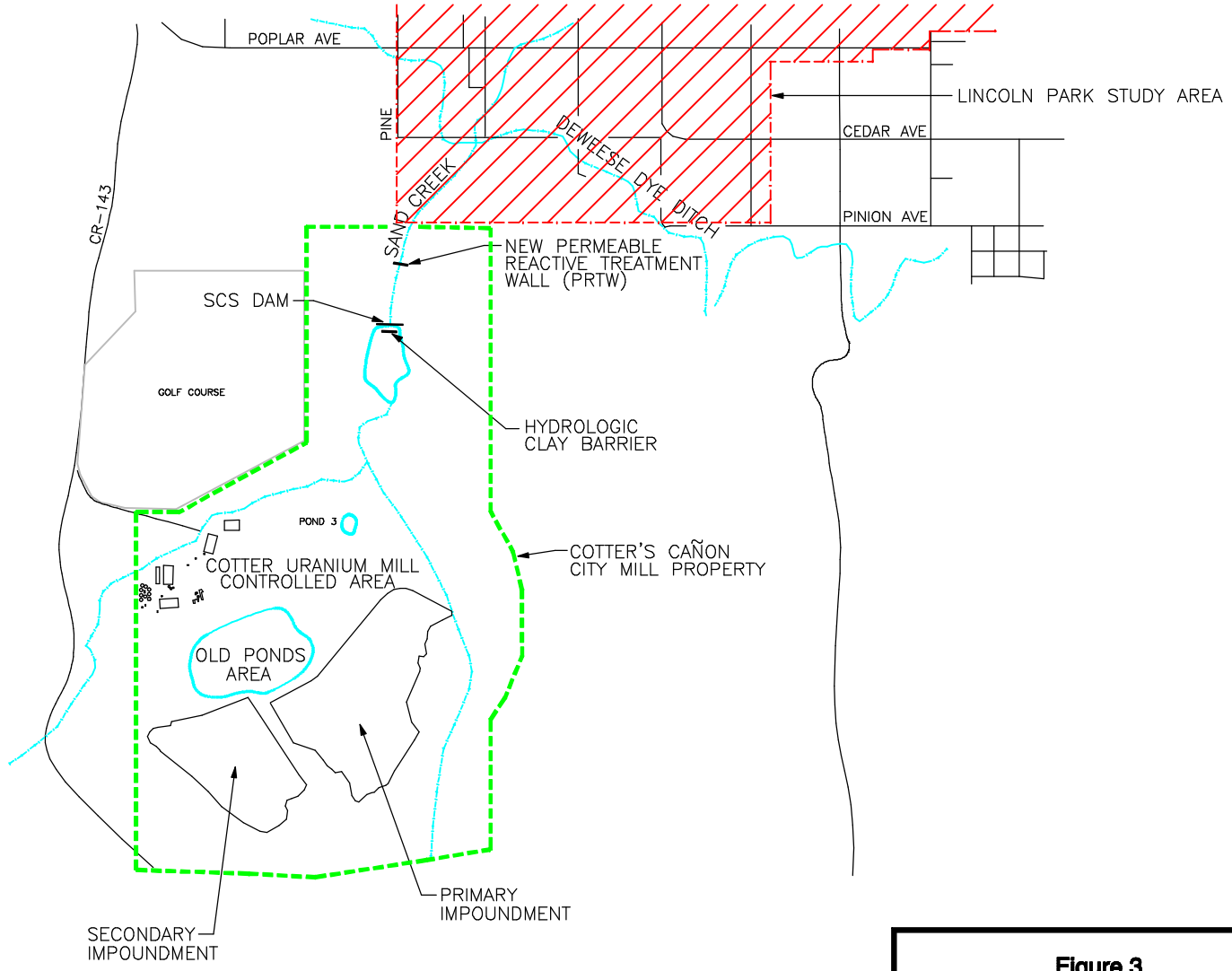


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Figure 3

Cotter's Cañon City Mill Property

Lincoln Park Study Area
Cañon City, Colorado

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Cotter Corporation was incorporated in the State of New Mexico on February 27, 1956 and started producing uranium oxide, or yellowcake, at the Cañon City mill in August of 1958. In addition to producing yellowcake, the mill produced both vanadium and molybdenum as by-products at one point in time. The mill was originally licensed by the Atomic Energy Commission, but authority for licensing was transferred to the Colorado Department of Health (currently called the Colorado Department of Public Health and Environment) in 1968.

The original mill used an alkaline-leach process and remained in service from July 1958 to the end of 1979. Ten ponds were used to store tailings, raffinate, and other liquids from the alkaline leach process. This area is referred to as the old ponds area.

In 1971 the Soil Conservation Service ("SCS") completed construction of an earthen dam across Sand Creek on Cotter's property. The dam was built to control flooding and has also served to prevent downstream movement of surface water and sediment from the mill site. Beginning in 1979, impounded water collected at the SCS dam was pumped back to the main impoundment.

In 1978, in preparation for operation as an acid-leach mill, a new main tailings impoundment was built. This main impoundment was constructed with a 60 millimeter hypalon liner and an 18-inch compacted clay subliner. The main impoundment was constructed as two cells to segregate acid-leach tailings and liquids (primary impoundment cell) from alkaline-leach tailings (secondary impoundment cell) (see Figure 3). In 1979, the mill was converted to an acid-leach process and this process was employed from 1979 to 1998, at which time the mill was reconverted to an alkaline-leach process.

Between 1981 and 1983, approximately 2.5 million cubic yards of alkaline tailings from the old ponds area were moved into the secondary impoundment cell. In 1989, the alkaline tailings in the secondary impoundment cell were covered with liquid for dust control and to create evaporative capacity. Additional contaminated soils were removed from the old ponds area from ground-surface level to bedrock and placed in the primary impoundment cell.

On December 9, 1983, the State of Colorado ("the State") filed a complaint against Cotter for injury to, loss of, and destruction of natural resources relating to their Cañon City uranium mill. This complaint was filed pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §9601 et seq.

On September 21, 1984, EPA placed Cotter's Cañon City mill site and the adjacent Lincoln Park community on the National Priorities List ("NPL"). Once placed on the NPL, the designated area became a Superfund Site. The term Lincoln Park Study Area refers to that portion of the residential neighborhood of Lincoln Park that has been adversely affected by Cotter's Cañon City mill operations (see Figure 2).

On April 2, 1986, the State and EPA executed a Memorandum of Agreement that established their respective roles and responsibilities for the Lincoln Park Superfund Site. Under this agreement, the State would act as lead agency with regard to oversight of the cleanup of the Lincoln Park Superfund Site.

A remedial investigation ("RI") (GeoTrans, Inc. ["GeoTrans"], 1986a) and feasibility study ("FS") (GeoTrans, 1986b) were completed in February 1986. Cleanup plans, which were evaluated in a Summary Remedial Alternatives Review, were completed as the Remedial Action Plan ("RAP"). The RAP required Cotter to perform cleanup actions, increase monitoring, and to conduct additional studies. The RAP is incorporated into the Federal Consent Decree for Civil Action No. 83-C-2389.

The RAP was incorporated into Cotter's Cañon City mill Radioactive Materials License (No. 369-01) as Condition 11.2 of Amendment 24 (Federal Court Order ["Fed C.O."], 1988). The Consent Decree with the State requires Cotter to implement and pay for all actions described in the Remedial Action Plan.

The remedial action work required by the RAP began in 1988. One such action was construction of a hydrologic clay barrier and pumpback system. The hydrologic clay barrier was installed in 1988 to help contain the contaminated ground-water plume emanating from the mill site. This barrier is located upgradient of the SCS dam on Cotter's Cañon City mill site. Ground water and surface water are collected in a sump at the barrier and are pumped back to the lined, main impoundment.

In addition to a Phase I human health risk assessment, which was completed in 1991 (HRAP, 1991), supplemental Phase II and Phase III human health risk assessments ("HHRAs") were completed in November 1996 (Roy F. Weston ["Weston"], 1996) and January 1998 (Weston, 1998), respectively. An ecological risk assessment was completed in February 1999 (The S.M. Stoller Corporation and Schafer & Associates, Inc. ["Stoller/Schafer"], 1999).

In 1995, EPA, CDPHE, and Cotter developed remedial action goals ("RAGs") for the Lincoln Park Superfund Site. RAGs consist of chemical concentrations that are protective and serve as specific numerical goals for cleanup actions. The RAGs for the Lincoln Park Superfund Site were established to aid in the development of both a decommissioning plan and a management/reclamation plan for the mill facility and Lincoln Park. Both of these plans are to be implemented under Cotter's Cañon City mill Radioactive Materials License.

In 1999, EPA and CDPHE developed Remedial Action Objectives ("RAOs") for the Lincoln Park Study Area. RAOs are general descriptions of goals for protecting human health and

the environment at a Superfund site. The following RAO was established for the soils portion of the Lincoln Park Study Area: limit the movement of contaminants from Cotter's Cañon City mill site into the Lincoln Park Study Area.

In addition to establishing RAOs, EPA and CDPHE also developed RAGs for the Lincoln Park Study Area. The following RAG is a subset of the above-mentioned RAO, is based on federal and State of Colorado environmental laws, and is the same RAG as that developed in 1995 for the Lincoln Park Superfund Site:

> *The average of all calculations for total radium concentrations at 1000 years including growth from thorium-230 and thorium-232, inclusive of background, will not exceed 4.0 picoCuries/gram ("pCi/g") for soil and sediments in residential areas and 6.8 pCi/g in industrial or commercial zones.*[1] *Soils and sediments with concentrations above these levels will be removed. Where these levels are achieved, such areas would be considered clean and available for unrestricted use.*

Cotter's Cañon City mill is presently authorized to operate under a renewed license issued on September 30, 1995. License Amendment 34, which became effective June 30, 1998, enabled Cotter to convert the mill from an acid processing method to an alkaline-leach process. Cotter began operating an alkaline-leach process, for the second time in the mill's history, in 1999; Cotter plans to operate for a minimum of 20 years. The Cañon City mill facility includes an abandoned alkaline-leach mill (90 percent of which has been torn down and properly disposed of on site), an active alkaline-leach mill, a spent catalyst plant, a partially reclaimed tailings disposal area, and an active tailings disposal area.

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[1] Thorium (Th)-230 and radium (Ra)-226 are decay products of uranium-238. Ra-228 is a decay product of Th-232, and total radium is a combination of Ra-226 and Ra-228. This RAO establishes cleanup objectives that are based on the concentrations of total radium that have formed, through decay of uranium and thorium, over a 1000-year period. These standards also factor in the amount of radium present as a result of naturally-occurring (or background) conditions.

Over the past several years, Cotter has implemented five cleanup actions within the Lincoln Park Study Area in response to offsite contamination caused by the Cañon City mill operations. One of these actions, the Sand Creek Soil Cleanup Action, was performed within the Lincoln Park Study Area and was designed to address contaminated soils and sediment. This action (also known as the Sand Creek Cleanup Project) was implemented by Cotter from 1993 through 1999 and involved the identification and removal of mill tailings that had moved into the creek bed as the result of surface-water runoff from Cotter's Cañon City mill site. The transport of these contaminated materials into the creek bed and subsequent deposition of sediment occurred prior to the construction of the Soil Conservation Service ("SCS") dam in 1971.

The Sand Creek Cleanup Project involved removal of 9,000 cubic yards of contaminated tailings, soil, and sediment from 1.25 miles of Sand Creek within the Lincoln Park Study Area. The cleanup objective was to remediate the creek to allow for unrestricted use of the area. To achieve this objective, the cleanup standard was set at 4 picocuries per gram ("pCi/g") for radium-226 as well as for thorium-230. All tailings, soil, and sediment containing levels of radium-226 or thorium-230 above 4 pCi/g were removed. This cleanup project was performed as part of Section 27 - Ephemeral Streams of the Remedial Action Plan (Cotter, 2000b and Cotter, 2000d).

A Proposed Plan, describing EPA's and CDPHE's preferred remedy, was issued on June 26, 2000 (EPA, 2000). The previously discussed cleanup action serves as the basis for EPA's and CDPHE's decision that no further action need be taken with regard to surface soils within the Lincoln Park Study Area. By issuing a separate no-further action decision for the surface soils, EPA may then proceed with deleting the soils portion of the Lincoln Park Study Area from the National Priorities List ("NPL").

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Public participation requirements are specified in CERCLA Sections 113 and 117. These sections require that before adoption of any plan for remedial action to be undertaken by EPA, the State, or an individual (e.g., PRP), the EPA shall:

1. Publish a notice and brief analysis of the proposed plan, which describes the proposed remedy, and make such plan available to the public; and

2. Provide a reasonable opportunity for submission of written and oral comments and an opportunity for a public meeting at or near the site regarding the proposed plan and any proposed findings relating to cleanup standards. EPA shall keep a transcript of the meeting and make such transcript available to the public. The notice and analysis published under item #1 above shall include sufficient information to provide a reasonable explanation of the proposed plan.

Additionally, notice of the selected remedy set forth in the Record of Decision ("ROD") must be published and the ROD must be made available to the public. The ROD must be accompanied by a discussion of any significant changes to the preferred remedy presented in the proposed plan, along with the reasons for the changes. A response to each of the comments, criticisms, and new data submitted in written form or oral presentations during the public comment period must be included with the ROD.

