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**Philips Semiconductors**

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December 9, 2002

Mr. William McDonald  
New Mexico Environment Department  
Sandia National Laboratories  
PO 5800 / MS 1089  
Albuquerque, NM 87185

Subject: RCRA Facility Investigation Report for SWMU #8, Former Coronado Municipal  
Landfill, RCRA Permit #NMD000709782

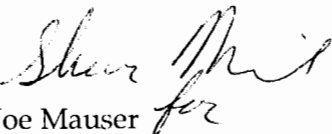
Dear : Mr. McDonald

Enclosed please find two copies of the RCRA Facility Investigation (RFI) Report for SWMU #8, Former Coronado Municipal Landfill. The report presents historical data as well as recent findings of the RFI activities that have been conducted at the site from 1999 through 2002. Philips Semiconductors is submitting this RFI Report in partial fulfillment of the RFI Work Plan submittal requirement of RCRA Permit #NMD000709782, Module IV.

If you have any questions regarding this report please contact Mr. Joe Mauser/Philips Semiconductors at (505) 822-7634 or Sharon Minchak/CH2M HILL at (505) 884-5600.

Sincerely,

Philips Semiconductors

  
Joe Mauser

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**RCRA Facility Investigation  
Report for  
Corrective Action Unit #8  
(Former Coronado  
Municipal Landfill)**

Prepared for

**PHILIPS**

**Philips Semiconductors  
Albuquerque, New Mexico**

DECEMBER 2002



**CH2MHILL**

**RCRA Facility Investigation  
Report for  
Corrective Action Unit #8  
(Former Coronado  
Municipal Landfill)**

Submitted to  
**Philips Semiconductor  
Albuquerque, New Mexico**

DECEMBER 2002

**CH2MHILL**

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# Acronyms

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AIDS	Albuquerque Industrial Development Service
AMAFCA	Albuquerque Metropolitan Area Flood Control Authority
ARCH	air rotary casing hammer
bgs	belowground surface
BH	Bohannon-Huston, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
CML	Coronado Municipal Landfill
COA	City of Albuquerque
COC	constituent of concern
DBSA	Daniel B. Stephens and Associates, Inc.
EB	exploratory boring
EMCON	EMCON Associates
EPA	U.S. Environmental Protection Agency
EPT	Extraction Procedure Toxicity
ERCO	Energy Resources Company
ERM	ERM-Rocky Mountain, Inc.
ESA	Environmental Site Assessment
ft	feet
ft/ft	feet per feet
HRMB	Hazardous and Radioactive Materials Bureau (NMED)
HSWA	Hazardous and Solid Waste Amendments
kg	kilogram
LEL	lower explosive limit
MCL	maximum contaminant level
MDL	method detection limit
µg/L	microgram per liter
µmhos/cm	micromhos per centimeter
mg	milligram
mg/L	milligram per liter
mg/kg	milligram per kilogram
msl	mean sea level
MW	monitoring well

NCLF	Nazareth/Coronado Landfills
ND	not detected
NFA	no further action
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NOAA	National Oceanic and Atmospheric Administration
PCE	tetrachloroethene
PID	photoionization detector
ppm	parts per million
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SHB	Sergent, Hauskins & Bechwith
SVOC	semivolatile organic compound
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TOC	total organic carbon
TPH	total petroleum hydrocarbon
UST	underground storage tank
VOC	volatile organic compound
yd <sup>3</sup>	cubic yard

**Section 1.**  
**Introduction**

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# 1. Introduction

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A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) has been conducted for Corrective Action Unit #8, known as the former Coronado Municipal Landfill (CML). The purpose of the RFI was to complete characterization of the nature and extent of potential contamination associated with this CAU. The CAU is present at the Philips Semiconductors facility site in Albuquerque, New Mexico.

Performance of the RFI satisfies the permit conditions as stipulated in Philips Semiconductors' (Philips) Hazardous and Solid Waste Amendments (HSWA) Module IV—Corrective Action of RCRA Permit No. NMD000709782-1 (hereinafter referred to as RCRA Permit). The U.S. Environmental Protection Agency (EPA) issued the RCRA Permit on April 1, 1986. In 1995, EPA proposed to modify the RCRA Permit issued to Philips to reflect the newly identified CAU called the CML. The permit was reissued by the New Mexico Environment Department (NMED) as HSWA Module IV (hereinafter referred to as the HSWA Module), which became effective March 18, 1996 (NMED, 1996). The RFI has been performed in accordance with the RFI Work Plan submitted to the NMED Hazardous and Radioactive Materials Bureau (HRMB) in October 1999 in accordance with the RFI Work Plan submittal requirement as set forth in the HSWA Module.

