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Philips Semiconductors

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 Muncipal 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

Sharon Minchak for

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

AIDS	Albuquerque Industrial Development Service
AMAFCA	Albuquerque Metropolitan Area Flood Control Authority
ARCH	air rotary casing hammer
bgs	belowground surface
BH	Bohannan-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^3	cubic yard

Section 1.
Introduction

1. Introduction

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^3) (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)

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

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.

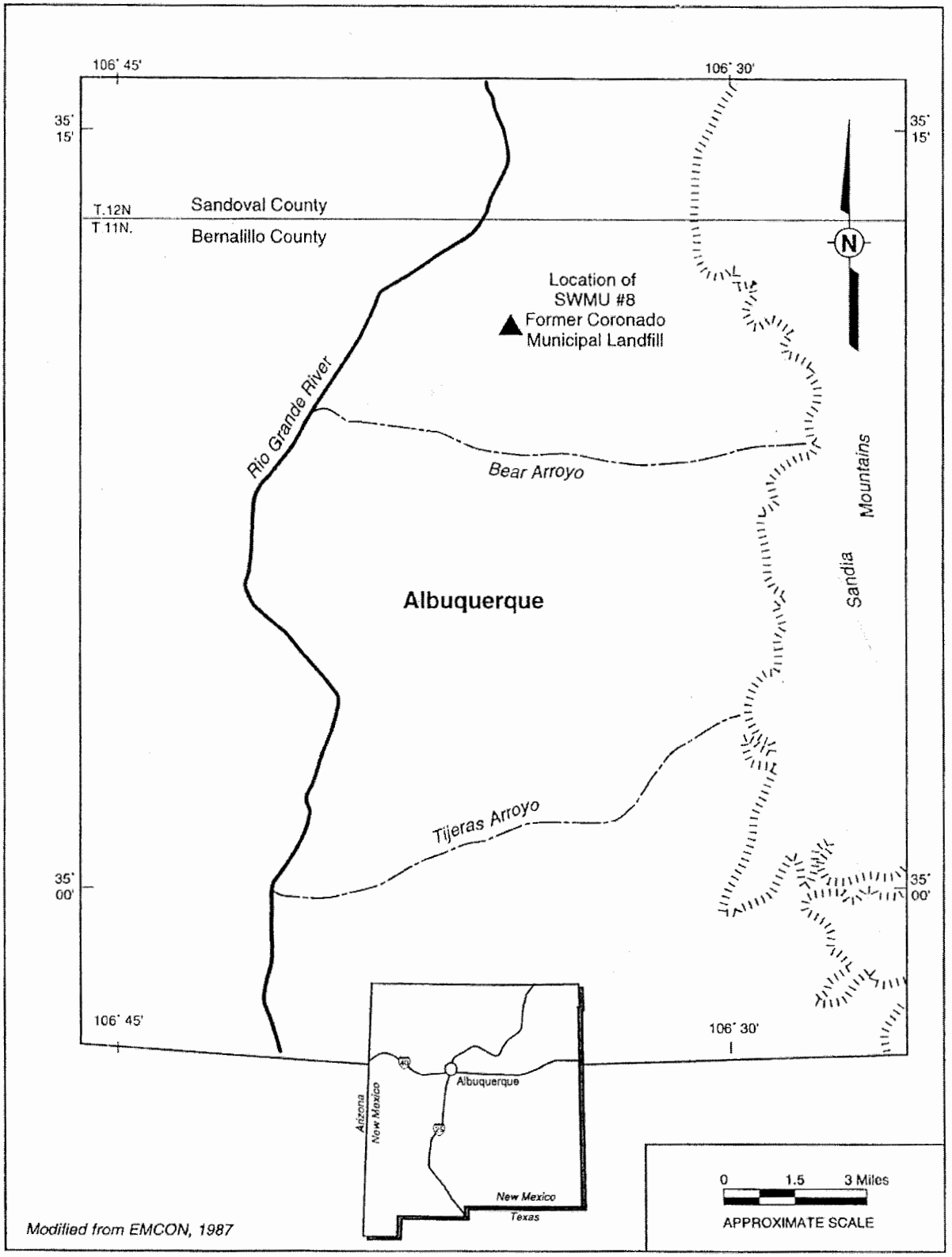

Figure 2-1. Location and Geographic Setting, CAU #8 (Former Coronado Municipal Landfill)

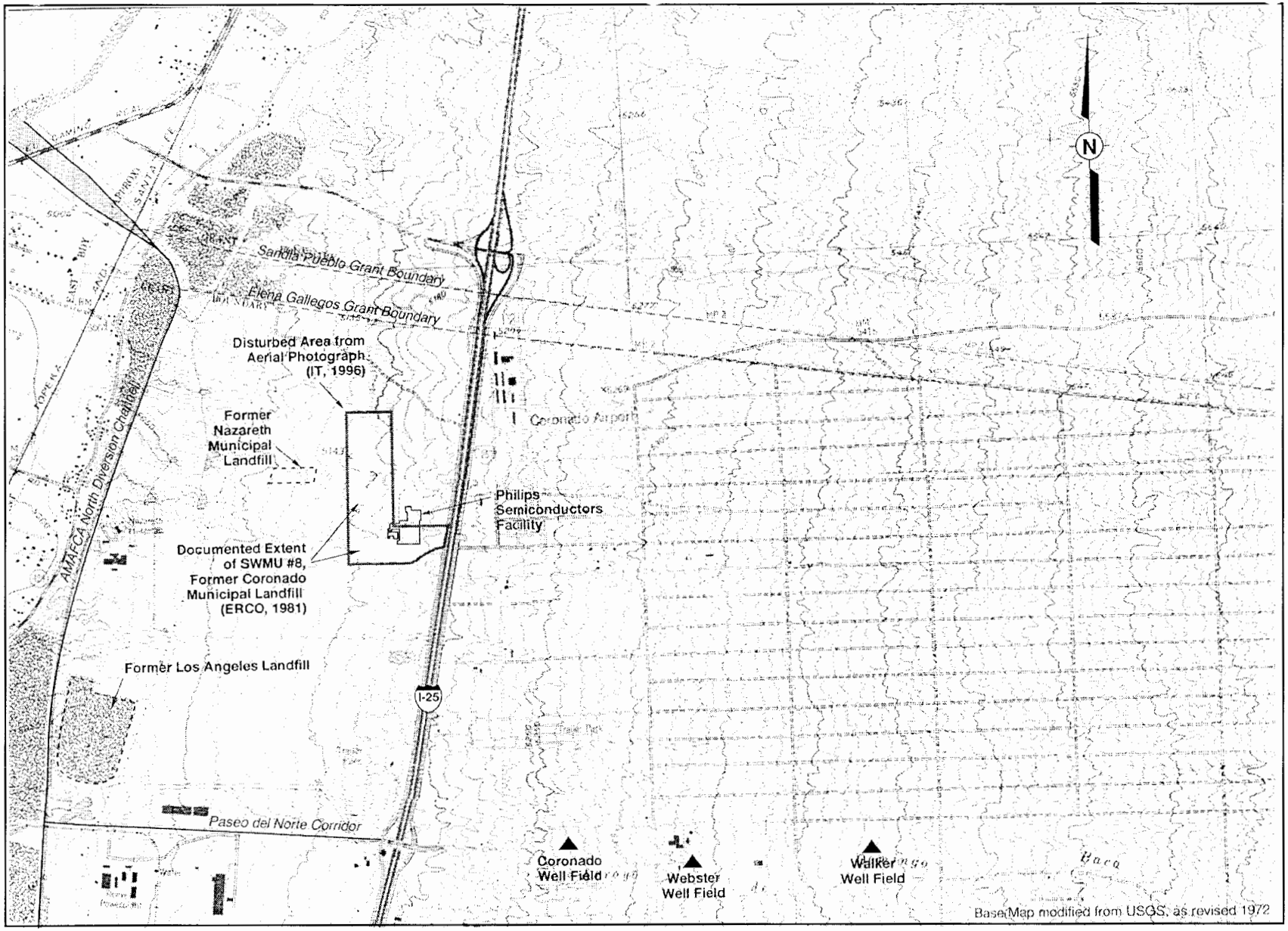

Figure 2-2
Boundaries of CAU #8, Location of Other Area COA Former Landfills, and Regional Features Philips Semiconductors Facility

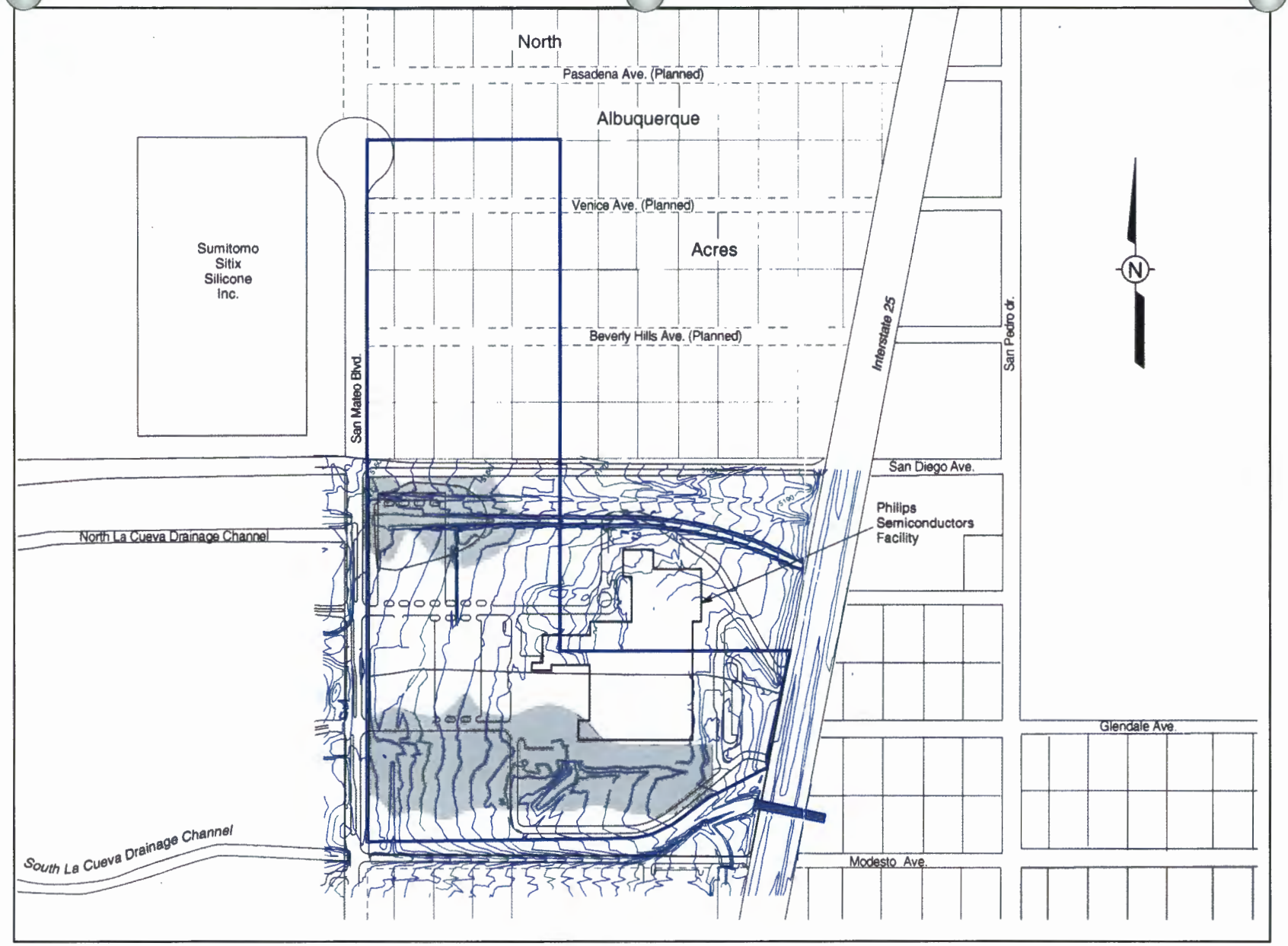

Figure 2-3
Topography and Boundaries of CAU #8
Philips Semiconductors Facility

2.2.1.4 Geology

Regional Geology

The Albuquerque Basin is one of several fault-bounded structural depressions in the Rio Grande rift system, a north-south trending structure that extends from southern Colorado to southern New Mexico, and through which the Rio Grande flows (Kelley, 1977). In the Albuquerque area, the basin is bounded to the east by Precambrian granitic intrusions and associated metamorphic rocks that comprise the Sandia Mountains and to the west by Tertiary and Quaternary sediments that form the Llano de Albuquerque. The crest of the Sandia Mountains is capped with Paleozoic carbonate rocks and local conglomerate. Between the Sandia Mountains and the Rio Grande floodplain, Quaternary gravel pediments and Tertiary sediments underlie the Llano de Sandia surface. Quaternary basalt flows (the Albuquerque volcanoes) are present between the Llano de Albuquerque and the Rio Grande floodplain. The Llano de Albuquerque is the broad depositional plain located between the Rio Grande and the Rio Puerco (Hawley and Haase, 1992).

In the vicinity of the former CML, the Albuquerque Basin is a structural basin bordered by the uplifted fault blocks of the Sandia Mountains on the east and the Llano de Albuquerque on the west. Materials derived by erosion of the uplifted fault blocks and sediments transported into the basin by the ancestral Rio Grande and other streams have filled the basin to a local thickness in excess of 18,000 feet (Hawley and Haase, 1992). The dominant basin fill material, the Santa Fe Group of Tertiary and Quaternary Ages, contains the principal aquifer in the Albuquerque Basin (Kernodle et al., 1987).

Sediments within the Albuquerque Basin can be primarily subdivided into three groups identified as (1) pre-Santa Fe deposits, (2) Santa Fe Group basin fill, and (3) recent alluvium. The primary water-bearing unit in the basin is the Santa Fe Group, which ranges in age from 1 to 25 million years old and is up to 12,000 feet thick (Hawley and Haase, 1992). The Santa Fe Group consists of unconsolidated to loosely consolidated fluvial sediments interbedded with basalt flows and volcaniclastic and debris flow deposits (Bjorklund and Maxwell, 1961). The Santa Fe Group is unconformably overlain in most locations by Quaternary sediments consisting of valley alluvium along the Rio Grande, terrace material along the valley sides, and alluvial fan deposits shed from the nearby Sandia and Manzano Mountains. The floodplain valley alluvium was formed from recent deposition of sediments by the Rio Grande. These deposits range from approximately 30 to 200 feet in thickness and consist primarily of discontinuous layers of clay, silt, sand, and fine gravel (Hawley and Haase, 1992).

Local Geology

Quaternary fluvial and alluvial deposits interfinger below the CML (EMCON, 1987). These deposits comprise part of the Santa Fe Group and Quaternary alluvium shed from the uplifts. The Quaternary sediments of the Santa Fe Group are divided into the Upper Buff Formation and the Edith Formation (Lambert, 1968). The geologic cross section on Figure 2-4 shows the relationship of these units below the former CML.

Alluvium Deposits and Menaul Formation

The alluvium deposits range in thickness from 70 to 100 feet and are composed of material ranging from fine sandy silt to gravel. Portions of the alluvium may be interbedded with thin beds of the Menaul Formation, a coarse-grained gravel unit deposited by the ancestral Rio Grande (Lambert, 1968).