With regard to community participation activities, CDPHE has: performed community interviews; issued *Lincoln Park Citizens' Update* newsletters and topic-specific fact sheets; provided the local information repository (the Cañon City Public Library) with site-related documents; and co-authored the January 1998 *Community Involvement Plan for the Lincoln Park Superfund Site and Cotter Uranium Mill* with EPA.

EPA, with assistance from CDPHE, has conducted the following community participation activities in connection with the Lincoln Park Study Area Proposed Plan ("Proposed Plan"): distribution of the Proposed Plan to the public; publication of notices of a 30-day public comment period in local newspapers; hosting a formal public meeting; the presentation of the selected remedy in this ROD; and preparation of responses to both oral and written public comments (Responsiveness Summary).

The Proposed Plan was released for public comment on June 26, 2000. The public comment period ran from July 1, 2000 through July 31, 2000. The public meeting for the Proposed Plan was held on July 17, 2000. The Proposed Plan, and relevant site-specific documents upon which the Proposed Plan was based, were made available to the public in the Administrative Record located at the EPA Superfund Records Center in Denver, at CDPHE's Laboratory Building (Laboratory and Radiation Services Division) in Denver, and at the Cañon City Public Library in Cañon City. Notices were published in the Cañon City Daily Record, Colorado Springs Gazette, and Pueblo Chieftain newspapers on June 26 and July 12, 2000. These notices: announced the availability of the Proposed Plan and relevant site-specific documents for public review; briefly described the Proposed Plan; and announced the dates for the public comment period and the public meeting.

On July 17, 2000, EPA and CDPHE hosted a public meeting to present the Proposed Plan to the community. The meeting was held at 7:00 p.m. at the Cañon Inn in Cañon City, Colorado. Representatives from EPA and CDPHE presented the Proposed Plan and also discussed previous cleanup actions at both Cotter's Cañon City mill and the Lincoln Park Study Area. A No Further Action remedy was presented as the preferred course of action. Representatives from Cotter presented the PRTW ground-water cleanup action and a portion of the meeting was dedicated to accepting formal oral comments from the public. EPA's and CDPHE's responses to oral and written comments received during the public comment period are included in the Responsiveness Summary, which is Appendix A of the Record of Decision.

4.0 SCOPE AND ROLE OF OPERABLE UNIT

The Lincoln Park Superfund Site encompasses a large area (Figure 1). In order to facilitate site characterization and the remedy decision-making process, EPA and CDPHE established two Operable Units ("OUs") for the cleanup of this Superfund site. These OUs are based on geographical areas within the Superfund site. The OUs are as follows: a defined portion of Cotter's Cañon City mill property (OU1); and the Lincoln Park Study Area (OU2).

The first OU, a portion of Cotter's Cañon City mill property, will be cleaned up under Cotter's Radioactive Materials License closure plan. To date, there have already been several onsite actions that have served to contain historic sources of contamination. These actions were taken to prevent further contamination from occurring both onsite and offsite. Future cleanup of Cotter's Cañon City mill site will further address source areas of contamination through containment of liquids in lined ponds, removal and disposal of onsite contaminated soils, hydraulic containment of groundwater onsite, and minimization of airborne contaminants. Past, current, and future cleanup actions at this OU are part of the RAP, which has been incorporated into Cotter's Cañon City mill Radioactive Materials License.

Cleanup of the soils portion of the second operable unit, which is the subject of this ROD, addressed soil and sediment contamination caused by past mill operations. The Sand Creek soils cleanup action has eliminated risks posed to the community by removing contaminated sediment/soils.

No Further Action has been chosen as the selected remedy for surface soils within the Lincoln Park Study Area. This decision is based on the fact that soil cleanup actions, taken within the Lincoln Park Study Area, have reduced contamination to safe levels.

5.0 SUMMARY OF SITE CHARACTERISTICS

Site characterization of the Lincoln Park Study Area is based on information gathered for the *Remedial Investigation, Cotter Uranium Mill Site* (GeoTrans, 1986a), the *Feasibility Study, Cotter Uranium Mill Site* (GeoTrans, 1986b), the Human Health Risk Assessments (HHRAs) (Health Risk Assessment Panel ["HRAP"], 1991; Weston, 1996; Weston, 1998), and the *Lincoln Park Superfund Site, Ecological Risk Assessment* (Stoller/Schafer, 1999).

5.1 SITE DESCRIPTION

Cañon City and vicinity lie along the Arkansas River where the river leaves the Rocky Mountains and enters the Great Plains physiographic province. The community of Lincoln Park, which is about 1.5 miles south of Cañon City, is a semi-rural area in unincorporated Fremont County. The Lincoln Park Study Area is approximately 1.5 square miles in size (see Figure 2).

The current mill and associated facilities at Cotter's Cañon City operations occupy an area of approximately 82 acres, as shown in Figure 3. Almost all of the old mill buildings have been dismantled and placed in the primary impoundment. Southeast of the existing mill are the new primary and secondary impoundments. The old ponds area extends east of the existing mill. The tailings and underlying contaminated soil from the old ponds area were excavated and placed in the new, lined main impoundment.

The mill is located in a topographic depression that is the surface expression of an underlying structure called the Chandler syncline. The uppermost bedrock unit beneath the site is the Poison Canyon formation, which forms the core of the syncline. The open areas north of the mill are covered with Quaternary alluvium consisting of gravel, cobbles, boulders, and sands. Soils in the vicinity of the mill are classified as shallow and well

drained. The top layer consists of a brown loam; the subsoil is a pale brown loam, grading into a yellowish brown sandy loam.

The primary hydrologic feature of the Lincoln Park Superfund Site is Sand Creek. The original channel and natural features of Sand Creek, which were previously present within Cotter's Cañon City mill site, have been almost completely altered by earlier and on-going tailings disposal activities and by reclamation and remediation efforts at the site. The natural drainage also consists of West Fork Sand Creek, which joins Sand Creek south of the SCS dam. West Sand Creek passes within 500 feet to the west of the mill structures, but topographic protection (from potential flooding) is available in the form of a ridge line running between the channel and the mill structures.

Subsurface evidence suggests that both West Fork and Sand Creek channels were formerly braided streams. Most of the multiple channel sections are buried beneath later deposits or were removed by activities at the site. Sand Creek exits through the northeastern corner of the bowl-shaped valley in which Cotter's Cañon City mill is located. From the valley, Sand Creek flows through the Lincoln Park Study Area on its way to the Arkansas River. In its natural state, Sand Creek is an ephemeral stream with perennial sections near its confluence with the Arkansas River.

In 1971 the Soil Conservation Service ("SCS") constructed an earthen dam across Sand Creek on Cotter's property. The purpose of the dam was flood control. This SCS dam also prevents downstream movement of surface water and sediment from the mill site. Upstream of the SCS dam, there are ground-water containment systems (a hydrologic clay barrier and pump-back system) that intercept shallow ground water in the drainage. A marshy wetland area has developed upstream from the SCS dam and ground-water containment system.

Other hydrologic features of the Lincoln Park Study Area include the DeWeese Dye Ditch, an irrigation ditch that flows through the southern portion of the site (see Figure 2), and two irrigation ponds. The DeWeese Dye Ditch and the irrigation ponds are used seasonally during the summer growing period. Seepage from the ditch and ponds are a source of ground-water recharge to the alluvium within the Sand Creek drainage. These sources of water serve to both dilute and flush the contaminated ground water under Lincoln Park.

5.2 SITE MEDIA

Primary sources of contaminants associated with the mill site include the old tailing impoundments and process waters. Secondary sources of contamination include soils, sediments, and surface water that have been affected by mill processes and emissions from the stack (for the yellowcake dryer), and represent potential sources for further downgradient transport of contaminants, or exposure pathways. Currently, emissions from the stack are properly controlled and monitored in accordance with the mill's license.

Humans and the environment may be exposed to chemicals by a variety of exposure pathways. Major exposure pathways (i.e., ground water, surface water, soil and sediment, and airborne dust) are discussed below.

5.2.1 Ground Water

From 1958 to 1979, Cotter disposed of tailings from an alkaline leach mill into two lined and seven unlined ponds (a tenth pond was used for storage of fresh water). Liquids from the unlined ponds leached into the ground water and eventually migrated into Lincoln Park. Contaminants in ground water from the mill have, in the past, been detected near the Arkansas River (approximately 2½ miles downstream along the Sand Creek drainage).

As part of a cleanup action performed between 1981 and 1983, Cotter removed and placed the material comprising the old tailing ponds within newly constructed lined impoundments. Mill operations have been altered so that tailings in the new impoundments are covered by water or fill in order to prevent wind-blown dispersion of particulate matter. In addition, a hydrologic clay barrier was installed in 1988 to help contain the contaminated ground-water plume. This barrier is located upgradient of the SCS dam on Cotter's Cañon City mill site. Ground water and surface water are collected in a sump at the barrier and pumped to the lined, main impoundment. Even though soils and ground water from the old tailings ponds area contain elevated concentrations of site-related contaminants, offsite releases have been largely eliminated.

In 1989, Cotter conducted a water well use survey in Lincoln Park (IMS Inc., 1989). Based on the survey, Cotter determined that there were five Lincoln Park residents who had private wells affected by uranium and molybdenum contaminated ground water and who were not already connected to the Cañon City municipal water supply. These residents were connected to the municipal water supply during the period 1989 through 1993. Subsequent to this initial survey and hook-up effort, two additional homes were connected to the municipal water supply.

Over the years, the following two actions have contributed to the improvement of ground-water quality under Lincoln Park: (1) the hydrologic clay barrier, which was built to restrict the flow of contaminated ground water from the Cotter mill site; and (2) remediation of the unlined impoundment areas at the Cotter mill site, which eliminated the source(s) of contamination.

One other action was recently implemented to further improve the ground-water quality under Lincoln Park. In 1999, EPA and CDPHE updated the 1986 Feasibility Study for the Lincoln Park Study Area. The updated document is entitled *Final Focused Feasibility Study for Lincoln Park Superfund Site, Canon City, Colorado, Lincoln Park Study Area*

(CDM Federal Programs Corporation ["CDM Federal"],1999) ("Focused Feasibility Study"). This Focused Feasibility Study took into account additional technical studies performed since 1988 and evaluated and screened remedial alternatives for ground water. One alternative that was evaluated was a permeable reactive treatment wall ("PRTW") to be installed near the downgradient base of the Soil Conservation Service ("SCS") dam. It was determined that this alternative best met the nine evaluation criteria in the National Contingency Plan ("NCP").

Consequently, conditions for the design, construction, and operation of the PRTW were incorporated into the Radioactive Materials License for Cotter's Cañon City mill. The purpose of the PRTW cleanup action, which is on-going and not located within the Lincoln Park Study Area, is to reduce and eventually eliminate ground-water contamination within the Lincoln Park Study Area.

The PRTW cleanup action was chosen as the most effective way to control the one to three gallons per minute of contaminated ground water that had been bypassing a previously installed underground hydrologic clay barrier. This clay barrier is located on the upgradient side of the SCS dam. Accordingly, during the time period April through June 2000, Cotter installed a PRTW system across the Sand Creek channel (Cotter, 2000c and Cotter, 2000e).

Specifically, the PRTW is located downgradient of the SCS dam on Cotter property (see Figure 3). The PRTW contains a layer of zero-valent iron filings that serves to chemically remove uranium and molybdenum from the ground water passing through the PRTW prior to the ground water moving into the Lincoln Park Study Area. The duration of operation of the PRTW will depend upon how long it takes to remove uranium and molybdenum from the ground water originating from the source(s) of contamination.

Under the Radioactive Materials License, Cotter is required to monitor and report on the effectiveness of the PRTW. Ground-water samples are collected both upgradient and downgradient, as well as within the reactive media (iron filings). Constituents to be analyzed for are uranium, molybdenum, iron, and manganese. In addition, major ions such as sulfate, bicarbonate, carbonate, chloride, nitrate, sodium, calcium, potassium, and magnesium are also included in the analysis. Field parameters include: depth to water; pH; specific conductance; temperature; dissolved oxygen; and oxidation-reduction potential. Monitoring locations (nine total) within the reactive gate are to be sampled monthly during the first year of operation and quarterly thereafter. Monitoring wells located in the shallow aquifer adjacent to the PRTW are sampled quarterly. An evaluation of the PRTW's operation and monitoring program is performed on an annual basis.

Although shallow subsurface flow from Cotter's Cañon City mill site is designed to be contained by the SCS dam and associated subsurface hydrologic barriers, a small amount of contaminated ground-water flow has been detected leaving the site. To address this problem, the PRTW was constructed during the spring of 2000 to remove uranium and molybdenum prior to the ground water flowing into the Lincoln Park Study Area.

Lastly, to help ensure contaminated ground water is not used by residents of Lincoln Park, Cotter will conduct an institutional action (semi-annual review of the State Engineer's records).

5.2.2 Surface Water

Sand Creek is an ephemeral stream that becomes perennial just upstream of its confluence with the Arkansas River. The presence of contaminants in the surface water have been previously traced to this confluence. Surface-water runoff from Cotter's Cañon City mill site, via Sand Creek, was a pathway for offsite transport of mill-derived contaminants. Surface-water runoff, however, has been controlled since the construction

of the SCS dam in 1971. As a result of previously performed cleanup actions (described in Section 2.0), contaminant concentrations in the creek are now below cleanup objectives.