The primary objective of the RFI was to more fully investigate and determine the nature and extent of contamination located at the Philips facility in association with the CML, and to determine whether the former CML is the source for tetrachloroethene (PCE) detected in groundwater samples from Philips wells MW-1, MW-2, and MW-4 and City of Albuquerque monitoring wells that have been installed in the vicinity of the site.

## 1.1 Facility Description

The Philips Semiconductors' facility is located in Albuquerque, New Mexico at the northern edge of the City of Albuquerque (COA) near the north boundary of the Elena Gallegos Land Grant and south of the Sandia Pueblo Land Grant. A portion of the Philips property is occupied by the former Coronado Municipal Landfill (CML). The former CML area was leased by the COA between 1963 and 1965 and was used as a municipal waste disposal area (EMCON Associates, 1987). The actual quantities of solid and potential hazardous waste disposed of at the site are unknown, although the COA estimated the total volume of refuse at the site to be approximately 300,000 cubic yards (yd<sup>3</sup>) (Energy Resources Company [ERCO], 1981).

## 1.2 Report Format

This report was prepared to present the results of the RFI investigation phases that have been performed during 1999 through 2002 at the Philips facility to address contamination associated with CAU #8, the former CML. The report is organized into two sections plus appendices and is based on the suggested guidance issued by the NMED.

- **Section 1—Introduction.** This section outlines the current study and scope of the RFI, as well as general background information.
- **Section 2—Site Description/Operational History/Investigatory Activities.** This section contains a study area description, and details on the previous and the current investigations conducted at the site, a discussion of the analytical results for the samples collected and the nature and extent of any contamination as defined by those samples. Finally, the section contains a conclusions and recommendations subsection that, based on analytical results, makes a recommendation for future action or proposes that a No Further Action decision document be prepared for the site.
- **Appendices—**Appendix information is as follows:
 

Appendix A	Methane Monitoring Reports
Appendix B	Soil Gas Survey Data
Appendix C	Soil Boring Logs and Well Construction Diagrams
Appendix D	Analytical Data
Appendix E	Area Well Search Information

## 1.3 Description of Current Study

The investigatory work reported in this RFI report only addresses CAU #8, the former CML. All other CAUs that were associated with the Philips facility were closed in accordance with the provisions of the Part B Permit. It should be noted that the occurrence of PCE in groundwater below CAU #8 is not associated with any historic or active operations at the Philips facility itself because PCE has never been used at the facility.

Throughout this RFI report, the term "site" refers to the former CML and the term "facility" applies to the Philips Semiconductors' manufacturing operations. Additionally, this RFI has only addressed portions of the CML south of San Diego Avenue that are overlain by property currently leased by Philips from the COA. Other portions of the former CML are located on other area properties that are privately owned but are not associated with the designated CAU at the Philips facility.

### 1.3.1 Project Objectives

The RFI sampling component of the Work Plan was designed to collect adequate samples to characterize the nature and extent of constituents of concern (COCs) in groundwater and soil. Specifically, the approach was targeted to collect data of sufficient quantity and quality to determine whether regulated hazardous constituents are present at the site at levels that would threaten human health or the environment. This characterization included review of existing data and collection of additional data, as necessary, to define the vertical and horizontal extent of COCs previously identified as being present in soil and groundwater samples. The goal of the RFI was to collect data sufficient for making a recommendation on whether further investigation was warranted, whether corrective measures were necessary, or whether the site was appropriate for a No Further Action (NFA) designation.

### **1.3.2 Investigative Process**

The investigative process requires data collection and the development or refinement of a conceptual model for the site. A conceptual model of a site consists of the following:

- Identification of any contaminants present and their concentrations
- Source characterization including location, source volume or quantity, and concentrations of hazardous constituents at the source
- Identification of potential migration pathways
- Identification of potential receptors

The degree of refinement necessary for a conceptual model at a site depends in part on the type and extent of contamination identified. Additional data were collected during the RFI to gain an understanding of the nature and extent of potential contamination at the site to aid in refinement of the conceptual model.