Edith Formation
The Edith Formation is a sandy pebble to gravel deposit interbedded with local lenses and tabular beds of cross-stratified sand and horizontally stratified mud and clay. Sand, mud, and clay comprise only a few percent of the formation (Lambert, 1968). The Edith Formation is encountered at a depth to approximately 75 to 100 feet below the surface and is generally 70 to 110 feet thick beneath the site (EMCON, 1987). However, in some areas below the CML, it may be over 180 feet thick.

Upper Buff Formation
The oldest Quaternary unit is the Upper Buff Formation. It is a very fine to fine-grained unit composed of clay, silty sand, and sand and may reach a thickness of 800 feet. In contrast to the overlying Edith Formation, the Upper Buff Formation is moderately well indurated and appears less permeable because of the presence of interstitial clays. The formation is encountered at a depth of approximately 150 to 200 feet beneath the CML (EMCON, 1987).

2.2.1.5 Hydrogeology

Regional Hydrogeology
The groundwater system in the Albuquerque Basin is divisible into two subsystems—the Rio Grande floodplain and regional groundwater in the basin (Kernodle et al., 1987). The Rio Grande floodplain subsystem is characterized by groundwater flow to the south, parallel to the river. Regional groundwater flow is from the mountain fronts to the Rio Grande, with local perturbations induced by groundwater withdrawal from the COA production wells. The regional subsystem is hydraulically connected to the floodplain subsystem.

Basin fill is largely comprised of the Santa Fe Group, which contains the principal aquifer in the Albuquerque area (Kernodle et al., 1987). The most productive zones of the aquifer are in the upper part of the Santa Fe Group, east of the Rio Grande. The saturated thickness of the upper part of the Santa Fe Group ranges between 1,100 and 1,400 feet below the floodplain of the Rio Grande and between 0 and 600 feet below the Llano de Sandia (Thorn et al., 1993). Groundwater in the basin generally occurs under unconfined conditions but may be confined locally by beds of silt or clay (Bjorklund and Maxwell, 1961).

The surface of the groundwater slopes southwest away from the Sandia Mountains at a rate of about 5 to 20 feet per mile. In the Albuquerque area, the surface is irregular because of withdrawals of groundwater from City production wells. Operation of production wells located east and southeast of the former CML have produced a groundwater surface that slopes east-southeast away from the Rio Grande (Thorn et al., 1993).

Groundwater is currently the sole source for Albuquerque's drinking water supply (Thorn et al., 1993) although the City is in the process of shifting to the use of surface water. In areas east of the Rio Grande floodplain, withdrawal of groundwater from municipal well fields caused a decline in groundwater levels of about 20 feet by 1960, and an additional 60 to 80 feet from 1960 to 1980 (Kernodle et al., 1987). Typically, the radius of influence associated with cones of depression around pumping centers extends outward approximately 1.5 miles. Locally, such as in the vicinity of the CML, this results in significant reversals in groundwater gradients (EMCON, 1987).

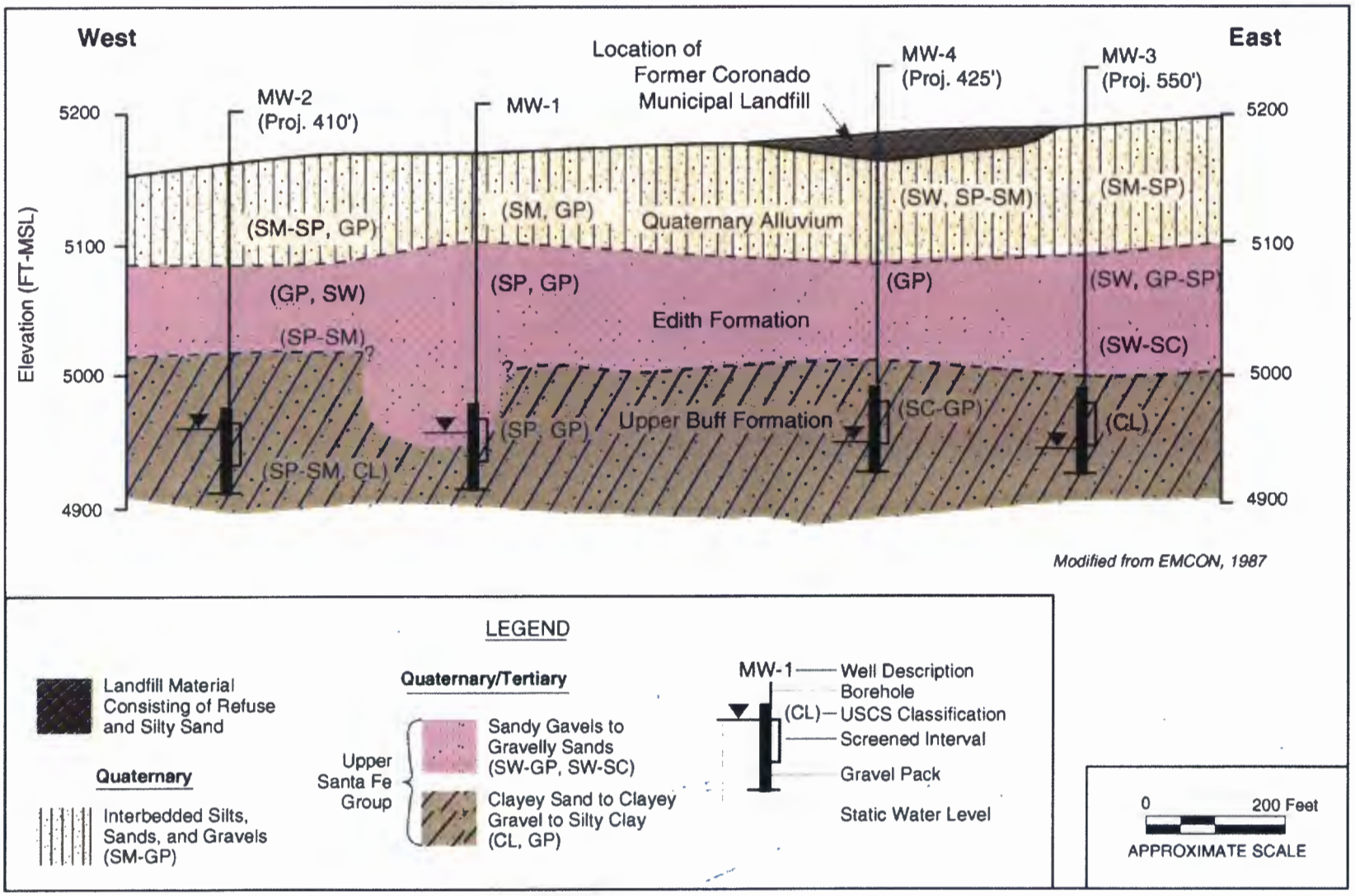

Figure 2-4
Geologic Cross-Section Underlying
Philips Semiconductors Facility

Recharge to the groundwater reservoir in the Albuquerque area is from precipitation (principally snowmelt in mountain areas), underflow of groundwater from adjacent areas, and seepage from the Rio Grande, streams, drains, canals, surface reservoirs, and applied irrigation water (Kernodle et al., 1995). The order of importance of each type of recharge depends on local conditions.

Local Hydrogeology

Monitoring wells around the Philips facility indicate that groundwater is first encountered in the Upper Buff Formation at a depth of 190 to 230 feet below the surface (EMCON, 1987). Subsurface site conditions are characterized by a series of interbedded silts, sands, and gravels (alluvium and Edith Formation) in the unsaturated zone with permeabilities of 10^{-3} to 10^{-6} centimeters per second (ERCO, 1981) and clay and clayey gravel in the saturated zone. Based on the completion logs for the four existing monitoring wells around the facility, the sediments below the former CML contain no water pockets or perched water above the level of the groundwater in the Upper Buff Formation (EMCON, 1987).

Water-level data collected since 1988 from monitoring wells at the Philips facility and since 1997 from other monitoring wells installed by the COA indicate groundwater flow direction under the facility is generally to the east-southeast at a gradient of approximately 0.003 foot per foot (ft/ft) and the water-table elevation has been declining at a rate of approximately 0.5 feet per year.

Under steady-state conditions of mountain front recharge, groundwater flows in the area would be to the west/southwest toward the Rio Grande and south end of the Albuquerque Basin (Thorn et al., 1993). However, the groundwater table below the former CML is approximately 20 feet lower than the surface-water elevation of the Rio Grande, resulting in east-southeast groundwater flow beneath the site. This groundwater gradient reversal in the site vicinity is attributed to a large cone of depression surrounding the Coronado, Webster, and Walker COA municipal wellfields (EMCON, 1987), located approximately 1.5 to 3 miles southeast to east-southeast of the site (Figure 2-2).

Surface-Water Hydrology

Surface-water runoff from the southern portion of the CML covered by the Philips facility is drained to the north and south side of the facility where it is discharged to concrete storm-water channels constructed to manage runoff from La Cueva Arroyo. Based on the topography of the northern portion of the former CML, surface water drains west to southwest and may enter the north La Cueva storm-water channel (Figure 2-3). This concrete-lined channel discharges into the Albuquerque Metropolitan Area Flood Control Authority (AMAFCA) North Diversion Channel, approximately 1 mile to the west of the former CML. The Rio Grande is the closest perennial surface water body to the former CML and is located approximately 2.5 miles northwest of the former CML. Between the AMAFCA North Diversion Channel and the Rio Grande, there is an extensive network of irrigation channels and waterways serving private residences and small farms in the river valley (PRC Environmental Management, Inc., 1992).

2.2.2 Operational History

The former CML area was leased by the COA between 1963 and 1965 and was used as a municipal waste disposal area (EMCON, 1987). A search at the COA Property Management and Real Estate Office did not indicate the actual owners of the site at that time. Records of activities concerning the operation methods at the former CML during the period 1963 to 1965 are not documented.

The COA records center was contacted in 1981 for this information by Energy Resources Company (ERCO), and it was found that no refuse division records exist prior to 1969. 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 yd^3 (ERCO, 1981). The lack of waste disposal records for landfills used in the 1960s is typical for that time period (ERCO, 1981).

ERCO compiled information from interviews with former equipment operators on the site, a former supervisor and COA officials of the Albuquerque Refuse Division, and the Property Management and Real Estate Office to establish if hazardous waste disposal took place at the former CML (ERCO, 1981). All those interviewed agreed this site accepted primarily residential material; however, the possibility of disposal of quantities of hazardous waste is unknown. Three of the five former site operators remember seeing typical residential garbage materials. In addition, the site operators recalled oil, chemicals, and cans of paint also were disposed at the site. None of the waste was segregated by trash type; it was buried as it came onto the site. The arroyo channels were filled first, and then the adjacent areas were excavated for additional fill space (ERCO, 1981).

At a later date, a meeting was held with the individual who had been the supervisor of the City Refuse Division during the 1963 to 1965 time period. The supervisor stated that contrary to statements made in other interviews on industrial waste disposal at the site, the former CML was used solely by the public for typical domestic waste disposal. He also stated that the equipment operators may have confused the former CML with the former Nazareth or Los Angeles Landfills, which are in the general vicinity of the former CML (Figure 2-2). To the best of the supervisor's knowledge, there was no industrial disposal of waste at the former CML (ERCO, 1981).

Nine historical aerial photographs spanning the time period from 1935 to 1991 were reviewed at the Spatial Data Analysis Center in Albuquerque to assess the dates of construction and operation of the site (IT, 1996). The date, identification, and brief summary of the photographs follow:

- 1935 (72-A and 73-A)
- August 26, 1947 (DFC-11D-13)
- October 4, 1951 (2-43, GS-RU)
- November 6, 1959 (1-127)
- September 20, 1967 (1-17, GS-VBUG)
- June 21, 1975 (2-129, GS-VDRE)
- June 2, 1982 (333-156, 350612, HAP 81)
- June 15, 1986 (336-34, 351065, NHAP2)
- May 5, 1991 (NAPP 3531-127).

The 1935, 1947, and 1951 historical aerial photographs show that the site and surrounding area were completely undeveloped. The topography appears undisturbed and the vegetation natural.

In the 1959 historical aerial photograph, the site appears to have been undeveloped. Construction of Interstate 25 to the east of the property is visible. A portion of the former CML is visible as a disturbed, east-west oriented rectangular shape where the Philips facility now exists.

The Coronado Airport is visible in the 1967 historical aerial photograph, as is a trailer park south of the airport. Construction of Interstate 25 is complete and visible in the photograph. There are two distinct disturbed areas near the site. One is the disturbed rectangle also visible in the 1959 photograph, and the other is a north-south trending rectangular disturbed area adjacent to this. These two areas appear to surround and contain the former CML.

The disturbed area surrounding the former CML is again visible in the 1975 historical aerial photograph. The Philips facility is visible in the 1982 historical aerial photograph. The 1986 and 1991 aerial photographs show the site and vicinity very much as they are today (IT, 1996).

2.2.2.1 Ownership History

The COA leased the CML for use as a waste disposal area and operated it between 1963 and 1965 (EMCON, 1987). A search at the Property Management and Real Estate Office did not delineate the actual owners of the site at that time. In the past, city records dealing with land agreements were kept by each division, giving the Refuse Division responsibility for these particular records (ERCO, 1981).

A past director of the Albuquerque Industrial Development Service (AIDS) in 1963 and 1964 was responsible for the land on which the Wildflower housing tract is now built. Both the AIDS Director and the Albuquerque Property Management and Real Estate Office recall that the property was first sold in the 1920s as a part of a larger piece of property called North Albuquerque Acres.

Philips bought the property south of San Diego Avenue in 1980 and in April 1981, via an industrial revenue bond process, the COA became the owner/lessor of the property. Currently, Philips leases the property from the COA for $1 per year. Table 2-1 summarizes known information on the ownership of the property south of San Diego Avenue between 1960 and the present.

Table 2-1. Historical Property Ownership For Former CML Area South of San Diego Avenue (Current Philips Facility)

Date	Ownership	Leasee
Prior to 1980	Unknown[a]	Unknown
1980 to 1981	Signetics Company	NA
1981 to present	City of Albuquerque	Signetics Company/Philips Semiconductors

[a] Signetics Company acquired the property from various limited partnerships and individuals, identified as Pan American 20-25-30-40-50-70 and 85 Limited Partnership, J.E. Ralph Sena, Gloria S. Sena, Teresa C. Salas, and Alfonso Salas.

NA = not applicable.

Prior to the construction of the Philips facility, an excavation program was initiated in 1981 for placing the foundation and to identify the contents of the former CML. The estimated excavation depth was 30 to 40 feet, and the estimated volume of landfill material removed was 74,000 yd^3 (PRC, 1992). Landfill materials were not generally present below a depth of 20 feet (ERCO, 1981). The reported contents of the landfill included trees and grass clippings, bottles, cans, cardboard, newspapers, wood, brick debris, rags, and organic household garbage. Pockets of tires and numerous water heaters were found as well as some gypsum board and concrete, but no containers or materials were found that would be considered to be storage units for hazardous wastes. Most of the excavated landfill material was not significantly decomposed (ERCO, 1981).

2.2.2.2 Waste Characteristics

A variety of investigatory work has been conducted at the site to assess the nature and extent of soil and groundwater contamination both before and during the current RFI activities. These previous investigations have indicated the presence of volatile organic compounds (VOCs) in the groundwater, and suggested the possible limited presence of anthropogenic pesticide and semivolatile organic compound (SVOCs) contamination in the soil at the site. Concentrations of arsenic have also been detected in the soils at levels exceeding the historic screening levels; however, these levels are below site background sample levels and are consistent with the naturally occurring concentrations in the native Albuquerque Basin materials. Therefore, arsenic is not considered an anthropogenic contaminant of concern at the site.