5.2.3 Soil and Sediment

Prior to implementation of the cleanup actions, contaminants were detected in sediments in the Sand Creek drainage; especially in reaches of the creek that experience low flow. The transport of these materials into the creek bed and subsequent deposits of sediment occurred prior to construction of the SCS dam. A cleanup action for the Sand Creek soils was conducted from 1993 through 1999. This action identified and removed mill tailings present within the creek bed, as described in Section 2.0 of this ROD.

5.2.4 Airborne Dust

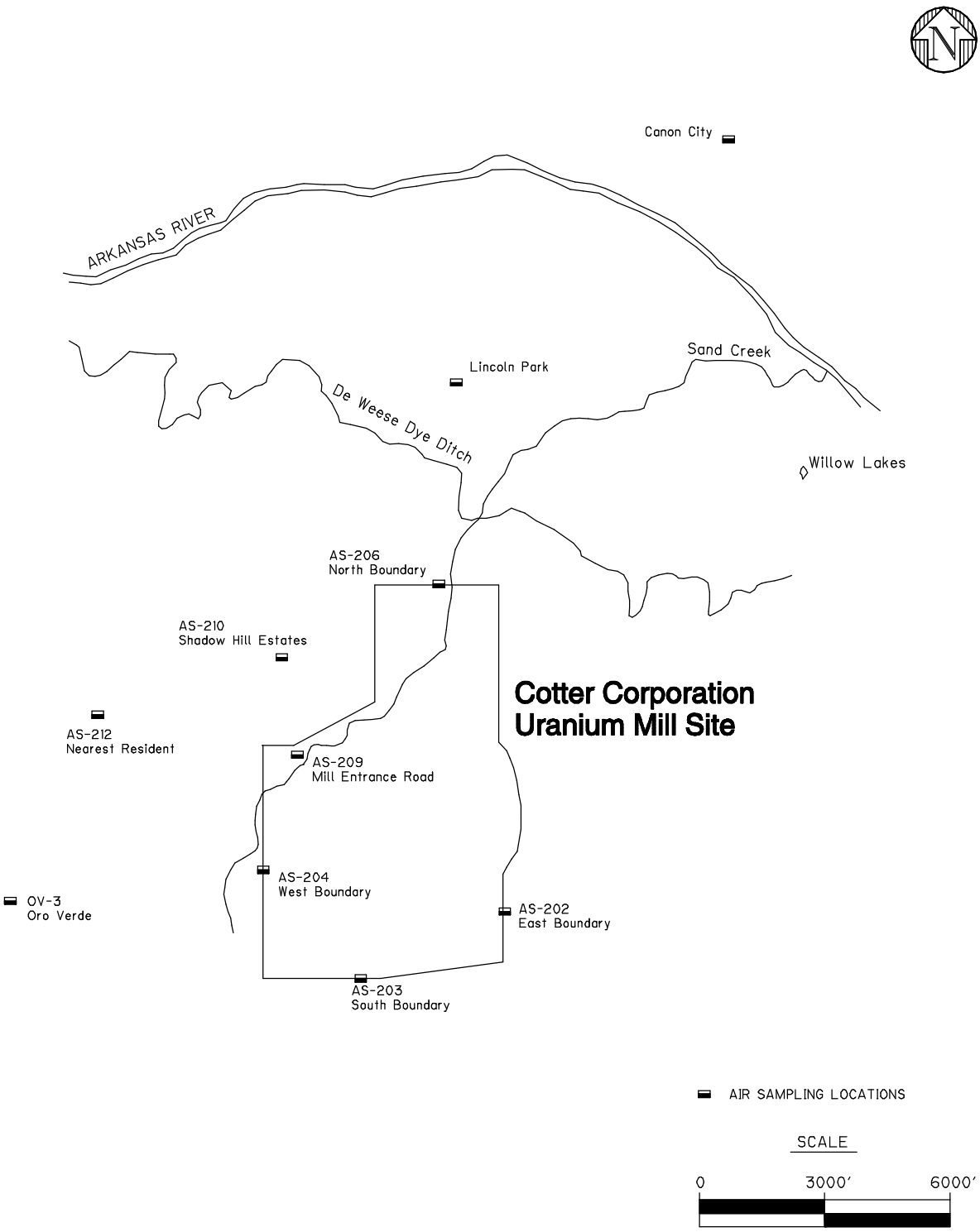
In the past, a number of sources of wind-dispersed particulates existed on Cotter's Cañon City mill site. These potential sources included the main and secondary impoundments, the old ponds area, the ore stockpile, the ore handling area, and emissions from the stack for the yellowcake dryer. Wind-dispersal sources have been brought under control by Cotter through the following actions: covering the primary impoundment beaches with soil material; compaction, isolation, and annual inspections of ore pads; revegetation of the old pond area; and redesign and modification of the scrubber system for the yellowcake dryer. Management of dust emissions, including emissions from the impoundments, is a condition of the Radioactive Materials License. Techniques for dust suppression include: submerging the tailings within the impoundments in water; and using water trucks to keep road dust, and dust from the stockpile and handling areas, to a minimum.

Time-trend analysis of air monitoring data indicate that locations immediately east and west of Cotter's Cañon City mill site were, at one time, impacted by airborne releases from

the site. However, releases from the site are currently either below established limits or absent (Weston, 1998).

Air monitoring is conducted as part of a site-wide monitoring program to identify radionuclides in particulates in all four compass directions, plus additional locations near Cotter's Cañon City mill and in Lincoln Park (see Figure 4). To date, no elevated readings of uranium, thorium, radium, lead, or polonium have been detected during the air monitoring program. Results from the emissions/air monitoring program are published in Cotter's annual reports, which are available for review in the Cañon City Public Library. The *Calendar Year 2000 Environmental and Occupational Performance Report and ALARA Review* (Cotter, 2001), or 2000 Annual Report for short, presents the most recent environmental air sample data for ten air monitoring locations (see Figure 4). The results show that, as with the results for calendar year 1999, there were no exceedances of dose limits during the year 2000.

Figure 4. Environmental Air Sampler Locations, Lincoln Park Superfund Site, Cañon City, Colorado



T:\CADD\3280-RAC8\025-LincolnPark\ROD\CADD\FIG6.DWG

Figure 4

Environmental Air Sampler Locations

Lincoln Park Superfund Site
Cañon City, Colorado

6.0 CURRENT AND POTENTIAL FUTURE LAND USE

The Lincoln Park Study Area is located within an area zoned for residential and commercial use. Land-use surrounding and within the Lincoln Park Superfund Site is predominately commercial and residential, and privately owned. Cotter's Cañon City mill is owned by the Cotter Corporation and is licensed and utilized for industrial purposes.

The extent of the property owned by Cotter, including the mill site, is shown in Figure 3. The additional Cotter-owned property that surrounds the mill site will serve as a buffer zone. The existence of this buffer zone will effectively prevent commercial or residential development from occurring too close to that portion of Cotter's Cañon City mill property that has been designated as Operable Unit 1.

7.0 SUMMARY OF SITE RISKS

The following subsections summarize the results of the human health and ecological risk assessment work performed for the Lincoln Park Superfund Site.

7.1 HUMAN HEALTH RISKS

Three separate human health risk assessments ("HHRAs" or "Risk Assessments") were performed for the Lincoln Park Superfund Site. The first human health risk assessment, the Phase I Risk Assessment, was completed in 1991 (HRAP, 1991). This first assessment was a planning-phase document. In 1996, a supplemental human health risk assessment, the Phase II Risk Assessment (Weston, 1996), was performed to re-investigate the risks to residents of Lincoln Park based on environmental conditions as they existed during the time period of 1987 to 1988. This time period was selected for the assessment of "baseline" risks, that is, risks that would have existed in the absence of any cleanup actions.

A second supplemental human health risk assessment, the Phase III Risk Assessment (Weston, 1998), was performed in 1998 to address risks to current and potential future residents in Lincoln Park and other areas in the vicinity of Cotter's Cañon City mill site. The Phase III Risk Assessment based its evaluation on environmental conditions that existed during the time period 1994 through 1996. By selecting this time period, the risk assessors were able to evaluate the effectiveness of cleanup actions taken since 1988. This second supplemental human health risk assessment is the subject of the remainder of this section of the ROD.

7.1.1 Exposure Assessment

People may be exposed to chemicals in a variety of ways. The risk that a chemical poses to a person depends on the level and duration of exposure to that chemical. The purpose of an exposure assessment is to determine reasonable exposure scenarios and pathways of concern. For the Lincoln Park Superfund Site, the Phase III Risk Assessment evaluated the pathways by which people might be exposed to mill-related chemicals in the environment and described how the level of each exposure was estimated. A diagram of potential pathways for the Lincoln Park Superfund Site is presented in Figure 5. This diagram, or conceptual model, was developed specifically for the circumstances found at the Lincoln Park Superfund Site.

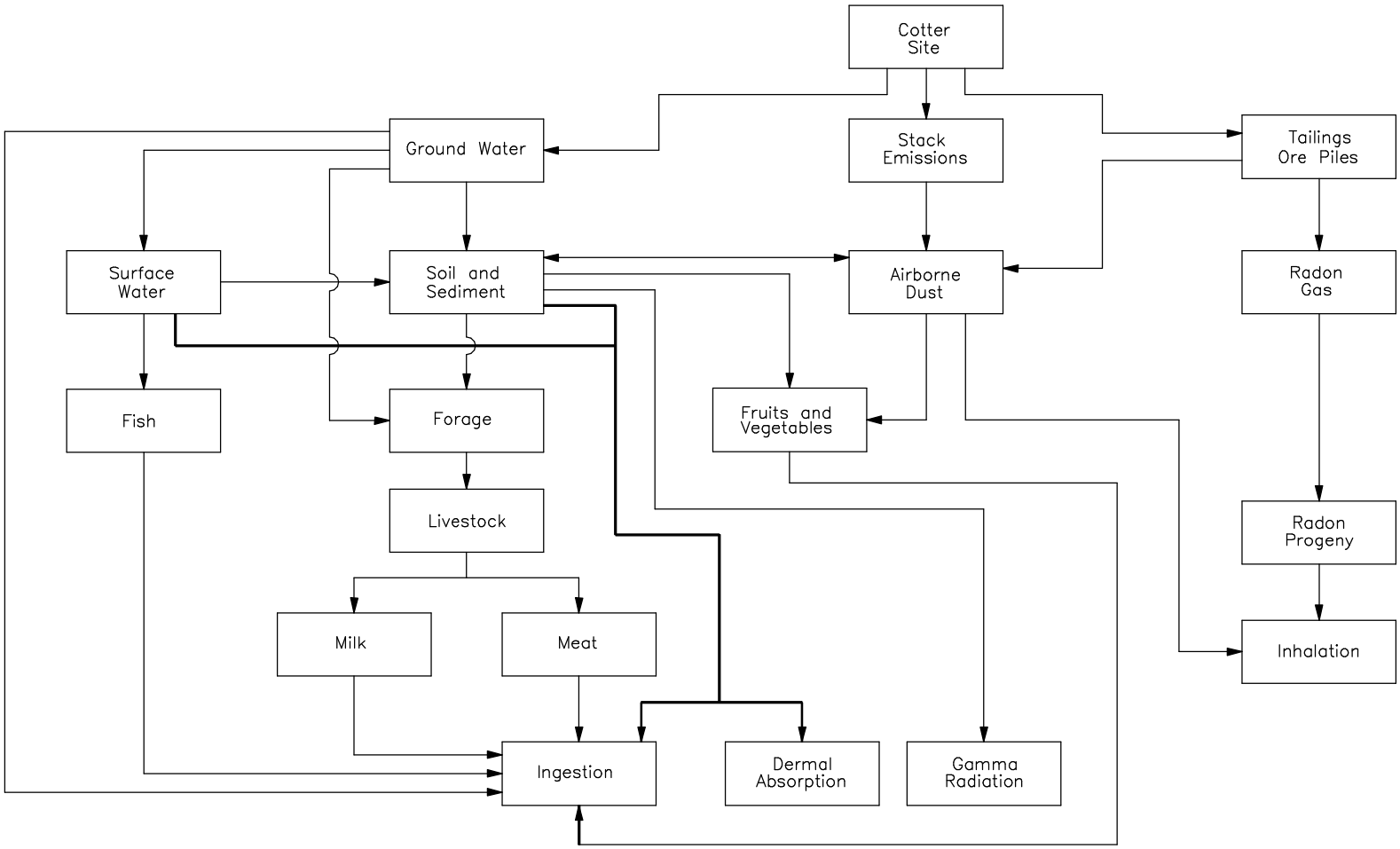
The conceptual model for the Lincoln Park Superfund Site (Figure 5) graphically illustrates the source of contamination, how the contamination might move through the environment, and how people, vegetation, and animals might get exposed to the contamination. The model was used by the risk assessors to focus their sampling and risk assessment efforts on the media and pathways by which people in Lincoln Park site might get exposed to mill-related contaminants.

For the Lincoln Park Superfund Site, the source of contamination was identified as Cotter's Cañon City mill property. The release mechanisms were determined to be ground water, stack emissions from the mill, and the tailings piles. Ground water was also designated as a contaminated medium and an exposure pathway.

The exposure assessment for the Phase III Risk Assessment determined reasonable exposure scenarios and possible pathways by which people might be exposed to mill-related chemicals in the environment.