### **1.3.3 Interpretation of Analytical Results**

Analytical results from the RFI were evaluated by comparison with:

- EPA Drinking Water Maximum Contaminant Levels (MCLs) (EPA, 1995)
- New Mexico Environment Department Soil Screening Levels (NMED, 2000)

If contamination of anthropogenic origin was detected, maximum-reported concentrations of the compounds were compared to the applicable EPA and NMED screening values (EPA, 1995; NMED, 2000).

### **1.3.4 Scoping Documents**

The RFI Work Plan (1999) served as the scoping document for the implementation of the CAU #8, former CML site RFI.

**Section 2.**  
**CAU #8 Philips Semiconductors Plant**  
**(Former Coronado Municipal Landfill)**

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## 2. CAU #8, Philips Semiconductors Plant, (Former Coronado Municipal Landfill)

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### 2.1 Summary

The former Coronado Municipal Landfill (CML) is located in New Mexico at the northern edge of the City of Albuquerque (COA). The former CML area was leased by the COA between 1963 and 1965 and was used as a municipal waste disposal area (EMCON Associates, 1987). Records of activities concerning the operation methods at the former CML during the period 1963 to 1965 are not well documented.

Several phases of investigation have been conducted at the site in addition to the recent RFI activities that were conducted from 1999 to 2002. These investigations have been conducted to determine the nature and extent of surface soil, subsurface soil, landfill gas and soil gas, and groundwater contamination.

The general conclusion of the various investigation phases has been that the primary contaminant of concern related to the former CML cells located at the Philips site is the presence of PCE in the groundwater underlying the site and other area properties. In some areas detected PCE concentrations exceed the EPA maximum contaminant level (MCL) for drinking water. The occurrence of PCE in the groundwater in monitoring wells located upgradient of the Philips site suggests that the former CML materials located on the Philips site may not be the only source of the PCE groundwater contamination and/or may not be the source at all. Limited concentrations of various hydrocarbons, volatile and semivolatile organic compounds, pesticides, and metal compounds have been identified during the recent and previous phases of investigation. However, all concentrations have been determined to be below applicable screening levels and/or their presence was not confirmed in subsequent investigations.

As part of the current RFI at the former CML, a field investigation including soil vapor sampling, groundwater monitoring well installation, surface and subsurface soil analyses, and groundwater sampling were performed. The analytical data collected confirm that other than the PCE concentrations present in the groundwater there do not appear to be inorganic or organic compounds of concern detected at levels in exceedance of applicable screening levels. Furthermore, PCE concentrations in groundwater do not appear to represent a significant risk to human health or the environment.

Based on these findings a No Further Action petition is being sought with regard to groundwater and soil in the CAU #8, former CML on the Philips Semiconductors site.



## **2.2 Site Description and Operational History**

### **2.2.1 Site Description**

#### **2.2.1.1 Location and Geographic Setting**

The former CML is located in New Mexico at the northern edge of the City of Albuquerque (COA) near the north boundary of the Elena Gallegos Land Grant and south of the Sandia Pueblo Land Grant (Figures 2-1 and 2-2). The disturbed area associated with the CML covers approximately 60 acres in Township 11 North, Range 3 East, Section 12 of the Alameda Quadrangle and is bordered on the east by Interstate 25, to the north by Beverly Hills Avenue (planned) and vacant land, to the south by Modesto Avenue and private businesses, and to the west by San Mateo Boulevard and manufacturing facilities (Figure 2-3). There is a residential area to the southwest of the former CML.