2.3 Investigatory Activities

2.3.1 Existing Data

Several previous data gathering investigations have been conducted with regard to the former CML site. These investigations have spanned the time period from 1980 when initial site drainage studies were done to the present when ongoing groundwater sampling of existing monitoring wells at the site is being conducted. The sections below summarize the investigatory activities that have been conducted at the site and the conclusions that have been drawn from those investigations.

2.3.1.1 Nonsampling Data

1980 Drainage Study

Bohannan-Huston Inc., conducted a study to determine the drainage management requirements needed on the Philips property in August of 1980. A number of improvements were recommended to protect the site from flooding (Bohannan-Huston, 1980).

1995 ERM-Rocky Mountain Groundwater Assessment

In 1995 ERM-Rocky Mountain, Inc. (ERM), conducted a groundwater assessment with regard to the former CML areas at the Philips facility. This assessment included a review of the available literature and records, groundwater quality data provided by Philips, and discussions with representatives of City and State agencies. The groundwater assessment indicated that the primary contaminant of concern in groundwater beneath the former CML is PCE. Material process documents show that this compound has never been used at the Philips facility as part of the manufacturing industrial processes or for any other use.

Research conducted by ERM indicated that there did not appear to be any record of PCE contamination or impacts to groundwater from sites that are considered upgradient of the former CML. (It should be noted that the property upgradient of the site is, or until recently has been, largely undeveloped; therefore, accounts of "no impact" may represent an absence of data as opposed to data that definitively indicate no impact.) Sites or reported incidents of groundwater contamination that occurred downgradient or crossgradient from the former CML were deemed unlikely to have impacted groundwater at the Philips site (ERM, 1995).

1996 Environmental Assessment

In January 1996 IT Corporation performed a Phase I Environmental Site Assessment (ESA) on properties comprising Blocks 4 and 5 of the North Albuquerque Acres Subdivision, Township 11 North, Range 3 East, Section 12, in Albuquerque, New Mexico. (These properties are located immediately north of the Philips facility.) The purpose of the ESA was to identify, to the extent feasible, potential adverse environmental conditions associated with the property. A significant finding in the ESA was that approximately one-half of the disturbed area north of San Diego Avenue is underlain by the northern extent of the former CML. The property north of San Diego Avenue for which the ESA was done is not part of the Philips site and is not considered in this work plan; however, it provides useful data regarding the extent of the landfill materials in the general area.

2.3.1.2 Sampling Data

1980 and 1981 ERCO Initial Site Investigation

In 1980 and 1981, ERCO performed preliminary studies for Philips to identify probable content and character of the waste fill and to implement an environmental investigation.

Landfill Material Characterization

In 1981, ERCO sampled landfill materials obtained from excavated portions of the former CML identified in Figure 2-5 (ERCO, 1981). A total of 10 composited samples and 2 duplicates were formed from materials collected from depths of 0 to 9 feet, 10 to 19 feet, and greater than 20 feet. Prior to compositing, the samples were examined and nonsoil

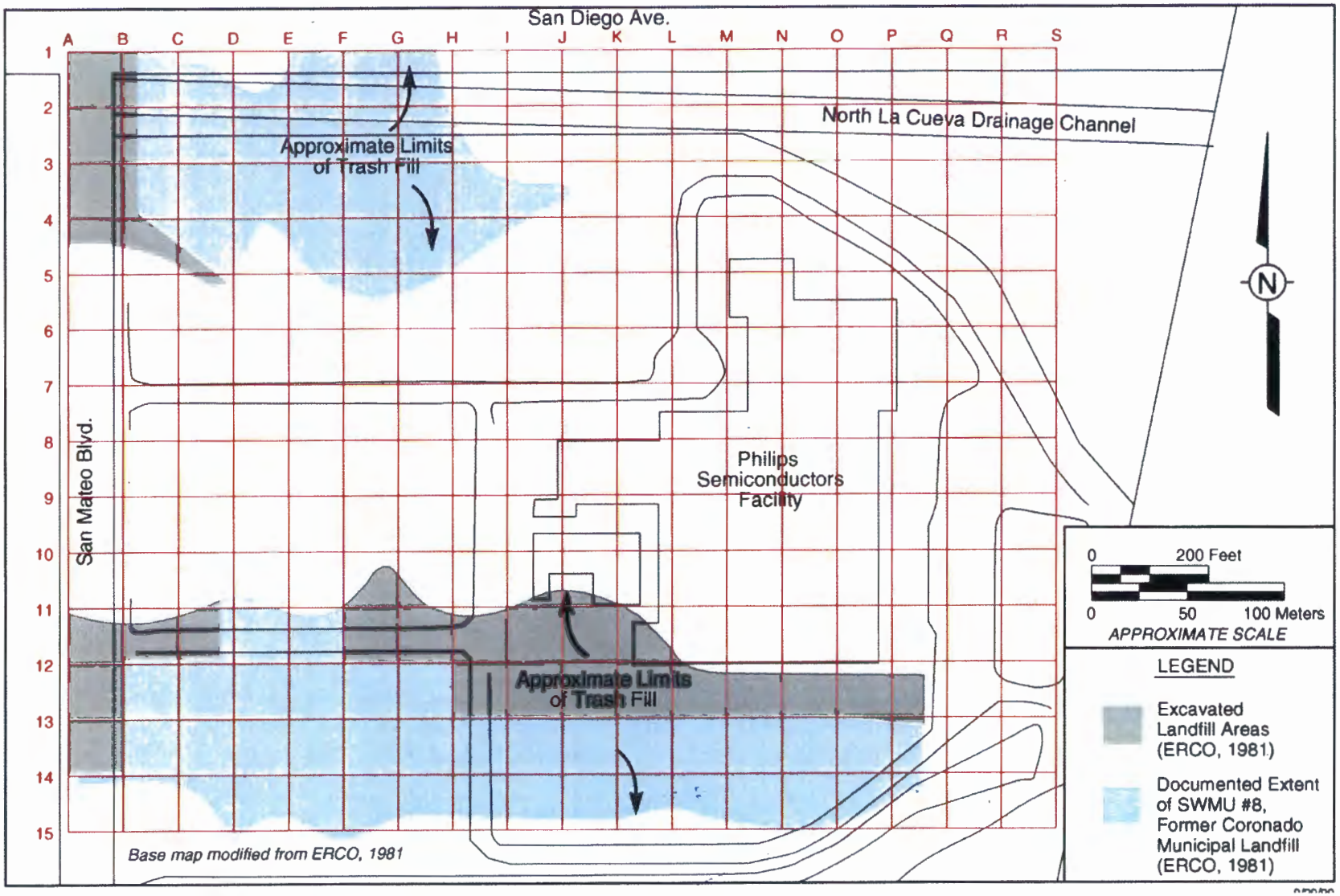

Figure 2-5
Approximate Location of Sampling Grid for Excavated Landfill Areas
1981 Geotechnical Investigation
Philips Semiconductors Facility

components were identified. The summary of the materials identified in the samples is presented in Table 2-2. Samples were sent to the ERCO Cambridge Laboratory for Extraction Procedure Toxicity (EPT) analysis. (The EPT analysis was used in the 1980s and was the precursors of the current toxicity characteristic leaching procedure [TCLP]. The extraction procedure was different but the compound lists and the applicable regulatory limits for given compounds are the same for previous EPT and current TCLP results). Toxicity testing included the metal analytes arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver; and the pesticides and herbicides endrin, lindane, methoxychlor, toxaphene, and 2,4-D and 2,4,5-TP Silvex (ERCO, 1981).

Table 2-3 lists the composite sample identification for the eight samples, as tied to the site collection area (Figure 2-5) and correlated with the nonsoil components listed in Table 2-2. There was no information provided in the ERCO 1981 report on the nonsoil components in the remaining two samples (12 J-N 6-20 feet, 10 H-J 6-15 feet). Analytical results given in Table 2-4 indicate that all constituent concentrations are below maximum concentrations established for the characteristic of toxicity. In some cases, the maximum sample at some locations is listed at less than 5 feet. It is assumed that sample collection was terminated at less than 5 feet belowground surface (bgs) because landfill materials did not occur at depths below 5 feet. The original report and complete data packages from the 1980 and 1981 investigations are not currently available for appendage to this report.

Table 2-2. Composition of Nonsoil Components in Excavated Landfill Materials From Former CML 1980 Initial Site Investigation

Sample Identification	Nonsoil Components
890	Small chunks of gypsum board
837	Concrete debris
782	Plastic spoon
923	Gypsum board
1247	Brick debris
1297	Burnt wood
1333	Gypsum board debris
1515	Plastic pieces
1619	Wood debris
460	Gypsum board debris
1067	Dumpings, glass, paper
664	Beer can, large rock
1682	Paper and burnt wood
2126	Burnt wood chips
1898	Brick, gypsum
1868	Gypsum
1769	Burnt wood
1803	Rust aggregates
1739	Paper
90	Roots
2054	Linoleum, paper, cloth
2082	Crest toothpaste tube
1941	Glass
2010	Newspaper
1978	Paper, cigarette holder
353	Shoe, yarn, wood
165	Plastic, cloth, bottles, etc.
29	Bottles, cans, paper, rust
652	Decomposed pieces of rust
126	Newspaper, grass clippings, stick, rags
208	Rust aggregates, milk carton

Source: Data obtained from Table 4-5 of ERCO, 1981, "Detailed Evaluation of the Waste Fill, Albuquerque, New Mexico," Energy Resources Company, Walnut Creek, California.

Table 2-3. Composite Sample Identification for Landfill Material Collected From Former CML 1980 Initial Site Investigation

Sample Identification[a]	Study Area	Component Samples[b]
A1-4 A	Top 9 feet of grid areas A1–A4	890, 837, 731, 782
A1-4 B	10- to 19-foot depth range of grid areas A1–A4	923, 1158, 1187, 1226, 1274, 1279, 1304, 1482, 1333
A1-4 C	Depth of 20 feet or greater in grid areas A1–A4	1447, 1515, 1548, 1359, 1386, 1586, 1619, 1652
A10-14 A	Top 9 feet of grid areas A10–A1–14	421, 460, 1022, 1067, 569, 959
A10-14 B	All depths greater than 9 feet in grid areas A10–A14	1096, 1124, 613, 664, 694, 486, 993, 529
Southwest Surface	All depths less than 5 feet in the southwestern grid areas	1682, 1711, 2126, 2100, 1868, 1835, 1769, 1803
Northwest Surface	All depths less than 5 feet in the northwestern grid areas	15, 90, 1739, 2153
Central Top 5 Feet	All depths less than 5 feet in the central grid area	1898, 2054, 2082, 1941, 2010, 1978, 1411, 353, 2178, 165

[a] Sample identification is tied to grid shown on Figure 2-5.
[b] See Table 2-2.

Source: Data obtained from Table 4-6 of ERCO, 1981, "Detailed Evaluation of the Waste Fill, Albuquerque, New Mexico," Energy Resources Company, Walnut Creek, California.

Table 2-4. Extraction Procedure Toxicity Results for Composite Samples of Landfill Material From Former CML 1981 Investigation

(Concentrations presented in µg/L)

Metals	TCLP MCL	ERCO Identification											
		A10-14 A	Northwest Surface	A1-4 B	A1-4 Black Duplicate	A1-4 C	A1-4 A	12 J-N 6-20 ft	12 J-N 6-20 ft Duplicate	A10-14 B	Southwest Surface	10 H-J 6-15 ft	Central Top 5 ft
Arsenic	5,000	7	17	6	5	7	6	6	9	7	10	4	10
Barium	100,000	250	300	197	220	224	360	250	250	460	193	272	370
Cadmium	1,000	3	3	2	2	4	2	2	4	2	5	1	5
Chromium	5,000	2	2	2	2	9	2	2	2	1	2	1	3
Lead	5,000	8	10	10	5	7	9	10	13	10	16	8	35
Mercury	200	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	1,000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Silver	5,000	0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	2.3	0.6

Metals	TCLP MCL	ERCO Identification											
		A10-14 A	Northwest Surface	A1-4 B	A1-4 B Duplicate	A1-4 C	A1-4 A	12 J-N 6-20 ft	12 J-N 6-20 ft Duplicate	A10-14 B	Southwest Surface	10 h-j 6-15	Central Top 5 ft
Endrin	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lindane	400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor	10,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-D	10,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-TP (Silvex)	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

MCL = Maximum contaminant level for characteristic of toxicity (40 CFR 261.24).

µg/L = micrograms per liter.

ND = Analyte not detected.

TCLP = Toxicity Characteristic Leaching Procedure.

Source: Data obtained from ERCO report, 1981.

Methane Monitoring
Methane gas and landfill material were discovered during a 1980 geotechnical investigation of the area selected for construction of the Philips facility. Thirty-five methane gas vents were initially installed along the north edge of the southern section of the former CML, just south and southwest of the Philips facility (ERCO, 1981). Thirteen of the methane vents are no longer operational due to construction activities; locations of the remaining 23 vents are shown on Figure 2-6.

During initial excavation activities at the site, the concentration of methane in the soil ranged from 0 to 80 percent of the lower explosive limit (LEL) (ERCO, 1981). During the excavation and removal of landfill material, one detection event reached 100 percent of the LEL (ERCO, 1981). From 1981 to 1993, methane gas detections at the vents ranged from 500 parts per million (ppm) (1 percent of LEL) to 28,500 ppm (57 percent of LEL). (Historical reports from the methane monitoring program are provided as Appendix A). Thirteen monitoring points within the Philips facility never detected methane above 500 ppm (1 percent of the LEL). The methane monitoring program was discontinued in 1993 after several months of nondetect readings.

Conclusions
Conclusions drawn from the 1980 and 1981 initial site investigations are summarized below:

- The contents of the landfill materials for the most part include "typical" residential garbage. There is a potential that the former CML may have accepted oils, paint, and inks in limited quantities as it occurred in typical domestic waste.
- Extraction procedure toxicity testing was conducted on composited samples of landfill material and all analytical results indicated levels below the MCLs established for the characteristic of toxicity.
- Methane gas was detected in the installed methane monitoring wells and during landfill excavation activities. However, methane monitoring was discontinued in 1993 due to a series of nondetects for methane.

The original report and data from the 1980 and 1981 ERCO investigations are not available at this time to be appended to this report.

1981 Subsurface Investigation
In 1981, Sergent, Hauskins & Beckwith performed a deep subsurface investigation on the Philips property. They concluded that the soil underlying the site consists predominantly of interbedded silty sand and sandy silt, which extend to depths ranging from 64 to 99 feet below existing grade. These unconsolidated sediments inferred to have been generally deposited by flash floods originating in the western flanks of the Sandia Mountains east of the site. Landfill materials were encountered at the surface in three of the borings with some areas containing considerable trash and debris. The fill material extended from 3 to 20 feet below existing grade at the time at the various boring locations (Sergent, Hauskins & Beckwith, 1981). The original report and data from the 1981 investigation are not available at this time to be appended to this report.