Figure 5 (Site Conceptual Model, Lincoln Park Superfund Site, Cañon City, Colorado)

T:\CADD\3280-RAC8\025-LincolnPark\ROD\CADD\FIG8.DWG



Source: Phase I HHRA (HRAP, 1991)

Figure 5

Site Conceptual Model

Lincoln Park Superfund Site
Cañon City, Colorado

The Phase III Risk Assessment focused on exposure pathways for current and future residents living in the vicinity of Cotter's Cañon City mill site, based on environmental conditions that existed during the 1994 to 1996 time period. The following pathways were identified as being of main concern for the soils and sediments within the Lincoln Park Study Area:

- Ingestion of soil or dust contaminated by material from the site; and
- External radiation from radionuclides in soil;

7.1.2 Toxicity Assessment

The purpose of a toxicity assessment is to identify the possible adverse health effects (e.g., cancer, internal organ damage) caused by a chemical and the dose level at which these adverse health effects might occur. If the dose, or amount of a given chemical, is present below the level that causes adverse health effects, then that dose is considered safe. If the dose is present at or above the level that may cause adverse health effects, then that dose is viewed as likely to cause adverse health effects.

Also included in the Phase III Risk Assessment was an assessment of the toxicity of chemicals in the environment within the vicinity of Cotter's Cañon City mill site. The toxicity assessment identified possible adverse health effects (e.g., cancer, internal organ damage) caused by certain chemicals and the concentrations at which these illnesses might occur. The toxicity information was grouped into two categories: non-cancerous (i.e., internal organ damage) health effects; and cancerous health effects.

7.1.3 Risk Characterization

Risk characterization is the process of combining information on exposure with information on toxicity in order to estimate the nature and likelihood of adverse health effects occurring in the exposed population (Weston, 1998). Two types of risk evaluated during the risk characterization were cancer and non-cancer. Risk calculations performed in the Phase III Risk Assessment used standard Superfund risk assessment guidance and measured concentration values in environmental media at the site.

The Phase III Risk Assessment evaluated chemicals detected in water, air, soil, or food, unless a chemical could be excluded by one of two tests: 1) the chemical was a beneficial mineral (e.g., iron, sodium, calcium, etc.) and environmental levels would not lead to intakes that exceeded recommended daily intakes; and 2) the chemical existed at a concentration that was far below a level of health concern. A detailed description of the methods used to perform these tests may be found in the Phase II HHRA (Weston, 1996). Chemicals selected for evaluation were called "chemicals of potential concern."

Chemicals of potential concern are chemicals which may be released to the environment from site-related materials or operations and which may pose a health risk to current or future human populations in the area (Weston, 1996). The principal group of chemicals of potential concern are the various metals that may be present in ore material and in mill waste at Cotter's Cañon City uranium mill site. In addition, because uranium is radioactive, there is a family of radioactive decay products that may exist in the ore and waste materials. Table 1 is a list of the chemicals of potential concern for each medium.

Focusing on the surface soils within the Lincoln Park Study Area, the Phase III Risk Assessment provided the following conclusions for current and future residents in Lincoln Park and other areas in the vicinity of Cotter’s Cañon City mill site.

TABLE 1. CHEMICALS OF POTENTIAL CONCERN PHASE III HUMAN HEALTH RISK ASSESSMENT LINCOLN PARK SUPERFUND SITE			
Ground Water	**Air**	**Soil**	**Food**
Non-Radioactive	***Non-Radioactive***	***Non-Radioactive***	***Non-Radioactive***
molybdenum	aluminum	arsenic	arsenic
nickel	arsenic	beryllium	barium
lead	barium	cadmium	cadmium
selenium	chromium	manganese	chromium
sulfate	cobalt	selenium *	cobalt
uranium	manganese		lead
	vanadium		manganese
			molybdenum
			nickel
			strontium
			vanadium
			uranium
			zinc
Radioactive	***Radioactive***	***Radioactive***	***Radioactive***
lead-210	lead-210	lead-210 *	lead-210
polonium-210	polonium-210	radium-226	radium-226
radium-226	radium-226	thorium-230	thorium-230
uranium-234	thorium-230	uranium-234	uranium-234
uranium-238	uranium-234	uranium-238	uranium-238
	uranium-238		
	radon-222		

Notes:

* Was not measured in samples used in the risk-based screen, but was measured in samples from Lincoln Park. Therefore, the chemical was retained for evaluation in the detailed risk assessment.

Source: Phase III HHRA (Weston, 1998)

The Phase III Risk Assessment evaluated the potential risks from incidental ingestion of, and dermal (skin) radiation exposure to, soil near the mill and in the Lincoln Park area. With regard to wind-blown contaminated soil, it was determined that contamination was not detectable in areas north of the mill site. It was therefore concluded that these areas, including Lincoln Park, had not been impacted by air-borne deposition of mill-contaminated soil.

The Phase III Risk Assessment also evaluated the potential for soil to become contaminated by irrigation with contaminated well water. Results of the analysis indicated that some chemicals, including uranium and molybdenum, were present at statistically higher values in areas where irrigation with contaminated well water had occurred. However, these higher values were comparatively small and did not constitute risks that exceeded the normal range of concern.

For areas near the mill and Lincoln Park, it was determined that there was no significant risk of non-cancer illnesses occurring in residents ingesting soil. This conclusion applied to current residents in Lincoln Park, as well as to future residents living on properties closer to the mill.

Two chemicals, arsenic and beryllium, were identified as potentially increasing the risk of cancer when ingested. Estimated cancer risk from ingestion of these two chemicals was found to be almost entirely due to arsenic, with a minor contribution from beryllium.

Concentration data for arsenic was plotted and it was observed that there was no discernible spatial pattern of distribution. This observation supported the conclusion that arsenic levels in the soil had not been measurably altered by airborne releases from the mill.

In addition, it was also observed that arsenic concentrations in areas near the mill and Lincoln Park were similar to arsenic concentrations found in mineralized areas in the western United States. Consequently, it was concluded that the estimated cancer risk from arsenic in soil was natural in origin.

The Phase III Risk Assessment found that cancer risks from exposure to soil would be due almost entirely to external radiation from radium-226. Comparison of site data with naturally-occurring levels present in Cañon City and elsewhere within the State of Colorado concluded that soil concentrations of radium-226 in areas north of the mill property, including Lincoln Park, were within normal background ranges. These findings were a reflection of the successful elimination of risks that was accomplished through implementation of the Sand Creek Soil Cleanup Action. To achieve the desired level of cleanup, the standard was set at 4 picocuries per gram ("pCi/g") for radium-226 as well as for thorium-230. All tailings, soil, and sediment containing levels of radium-226 or thorium-230 above 4 pCi/g were removed from the Sand Creek drainage. This cleanup action made it possible for there to be unrestricted use of this area. Overall, the risk assessment concluded that there were no health risks, due to mill-related contaminants, from soil in yards.

For the complete risk assessment analysis of the chemicals of potential concern, please refer to the Phase III Risk Assessment (Weston, 1998).

7.1.4 Uncertainties

There is always a degree of uncertainty associated with estimates of risk; these include uncertainties regarding estimates of exposure and toxicity. Table 2 summarizes the uncertainties associated with the Phase III Risk Assessment.

TABLE 2. SUMMARY OF UNCERTAINTIES PHASE III HUMAN HEALTH RISK ASSESSMENT LINCOLN PARK SUPERFUND SITE	
Probable Direction of Error	**Source of Uncertainty**
Underestimation of Risk	Lack of toxicity values for all chemicals of potential concern by all exposure routes Lack of local produce samples from areas of highest ground-water contamination
Overestimation of Risk	Use of upper-bound concentration estimates (either the upper confidence level of the mean or the maximum) to calculate exposure Use of conservative estimates of human contact with contaminated environmental media Use of conservative toxicity values to calculate potential risks to humans. Inclusion of naturally-occurring concentrations along with mill-related increases in concentration in all calculations of risk to residents.
Unknown Direction	Variations in analytical measurements Detection limits too high to derive accurate concentrations Toxicological or pharmacokinetic interactions between chemicals

Source: Phase III HHRA (Weston, 1998)

7.2 ECOLOGICAL RISKS

A baseline Ecological Risk Assessment ("ERA") was completed for the Lincoln Park Superfund Site in 1999 (Stoller/Schafer, 1999) and was performed under the direction of a Biological Technical Assistance Group ("BTAG"). The BTAG consisted of representatives from CDPHE, EPA, and Cotter.

The ERA was conducted to assess the potential for adverse ecological effects from the release of: windblown mill tailings; surface-water runoff; and subsurface water. The potentially impacted areas that were studied were Lincoln Park, Cotter's Cañon City mill site, and agricultural and open space lands adjacent to Cotter's property.

Within the context of the site conceptual model, ecological receptors could be exposed to site contaminants through direct contact with contaminated man-made material or ingestion of forage (vegetation) or prey that may have contacted contaminants (Figure 6). For plants and soil invertebrates (insects), direct contact is the most important pathway of exposure.

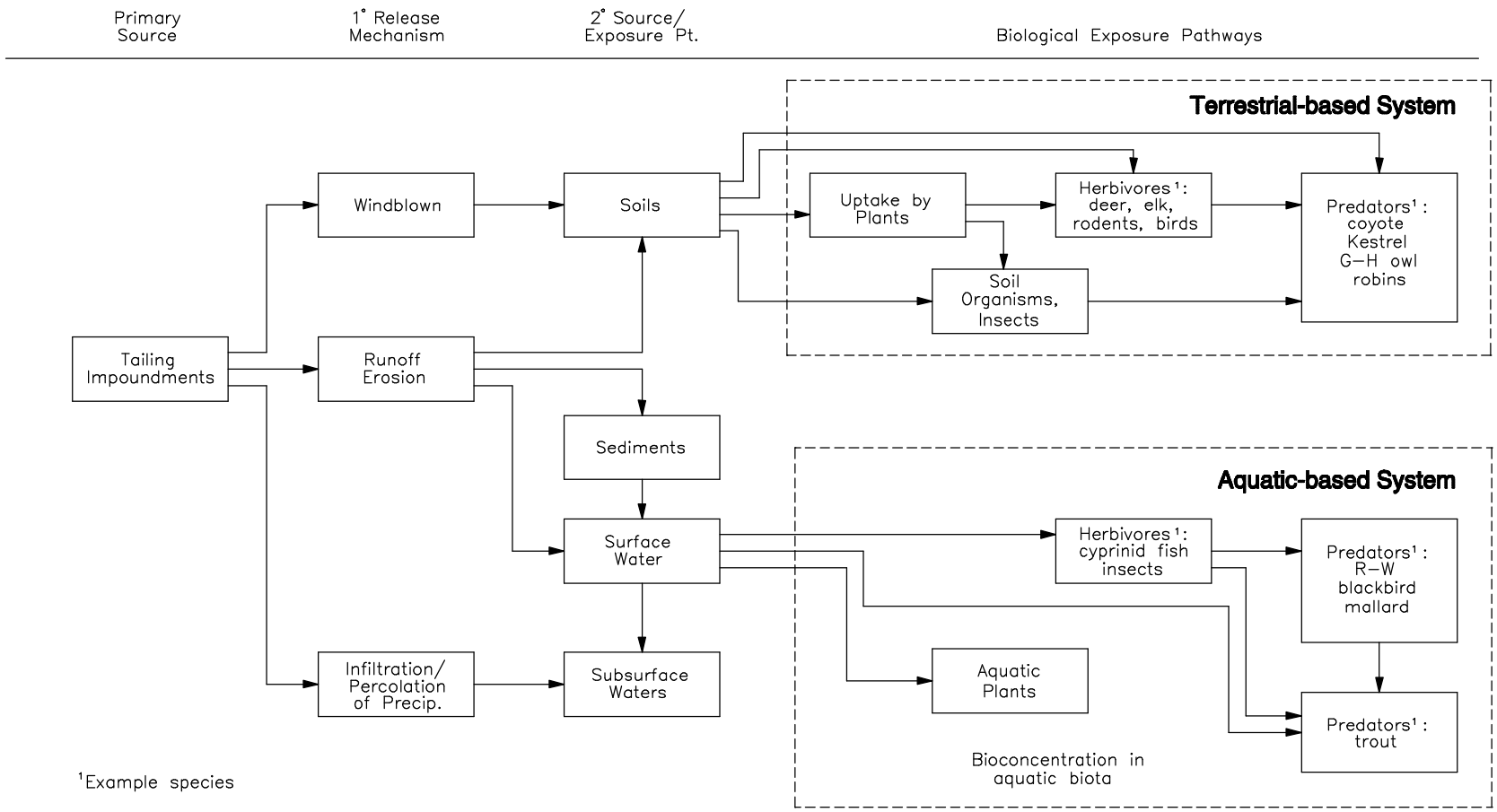
The assessment of ecological risks included both a preliminary screening-level evaluation, which identified data gaps, followed by supplemental sampling and analysis, and a baseline ecological risk assessment. These assessments were conducted in accordance with the most recent EPA guidance for conducting ecological risk assessments (EPA, 1997a).

7.2.1 Screening Level Ecological Risk Assessment

A screening-level risk assessment was conducted to aid in the identification of chemicals of concern ("COCs") associated with the site. These COCs included: arsenic; cadmium; copper; lead; molybdenum; nickel; radium-226; selenium; uranium; and zinc.