#### **2.2.1.2 Topography**

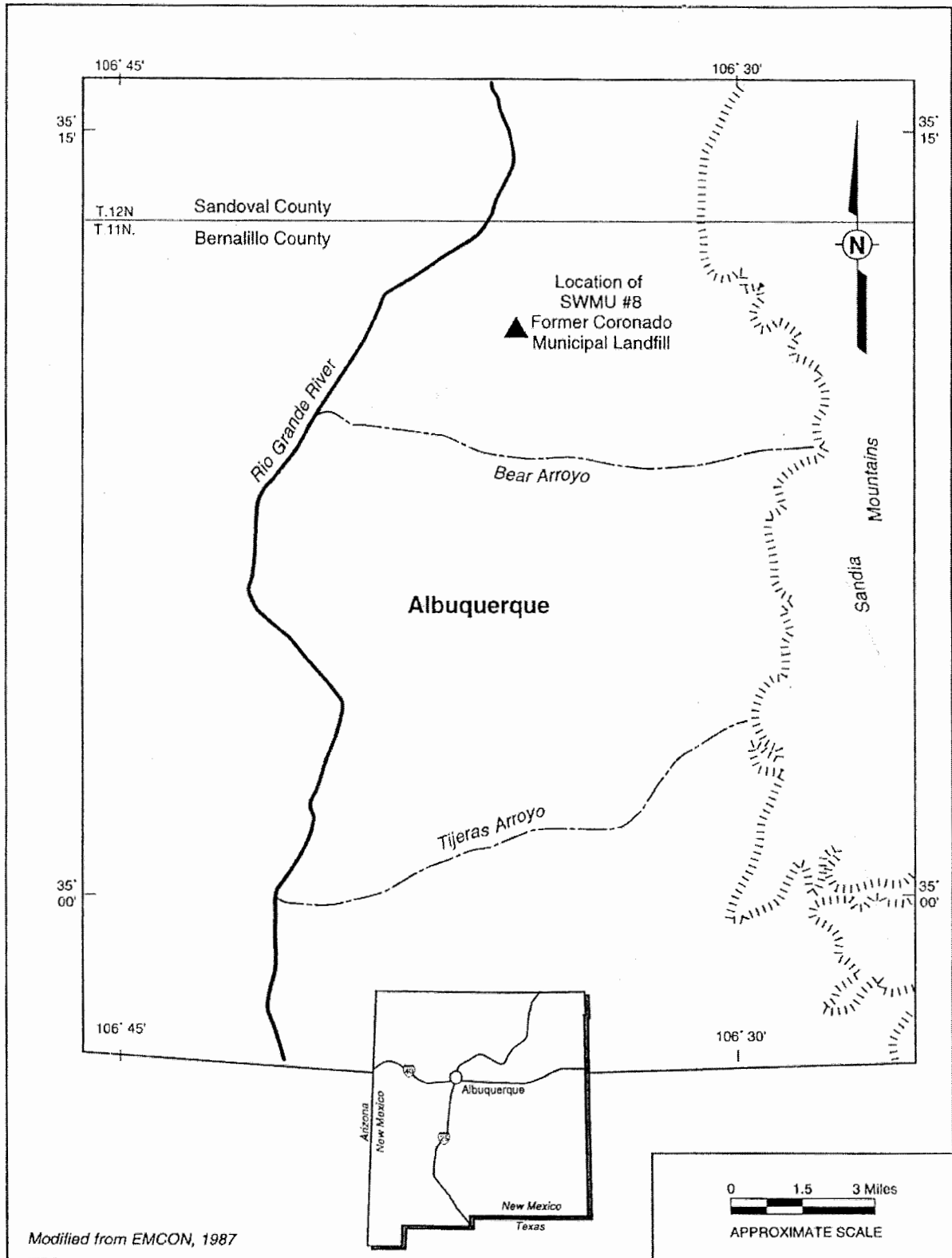
The disturbed area north of the Philips facility slopes gently westward toward the Rio Grande, while portions of the former CML covered by the facility slope gently south and north to diversion channels constructed on the south and north sides of the facility. The principal drainage features associated with the CML are the north and south La Cueva diversion channels (Figure 2-3). Elevations across the CML area range from 5,150 feet above mean sea level (msl) on the west to 5,190 feet above msl on the east.