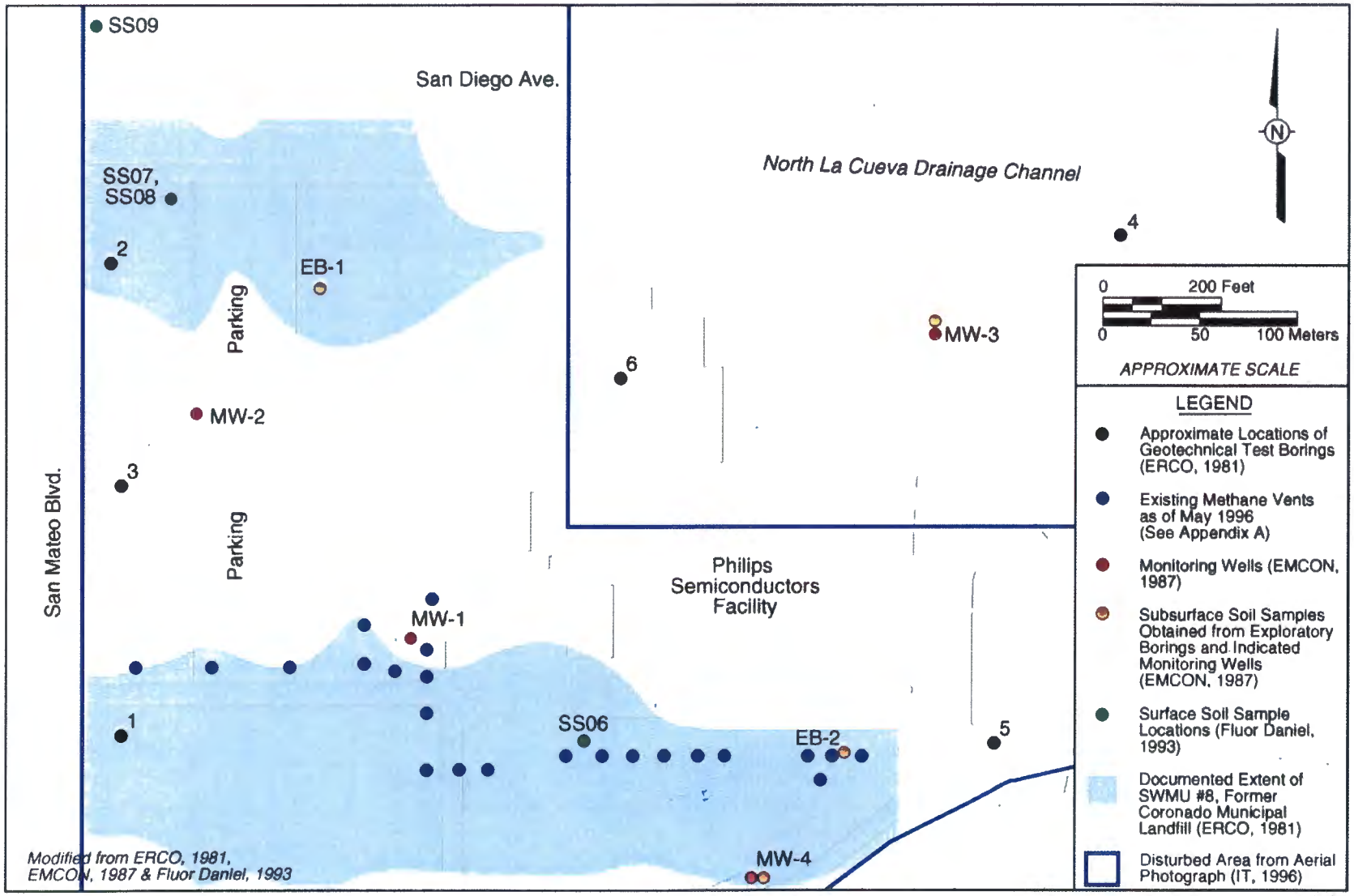

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Figure 2-6
Approximate Location of Previous Investigation Data and Sampling Points
Philips Semiconductors Facility

(Surface Soil Samples, Geotechnical Test Borings, Exploratory Borings, Monitoring Wells, Outdoor Methane Monitoring Vents)

1984 NMED Landfill Review

In 1984 the NMED (at the time the New Mexico Environmental Improvement Division) conducted an inspection of the former CML as part of a statewide review of landfills. The inspection consisted of gas and soil testing for metals, pesticides, and solvents. Results did not identify any hazards but did note that there were no wells to evaluate the groundwater quality (EMCON, 1987). The original report and data from the 1981 investigation is not available at this time to be appended to this report.

1987 EMCON Baseline Groundwater Investigation

In 1987, EMCON Associates (EMCON) conducted a baseline investigation of groundwater underlying the Philips facility. The primary objectives of this investigation were to determine the nature of the geologic materials, establish the hydraulic gradient and direction of groundwater flow beneath the site, and evaluate the potential impact of leachate migration from the waste fill into the groundwater.

Groundwater

In 1987, EMCON completed four monitoring wells in and around the southern portion of the former CML to establish baseline water-quality information and to assess the impact of potential leachate migration on groundwater quality (EMCON, 1987). Groundwater samples were collected following completion and development of wells MW-1, MW-2, MW-3, and MW-4. The location of these wells is shown on Figure 2-6. Samples were analyzed for VOCs (EPA Method 624), SVOCs (EPA Method 625), total dissolved solids (TDS) (EPA 160.1), total Kjeldahl nitrogen (TKN) (EPA Method 351.3), total organic carbon (TOC) (EPA Method 415.1), nitrate as nitrogen, chloride, and sulfate (EPA Method 300.0), alkalinity (EPA 310.1), and sodium, calcium, magnesium, lead, zinc, copper, total chromium, nickel, and manganese by atomic absorption (EPA Method 6000). In addition pH and conductivity were measured in the field.

Table 2-5 summarizes the results for the 1987 baseline groundwater analyses. Analytical results for the inorganic parameters were consistent with the range of values reported to occur in groundwater samples obtained from municipal wells (City of Albuquerque, 1996). Elevated values for pH, electrical conductivity, TDS, alkalinity, and calcium were detected in the initial groundwater sample obtained from MW-1 but were attributed to the introduction of cement grout into the formation water during well construction. The anomalously low magnesium value for MW-1 was attributed to the removal of magnesium by formation of the mineral brucite at the high pH conditions caused by the cement grout introduction into the formation water. The elevated concentrations of TKN and ammonia detected in MW-1 during the baseline sampling were not attributable to grout contamination. However, subsequent analytical results indicated no detection of TKN (Daniel B. Stephens and Associates, Inc., [DBSA], 1996).

The primary contaminant of concern that was identified in the groundwater during the baseline sampling was concentrations of PCE were detected in wells MW-1, MW-2, and MW-4. Concentrations of PCE have continued to be reported in these same wells in subsequent sampling events since.

Table 2-5. Summary of Baseline Analytical Data for Groundwater Samples
1987 Baseline Groundwater Investigation

	MW-1	MW-2	MW-3	MW-4	Groundwater Standard
Basic Water Quality Parameters					
pH	12.2	7.2	7.0	7.3	6.5-8.5[a]
Electrical conductivity (μmhos/cm)	6,350	680	500	700	1,600
Total dissolved solids (mg/L)	4,080	454	326	500	500[a]
Total organic carbon (mg/L)	3	2	1	1	—
Total Kjeldahl nitrogen (mg/L)	220	0.10	0.13	0.94	—
Ammonia as nitrogen	17	ND	ND	ND	—
Inorganic Parameters (mg/L)					
Alkalinity as $CaCO_3$	1,550	217	132	298	—
Chloride	13	18	16	21	250[a]
Nitrate as nitrogen	0.2	0.4	1.4	0.1	10[b]
Sulfate	63	110	85	150	500[b]
Calcium	560	83	53	120	—
Lead	<0.02	<0.02	<0.02	<0.02	0.05[c]
Manganese	<0.05	<0.05	<0.05	<0.05	0.05[a]
Sodium	120	42	29	43	—
Zinc	<0.05	<0.05	<0.05	<0.05	5.0[a]
Chromium, total	<0.05	<0.05	<0.05	<0.05	0.05[c]
Copper	0.03	0.01	0.01	0.01	1.0 [a,c]
Nickel	<0.05	<0.05	<0.05	<0.05	—
Iron	<0.05	<0.05	<0.05	<0.05	0.3[a]
Magnesium	0.008	17	11	19	—
Volatile Organic Compounds (μg/L)					
Tetrachloroethene	19	16	ND	11	5[b]
All other VOCs	ND	ND	ND	ND	—
SVOCs (μg/L)	ND	ND	ND	ND	—

[a] EPA secondary drinking water standard, except where noted.
[b] Primary drinking water standard.
[c] NMWQCC standard, used if an EPA primary or secondary drinking water standard does not exist for compound. In some cases a NMWQCC standard exists for a compound that also has an EPA MCL in which case the more stringent value is used for comparison.

Notes:

$CaC0_3$	= calcium carbonate	μg/L	= micrograms per liter
μmhos/cm	= micromhos per centimeter	mg/L	= milligrams per liter
ND	= Analyte not detected	NMWQCC	= New Mexico Water Quality Control Commission

Source: Data obtained from Table 4 of EMCON, 1987, "Baseline Ground-Water Investigation, Signetics Corporation, Albuquerque, New Mexico," EMCON Associates, San Jose, California.

Subsurface Soils
The baseline groundwater investigation at the former CML included the advancement of two exploratory soil boreholes in addition to the four boreholes for the installation of the monitoring wells (EMCON, 1987). Soil samples were collected during the advancement of Exploratory Boring (EB) 1 and EB-2, and during the borehole advancement of MW-3 and MW-4 (Figure 2-6). No soil samples were collected during advancement of wells MW-1 and MW-2. The subsurface soil samples were analyzed for pH, soil moisture, VOCs, and pesticides. The intent of the soil sampling was to assess the impact of potential leachate migration from the landfill material into the underlying substrate. Boreholes EB-1 and EB-2 penetrated between 20 and 35 feet of fill and trash before encountering basal fill or native materials. Two to three samples were then collected beneath the landfill material at 5-foot intervals and submitted for analysis. Background samples were collected from similar depths in MW-3 and MW-4, which were located outside of the areal extent of the former CML (EMCON, 1987).

Table 2-6 summarizes results of the subsurface soil analyses. With the exception of methylene chloride, VOCs, and pesticides were not detected in any of the soil samples analyzed. Methylene chloride is used by the EPA contract laboratory as a laboratory reagent (EMCON, 1987) and is a common laboratory contaminant and therefore has not been further considered as a potential contaminant of concern at the site. The original report and data from the 1981 investigation are not available at this time to be appended to this report.

Conclusions
The 1987 subsurface and groundwater investigation concluded that:

- Geologic site conditions are characterized by a series of interbedded silts, sands, and gravels in the unsaturated zone and clay and clayey gravel in the saturated zone.
- Subsurface soil samples that were collected did not indicate the presence of VOC or pesticides contamination in soils underlying landfill materials.
- Groundwater at the time of the 1987 investigation was interpreted to flow to the east at an approximate gradient of 0.0045 ft/ft in response to pumping of City municipal wells that lie to the southeast.
- Groundwater results from the investigation indicated that concentrations of PCE in excess of the EPA MCLs were present in the groundwater.

1992 EPA Site Investigation
In 1992 EPA Region 6 conducted a site investigation of the former CML and collected surface soil and groundwater samples. The results of that investigation are summarized below.

Groundwater
As part of the former CML site investigation conducted for EPA Region 6 in September 1992, Fluor Daniel (on behalf of EPA) (1993) obtained groundwater samples from MW-1, MW-2, MW-3, MW-4, and from the Coronado 1 municipal well (approximately 1 mile southeast of the site). Duplicate samples were collected from MW-4, and the municipal well, Coronado 1. (The location of the COA Coronado wellfield can be seen on Figure 2-1.) The municipal well Coronado 1 was sampled with the intention of it representing a regional background data point. However, the well is located hydraulically downgradient of the CML site and therefore is not a

Table 2-6. Summary of Analytical Data for Subsurface Soil Samples
1987 Baseline Groundwater Investigation

	Boring EB-1				Boring EB-2		Boring MW-3			Boring MW-4		
	20 ft	20 ft (DUP)	27.5 ft	35 ft	35 ft	40 ft	25 ft	30 ft	35 ft	25 ft	30 ft	35 ft
pH (standard units)	9.5	9.38	9.7	9.8	7.8	8.4	9.2	8.4	8.2	8.8	8.2	8.3
Soil moisture content (percent)	5.2	2.7	1.3	1.9	3.8	4.0	3.0	5.4	18.0	7.9	0.9	1.8
Volatile organic compounds (EPA Method 8240)	ND[a]	ND	NA	NA	ND[a]	NA	ND[a]	NA	NA	ND[a]	NA	NA
Pesticides (EPA Method 8080)	ND	ND	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA

[a] Methylene chloride was detected but was attributed to laboratory reagent contamination.

Notes:
DUP = Duplicate.
EB = Exploratory borings.
NA = Analysis not available.
ND = Analyte not detected.

Source: Data obtained from Table 3-1 in EMCON 1987.

valid location for collection of a true background sample for which an upgradient location would be required. However, at the time of the 1992 sampling event a more appropriate upgradient background location did not exist. Therefore, the results from the Coronado 1 well are provided as regional comparison values, particularly for inorganic compound concentrations. Samples were analyzed for a target compound list of organics and target analyte list metals at Datachem Laboratories, which was a participant in the EPA Contract Laboratory Program at the time of sampling. Table 2-7 summarizes the analytical groundwater results for the 1992 sampling event. The original report and data from the 1992 investigation are not available at this time to be appended to this report.

The only VOC detected in the groundwater samples was PCE, which ranged from 11 μg/L in MW-2 to 14 μg/L in MW-1. These results were consistent with the results of the quarterly groundwater samples collected by Philips during the same time period. These concentrations of PCE in the Philips wells exceeded the EPA MCL of 5 μg/L for PCE. The sample collected from the COA municipal well Coronado 1 indicated a PCE concentration of 2 μg/L, which did not constitute an exceedance of the EPA MCL. It should be noted, however, that during regular drinking water compliance sampling of Coronado 1 conducted by the COA (verbal communication, 1999) no VOCs have ever been detected. The specific sample collection protocol used by the EPA in 1992 for the COA Coronado 1 well is unknown. However, the lack of PCE detections prior to or after the time of the apparent positive EPA detection suggest that a sampling error or cross-contamination may have been the source of the anomalous detection.

The SVOC bis(2-ethylhexyl)phthalate was detected in the 1992 groundwater samples as well. This SVOC had not been detected previously nor has it been detected subsequently during the last 10 years of groundwater sampling at the site. The pervasiveness of this plastics-related compound in the environment and its occurrence as a common laboratory contaminant suggest the 1992 detections were not indicative of true contaminants of concern in the groundwater at the Philips site. No pesticides or polychlorinated biphenyls were detected in the groundwater samples collected during 1992.

The only metal of potential concern that was identified was selenium, which had a reported concentration of 20.2 μg/L in MW-2. This concentration was greater than the concentration from Coronado 1, used for regional background comparison; however, the selenium concentration was well below the EPA drinking water MCL of 50 μg/L. Chromium was reported as not detected for the four Philips wells; however, the method detection limit (MDL) of 5.6 μg/L slightly exceeded the EPA MCL for chromium of 5 μg/L. However, since chromium had not been previously detected or subsequently identified as a contaminant of concern in the groundwater at the site, the reported nondetect values most likely do truly represent no detection in spite of the slightly elevated MDLs.