Figure 6 (Ecological Site Conceptual Model, Lincoln Park Superfund Site, Cañon City, Colorado)

T:\CADD\3280-RAC8\025-LincolnPark\ROD\CADD\FIG9.DWG

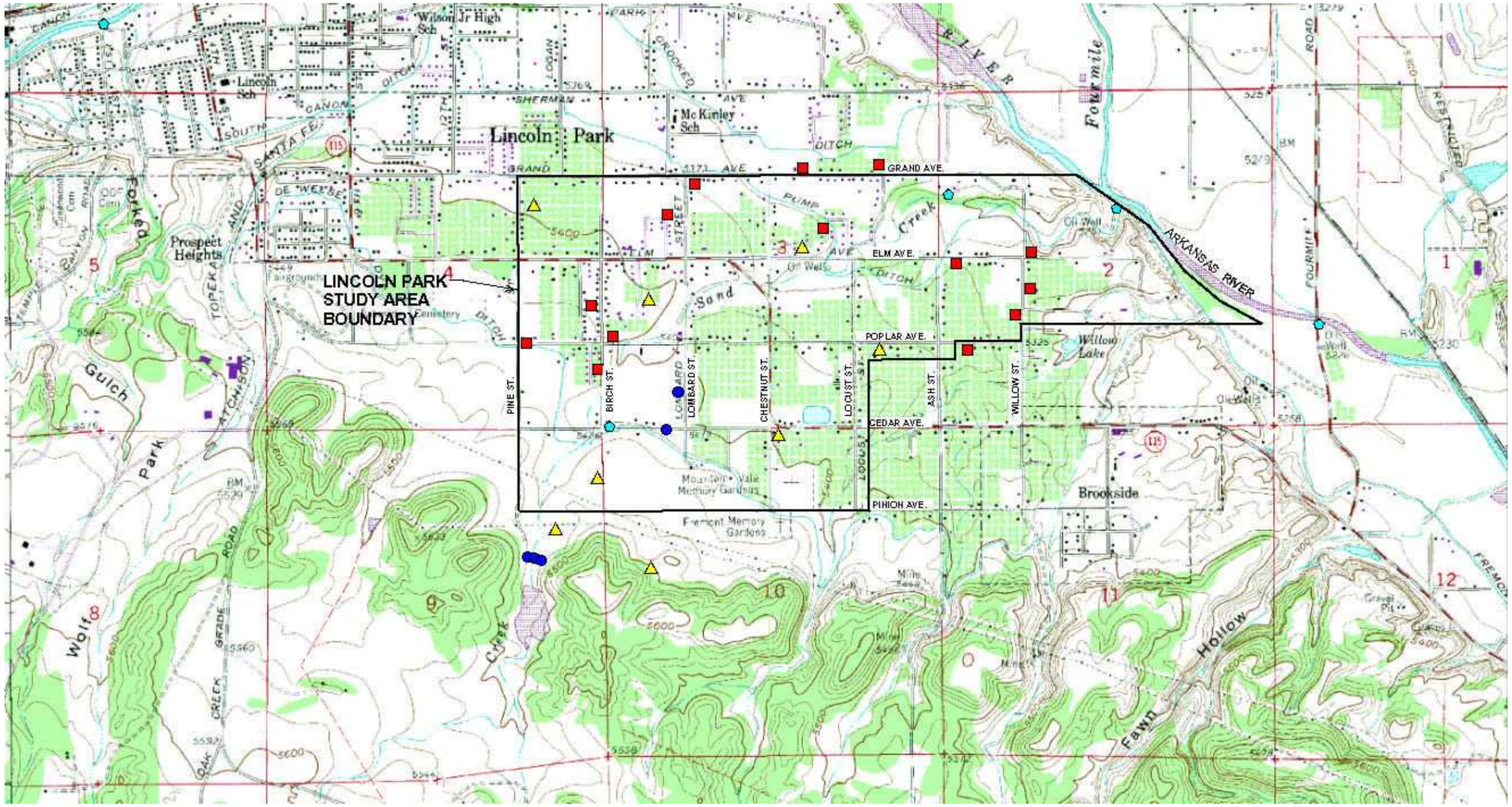


Source: ERA (Stoller/Schafer, 1998)

Figure 6

Ecological Site Conceptual Model

Lincoln Park Superfund Site
Cañon City, Colorado


LINCOLN PARK
STUDY AREA
BOUNDARY
Lincoln Park
Prospect Heights
Brookside
Wilson Jr High Sch
Lincoln Sch
McKinley Sch
GRAND AVE.
ELM AVE.
POPLAR AVE.
CEDAR AVE.
PINION AVE.
PINE ST.
BIRCH ST.
LOMBARD ST.
CHESTNUT ST.
LOCUST ST.
ASH ST.
WILLOW ST.
ARKANSAS RIVER
Fourmile
Willow Lake
Mountain Vale Memory Gardens
Fremont Memory Gardens
Wolf Gulch
Fawn Hollow
Forked Park Creek
Sand Creek
Pump Ditch
Oak Creek Grade Road
Fremont Road
Fourmile Road
Restricted
Santa Fe
Canon
Oil Well
Gravel Pit
Mine
Cemetery
Campground
Golf Course
Temple Canyon Road
Topeka and Atchison
Sherman Ave
Park Ave
Grooked Ave
Logan
De Weese
Ditch
Canon
South
Canon
Canon
Canon

Potential exposure points that were identified included soils, sediments, and surface water in the wetlands that receive runoff from the site. It was determined that both aquatic and terrestrial habitats could potentially be affected by site-related contaminants. Receptor species used in the screening-level ERA were the deer mouse, short-tailed shrew, mule deer, domestic cow, red fox, American kestrel, and American robin.

Prior to the screening-level assessment, supplemental soil, ground water, surface water, air, and vegetation samples were collected. The assessment also used data collected from the remedial investigation (GeoTrans, 1986a), data collected prior to the Phase II HHRA (Weston, 1996), and surface soil data collected in 1996 as part of the Phase III HHRA (Weston, 1998).

7.2.2 Baseline Ecological Risk Assessment: Problem Formulation and Study Design

The following ecological risk management goals were selected for the site:

1. Protect the integrity of wildlife habitat and the vegetation community from adverse impacts as a result of exposure to chemicals of concern ("COCs"); and

2. Protect wildlife populations from adverse impacts due to exposure to COCs.

Toxicity reference values ("TRV") were calculated as part of the toxicity assessment to quantify potential adverse effects on the ecology associated with exposure to COCs at the Lincoln Park Superfund Site.

7.2.3 Ecological Risk Characterization

Following the screening-level ERA, which was based on available soil data, supplemental biological tissue data collected from potential receptors were incorporated into a Phase I ecological risk characterization. If any of the COC/receptor combinations in the Phase I analysis resulted in a Hazard Quotient ("HQ") greater than one, these combinations were evaluated further in Phase II. This second phase included a more detailed analysis to characterize the magnitudes and sources of risk, identify spatial distributions of risk, and provide an assessment of probability that threshold levels might be exceeded. The second phase also characterized any uncertainties that might be associated with the analysis.

Based on the Phase II analysis, potential risks were characterized for vegetation, small mammals (deer mouse), ruminants, mammalian predators (red fox), avian predators (American kestrel and great horned owl), and aquatic life.

Vegetation

Although soil concentrations were found to exceed plant benchmark values (i.e., ecological screening values) for some chemicals of concern, the risk of impact to the vegetation community was determined to be minimal.

Small Animals

Risks to small mammals (i.e., deer mouse), from exposure to arsenic, radium-226, cadmium, and selenium, were found to be minimal for individuals and negligible for small mammal populations. This means that there may be a potential risk to certain more sensitive individuals, but that overall, the risk is below established action levels for the small mammal populations. In other words, exposure risks are no different than the risks associated with uncontaminated locations.

Ruminants

For the purposes of this discussion, the term “ruminants” is referring to cattle, horses, sheep, mule deer, and elk. Selenium concentrations in the vegetation and soil were found to pose no risk to mule deer, elk, or other wild ungulates. In addition, it was determined that the levels of selenium did not pose a risk to cattle or horses that might be grazed in pastures.

Risks to mule deer from arsenic, cadmium, and zinc were found to be minimal and for molybdenum, negligible. This means that there may be a small potential risk, for certain more sensitive deer, posed by arsenic, cadmium, and zinc; while the risk from molybdenum is below the action level. The potential for toxic exposure is associated with the scenario in which individual animals would spend weeks feeding in small areas northwest of the mill.

Molybdenum concentrations and low copper:molybdenum concentration ratios found in vegetation adjacent to the mill property were determined to have the potential to cause molybdenosis in cattle and sheep. However, evaluation of soil and vegetation data showed that low copper:molybdenum ratios were, for the most part, due to naturally low copper concentrations in soils of the area.

Mammalian Predators

Risks to predators such as fox, coyote, and cougar were determined to be negligible.

Avian Predators

Risks from toxic exposure to copper, radium-226, cadmium, and selenium were found to be negligible for the American Kestrel and Great Horned Owl. For lead, individual kestrels

or owls could be at risk if they fed a majority of the time at the site, but risks to populations were determined to be negligible. These raptors and their feeding behaviors were deemed to be representative of typical avian predators.

Aquatic Life

Aquatic risks were characterized based on data collected in the Arkansas River and Willow Lakes areas, and in those portions of Sand Creek with surface-water flows. Results of a study of the Arkansas River indicated that adverse impacts from Cotter's Cañon City mill site were minimal (Cotter, 1992). Results of a study of the Willow Lakes area also indicated that risks to aquatic life were minimal (Cotter, 1993). For the portions of Sand Creek that have flowing surface water and that are downgradient of Cotter's Cañon City mill site, risks to aquatic life from waterborne chemicals of concern were determined to be minimal (Stoller/Schafer, 1998).

Risk Management Recommendations

Overall, ecological risks and adverse impacts within the Lincoln Park Study Area appear to be minimal. Therefore, large-scale soil remediation aimed at reducing ecological risk was not recommended for Lincoln Park.

8.0 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Lincoln Park Study Area was released for public comment on June 26, 2000. The Proposed Plan described cleanup actions involving the cleanup of contaminated soils at three separate offsite railroad unloading areas outside the boundaries of the Lincoln Park Study Area. Although not directly related to the soil problems within the Lincoln Park Study Area, cleanup activities for the railroad unloading area(s) were described in the Proposed Plan in order to portray a more complete picture of cleanup actions that have been implemented. Because contamination at the offsite railroad unloading areas did not contribute to the soil contamination within the Lincoln Park Study Area, discussion of the cleanup actions for these locations has not been included in this Record of Decision ("ROD").

The Proposed Plan identified "No Further Action" as the appropriate remedial action for the Lincoln Park Study Area. Although the Proposed Plan identified EPA's and CDPHE's preference for no further action for the entire Lincoln Park Study Area, the remedy decision discussed in this ROD pertains only to the surface-soils portion of the Lincoln Park Study Area. A final decision regarding the ground-water portion of the Lincoln Park Study Area will be made at a later date.

EPA and CDPHE reviewed all oral and written comments submitted during the public comment period. Based on public comments received during the public comment period, EPA and CDPHE have concluded that issuance of a No-Further Action ROD for the Lincoln Park surface soils is appropriate at this time. There are several reasons why EPA and CDPHE have chosen to postpone final decision-making for the ground-water portion of the Lincoln Park Study Area.

First, at the time the Proposed Plan was issued, the uranium cleanup objective established for the Remedial Action Plan was 0.035 mg/L. On December 7, 2000, EPA promulgated a drinking water standard for uranium (0.030 mg/L). Because this new standard is Relevant and Appropriate[2] to the site cleanup, the Remedial Action Plan will be modified to meet the requirements of the new regulation. Procedures for modifying a ground-water standard are described in the Remedial Action Plan. The first step in the procedure is to collect ground-water data from designated Lincoln Park compliance wells for a specified period of time. A final remedy decision for the ground water under Lincoln Park will not be made until such time as the cleanup objective for the Remedial Action Plan has been modified to meet the requirements of the new drinking water regulation.

Secondly, although monitoring data indicate that the ground-water quality under Lincoln Park is gradually improving, there are portions of the aquifer that remain above cleanup objectives for uranium and molybdenum. Several members of the public expressed concern about issuing a No-Further Action ROD for ground water under these circumstances. Consequently, a final remedy decision for the ground water will be postponed. In order to effectively monitor the ground-water quality under Lincoln Park, EPA and CDPHE have concluded that it would be appropriate to expand the existing ground-water monitoring program for the Lincoln Park Study Area. This decision is in direct response to public comments.

The existing ground-water monitoring program is a requirement under the Radioactive Materials License for Cotter's Cañon City mill. Results of the monitoring program are reviewed by EPA and CDPHE to ensure continued compliance with cleanup objectives. Results from sampling events have been, and will continue to be, documented in Cotter's annual reports, which are available at the Cañon City Public Library.

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[2] Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that address problems or situations sufficiently similar to those encountered at a CERCLA site that their use is well suited to the site.

Finally, although not the subject of the Proposed Plan or Record of Decision, numerous public comments were submitted on the topic of deletion/delisting. Many of the comments expressed an interest in delaying this process. In response to these concerns, the delisting/deletion process for the ground-water portion of the Lincoln Park Study Area will be postponed.

However, because EPA has determined that: (1) no further cleanup action is necessary for the surface soils within the Lincoln Park Study Area; and (2) there are no longer any unacceptable risks posed by the surface soils, EPA is able to proceed with deleting the surface soils portion of the Lincoln Park Study Area from the National Priorities List ("NPL").