#### **2.2.1.3 Climate**

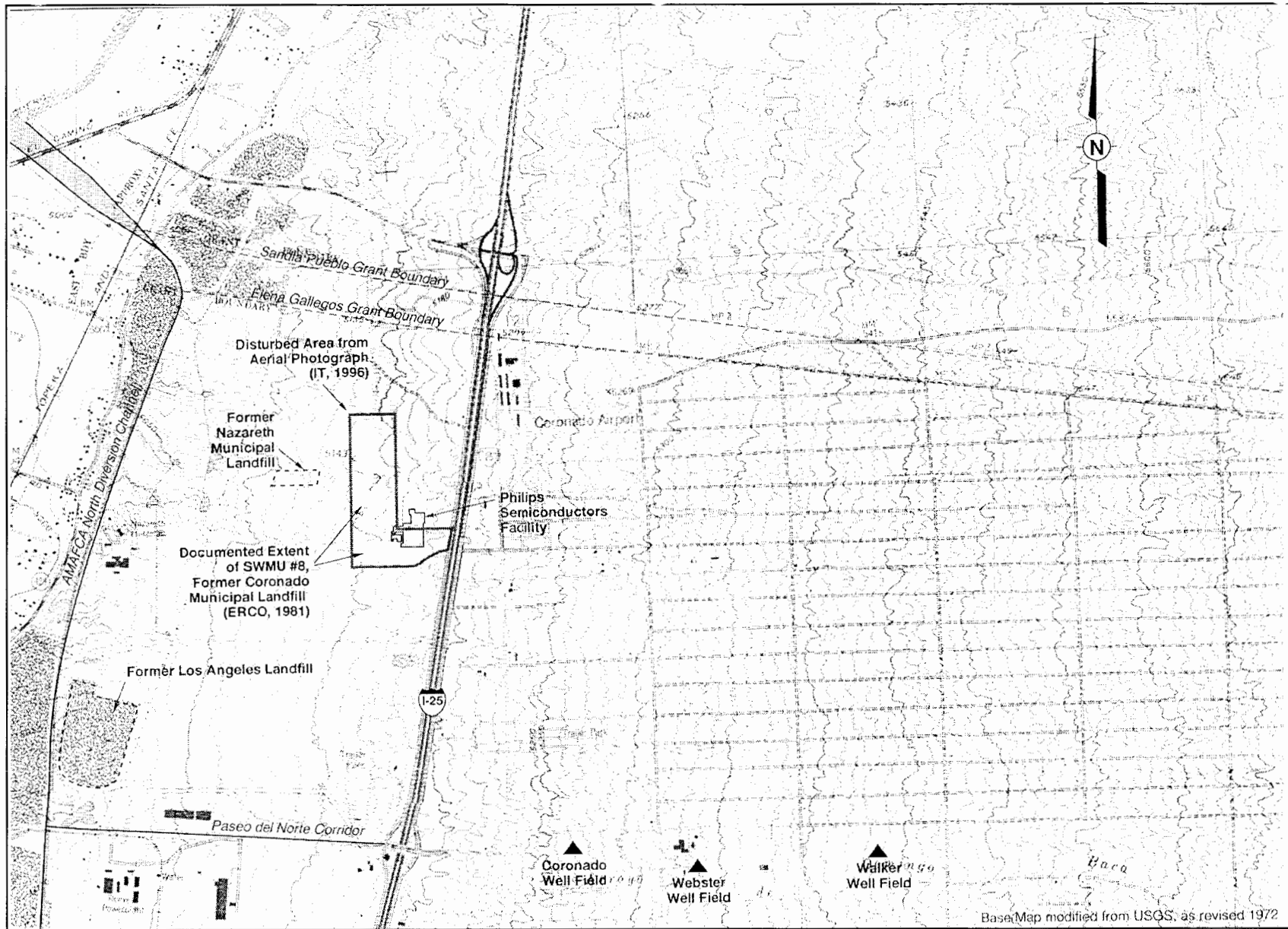
The Albuquerque area climate is characterized by low precipitation; wide temperature extremes; frequent, drying winds; heavy rain showers usually of short duration and often with erosive effects; and erratic, seasonal distribution of precipitation. The average annual temperature in Albuquerque is 56°F, with an average diurnal temperature range of 28°F. The average daily temperature range is highly variable, but extreme temperatures are rare. In Albuquerque, the temperature reaches 90°F an average of 63 days a year, usually from May through September. In the Albuquerque region, the valley and mesa areas are arid, with annual precipitation averaging 8 inches (National Oceanic and Atmospheric Administration [NOAA], 1987).

Freezing temperatures occur an average of 119 days each year, primarily from November to early April. On average, the temperature reaches 0°F and below less than 1 day a year (NOAA, 1990). The average frost-free season in Albuquerque is 190 days, from mid-April to late October. The air is normally dry, and the average annual relative humidity is about 44 percent, ranging from nearly 60 percent in the early morning to approximately 29 percent in the afternoon (NOAA, 1990). On average, Albuquerque has 169 sunny days a year.

The climate summary is based on weather information from the NOAA meteorological station located at the Albuquerque International Sunport, which is the closest NOAA meteorological station to the CML. Monthly climatological data for precipitation, relative humidity, and temperature at the Albuquerque International Sunport are probably adequate to characterize the CML. However, the data may not be fully representative of conditions at the site.



**Figure 2-1. Location and Geographic Setting, CAU #8  
(Former Coronado Municipal Landfill)**



**Figure 2-2**  
**Boundaries of CAU #8, Location of Other Area COA**  
**Former Landfills, and Regional Features**  
**Philips Semiconductors Facility**