Surface Soil

Four surface-soil samples were collected from the southern portions of the former CML during the 1992 EPA Site Inspection (Fluor Daniel, 1993). Two samples from the landfill area (SS06 and SS07), a duplicate sample collected at the SS07 location (SS08), and a background sample (SS09) were collected from depths of 0 to 8 inches bgs. (The rationale for the numbering convention is unknown. Other soil samples considered unrelated to the former CML may have been collected at samples SS01-SS05.) The surface soil samples from the landfill area were collected from

Table 2-7. Summary of Analytical Data for Groundwater Samples
1992 EPA Site Inspection
(Concentrations presented in µg/L)

Analyte	Groundwater Standard	COA Coronado Well No. 1 [a]		MW-01		MW-02		MW-03		MW-04		MW-04 Duplicate	
VOC detections													
Tetrachloroethene	5	2	U	14	F	11	F	10	F	7	JF	8	JF
SVOC detections													
bis(2-ethylhexyl)phthalate	N/A	4	U	11	F	4	F	13	F	18	F	14	F
Pesticides/PCBs	-	None Detected											
Metals													
Arsenic	50[b]	23.4	–	1.1	U	1.8	B	0.3	J	2.0	B	2.0	B
Barium	1000[c]	NA	–	226	B	110	B	65.7	B	124	B	130	B
Cadmium	5[b]	NA	–	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U
Chromium	50[c]	NA	–	10	U	10	U	10	U	10	U	10	U
Lead	50[c]	5.6	–	1.1	U	1.1	U	2.2	B	1.1	U	1.1	U
Mercury	2 [b,c]	NA	–	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Selenium	50[b]	2.9	U	1.1	R	20.2	JF	1.1	R	1.1	R	1.1	R
Silver	50[c]	NA	–	4.4	R	4.4	R	4.4	R	4.4	R	4.4	R

[a] This COA municipal well was sampled the same week as the monitoring wells and was used as a regional background comparison point.
[b] EPA primary drinking water MCL.
[c] NMWQCC standard.

Notes:
B = Analyte was detected above the instrument detection limit but below the contract required detection limit.
F = Analyte is greater than three times background concentration or greater than quantitation limit.
J = The associated value is an estimated quantity.
NA = Analysis not available.
Q = Qualifier.
R = Data for analyte is unusable.
U = The material was analyzed for but was not detected above the level of the associated value.

Source: Data obtained from Table 3 of Fluor Daniel, 1993, "Revised Site Inspection Report for Coronado Landfill Site NMD980622708, WA # 25-6JZZ," Fluor Daniel ARCS Team, Dallas, Texas.

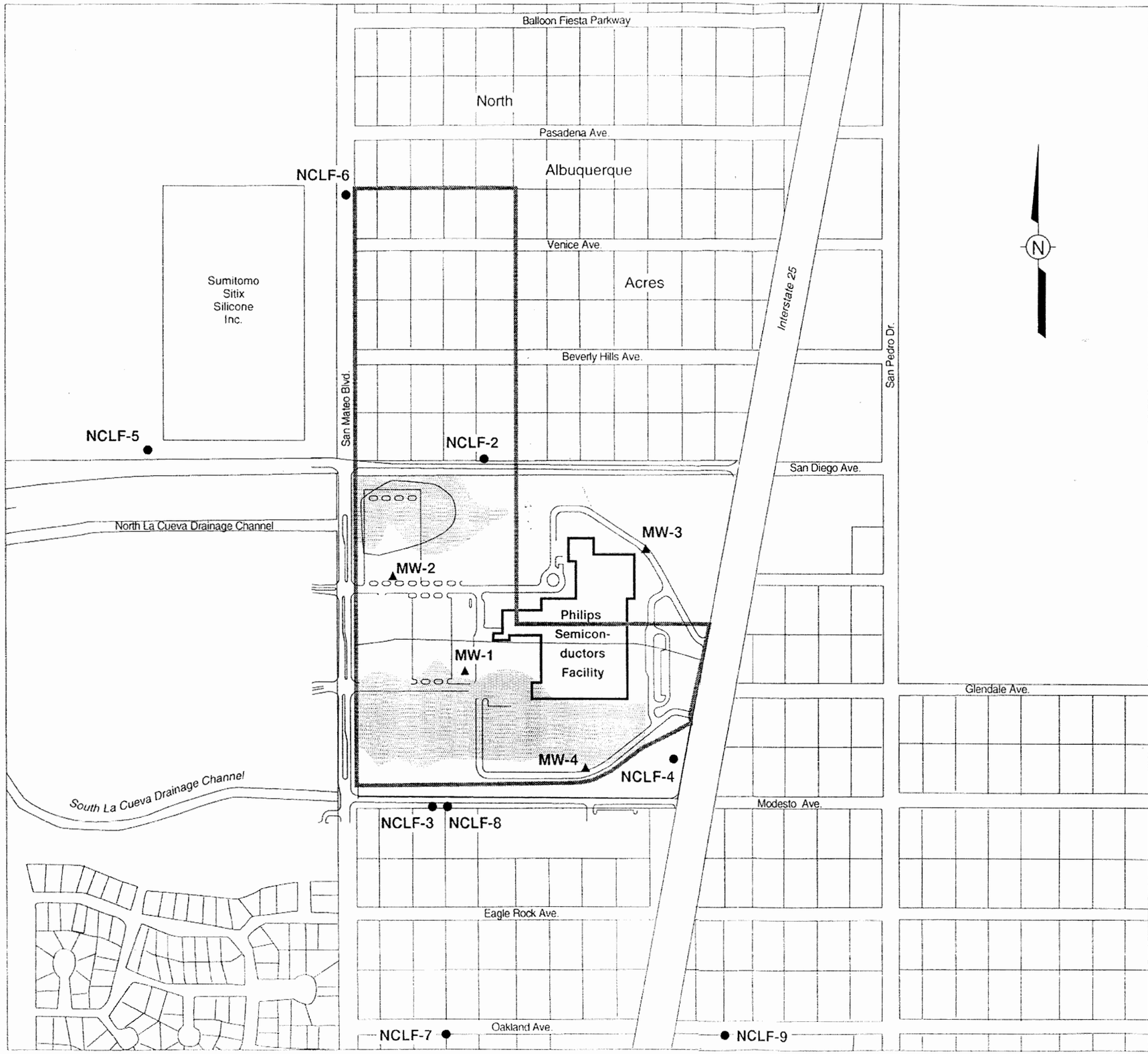
locations adjacent to the Philips parking lot area. Figure 2-7 shows the sample locations and Table 2-8 summarizes the analytical results for the target compound list of organics and target analyte list metals. As indicated previously, the original report and data from the 1992 investigation are not available at this time to be appended to this report.

No VOCs were detected in any of the collected surface soil samples (Flour Daniel, 1993). No SVOCs were detected in the selected background surface soil sample (SS09) and sample SS06. In surface soil samples SS07 and SS08 (duplicate), 19 SVOCs were detected at concentrations greater than the analytical MDLs. At the time of the investigation and in subsequent reports and work plans, various polyaromatic hydrocarbons have been reported as exceeding EPA residential and/or industrial screening levels in effect at the time of the writing. In this report all concentrations have been compared to the current NMED soil screening levels (NMED, 2000).

Comparison to the NMED soil screening levels indicates that the reported SVOC sample results for samples SS07 and SS08 indicate that as many as five polyaromatic hydrocarbons exceeded the residential NMED soil screening levels, with some concentrations also exceeding the industrial levels. The type of polyaromatic hydrocarbon SVOC compounds detected in the surface soils at the Philips site are often associated with oil products and asphalt products. Therefore, the proximity of the 1992 soil sampling locations to the Philips parking lot suggests that the elevated SVOCs may have been due to surface soil impacts from parking lot materials and runoff as opposed to representing contamination associated with former landfill materials. This is further supported by the fact that the sampled top 8 inches of soil was very unlikely to be indicative of original landfill material or surface cover. The almost 30 years of time since the landfill had been in use, during which the site was developed and the Philips facility and parking areas were all constructed, suggests that the upper 8 inches of soil in the sampled areas was likely fill or at minimum highly reworked material from throughout the site.

Seven pesticides were detected in the soil samples, with all samples containing concentrations of at least one or more of the seven compounds. As with the SVOCs the pesticide results have been reported as exceeding various EPA residential and/or industrial screening levels that were in effect at the time different documents were written. However, in this report all concentrations have been compared to the current NMED soil screening levels (NMED, 2000). Reported concentrations for one of the identified pesticides (dieldrin) exceeded the residential NMED screening level in the diluted run of surface soil sample SS07. Prior to analysis of the diluted samples, none of the surface soil sample results indicated concentrations of any of the seven pesticides that exceeded the residential or industrial screening levels. The sample dilutions were conducted to quantify the SVOC concentrations that exceeded the instrument detection limits. The diluted sample results were all flagged as estimated concentrations and were also noted as having more than a 25 percent discrepancy between chromatograph readings. These laboratory flags indicate that the concentrations should be considered as estimated and likely do not represent true soil results.

Concentrations of chromium, lead, and mercury were detected in investigatory samples at concentrations greater than those detected at the background boring location (SS09). However, all metals concentrations were significantly below NMED residential and industrial screening levels.



LEGEND

Documented Extent of SWMU #8 Former Coronado Municipal Landfill (ERCO, 1981)

Disturbed Area From Aeriel Photograph (IT, 1996)

▲ Philips' Monitoring Wells

● COA NCLF Monitoring Wells

0 750 Feet

APPROXIMATE SCALE

Figure 2-7
Quarterly Monitoring Program Philips' and COA NCLF Wells
Philips Semiconductors Facility

Table 2-8. Summary of Analytical Data for Surface Soil Samples
EPA 1992 Site Inspection

Analyte	NMED Residential Soil Screening Level	NMED Industrial Soil Screening Level	SS09 Background Location		SS06 Surface Soil		SS07 Surface Soil		SS07 Diluted Sample		SS08 Duplicate (SS07)		SS08 Diluted Duplicate	
SVOCs (Concentrations in µg/L)														
2-methylphenol	N/A	N/A	<350	U	<350	U	<350	U	<35000	U	69	J	<17000	U
4-methylphenol	N/A	N/A	<350	U	<350	U	130	J	<35000	U	94	J	<17000	U
2,4-dimethylphenol	120,000	300,000	<350	U	<350	U	40	J	<35000	U	<350	U	<17000	U
Naphthalene	53,000	43,000	<350	U	<350	U	470		<35000	U	430		<17000	U
2-methylnaphthalene	N/A	N/A	<350	U	<350	U	240	J	<35000	U	180	J	<17000	U
Acenaphthylene	N/A	N/A	<350	U	<350	U	2000		<35000	U	1600		<17000	U
Acenaphthene	2,800,000	4,900,000	<350	U	<350	U	3000	E	2800	DJ	1900		<17000	U
Dibenzofuran	N/A	N/A	<350	U	<350	U	2200		<370	U	<360	U	<370	U
Fluorene	2,100,000	4,000,000	<350	U	<350	U	4900	E	<370	U	<360	U	<370	U
Phenanthrene	1,800,000	4,400,000	<350	U	120	J	56000	E	<370	U	<360	U	<370	U
Anthracene	16,000,000	34,000,000	<350	U	<350	U	7700	E	<370	U	<360	U	<370	U
Carbazole	N/A	N/.A	<350	U	23	J	29000	E	<370	U	<360	U	<370	U
Di-n-butylphthalate	6,100,000	15,000,000	<350	U	<350	U	350	U	<370	U	<360	U	79	J
Fluoranthene	2,300,000	5,300,000	<350	U	260	J	84000	E	<370	U	<360	U	<370	U
Pyrene	1,800,000	4,300,000	<350	U	220	J	130000	E	170000		82000	E	100000	D
Benzo(a)anthracene	6,200	26,000	<350	U	92	J	<410	U	<370	U	<360	U	<370	U
Chrysene	610,000	2,500,000	<350	U	170	J	<410	U	<370	U	<360	U	<370	U
Benzo(b)fluoranthene	6,200	26,000	<350	U	210	J	***75000*** [a]	EJ	***110000***	D	6000	EJ	6200	D
Benzo(k)fluoranthene	62,000	260,000	<350	U	220	J	<350	UJ	*65000*	DJ	<350	UJ	*75000*	DJ
Benzo(a)pyrene	620	2,600	<350	U	83	J	***30000***	EJ	***88000***	D	***17000***	EJ	***58000***	D
Indeno(1,2,3-cd)pyrene	6,200	26,000	<350	U	130	J	***32000***	EJ	***55000***	D	*18000*	EJ	***35000***	D
Dibenzo(a,h,)anthracene	620	2,600	<350	U	<350	U	***13000***	EJ	***28000***	DJ	***5500***	EJ	***18000***	D
Benzo(g,h,i)perylene	N/A	N/A	<350	U	120	J	32000	EJ	55000	D	14000	EJ	33000	D
Pesticides (Concentrations in µg/L)														
Heptachlor	1,100	4,500	<1.8	U	<1.8	U	<1.8	U	150	DJP	<1.8	U	150	DJP
Aldrin	290	1,200	<1.8	U	<1.8	U	15	JP	<180	U	14	JP	<180	U
Heptachlor epoxide	N/A	N/A	<1.8	U	3.3	JP	8.5	JP	<180	U	8.3	JP	<180	U
Dieldrin	300	1,300	21	X	3.0	JP	<3.5	UJ	***310***	DPJ	<3.5	UJ	62	DPJ
Endrine ketone	18,000	44,000	<3.5	U	<3.5	U	<3.5	UJ	280	DPJ	<3.5	UJ	190	DPJ
Alpha-chlordane	16,000	70,000	2.5	P	6.2		5.9	JP	<180	U	5.5	JP	<180	U
Gamma-chlordane	16,000	70,000	2.4	P	5.2		<1.8	U	<180	U	<1.8	U	<180	U

Table 2-8. Summary of Analytical Data for Surface Soil Samples
EPA 1992 Site Inspection (continued)

Analyte	NMED Residential Soil Screening Level	NMED Industrial Soil Screening Level	SS09 Background Location		SS06 Surface Soil		SS07 Surface Soil		SS08 Duplicate SS07	
Metals (Concentrations in mg/L)										
Arsenic	3.9	17	2.7		1.3	B	2.3		1.9	B
Barium	5,200	15,000	138	J	64.5	J	119	J	122	J
Cadmium	70	1,900	<1.0	U	<1.1	U	<1.1	U	<1.1	U
Chromium	100,000 (III) / 230 (VI) [b]	100,000 (III) / 660 (VI) [b]	6.2		3.4		20.9		9.3	
Lead	400	2,000	10.1		8.9		72.4		62.5	
Mercury	23	69	<0.05	U	<0.05	U	0.09	B	0.09	B
Selenium	380	1,200	2.1	R	2.1	R	2.1	R	2.1	R
Silver	380	1,200	<0.84	U	<0.84	U	<0.85	U	<0.86	U

[a] Reported results shown in italics exceed the NMED residential soil screening levels (NMED, 2000). Results shown in bold italics indicate that the concentration also exceeds the NMED industrial screening levels. Reported results for various compounds were reported as exceeding various combinations of EPA Region 6 residential and/or industrial risk-based screening levels at the time of the investigation and during subsequent reports and work plans since 1992. Currently, however, results are compared only to the applicable 2000 NMED soil screening levels.

[b] Screening levels for both trivalent chromium (III) and hexavalent chromium (VI) are listed.