Deletion/delisting of the ground-water portion of the Lincoln Park Study Area will be considered at a later date and not until: (a) sufficient data have been collected to demonstrate that the PRTW is operating effectively; and (b) ground water under Lincoln Park is in compliance with cleanup objectives throughout the aquifer underlying the Lincoln Park Study Area. Any decision regarding deletion/delisting of the ground-water portion of the Lincoln Park Study Area will be based on whether or not any further actions are necessary to achieve cleanup objectives.

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APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY FOR THE LINCOLN PARK STUDY AREA PROPOSED PLAN LINCOLN PARK SUPERFUND SITE

This Responsiveness Summary provides responses to comments received by the United States Environmental Protection Agency ("EPA") and the Colorado Department of Public Health and Environment ("CDPHE") regarding the Proposed Plan for the Lincoln Park Study Area. This Proposed Plan was issued June 20, 2000. Individual comment letters, e-mail messages, and a transcript of the July 17th public meeting are included in the administrative record for this decision, and are available for review at the Cañon City Public Library, 516 Macon Avenue, Cañon City, Colorado 81212, at the offices of CDPHE, Laboratory Building, Laboratory and Radiation Services Division, 8100 Lowry Boulevard, Denver, Colorado 80230-6928 (attn: Michelle Lavigne), and at the EPA Superfund Records Center, 999 18th Street, 5th floor North Terrace, Denver, Colorado 80202. EPA and CDPHE have given full consideration to these comments.

Although the Proposed Plan relates only to soil and ground-water cleanup actions in the Lincoln Park Study Area, comments were received on two additional issues. The first issue was whether or not EPA should remove the Lincoln Park Study Area from the National Priorities List (delisting/deletion). The second issue related to operations under Cotter Corporation's Radioactive Materials License for the Cañon City mill. EPA and CDPHE want to respond to all concerns raised during the comment period for the Proposed Plan. However, since some of these issues do not relate directly to the Proposed Plan, EPA and CDPHE have separated those comments relating to delisting/ deletion and radioactive materials licensing from the comments relating to the Proposed Plan.

Finally, in situations where written comments or oral comments expressed similar ideas or concerns, these ideas or concerns were combined into a single comment. Each individual piece of written correspondence received regarding the Proposed Plan for the Lincoln Park Study Area, and the official verbatim transcript of the July 17, 2000 public meeting, are a permanent part of the Administrative Record for the Lincoln Park Superfund Site.

PROPOSED PLAN ISSUES

Comment No. 1

One commenter encouraged EPA to implement the Proposed Plan. The commenter indicated that by implementing the No Further Action proposal, the Lincoln Park Study Area could then be removed from the National Priorities List. The commenter also stated comfort with the planned monitoring, and continued involvement of, EPA and CDPHE.

Response to Comment No. 1

The No Further Action proposal is consistent with this individual's comments. EPA and CDPHE believe that all necessary actions regarding the Lincoln Park Study Area have been taken, and that the data showing decreasing ground-water contamination are evidence that these measures have been effective. However, EPA has decided to only issue a Record of Decision ("ROD") for surface soils within the Lincoln Park Study Area. This decision is based on the following factors:

- public comments received during the comment period for the Proposed Plan;
- recent publication of the new EPA drinking water standard for uranium in ground water; and
- additional evaluation of the appropriateness of issuing a "No Further Action" decision under existing circumstances at the Lincoln Park Superfund Site.

EPA continues to believe that past and ongoing cleanup actions have substantially reduced or eliminated the risks to human health and the environment. Implementation of the conditions and terms of Cotter's Cañon City mill Radioactive Materials License and Remedial Action Plan ("RAP") will continue to ensure the protection of human health and the environment. To verify that no unacceptable exposures to risks posed by the site occur in the future, the existing ground-water monitoring program will be expanded. EPA's and CDPHE's decision to expand the ground-water monitoring program is in direct response to public comments received. Results of the monitoring program will be reviewed by EPA and CDPHE to ensure continued compliance with applicable cleanup objectives.

Comment No. 2

One commenter questioned whether it was safe to drink well water in Lincoln Park.

Response to Comment No. 2

Lincoln Park residents should not use their ground-water wells for drinking purposes, unless their wells have been tested and shown to be below cleanup objectives. Lincoln Park residents who have been affected by the presence of contaminated ground water have all been offered city water, and it is our understanding that all of these residents have been hooked-up to the city water system. Additional hookups are available if anyone is found to be drinking well water within the designated impacted area.

Although there is currently a portion of Lincoln Park with ground water in exceedance of cleanup objectives, ground-water monitoring results indicate that elevated levels of uranium and molybdenum in the aquifer are decreasing with time.

Comment No. 3

One commenter suggested that since there has been contamination of vegetables irrigated with ground water, additional cleanup is required to make the area safe. Another commenter asked about the risks associated with eating vegetables.

Response to Comment No. 3

In 1998, a risk assessment was performed to evaluate potential risks from eating garden vegetables that were primarily irrigated with contaminated ground water. In order to perform the assessment, samples of vegetables were collected from gardens within the Lincoln Park Study Area. It should be noted that the risk assessment did not collect samples of produce irrigated with water from wells with the highest concentration levels of molybdenum or uranium because residents in these areas were either not using the ground water or did not provide samples of their garden produce. It was subsequently confirmed that no one was irrigating fruits and vegetables with the contaminated ground water found upgradient of the DeWeese Dye Ditch, which is where the highest concentrations of contaminants are found.

Analyses of the samples that were collected showed that there was no evidence of mill-related contamination, except in the case of turnips. It was observed that molybdenum may have a tendency to accumulate in the outer skins of turnips. The molybdenum accumulation in turnips did not appear to extend to the inner portion of the vegetable. It was therefore concluded that vegetable uptake of contamination may be possible, but was not widespread. Consequently, the risk assessment concluded that there were no health risks from mill-related contaminants to Lincoln Park residents from the soil in their yards or gardens or from eating home-grown fruits or vegetables.

Comment No. 4

What about the risks posed to wildlife and domestic animals from eating the grass and vegetables?

Response to Comment No. 4

This issue was studied in the ecological risk assessment performed for the Lincoln Park Study Area. The ecological risk assessment determined that, overall, potential risks at the site are negligible and any areas of concern are from non-radioactive metals. For the Lincoln Park Study Area, the ecological risk assessment drew the following conclusions:

- Risks to small mammals (i.e., deer mouse), from exposure to arsenic, radium-226, and selenium, were found to be minimal for individuals and negligible for small mammal populations. This means that there may be a potential risk to certain more sensitive individuals, but that overall, the risk is below established action levels for the small mammal populations.

- Selenium concentrations in the vegetation and soil in Lincoln Park were found to pose no risk to mule deer, elk, or other wild ungulates. Risks to mule deer from arsenic, cadmium, and zinc were found to be minimal, and negligible for molybdenum. This means that there may be a small potential risk, for certain more sensitive deer, posed by arsenic, cadmium, and zinc; while the risk from molybdenum is below the action level. In addition, it was determined that the levels of selenium did not pose a risk to cattle or horses that might be grazed in pastures.

- Overall risks to predators such as fox, coyote, and cougar are negligible.

- Risks from toxic exposure to copper, radium-226 and selenium were found to be negligible for the American Kestrel and Great Horned Owl.

Comment No. 5

Are there ecological risks to animals eating the contaminated wind blown dust?

Response to Comment No. 5

If the commenter is concerned about conditions within the Lincoln Park Study Area, please see the previous response.

If the commenter is referring to risks associated with the areas adjacent to Cotter's Cañon City mill property, the potential ecological risks associated with contaminated soil and wind blown dust were determined to be minimal, based on the results of the ecological risk assessment.

Comment No. 6

Several commenters indicated that it was their understanding that the cleanup of Sand Creek stopped at a point in the 1700 block of Elm Avenue and wondered why the cleanup had not been extended to the east. The commenters also expressed their belief that none of the cleanup actions to date had stopped contaminants from contaminating Sand Creek and certain wells in Lincoln Park.

Response to Comment No. 6

Sediment removal from Sand Creek began on Cotter property and proceeded downstream until the point where Sand Creek becomes a perennial stream, west of Ash Street. Sediments within that portion of Sand Creek that is perennial were sampled as part of the Ecological Risk Assessment. Results from the sampling indicated no elevated levels of contaminants in Sand Creek sediments, nor where Sand Creek enters the Arkansas River.

In addition, water samples are regularly taken from Sand Creek near Ash Avenue. In 2000, the highest concentration of molybdenum was 0.011 milligrams per liter ("mg/L") and the highest concentration of uranium was 0.0134 mg/L (*Calendar Year 2000 Environmental and Occupational Performance Report and ALARA Review* ["2000 Annual Report"], Cotter Corporation, June 30, 2001). These values are well below the ground-water cleanup objectives of 0.1 mg/L for molybdenum and 0.035 mg/L for uranium. Furthermore, the concentration for uranium is also well below EPA's drinking water standard, or maximum contaminant level ("MCL") of 0.030 mg/L, which was promulgated on December 7, 2000.

EPA's and CDPHE's proposal of no further action was based on information obtained from reports that have been produced over the past several years. EPA's and CDPHE's proposal was also based on the results of cleanup actions that have taken place in Lincoln Park and at Cotter's Cañon City mill. The above mentioned reports are available for review in the Cañon City Public Library.

EPA and CDPHE will continue to be involved with monitoring activities at Cotter's Cañon City mill and will continue to review data obtained from monitoring wells in Lincoln Park.

Comment No. 7

Which wells are being used in the monitoring network? Are there enough? How long will these wells be monitored?

Response to Comment No. 7

Initially, over 200 wells were sampled to delineate the nature and extent of contamination in the vicinity of Cotter's Cañon City mill. Currently, there are over 50 locations that are monitored for water levels and/or water quality. These sampling locations include ground-water wells and surface-water sites. All monitoring results are reported in annual reports, which are issued by Cotter and reviewed by CDPHE and EPA. Ground-water monitoring in Lincoln Park will continue until the Radioactive Materials License is terminated.

There are an adequate number of wells to evaluate Cotter's compliance with pertinent license requirements and to monitor the ground-water quality under Lincoln Park. However, in response to public concerns, EPA and CDPHE have determined that additional ground-water sampling locations are needed to adequately define the extent of the uranium and molybdenum plumes. Therefore, EPA and CDPHE have developed an expanded ground-water monitoring program to accomplish this goal. Approximately twelve additional ground-water monitoring wells will be added to the existing monitoring program. Expansion of the existing program was initiated in the spring of 2001.

Comment No. 8

The government should do surprise inspections and collect independent data. The government should not just rely on Cotter to report monitoring results.

Response to Comment No. 8

CDPHE has a policy of conducting both announced and unannounced inspections. Announced inspections are sometimes necessary to ensure that personnel, such as the laboratory supervisor, the radiation safety officer, or the Quality Assurance/Quality Control ("QA/QC") representative are available to meet with the CDPHE inspector.

CDPHE collects split samples when Cotter personnel perform certain sample collections. The term "split" means that a sample is divided into two separate samples. One sample is then analyzed by the Cotter lab and the other is analyzed by CDPHE to verify laboratory analytical results. CDPHE collects both ground water and soil split samples. To date, analytical results for samples collected by Cotter personnel have been comparable to the analytical results for split samples collected by CDPHE.

With regard to the monitoring of soil cleanup activities, both CDPHE and EPA have independently conducted gamma surveys to verify that cleanup actions have been properly implemented. In a few cases, these independent surveys resulted in Cotter personnel performing additional soil removal.

Comment No. 9

How does the permeable reactive treatment wall work?

Response to Comment No. 9

The permeable reactive treatment wall ("PRTW") was installed to treat the 1 to 3 gallons per minute ("gpm") of ground water that continues to flow under the Soil Conservation Service ("SCS") Dam. The PRTW contains a layer of zero-valent iron ("ZVI") filings. These iron filings react chemically with the uranium and molybdenum within the ground

water passing through the PRTW. As a result of the chemical reaction, the dissolved uranium and molybdenum attach themselves to the iron filings and are consequently removed from the ground water. It is anticipated that the iron filings (the reactive medium in the wall) will last from 20 to 50 years and the system has been designed such that the iron filings can be replaced if necessary.

Comment No. 10

What are the factors that will impact the life expectancy of the Permeable Reactive Treatment Wall ("PRTW")? What will happen to the spent iron filings and “trapped” contamination?

Response to Comment No. 10

As discussed in the document entitled *Final Design for a Permeable Treatment Wall Down Gradient from the SCS Barrier*, dated April 3, 2000, there is no historical information on life expectancy for permeable reactive barriers that have been constructed to treat uranium and molybdenum contamination in ground water. Factors that may influence removal of the zero-valent iron ("ZVI") from the PRTW include:

- loss of permeability through the reactive gate;
- reaching capacity of the ZVI to reduce the concentration of uranium and molybdenum;
- desorption of either uranium or molybdenum from the ZVI;
- development of the property and institutional controls; and
- when cleanup objectives are met.

The PRTW is designed so that the ZVI can be accessed, removed, and replaced with new material if any of the above factors are determined to exist. Once the iron filings become saturated with uranium and molybdenum, the filings will be removed and placed in the lined impoundments.

Comment No. 11

How do you measure the effectiveness of the Permeable Reactive Treatment Wall?

Response to Comment No. 11

Ground-water samples are collected both upgradient and downgradient, as well as within the reactive medium (iron filings). Monitoring locations within the reactive medium are being sampled monthly during the first year of operation and will be sampled quarterly thereafter. Monitoring wells located in the shallow aquifer are sampled quarterly. Samples are analyzed in the laboratory, evaluated, and then the results are submitted to EPA and CDPHE for review.