Notes:
B = Analyte was detected above the instrument detection limit but below the contract required detection limit.
D = Diluted extract result.
E = Exceeds instrument range.
J = Associated value is an estimated quantity.
mg/kg = milligrams per kilogram.
P = Greater than 25 percent difference between two gas chromatograph columns for the detected concentration.
Q = Qualifier.
R = Data for analyte is unusable.
U = Material was analyzed for but was not detected above the level of the associated value.
X = Results are considered suspect because retention time windows fall within the range belonging to Aroclors.
µg/kg = micrograms per kilogram.

Source: Data obtained from Fluor Daniel, 1993.

Conclusions
Conclusions drawn from the 1992 EPA investigation are summarized below:

- The only constituent detected at concentrations above applicable MCLs in the groundwater samples from the Philips wells was PCE, detected at concentrations ranging from 11 to 14 µg/L.
- Five polyaromatic hydrocarbons were found in a soil sample (and its duplicate sample) obtained adjacent to the Philips parking lot with detected concentrations in exceedance of NMED soil screening levels. One pesticide result in the diluted soil sample had a reported result that exceeded the NMED screening level as well; however, laboratory qualifiers suggest that result may not represent an accurate value.

1996 Appendix IX Sampling
In April 1996, Philips obtained groundwater samples from MW-1, MW-2, MW-3, and MW-4 to fulfill the quarterly sampling requirement of the HSWA Module. As set forth by the HSWA Module requirements, these samples were analyzed for Appendix IX constituents, as codified in the *Code of Federal Regulations*, Title 40, Part 264 (40 CFR 264).

The only organic compound detected at concentrations exceeding the MCL was PCE detected in groundwater samples from MW-1 and MW-2 at concentrations of 7.4 µg/L and 6.6 µg/L, respectively. These PCE concentrations exceeded the EPA MCL of 5 µg/L. The metals barium and zinc were detected in groundwater samples from all monitoring wells. Additionally arsenic was detected in groundwater samples from MW-2, MW-3, and MW-4 and chromium was detected in the groundwater sample from MW-1. None of the detected inorganic constituents exceeded applicable MCLs or drinking water standards, and results were consistent with previous and subsequent sampling results from the Philips monitoring wells. Based on the results of the 1996 sampling event, post-1996 analyses of groundwater samples at the Philips site were limited to VOCs, SVOCs, RCRA metals, and organochlorine pesticides.

1987 to Present—Quarterly Groundwater Sampling of Philips Monitoring Wells and City of Albuquerque Monitoring Wells
Since the installation and initial sampling event in 1987, the four Philips groundwater monitoring wells (MW-1, MW-2, MW-3, and MW-4) have been sampled on a more or less quarterly basis since 1988. During 1997, the COA began its own investigation of the former Nazareth/Coronado Landfills (NCLF). As part of that ongoing simultaneous investigation, the COA has installed a series of monitoring wells designated the NCLF wells. Most of the NCLF monitoring wells (NCLF-2 through -9) are installed in the vicinity of the Philips site and provide data applicable to the investigation of the former CML located on the Philips facility (Figure 2-7). Therefore, since installation, the COA monitoring wells have been sampled on a quarterly basis in conjunction with the Philips wells. Wells NCLF-2 through -6 were installed in October 1996, NCLF-7 and -8 were installed during the summer of 1999, and NCLF-9 was installed in September 1999. The COA well NCLF-1 has not been sampled in conjunction with the investigation at the Philips facility because it is located almost 2,000 feet crossgradient from the site and other COA monitoring wells are located between that location and the investigation site.

The groundwater samples collected from the Philips monitoring wells prior to 1996 were analyzed for halogenated volatile organics (EPA Method 8010), TKN (EPA Method 351.2), and TOC (EPA Method 9060) (EPA, 1986). Table 2-9 presents a summary of that series of

groundwater sample results that contained detections of PCE. Concentrations of PCE were detected at concentrations ranging from 3.6 to 30 μg/L during this period. The only other VOC detected was during the 1988 and 1989 sampling events when the compound 1,1,2,2-tetrachloroethane was detected at concentrations ranging from 9.2 to 30 μg/L. However, during this time, the analytical laboratory reported a co-elution problem with PCE and 1,1,2,2-tetrachloroethane. Therefore, they could not distinguish between the two compounds and it is likely that 1,1,2,2-tetrachloroethane was not present. Subsequent to the December 1989 sampling date, neither 1,1,2,2-tetrachloroethane nor any other volatile compounds other than PCE had been detected in the groundwater samples from the Philips wells, nor have any been detected since.

Since 1996 groundwater samples from the Philips monitoring wells have been analyzed for VOCs (EPA Method 8260), SVOCs (EPA Method 8270), organochlorine pesticides (EPA Method 8080) and RCRA metals (EPA Methods 6000/7000). These historic data from the Philips monitoring wells are summarized in Table 2-9. In 1998 well MW-3 went dry and therefore ceased to be sampled. Also, beginning in 2000 the sampling frequency for the Philips wells was reduced to annually because eight quarters of sample data had been accumulated for those wells and indicated fairly stable groundwater conditions. Table 2-10 summarizes the detected PCE concentrations that have been detected in the COA NCLF wells since the first installed wells began to be sampled along with the Philips wells in 1996. Analytical results indicate that the only organic compound that has been detected in the Philips monitoring wells above applicable groundwater standards has been PCE. Concentrations of PCE in both the Philips and NCLF wells have been consistently dropping since the initiation of sampling in the late 1980s. In well MW-1, initial sampling results in 1988 were as much as 30 μg/L whereas concentrations are now typically less than 10 μg/L. Since 2001 the PCE concentrations in all the Philips and NCLF wells have been less than 10 μg/L with some wells that have historically contained concentrations in excess of the MCL having dropped to less than and/or only slightly above the MCL. The PCE concentration changes generally represent a two- to three-fold reduction in concentration in most wells since the initiation of monitoring.

Concentrations of carbon tetrachloride, chloroform, and freon-12 have been detected intermittently in the Philips monitoring wells; however, all concentrations have been below applicable standards. Other organic compounds (toluene and phenol) have been detected in some of the COA's NCLF wells. However, these compounds have not been detected in any of the Philips groundwater monitoring wells.

Concentrations of barium, chromium, lead, selenium, silver and zinc have been detected in various Philips monitoring wells intermittently throughout the quarterly sampling program. However, the only detected metals concentrations that exceeded NMED water quality standards were chromium concentrations of 0.11 and 0.09 mg/L in MW-3 and MW-4, respectively, during the April 1997 sampling event (the NMWQCC standard for chromium is 0.05 mg/L) and a silver concentration of 0.111 mg/L detected in MW-1 during the July 1998 sampling event (the NMWQCC standard for silver is 0.05 mg/L). The isolated occurrence of these metals exceedances in groundwater samples with no discernible pattern of repetitive occurrences in the same wells or of the same compounds suggests that these data represent naturally occurring variations in inorganic constituents in the groundwater.

Table 2-9. Summary of Tetrachloroethene Concentrations from Philips Wells MW-1, MW-2, MW-3, and MW-4 1988 through 2001

Sample Date	Parameter	Sample Location				Trip Blank	Reporting Limit (µg/L)
		MW-1 (µg/L)	MW-2 (µg/L)	MW-3 (µg/L)	MW-4 (µg/L)		
September 1988	Tetrachloroethene	30	14	30	NS	ND	0.5
May 1989	Tetrachloroethene	25	14	NS	9.2	NA	0.5
September 1989	Tetrachloroethene	15	9.9	NS	6.8	ND	0.5
December 1989	Tetrachloroethene	17	11	ND	17	NA	0.5
March 1990	Tetrachloroethene	NS	13	NS	NS	NA	0.5
June 1990	Tetrachloroethene	20	13	ND	8.1	NA	0.5
September 1990	Tetrachloroethene	17	11	ND	7.6	ND	0.5
December 1990	Tetrachloroethene	24	15	ND	11	NA	0.5
April 1991	Tetrachloroethene	11	4.7	ND	5.7	ND	0.5
June 1991	Tetrachloroethene	14	9.2	ND	6.5	NA	0.5
September 1991	Tetrachloroethene	12	11	ND	7.0	NA	0.5
December 1991	Tetrachloroethene	13	9.3	ND	6.2	ND	0.5
March 1992	Tetrachloroethene	13	9.5	ND	4.7	ND	0.5
May 1992	Tetrachloroethene	9.0	8.7	ND	4.8	ND	0.5
September 1992	Tetrachloroethene	11	10	ND	5.5	NA	0.5
January 1993	Tetrachloroethene	6.2	7.1	ND	5.4	ND	0.5
March 1993	Tetrachloroethene	8.3	7.2	ND	5.7	NA	NA
June 1993	Tetrachloroethene	12	4	ND	3.6	NA	NA
September 1993	Tetrachloroethene	13	9.9	ND	6.4	NA	NA
November 1993	Tetrachloroethene	10	8.7	ND	5.6	NA	NA
March 1994	Tetrachloroethene	9.8	9	ND	5.4	NA	NA
July 1994	Tetrachloroethene	5.2	6.5	ND	3.8	NA	NA
August 1995	Tetrachloroethene	NS	6	ND	4.1	NA	NA
November 1995	Tetrachloroethene	6.4	NS	NS	NS	NA	NA
1996	Tetrachloroethene	7.4	6.6	ND	ND	NA	NA
January 1997	Tetrachloroethene	8.6	8.2	1	5.2	NA	NA
April 1997	Tetrachloroethene	9.5	8.2	ND	5.6	NA	NA
July 1997	Tetrachloroethene	4.7	3.9	ND	3.1	NA	NA
October 1997	Tetrachloroethene	8.8	7.2	ND	4.8	NA	NA
January 1998	Tetrachloroethene	9.6	9.2	ND	5.8	NA	NA
April 1998	Tetrachloroethene	9.5	10	ND	5.8	NA	NA
July 1998	Tetrachloroethene	10	10	9.6	NS	NA	NA
October 1998	Tetrachloroethene	8.8	7.5	NS [a]	5.3	NA	NA
January 1999	Tetrachloroethene	8.1	7.4	NS	5.4	NA	NA
April 1999	Tetrachloroethene	8.7	7.6	NS	5.5	NA	NA
July 1999	Tetrachloroethene	8.5	7.0	NS	5.3	NA	NA
October 1999	Tetrachloroethene	7.4	7.0	NS	4.7	NA	NA
January 2000	Tetrachloroethene	- [b]	-	-	-	NA	NA
April 2000	Tetrachloroethene	9.4	7.6	NS	5.2	NA	NA
July 2000	Tetrachloroethene	-	-	-	-	NA	NA
October 2000	Tetrachloroethene	-	-	-	-	NA	NA
January 2001	Tetrachloroethene	-	-	-	-	NA	NA
April 2001	Tetrachloroethene	5.9	6.7	NS	4.9	NA	NA
July 2001	Tetrachloroethene	-	-	-	-	NA	NA
October 2001	Tetrachloroethene	-	-	-	-	NA	NA

Table 2-9. Summary of Tetrachloroethene Concentrations from Philips Wells MW-1, MW-2, MW-3, and MW-4 1988 through 2001

Sample Date	Parameter	Sample Location				Trip Blank	Reporting Limit (µg/L)
		MW-1 (µg/L)	MW-2 (µg/L)	MW-3 (µg/L)	MW-4 (µg/L)		
July 2001 [c]	Tetrachloroethene	**MW-5**	< 1	**MW-6**	< 1		-
October 2001 [c]	Tetrachloroethene	**MW-5**	< 1	**MW-6**	< 1		-

[a] The static water level in well MW-3 dropped below the screen interval in 1998 and the well went dry. Therefore, sampling was unable to be continued.

[b] Beginning in 2000 for wells that had more than 8 quarters of sampling data available the sampling frequency was reduced to annually. The annual event occurs in the second quarter of each year (April).

[c] The new Philips wells MW-5 and MW-6 were installed during 2001 and were sampled in the 3rd and 4th quarters (July and October) of 2001. Results for both wells during both quarters were non detect.

Notes: 1. Analyses performed using EPA Method 601, 8010, or 8260.
2. NA = Results not available. NS = Well not sampled. ND = Analyte not detected.

Sources: September 1988 through January 1993 data obtained from Table 6-2, PRC Environmental Management, Inc. (PRC), 1992, "RCRA Facility Assessment Report, Signetics Corporation, Albuquerque, New Mexico, *NMD000709782*," PRC Environmental Management, Inc., Dallas, Texas. January 1993 through November 1995 data obtained from Philips Semiconductors central files. April 1996 data obtained from Table 3, Daniel B. Stephens and Associates, Inc., May 1996, "North American Philips Company Quarterly Ground-Water Monitoring Report," Daniel B. Stephens and Associates, Inc., Albuquerque, New Mexico. 1997 through 1999 data obtained from Philips Semiconductors.

Table 2-10. Summary of Tetrachloroethene Concentrations from NCLF Wells 1997 through 2001

Sample Date	Sample Location							
	NCLF-2	NCLF-3	NCLF-4	NCLF-5	NCLF-6	NCLF-7	NCLF-8	NCLF-9
January 1997	8.2	7.2	4	[a]				
April 1997	6.2	7.2	5.6					
July 1997	3.6	3.6	2.4					
October 1997	7.4	7.8	4.8					
January 1998	8.5	12.0	7.1					
April 1998	10	11.0	7.1					
July 1998	10	11	7.3	ND	1.8			
October 1998	8.4	7.8	4.7	ND	1.7			
January 1999	9.4	9.2	5.7	ND	1.7			
April 1999	10	9.4	4.7	ND	1.8			
July 1999	7	9.6	4.1	ND	1.9			
October 1999	7.8	7.6	2.7	ND	1.7			
January 2000	- [b]	-	-	ND	1.7	1.6	3.6	1.9
April 2000	11	9.7	3.7	ND	2.2	1.7	3.9	<1
July 2000	-	-	-	ND	1.4	1.1	3.4	1.1
October 2000	-	-	-	ND	1.9	1.5	3.8	<1
January 2001	-	-	-	-	-	1.3	2.6	1.1
April 2001	7.6	6.9	3.4	ND	2.5	1.7	3.7	<1
July 2001	-	-	-	-	-	<1	3.0	<1
October 2001	-	-	-	-	-	1.8	3.6	<1

[a] A blank indicates that the well was not yet installed during that quarter.

[b] Beginning in 2000 for wells that had more than 8 quarters of sampling data the sampling frequency was reduced to annually. The annual event occurs in the second quarter of each year (April).

ND = Analyte not detected

Source: Data obtained from Philips Semiconductors central files.

The hydrogeologic conditions that have been determined based on the quarterly sampling program indicate that the static water level in most wells has dropped considerably since the program began in the late 1980s. For instance the static water level in wells MW-1 and MW-4 has dropped roughly 9 feet since 1988 and the water level in MW-3 has dropped below the screen interval resulting in the well going dry. Based on historical water level measurements collected from the Philips wells and the COA's NCLF wells, the groundwater flow direction under the former CML has been estimated to the southeast at a gradient of approximately 0.003 ft/ft.

2.3.2 Current RFI Sampling Activities (1999-2002)

2.3.2.1 Contaminant Source

The PCE that has been identified in the groundwater below the Philips site is presumably from the former CML. However, the presence of PCE contamination in upgradient monitoring wells suggests that the portions of the former CML located on the Philips site may not be the only source of VOC contamination in the groundwater or may not be the source at all. As indicated in an interview with the individual who had been the supervisor of the City of Albuquerque Refuse Division during the operational period of the CML the nearby COA Nazareth and Los Angeles landfills had been used for some industrial waste disposal whereas the CML had been used solely for domestic waste disposal (ERCO, 1981). The Nazareth Landfill in particular is located roughly 1,500 feet directly upgradient of the Philips site. Figure 2-2 shows the location of both the former Nazareth and Los Angeles landfills relative to the Philips site.

Prior investigations to the current one reported here have not identified subsurface soil contamination. Limited surface soil contamination has been inferred based on the previous 1992 EPA investigation; however, circumstances of that sampling effort and analysis of the samples make the data somewhat suspect. Confirmation of the type and magnitude of the reported contaminants identified in that 1992 investigation was a goal of the investigation reported here. A possible source of the identified contaminants in 1992 could be contamination or materials from the former CML. However, it is more likely that the SVOCs detected were associated with asphalt parking lot materials and runoff and the pesticide compounds identified may be from widely used landscape applications.

2.3.2.2 Media Characterization

Impacts to groundwater have been and continue to be characterized by collecting and analyzing groundwater samples from existing and new monitoring well locations. Additional surface and subsurface soil characterization has been conducted as part of this investigation by collecting and analyzing soil samples. Soil gas, as an indicator of a subsurface contaminant source and a possible contaminant transport mechanism, has been evaluated as part of this investigation by conducting onsite soil gas survey activities. Investigative samples have been collected and analyzed as outlined in the RFI Work Plan (with exceptions as noted in this text) and the Data Management Plan and Data Collection Quality Assurance Plan.

2.3.3 Preliminary Conceptual Model

The preliminary conceptual model was developed based on the historic investigations and data collection that has occurred at the former CML. There are several components of the overall site conceptual model including groundwater, surface and subsurface soil, landfill gases and soil

gas, and landfill waste material. Each of these media and its basic conceptual model are discussed below and then discussed as a whole.

Groundwater Contamination

Concentrations of PCE have historically been detected in the groundwater under the Philips site as well as on properties in the general vicinity of the Philips facility. The northern edge of the PCE plume is monitored by COA well NCLF-6 and has consistently shown low PCE concentrations (2.3 μg/L in the second quarter of 2002) since its installation in early 1998. The presence of PCE in the NCLF-6 is notable since that well is installed approximately 1,300 feet upgradient of the northern edge of the areas of the former CML located on the Philips property. Well NCLF-6 is even upgradient of the northernmost cell of the former CML, which is located on the privately-owned properties between San Diego and Venice Avenues, north of the Philips site (Figure 2-7).

The most upgradient well located immediately adjacent to the Philips site is NCLF-2. This well has consistently displayed PCE values commensurate with those levels seen in Philips wells MW-1 and MW-2, making it consistently among the top several wells with the highest detected PCE concentrations. The range of PCE concentrations that separate the three wells with the highest levels is typically 1 to 2 μg/L. However, the absolute value difference between the concentrations in NCLF-2 and the Philips wells is not as important as the observation that significantly degraded groundwater may be migrating into the portion of the aquifer underlying the Philips site from an upgradient direction.

The southern extent of PCE concentrations in groundwater that exceed the MCL has been delineated with the COA wells, NCLF-7 and NCLF-9, which are installed along Oakland Street approximately 1,500 feet south of the southern edge of the former CML site. Recent results from NCLF-7 and NCLF-9 have been on the order of 1 to 3 μg/L PCE, which are below the EPA MCL.

The eastern boundary of the PCE contamination in groundwater above the MCL has been delineated as well. Historically samples from Philips well MW-3 did not indicate the presence of any VOCs with the exception of a single minor occurrence of PCE (1 μg/L) and single anomalous occurrences of carbon tetrachloride and chloroform during the two initial quarters of sampling. In 1998 the declining water table level in the MW-3 area dropped below the bottom of the screen causing the well to go dry and no longer be samplable. A proposed element of the RFI being reported here was the installation of a replacement well in the MW-3 area to re-establish the eastern delineation point of groundwater contamination.

The western edge of PCE contamination in the groundwater west of the former CML cells has been delineated by COA well NCLF-5, which has been a nondetect value for PCE since its installation in early 1998.

Prior to the current RFI the vertical extent of PCE contamination in the groundwater at levels above the MCL had not been determined. However, installation of a deeper monitoring well adjacent to the historically most contaminated water table well was an element of the RFI.

Surface Soil Contamination

The nature and extent of surface soil contamination as suggested by the 1992 EPA investigation had not been fully defined nor the existence of such contamination confirmed. The RFI activities reported here included additional sampling to re-evaluate the issues of elevated

SVOCs and pesticide concentrations detected in samples collected from the northwest portion of the site.

Subsurface Soil Contamination

Previously collected subsurface soil samples from the former CML site had never indicated the presence of any anthropogenic contamination. The RFI activities reported here gathered further data on subsurface soils at the site to confirm this conclusion.

Methane Migration and Soil Gas

The installation of 35 methane vent wells and monitoring of those locations from 1981 to 1993 led Philips to conclude that the nature and extent of methane associated with the former CML had been adequately delineated. Monitoring was discontinued in 1993 after methane ceased to be detected at the various monitoring points.

As part of the RFI activities reported here, a soil gas investigation was conducted to identify the possible presence of elevated concentrations of solvents that may occur in the soil gas in or around the landfill materials and act as a source for contaminant migration to the groundwater.

Landfill Waste

Several previous investigations and a compilation of historic data has adequately delineated the general nature and extent of the waste material that was disposed of in the former CML. Additional attempts to delineate possible specific PCE sources within the landfill material were conducted by performing a soil gas survey as part of the RFI activities reported here.

Overall Preliminary Conceptual Site Model

The overall preliminary conceptual site model that was developed based on the existing data collected prior to the recent RFI activities was that of an historic municipal landfill used mainly for disposal of domestic waste that operated in several areas (including two cells on what is now the Philips site and one cell on now privately-owned property north of San Diego Avenue). The makeup of the landfill material present in the cells on the Philips site has been documented by sampling and no industrial-related hazardous constituents have been identified.

Limited surface soil contamination at the site was identified during an EPA site investigation in 1992. However, sample locations were immediately adjacent to the large parking lot area at the Philips facility and the SVOC contaminants that were identified as exceeding applicable regulatory screening levels could potentially be associated with materials from the asphalt parking lot and/or surface water runoff from the asphalt areas. Pesticides also were identified in some of the surface soil samples with some apparently exceeding applicable screening levels. However, elevated detection levels and non-agreement between chromatograph readings caused those results to all be flagged as estimated and the reported values may be suspect. The RFI activities reported here included additional sampling to assist in resolving the issues associated with these suspect data. However, the issue of the possible SVOC and/or pesticide contamination in the surface soils at the site does not influence or alter the conceptual model related to the groundwater issues at the site.

Previous data from subsurface soil samples did not indicate the presence of contamination. Soil samples collected from depths ranging from 20 to 40 feet bgs at locations EB-1 and EB-2 and during the installation of MW-3 and MW-4 did not indicate the presence of VOCs in the soils. At locations EB-1 and EB-2, these sample depths would have been underneath the landfill materials and the absence of contamination in the soil suggests that, at least at those locations, vertical migration into the soil of landfill leachate or liquid contaminants did not occur.

The conceptual groundwater site model is basically that of a water table aquifer system with groundwater flowing from a northwest to southeast direction. Contamination has been observed at the highest levels in the monitoring wells located in the central portion of the Philips site and in the wells on both the upgradient and downgradient sides of the site. Concentrations of PCE have been detected in all but one well, NCLF-5, including the most upgradient well NCLF-6, which is located over 1,000 feet upgradient of the Philips site. The widespread occurrence of PCE in wells on both the downgradient and upgradient sides of the Philips site suggest that PCE contamination in the groundwater underlying the portions of the CML on the Philips site may represent contamination that is flowing onto the site from an upgradient source in the aquifer. Such a source could be portions of the CML landfill that are present on the private properties north of the Philips site; the source could landfill vapor transport in the vadose zone, with contaminants then transferred to groundwater in both up and downgradient directions from the site; the source could be contamination from the nearby Nazareth landfill located north and west of the Philips site; the source could be another unidentified regional contaminant source; or the source of PCE observed in the groundwater at the Philips site could be a combination of several or all of these potential sources. As part of the RFI that is reported here, additional data were collected to help better develop a site model of PCE distribution in the groundwater and groundwater flow at the site.

2.3.4 RFI Field Investigation and Data Evaluation

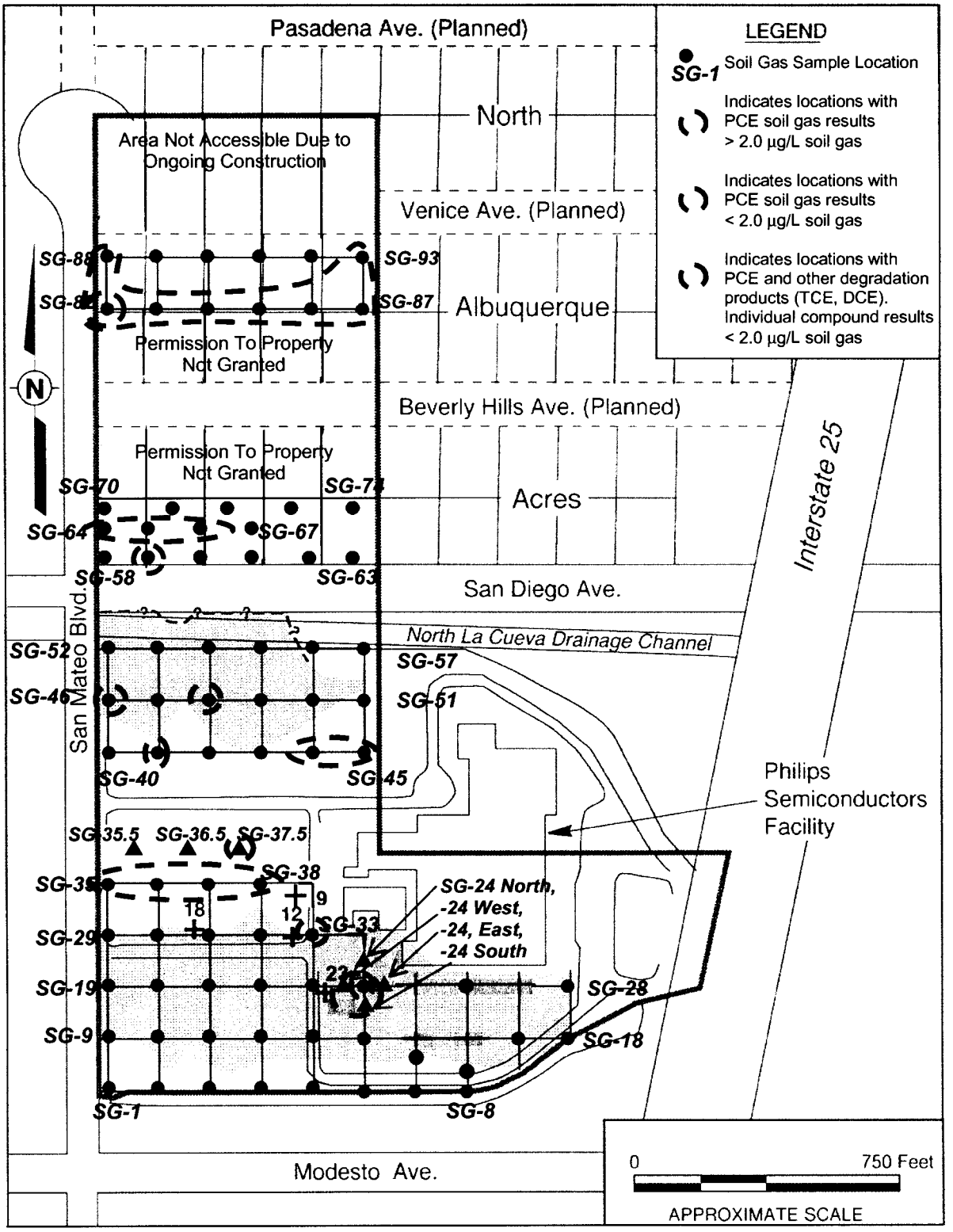
The field activities that were conducted during the RFI are as follows:

- Soil gas survey activities to investigate possible contaminant source areas in the former CML materials and evaluate soil gas as a potential contaminant transport mechanism.
- Installation of two additional monitoring wells to delineate the vertical and horizontal extent of identified PCE contamination in groundwater.
- Subsurface soil sampling during installation of the new monitoring wells to assess the potential presence of contamination in the subsurface vadose zone.
- Continued collection and analysis of groundwater samples from the existing site monitoring wells (MW-1, MW-2, and MW-4), the newly installed monitoring wells (MW-5 and MW-6), the COA NCLF wells.
- Surface soil sampling in the former CML area to confirm the presence of and/or delineate the extent of previously detected SVOC and pesticide compounds.
- Review of regional and area literature to develop a range of likely hydrogeologic characteristics for the site aquifer.

The details of each field activity are discussed below.

2.3.4.1 Soil Gas Survey

In December 1999, a soil gas survey was conducted at the Philips site. A predetermined sampling grid, as presented in Section 3.3.6 of the RFI Work Plan, was laid out overlying the suspected areas of subsurface landfill material. A total of 91 samples were collected and analyzed; 87 samples were collected from soil gas sample probe points and 4 samples were collected from existing methane vent wells at the Philips site. Sample locations are shown in Figure 2-8.



Sample locations shown outlined with a dashed colored contour line are locations that had detectable soil gas concentrations of PCE, TCE, and/or DCE. The key at the upper right explains the meaning of the different contour colors. The contour lines on the figure are dashed because the location of a given concentration contour is only estimated based on available data points and does not necessary occur as depicted on the figure.

Figure 2-8. Soil Gas Survey Sample Locations and PCE Concentration Contours Philips Semiconductors Facility

Two main 150- by 150-foot cell sampling grids were laid out on the Philips property, one grid on the southern property edge and the second along the northern property edge. Soil gas samples were collected from a total of 61 points on the Philips property, 54 samples from the predetermined gridded nodes, 4 additional samples around the first sample location that showed a detection of PCE in the soil gas (SG-24), and 3 additional locations in the area between the southern and northern grids to provide data from that area. The remaining samples were collected from sampling grids presumed to overlie northern portions of the CML located on the private properties adjacent to the Philips site, north of San Diego Ave. In some areas the sampling grid is truncated to include only those areas where the land owner was willing to grant Philips access.

Each soil gas sample was collected by advancing 1-½-inch-diameter steel sampling rods into the soil to depths of approximately 8 to 10 feet belowground surface, evacuating the sampling rods with a vacuum pump, and then collecting samples directly from the advanced sampling rods into Tedlar bags. The sample collection bags were then taken to the onsite mobile laboratory for immediate analysis.

The results of the December 1999 soil gas survey indicated the presence of low levels of multiple compounds in soil gas in several areas of the Philips property and the private properties. Compounds detected in the soil gas included benzene, toluene, ethylbenzene, m&p- and o-xylenes, PCE, trans- and cis-1,2-dichloroethene (DCE), and trichloroethene (TCE). Results are summarized in the bullets below:

- At 37 of the 87 soil gas sample locations, no volatile halogenated or aromatic hydrocarbon compounds were detected at all (the detection levels were 0.25 μg/L).
- At 24 locations, only detections of one or more of the compounds benzene, toluene, ethylbenzene, and m&p- or o-xylenes (BTEX compounds) occurred.
- In 26 samples, the chlorinated compound PCE was detected, both with and without companion concentrations of BTEX compounds.
- Only two of the 24 samples that contained concentrations of PCE and also contained one or more of its degradation products (TCE and DCE).