Comment No. 12

How can we judge the effectiveness of the Permeable Reactive Treatment Wall ("PRTW"), given that it has been operating for such a short period of time?

Response to Comment No. 12

Although the PRTW has only been in operation since June 2000, initial monitoring results suggest that the PRTW is effectively removing uranium and molybdenum from the ground water. Nevertheless, EPA and CDPHE will continue to evaluate data as it becomes available and will make a determination as to the PRTW's long-term effectiveness only after sufficient data have been collected. It is estimated that a minimum of one year of data may be needed to make such a determination. This is another reason why EPA and CDPHE have decided to temporarily postpone issuing a decision on the ground-water portion of the Lincoln Park Study Area.

Comment No. 13

How will EPA and CDPHE address the uncertainty associated with future catastrophic events that might warrant EPA involvement?

Response to Comment No. 13

Under the authorities granted by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA") and requirements contained in the Radioactive Materials License for Cotter's Cañon City mill, the state and federal governments have the authority to take action in response to any potential adverse impacts to human health or the environment from Cotter's Cañon City mill. In addition, EPA maintains an active emergency response program that can be activated immediately if there is a major threat to public health.

Also, the Radioactive Materials License contains requirements and protocols for reporting accidents and emergency response capability. Under the license, Cotter is required to immediately report any discovery of failure, or imminent threat of failure, to CDPHE. CDPHE, in turn, keeps EPA informed of all significant actions taken in connection with Cotter's operations.

Comment No. 14

One commenter stated it was not clear what effect the Proposed Plan remedy would have on the notations for real estate. The commenter also asked whether reference to potential contamination would be removed from deeds and, if so, how this would happen.

Response to Comment No. 14

Neither EPA nor CDPHE has directed that any reference to contamination be included in any title documents. The remedy, as proposed by EPA and CDPHE, was based on the conclusion that EPA and CDPHE believe that, due to the effectiveness of prior cleanup activities, there is no risk to human health or the environment and that no additional cleanup is necessary within the Lincoln Park Study Area. However, in light of some other issues that were raised during the public comment period [please see Response to Comment No. 1], EPA has decided to postpone issuance of a Record of Decision ("ROD") for the ground-water portion of the Lincoln Park Study Area and instead, issue a ROD for only the surface-soils portion of the site.

In any event, the effect that an EPA or CDPHE decision would have on real estate title documents and deeds would depend upon the guidelines and requirements established by the real estate community.

Comment No. 15

One commenter asked whether the boundary of the Lincoln Park Study Area Operable Unit had changed since the study began.

Response to Comment No. 15

A specific boundary for the Lincoln Park Study Area was not drawn until 1998. Since that time, the boundary has not changed. The boundary was drawn in response to real estate professionals who were allegedly stating that any property in an area as large as Fremont County was potentially within the Superfund site boundary. The boundaries of the Lincoln Park Study Area were established based on the potential extent of ground-water contamination.

Comment No. 16

Can we project when the molybdenum and uranium plumes might disappear completely?

Response to Comment No. 16

No. It is not the goal of the ground-water cleanup effort to completely eliminate concentrations of molybdenum and uranium in the ground water. Rather, EPA's and CDPHE's goal is to ensure that the concentration levels of these contaminants meet objectives that protect human health and the environment. In areas where the goals have not yet been met, restrictions called institutional controls have been put into place.

While it is not possible to predict when the plumes might disappear completely, efforts have been made to predict concentration trends over time. In a document entitled, *Ground-Water Hydrology and Simulation of Five Remediation Alternatives for an Area Affected by Uranium-Mill Effluent Near Cañon City, Colorado*, Water Resources Investigations Report 98-4229, 1999, the United States Geological Survey ("USGS") reported that remedial actions implemented prior to 1996 would likely result in long-term decreases in concentrations of uranium downgradient of the mill site.

Ongoing collection of data from the ground-water monitoring program can be used to observe future ground-water quality trends. In comparing the data, evidence suggests that ground-water quality in Lincoln Park is improving over time. The ground-water monitoring program is a tool that will allow EPA and CDPHE to evaluate these trends.

DELISTING/DELETION ISSUES

Comment No. 17

Several commenters expressed the desire to have the Lincoln Park area removed from the National Priorities List ("NPL" or "Superfund List"). Some of these comments were qualified, stating that the area should be delisted only if it was safe to do so.

Response to Comment No. 17

EPA and CDPHE have reviewed the Lincoln Park Study Area data, and have determined that the removal of contaminated soils, coupled with the current institutional control (providing city drinking water to Lincoln Park residents) removes all exposure pathways to contaminants. Further, data showing the continuous improvement in ground-water quality in the Lincoln Park Study Area indicate that the cleanup actions taken to date at the mill have effectively eliminated the source of ground-water contamination.

However, it is current EPA policy that a site such as the *entire* Lincoln Park Study Area cannot be deleted from the National Priorities List ("NPL") until the ground water under Lincoln Park has reached cleanup objectives throughout the entire aquifer.

Although the current policy toward ground-water cleanup does not allow for deletion of the *entire* Lincoln Park Study Area at this time, the surface soils portion of the site *is* eligible for deletion because the soils cleanup actions have eliminated the risks associated with contaminated sediments within the Sand Creek drainage. A separate public comment period would be held for any delisting proposal prepared by EPA.

Comment No. 18

Several commenters expressed the desire to have EPA and CDPHE continue to monitor, to ensure that the remedy is, and remains, protective of human health and the environment. In a related issue, one commenter stated a concern that removing the Lincoln Park Study Area from the National Priorities List might cause Cotter to become lax in their commitment to human health and environmental protection.

Response to Comment No. 18

Monitoring of Cotter's Cañon City mill and within the Lincoln Park Study Area is required under the Radioactive Materials License. Ground-water monitoring and air-quality monitoring are reported annually. This information is summarized in reports that are available at the Cañon City Public Library.

CDPHE reviews the data from each monitoring event to ensure that air quality remains within state standards, and that water quality is improving. CDPHE can, through the license, require Cotter to correct any problems detected as a result of these monitoring programs. EPA will also review this data to ensure that the cleanup continues to be protective of human health and the environment. The purpose of these reviews is to confirm that human health and the environment are being effectively protected. These reviews are also performed to evaluate whether or not the original cleanup levels have remained protective. If a given review determines that the cleanup actions are no longer protective, appropriate action may be taken to address the problems identified.

CDPHE and EPA meet to discuss Superfund sites regularly, and if necessary, CDPHE will alert EPA of any problems that may arise, regardless of the five-year review time frame. Since both CDPHE and EPA maintain all of their authority to regulate Cotter's Cañon City mill regardless of the Superfund listing status, EPA and CDPHE have no intention of allowing operation of the mill to become lax.

The State and EPA have the authority to take enforcement action even if a site is not on the National Priorities List ("NPL"). If a site is on the NPL, it is eligible for federal funds to be used for cleanup. However, if there is a responsible party that can perform the cleanup work, listing on the NPL is not required. Several sites in the State of Colorado that are not on the NPL are being cleaned up under EPA supervision. Removing a site from the National Priorities List does not take away any of the State's or EPA's authority to deal with either an emergency situation or a non-emergency situation.

Comment No. 19

Several commenters stated that they were opposed to the delisting of the Lincoln Park Study Area as a Superfund site because they believed that there is a need to see more cleanup results before delisting. This includes treatment results from the permeable reactive treatment wall, and additional or complete disappearance of the contaminated ground-water plumes underneath the Lincoln Park Study Area.

The commenters also indicated that they were not convinced that there had been improvements in the quality of the water or soil. In addition, the commenters stated that they did not believe that there was any improvement in public perceptions of the perceived risks to the health and well being of the general public. Also, one commenter stated that they believe that past contamination still exists, has not been cleaned up, and that it is unknown whether current contamination is being stopped.

Response to Comment No. 19

The subject of delisting has been addressed in the Response to Comment No. 17. Regarding the commenters desire to see additional or complete disappearance of the contaminated ground-water plume underneath the Lincoln Park Study Area, EPA and CDPHE have data that confirm improvements in the ground-water quality and improvements in soils where removals were deemed necessary.

EPA and CDPHE consider protection of human health and the environment to be the highest priority. Conclusions from the risk assessment process for the Lincoln Park Superfund Site indicate that risks no longer exist to residents. Delisting of the Lincoln Park Study Area will not be considered until data demonstrate that the PRTW is operating effectively and the ground water under Lincoln Park has reached cleanup objectives throughout the entire aquifer.

Comment No. 20

One commenter was opposed to the delisting of the Lincoln Park Study Area as a Superfund site until there is a more complete understanding of the linkage between contamination and observed illnesses in the community, particularly autoimmune diseases.

Response to Comment No. 20

The linkage between contamination from Cotter's Cañon City mill and the incidence of autoimmune diseases in the community has not been shown. Although EPA and CDPHE know about the effects of certain contaminants, it is difficult to prove a cause and effect relationship between a given person's illness or the statistical prevalence of an illness in a community.

The three cancer studies performed by CDPHE did not show any statistically higher incidences of cancer in the Lincoln Park neighborhood. This is not to say that none of the cancers in the neighborhood were a result of the contamination from Cotter's Cañon City mill; they may have been. It only shows that widespread effects cannot be proven.

Health Sciences in the United States have advanced dramatically in the last 100 years, however there remain areas where unknowns exist. The linkage between contamination from Cotter's Cañon City mill and the incidence of autoimmune diseases in the community is one of these unknowns. If Cotter were still contaminating the Lincoln Park community, this might be a reason to require further action, but this is not the case.

Adverse health effects associated with exposure to radionuclides, such as carcinogenicity and effects on the immune system, are well documented in scientific literature. Those effects, however, are associated with the dose of radiation received. The dose-response relationship applies to radionuclides, just as it does with any other chemical or contaminant. At low doses it is highly unlikely that any adverse effects will occur, and with increasing dose, one will see an increase in the severity of effect. This quantitative relationship between the dose of radionuclides and the effects observed have also been well documented (e.g., *Federal Guidance Report #13, Cancer Risk Coefficients for Environmental Exposure to Radionuclides*).

The risk assessment conducted for the Lincoln Park Study Area looked at the level of radionuclides that were present in the area, and making use of this relationship between dose and effect, looked at the potential for risk to the residents in the area. The risk assessment concluded that there was a potential for unacceptable risks at some of the wells in the Lincoln Park Study Area, if residents were using those wells as their only drinking water source. It also concluded that the levels of radionuclides in soil in the Lincoln Park Study Area were consistent with typical background levels in Colorado.

As far as the Proposed Plan is concerned, it is important to note that any possible illnesses caused by Cotter's Cañon City mill would have been a result of past contamination. EPA and CDPHE are fully aware of the neighborhood's concern and frustration regarding this past contamination. However, the issue at hand is the current status of that contamination, and whether or not people are still being exposed to levels of contaminants that put their health at risk.

Past contamination, which may or may not have resulted in specific illnesses, only contributes to this decision in terms of how much of this contamination may remain. EPA's responsibility under the law is to clean up contaminated sites that may present risks to human health or the environment. Consequently, any decision regarding the delisting of the Lincoln Park Study Area will be based on whether the cleanup actions taken to date will be protective and whether or not these actions will ensure that people will not be drinking water in excess of the cleanup objectives.

Comment No. 21

Several commenters stated that decisions on "No Further Action" and delisting were politically motivated, and that environmental protection should be more important than stigma. One commenter specifically indicated that they believed EPA was considering delisting the Lincoln Park Study Area just to remove the stigma of a "Superfund" label.

Response to Comment No. 21

Although deletion of the Lincoln Park Study Area would in effect remove the Superfund stigma from the Lincoln Park community, this is not the basis for EPA's proposal for deletion. EPA has been considering deletion of the Lincoln Park Study Area from the NPL because we believe that no further remedial actions are required and that current conditions in the Lincoln Park Study Area are protective of human health and the environment. In addition, EPA and CDPHE have heard from some residents that the issue of "Superfund stigma" was important to the community of Lincoln Park.

However, in direct response to other public comments and issues raised during the public comment period, EPA has decided to postpone deletion of the ground-water portion of the Lincoln Park Study Area from the NPL. Deletion/delisting of the ground-water portion of the site will be considered at a later date and not until sufficient data have been collected to demonstrate that the PRTW is operating effectively and ground water under Lincoln Park is in compliance with cleanup objectives throughout the aquifer underlying Lincoln Park.

The decision regarding the Lincoln Park Study Area soils, and the eventual deletion of this portion of the site from the NPL, will at least remove a part of the "Superfund stigma" from the Lincoln Park community.

Comment No. 22

How do you put a site back on the NPL after it's been delisted?

Response to Comment No. 22

Sites may be restored to the NPL when conditions warrant it. If releases or threats of releases of a hazardous substance are detected, EPA can place a site back on the NPL by publishing a notice in the Federal Register. Being on the NPL is not a prerequisite for EPA to take action at a site.

EPA always retains its enforcement authority to require a potentially responsible party to perform actions that would correct any contamination problems that might arise. The only time a listing would be necessary is if funding from the Superfund Trust Fund would be needed to take action, a situation unlikely to occur at the Lincoln Park Superfund Site.

Comment No. 23

One commenter specifically questioned what type of performance would need to be demonstrated by the permeable reactive treatment wall ("PRTW") before the Lincoln Park Study Area could be delisted. The commenter cited a CDPHE Lincoln Park Superfund Site news letter (dated December 1999) that stated "[T]he effectiveness of the PRTW, in cleaning contaminated ground water, will have to be determined before Superfund delisting discussions can begin." The commenter felt that EPA and CDPHE were implying that circumstances had changed, with regard to delisting and the effectiveness of the PRTW, and wondered why circumstances had changed.

The commenter also expressed concern that EPA's proposed decision was being based on politics and not on the needs and desires of the community. The commenter finally stated that EPA should allow for a period of time to assess the effectiveness of the PRTW before proceeding toward the delisting process.

Response to Comment No. 23

The Superfund process identifies certain cleanup technologies that are appropriate for a given site. These technologies are evaluated to ensure that they will work with the contaminants of concern and with other site-specific factors such as geology or weather.

Sometimes, a technology has a proven record and the evaluation is based on the past performance of the technology. At other times, a technology is newer, and specific testing is necessary. In this particular case, the PRTW is a relatively new technology that has had an excellent record of treating ground-water contamination. However, it does not have an extended track record with the contaminants of concern at this particular site. For that reason, bench scale testing (testing performed in the laboratory rather than after installation) was performed in 1999. This testing found that the PRTW technology would do a good job of treating the contaminants found at Cotter's Cañon City mill.

Based on this testing, EPA and CDPHE concluded that the PRTW technology chosen by Cotter was acceptable. This decision is consistent with the Superfund process.

In response to concerns expressed by some members of the community, EPA will postpone the delisting process for the ground-water portion of the Lincoln Park Study Area. It is current EPA policy that a site cannot be completely deleted from the National Priorities List until such time as the ground water under the site has reached cleanup objectives throughout the entire aquifer. EPA will wait until a sufficient amount of ground-water monitoring data from the PRTW has been collected to demonstrate that the system is operating as expected.

Comment No. 24

With regard to performing an assessment of the effectiveness of the PRTW prior to delisting, what changed since the December 1999 fact sheet was issued?

Response to Comment No. 24

Nothing has changed since issuance of the December 1999 fact sheet. EPA will not initiate the delisting process for the ground-water portion of Lincoln Park Study Area until sufficient data have been collected to demonstrate that the PRTW is operating effectively.

COTTER'S CAÑON CITY MILL & RADIOACTIVE MATERIALS LICENSING ISSUES

Comment No. 25

Several commenters expressed concern that continued operation of Cotter's Cañon City mill (particularly additional disposal of material in the tailings ponds) might result in additional contaminated ground water entering the Lincoln Park area. The commenters believe that this might cause the contaminated ground-water plume to remain, rather than shrink, and suggested that further action needs to be taken regarding these ponds.

Response to Comment No. 25

Under its Radioactive Materials License, the Cotter Corporation has removed source material (tailings) from areas where they were contributing to ground-water contamination, and moved these tailings to lined impoundments. These impoundments have been monitored since their construction, and show no evidence of any leakage. In addition, Radioactive Health and Safety Procedure 3-10 of Cotter's Radioactive Materials License requires evaluation of potential impoundment liner breakthrough and specifies the necessary corrective actions that must be taken in the event of a breakthrough. The results of the evaluation are reported in the annual *Environmental and Occupational Performance Report and ALARA Review*, which is prepared by Cotter.

Residual ground-water contamination at Cotter's Cañon City mill flows down the Sand Creek alluvium within the mill property. However, at the Soil Conservation Service ("SCS") dam, this flow is intercepted by a collection system. The water is pumped back to the mill. Any ground water that is not captured by this collection system (approximately 1 to 3 gallons per minute) will flow through the permeable reactive treatment wall ("PRTW") located downgradient of the SCS dam, where dissolved uranium and molybdenum will be removed from the ground water.

Based on the control systems in place, EPA and CDPHE do not believe that continued operation of Cotter's Cañon City mill presents a health or environmental risk to the community. Although additional cleanup actions at the mill will need to be taken under the Radioactive Materials License, this additional cleanup relates only to the mill itself.

Comment No. 26

One commenter expressed the need to clean up contaminated soil adjacent to the mill as an additional action that must be taken. The commenter stated that this cleanup needs to be done now, before the material is blown by the wind towards developed areas.

Response to Comment No. 26

Air monitoring data collected both at Cotter's Cañon City mill and in the Lincoln Park Study Area show no indication that the contaminated soils either become airborne or are transported to developed areas. Furthermore, this localized area of contaminated soil has not contributed to the past contamination of either Sand Creek or the ground water within the Lincoln Park Study Area. Cleanup of this area of contaminated soil will be addressed during final reclamation of Cotter's Cañon City mill property. The no-further action decision for the soils portion of the Lincoln Park Study Area reflects the findings that there are no unacceptable risks posed by the soils.

Comment No. 27

Several commenters expressed a desire to restrict Cotter's Cañon City mill from receiving additional material. These commenters did not want Cañon City to be a dumping ground, and did not want any additional waste to be deposited at Cotter's Cañon City mill.

One commenter pointed out that Cotter was originally issued a permit for solid waste disposal. The commenter further stated that although it was Fremont County's original understanding that Cotter would mill raw uranium ore, Cotter was subsequently granted permission to receive tailings, residues, raffinates, and spent catalysts. The commenter believes that all governing agencies, including the Fremont County commissioners, and an informed community have the responsibility to re-visit the solid waste disposal permit and restrict Cotter to receiving only raw ore.

Response to Comment No. 27

Across the United States and in Colorado, any industry that can show, using the best technology currently available, that they can safely operate and successfully manage the wastes they generate is allowed to do so.

The use of Cotter's Cañon City mill to process and dispose of additional radioactive material is controlled by Cotter's Radioactive Materials License. Section 9.1 of the license allows Cotter's Cañon City mill to receive, store, process, transfer and dispose of uranium-bearing and thorium-bearing solids and liquids. Citizens concerned about this issue should comment to CDPHE during the license renewal process for Cotter's Cañon City mill. The Proposed Plan is not intended to address the issues raised by the commenter.

Comment No. 28

One commenter requested monitored retrievable storage of materials at Cotter's Cañon City mill, rather than permanent disposal.

Response to Comment No. 28

The concept of monitored retrievable storage assumes that there is no current technology sufficient to deal with the waste under consideration. Consequently, the waste would be temporarily stored until such technology is developed. In the United States, waste regulation is not premised on future technology. Instead, industries are required to show that, using the best technology currently available, they can successfully manage the wastes they generate. In this way, there is some assurance that a business can operate safely today, using currently available technology. If this were not required, businesses would be allowed to do anything, premised on the hope that some day they could control the wastes they are creating today.

CDPHE does not believe that, for this situation, it is wise to require monitored retrievable storage. The wastes at Cotter's Cañon City mill will be permanently disposed of under the existing license, in a disposal cell designed to last at least 1000 years. If it is advisable at some time in the future, the cell could always be opened and the material recycled, treated, or subjected to whatever technology necessitated the re-opening of the cell. In the meantime, Cotter's waste management procedures rely on the best available current technology to ensure protection of human health and the environment.

Comment No. 29

One commenter questioned whether doctors in the area had been trained to recognize and treat radiation-related illnesses.

Response to Comment No. 29

Within the context of past radioactive contamination exposure caused by Cotter's Cañon City mill, the primary radiation-related illness that could be caused by this exposure is cancer. Medical professionals in Cañon City, as well as medical professionals in other Colorado cities, are trained to recognize and treat cancer.

Nevertheless, in response to public concerns, EPA will contact the appropriate local health agencies, obtain a list of medical professionals in the area, and send out letters that provide pertinent information regarding the Superfund site.

Comment No. 30

One commenter questioned how the community would be informed in case of a release or emergency at Cotter's Cañon City mill.

Response to Comment No. 30

Under the Radioactive Materials License, Cotter is required to prepare a written plan that establishes a warning system for the mill facility. This plan includes protocols for reporting accidents and emergency response capability. The plan also contains requirements for immediately reporting any discovery of an emergency, or imminent threat of an emergency, to CDPHE. In emergency situations, Cotter or CDPHE would notify the community, in cooperation with local emergency response officials and broadcast channels.

Comment No. 31

What is the life expectancy of the tailings pond (disposal cell) liner?

Response to Comment No. 31

Synthetic liners are generally expected to last a minimum of 20 years. The containment system beneath the main impoundment at Cotter's Cañon City mill consists of 18 inches of a compacted bentonite clay sub-liner and a synthetic, or hypalon, liner that is covered by an additional 12 inches of compacted bentonite clay. It is expected that this triple liner system will hold contaminants inside the impoundment for the long term.

Cotter's Cañon City mill utilized unlined tailings ponds between 1958 and 1983, when a new multi-layered clay-and-hypalon-lined main impoundment was constructed and put into service. Although Cotter began using the main impoundment in 1979, it took until 1983 to excavate and transfer all of the old tailings pond materials to the new main impoundment.

The main impoundment looks like two "ponds," or disposal cells, because water is placed over the tailings material in order to minimize dust problems. The main impoundment is composed of two disposal cells called the primary and secondary impoundments.

The Remedial Action Plan ("RAP") requires that a study be performed annually to evaluate the integrity of the liner system. Evaluations of the liner system's integrity were first performed in 1995. A report dated August 15, 1995 and entitled *Using Piper/Stiff Diagrams to Characterize Ground Water in Area of New Impoundments,* concluded that there was no evidence of liner leakage at that time. A second report, dated August 22, 1995, and entitled *Seepage Detection, Verification and Response Plan for the New Impoundment*, established a monitoring system and evaluation method using magnesium as a key indicator to evaluate the potential for liner leakage. The monitoring system and evaluation method described in this report are used each year by Cotter to evaluate the liner system's integrity. Results of the evaluations are published annually by Cotter. The 2000 Annual Report presents data that indicate that there has been no liner leakage during the year 2000. If leakage is discovered through the monitoring program, Cotter is required to remedy the situation under the Radioactive Materials License.

At the end of the operating life of Cotter's Cañon City mill facility, the primary and secondary impoundments will be de-watered, the tailings materials will be contoured into a mound shape, and both impoundments will be capped with fill dirt. The purpose of entombment is to isolate the tailings material from rain, snow, and from ground water.

Comment No. 32

Have there been high dust readings that the public was not informed about?

Response to Comment No. 32

No. However, because of the size of Cotter's Cañon City mill operations, it is impossible to completely eliminate all dust emissions from such sources as unpaved service roads. In order to monitor air emissions from the mill, ten air monitoring stations have been installed around the boundary of Cotter's property and in the community of Lincoln Park. Data from these monitoring locations are used by CDPHE to evaluate Cotter's compliance with radioactive dose limits. These limits have been set at levels to be protective of people living near the Cañon City mill facility and include limits for dust emissions. Management of dust emissions, including emissions from the impoundments, is a condition of the license. Results from the emissions/air monitoring program are published in Cotter's annual reports, which are available for review in the Cañon City Public Library. The 2000 Annual Report presents the most recent environmental air sample data for the ten air monitoring locations. The results show that there were no exceedances of dose limits during the year 2000.

Comment No. 33

Were requirements for the PRTW added to the Radioactive Materials License?

Response to Comment No. 33

Yes. Design, construction, operation, and reporting requirements for the PRTW are a part of the Remedial Action Plan, which is Condition 11.2 of the Radioactive Materials License.

Comment No. 34

The State has failed to adequately monitor Cotter's operations before, why should the public trust the State now?

Response to Comment No. 34

CDPHE does not believe that it has ever failed in its responsibilities to regulate the Cañon City mill operations. Ground-water contamination under Lincoln Park is a result of mill tailings stored in leaky, unlined ponds. These ponds began leaking almost immediately after the Cañon City mill began operation in 1958. At that time, the Atomic Energy Commission was the licensing and regulatory authority for the mill.

In 1968, CDPHE was granted authority to regulate the mill and to enforce the license. Through the licensing process, CDPHE required Cotter to construct lined impoundments and to remove the contaminated materials from the unlined impoundments area.

In 1983, CDPHE took legal action against Cotter, under CERCLA, to require additional cleanup. In 1988, CDPHE and Cotter entered into a federal court-ordered agreement whereby Cotter would perform additional cleanup activities in and around the Cañon City mill. Ground-water quality within Lincoln Park has improved as a result of these activities.

CDPHE believes that current license conditions, and Cotter's compliance with those conditions, demonstrates CDPHE's commitment to the protection of human health and the environment.

Comment No. 35

One commenter stated that they had no confidence of receiving prompt help from the government.

Response to Comment No. 35

Under the authorities granted by CERCLA and the requirements contained in the Radioactive Materials License, the state and federal governments are in a position, and have an obligation, to act quickly in response to any potential threat to human health or the environment from Cotter's Cañon City mill. Both EPA and CDPHE are fully committed to fulfilling that obligation.

In addition, EPA maintains an active emergency response program that can be activated immediately if there is an imminent or substantial threat to public health.

Comment No. 36

Is there a financial warranty to clean up the site?

Response to Comment No. 36

Yes. Cotter has set aside money for two surety bonds, one for the RAP ($2,632,000) and one for the Radioactive Materials License ($13,125,000). These bonds are payable to the State of Colorado and are for the express purpose of ensuring that mill closure and reclamation, and completion of the Remedial Action Plan, are adequately funded.