The highest detected soil gas concentration for any compound was a concentration of 4.26 μg/L PCE detected in sample SG-82, which was located on one of the northern private properties. Soil gas concentrations of PCE between 2.0 and 3.0 μg/L were detected at three sample locations, SG-24, SG-59, and SG-92. Location SG-24 is located on the Philips property and locations SG-59 and SG-92 are located on the privately-owned properties north of San Diego Avenue. All remaining detected soil gas concentrations of PCE were between 1.0 and 2.0 μg/L. Thirteen of the <2.0-μg/L PCE detections were from sample locations on the Philips property and the other nine detections were from locations on the privately-owned properties north of San Diego Avenue.

Methane was detected at 35 soil gas sample locations with concentrations ranging from 1.1 to 26.2 percent. There was no clear correlation between the presence of methane in a given sample and the occurrence of other chlorinated or petroleum hydrocarbon compounds.

The presence of BTEX compounds in samples from the December 1999 soil gas survey is not unusual considering that the materials disposed of in the landfill most likely included various

household sources of petroleum hydrocarbon compounds. The occurrence of methane in various samples also is not unusual because the area is known to contain landfill materials that are decomposing and producing methane.

The concentrations of PCE detected in the soil gas survey at the Philips site and on the northern private properties were all relatively low. If an active PCE source occurred within the near surface in the proximity of a sample location, soil gas concentrations on the order of 100's μg/L would have been more likely to occur than concentrations of <2.0 μg/L. As with the BTEX compounds, it is not unlikely that the household materials historically disposed in the landfill might contain low levels of chlorinated solvents.

The soil gas survey data report is provided in Appendix B.

2.3.4.2 Groundwater Monitoring Well Program

Monitoring Well Installation

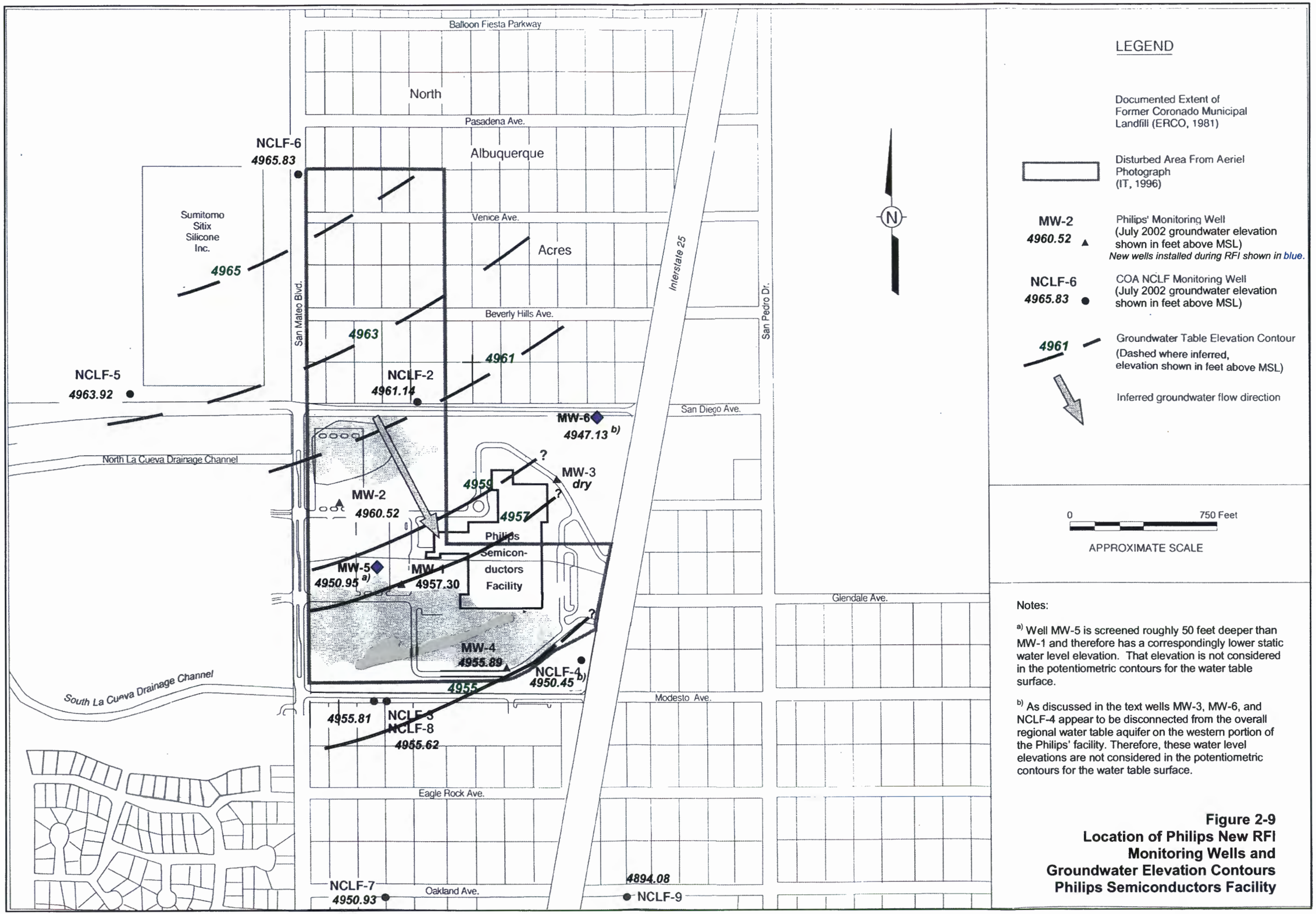
Two groundwater-monitoring wells were installed between May 24, 2001 and July 3, 2001 at the Philips Semiconductors Albuquerque Plant to further delineate groundwater contamination at the site.

Monitoring well MW-5 was installed adjacent to existing well MW-1 and was installed at a greater depth to assess the vertical extent of contamination identified in well MW-1. The location of well MW-5 is shown on Figure 2-9.

Monitoring well MW-5 was drilled using a combination of mud rotary and air rotary casing hammer (ARCH) techniques. Drilling began using the ARCH method; however, heaving sands that entered the ARCH casing below the water table required a change to mud rotary drilling to stabilize the borehole. Subsurface soils encountered during the installation of MW-5 were typical of the Middle Rio Grande Basin. Sands and silty sands were observed from the surface to approximately 100 feet bgs. Below roughly 100 feet bgs, coarse gravel extended to approximately 160 feet bgs. Gravels, sands, and clayey sands were found from 160 feet bgs to the total depth of the borehole at 298 feet bgs. A soil boring log is provided in Appendix C.

The monitoring well was constructed of 4-inch nominal diameter, Schedule 80 threaded polyvinyl chloride (PVC) well casing. The total depth of the well, including a 1-foot sump below the screened interval is 298 feet bgs. The screen interval was placed from 277.5 to 297.5 feet bgs. The gravel pack, grout, and surface seal were installed through a tremmie pipe. The annulus gravel pack (10x20 Colorado Silica sand) extends from the bottom of the borehole (305 feet bgs) to approximately 268 feet bgs. An approximately 12-feet thick seal of 3/8-inch coated bentonite pellets and chips was installed above the gravel pack. Quick Grout bentonite slurry was pumped into the borehole annulus from approximately 256 feet bgs to approximately 40 feet bgs. A surface seal of Portland cement was installed from 40 feet bgs to the surface. The surface completion of the MW-5 consists of a 10-inch steel surface casing, 3-foot square concrete pad, cement filled bollard posts, and a locking cap on the casing. A well construction diagram is provided in Appendix C and well construction details are summarized in Table 2-11. The well was developed by manual surging and bailing and then pumping with a submersible pump until water quality parameters stabilized.

Split spoon soil samples were collected during advancement of the MW-5 borehole at the predetermined intervals indicated in the Work Plan. In some cases sample intervals were modified from those in the Work Plan because it was not possible to sample the predetermined



Notes:

a) Well MW-5 is screened roughly 50 feet deeper than MW-1 and therefore has a correspondingly lower static water level elevation. That elevation is not considered in the potentiometric contours for the water table surface.

b) As discussed in the text wells MW-3, MW-6, and NCLF-4 appear to be disconnected from the overall regional water table aquifer on the western portion of the Philips' facility. Therefore, these water level elevations are not considered in the potentiometric contours for the water table surface.

Figure 2-9
Location of Philips New RFI Monitoring Wells and Groundwater Elevation Contours
Philips Semiconductors Facility

Table 2-11. MW-5 Well Construction Details

Well	Construction Details
Monitoring Well MW-5	• Nominal, 4-inch nominal diameter, Schedule 80 PVC well construction materials • 20-ft length of 0.010-in factory-slotted Schedule 80 PVC well screen placed from 277.5 to 297.5 ft bgs • Split spoon samples collected at 5-foot intervals from ground surface to 30 feet bgs, 150, 200, and 280 feet bgs. • Analytical testing of samples from 30 ft bgs and 200 ft bgs

interval due to the presence of unsamplable geologic materials. Field screening with a photoionization detector (PID) suggested that none of the split spoon samples contained any VOCs, so only samples collected from just below the maximum depth of the former landfill (30 feet bgs) and from just above the water table (200 feet bgs) were submitted for laboratory analysis. Samples were analyzed for eight RCRA metals (Ag, As, Ba, Cd, Cr, Hg, Pb, and Se), VOCs, SVOCs, and organochlorine pesticides. No VOCs, SVOCs, or organochlorine pesticides were detected. Four of the RCRA metals were detected at levels consistent with typical background levels observed throughout the Middle Rio Grande Basin and below NMED soil screening levels. Analytical soil sample results are provided in Appendix D.

Monitoring well MW-6 was drilled using an ARCH drilling method on the northeast side of the Philips Semiconductors plant. This well was installed to replace existing well MW-3, which had gone dry (Figure 2-9). Subsurface soils encountered during the installation of MW-6 were typical of the Middle Rio Grande Basin. Sands and silty sands were observed from the surface to approximately 100 feet bgs. Below this coarse gravel extended to approximately 160 feet bgs. Gravels, sands, and clayey sands were found from 160 feet bgs to the total depth of the borehole at 262 feet bgs. A soil boring log is provided in Appendix C.

The well was constructed of 4-inch nominal diameter, Schedule 80 threaded PVC well casing. The total depth of the well, including a 1-foot sump below the screened interval, is 260 feet bgs. The screen interval is from 239 to 259 feet bgs. The gravel pack, grout, and surface seal were installed through a tremmie pipe. The annulus gravel pack (10x20 Colorado Silica sand) extends from the bottom of the borehole (262 feet bgs) to approximately 234 feet bgs. An approximately 11-feet thick seal of 3/8-inch bentonite chips was installed above the gravel pack. Quick Grout bentonite slurry was pumped into the annulus from approximately 223 feet bgs to approximately 45 feet bgs. A surface seal of Portland cement was installed from 45 feet bgs to the surface. The surface completion of the MW-6 consists of a 10-inch-diameter steel protective casing, 3-foot square concrete pad, cement filled bollard posts and a locking cap on the casing. A well construction diagram is provided in Appendix C and well construction details are summarized in Table 2-12. Development was accomplished by manual surging and bailing, and finally pumping with a submersible pump until water quality parameters stabilized. Approximately 350 gallons of groundwater was removed from the well during development. A small amount of bentonite grout was observed in the well at the start of development; however, the grout was removed during development and additional grout did not enter the well.

Table 2-12. MW-6 Well Construction Details

Well	Construction Details
Monitoring Well MW-6	• Nominal, 4-inch nominal diameter, Schedule 80 PVC well construction materials • 20-ft length of 0.010-in factory-slotted Schedule 80 PVC well screen placed from 239 to 259 ft bgs • Split spoon samples collected at 5-foot intervals from ground surface to 30 feet bgs, 150, 200, and 280 feet bgs.

Split spoon soil samples were collected during advancement of the MW-6 borehole at the predetermined intervals indicated in the Work Plan. In some cases sample intervals were modified from those in the Work Plan because it was not possible to sample the predetermined interval due to unsampable geologic materials. Field screening suggested that none of the split spoon samples contained VOCs, so only samples collected from just below the maximum depth of the former landfill (30 feet bgs) and from just above the water table (220 feet bgs) were submitted for laboratory analysis. Samples were analyzed for eight RCRA metals (Ag, As, Ba, Cd, Cr, Hg, Pb, and Se), VOCs, SVOCs, and organochlorine pesticides. A single detection of toluene (0.052 milligram per kilogram [mg/kg]) occurred in the 30 feet bgs sample at the MW-6 location. Also, low levels of di-n-butylphthalate (2.5 mg/kg at 30 feet bgs and 0.4 mg/kg at 220 feet bgs) were present in the MW-6 samples. The concentrations of both toluene and di-n-butylphthalate were all well below the applicable NMED soil screening levels. Toluene is a common petroleum hydrocarbon-related compound and it would not be unexpected for low levels to occur in landfill materials or in near landfill soils. Di-n-butylphthalate is a pervasive compound associated with plastics and therefore would not be unexpected in landfill materials and/or could be associated with contamination from the sampler's or lab technician's nitrile gloves. No organochlorine pesticides were detected. Six of the RCRA metals were detected at levels below typical background levels observed throughout the Middle Rio Grande Basin and below NMED soil screening levels. Analytical soil sample results are provided in Appendix D.

The RFI Work Plan indicated that monitoring well MW-7 was proposed for installation at the intersection of San Mateo Boulevard and Balloon Fiesta Parkway. Based on discussions with Philips, the NMED determined that installation of a monitoring well at this location would not contribute substantial additional data to the RFI and therefore did not merit the logistical difficulty associated with installing a well on non-Philips property.

Groundwater Elevation Data

Groundwater elevation data from the April 2002 quarterly sampling event are presented in Table 2-13 and a contour map of the data is presented in Figure 2-9. The groundwater elevations across the Philips site and surrounding area generally depict the same groundwater flow direction from northwest to southeast as has been historically identified with a hydraulic gradient of roughly 0.003 ft/ft.

These flow direction and gradient interpretations do not take into account the water level data from Philips wells MW-3 and MW-6, and COA well NCLF-4. Recorded water levels at these locations appear to be disconnected from the overall groundwater flow regime that is otherwise indicated by water levels measured in 2002 and historically in the other COA and Philips

monitoring locations further to the west. Philips well MW-3 went dry (the water table has dropped below the bottom of the well screen) in 1998. Based on the location of MW-3, the elevation of the screened interval (approximately 4946 to 4976 feet above msl), and the static water level elevation in the other wells on the site there should be 10 to 15 feet of water in the well. Prior to going dry the water levels in MW-3 were consistently 7 to 8 feet lower than would have been predicted, culminating with a final drop of almost 8 feet from the fourth quarter of 1998 to the first quarter of 1999 when the well finally went dry. Well MW-6, which was installed as part of the current RFI to replace MW-3, likewise displays a water level elevation roughly 10 feet lower than would be expected based on the other area monitoring wells. Additionally, COA well NCLF-4 also has a static water level roughly 5 feet lower than what would be predicted based on other nearby well locations.

The April 2002 water level measurements collected indicated that the water elevation in NCLF-4 was 4950 feet above msl, while that in Philips well MW-4, which is only located approximately 400 feet west, was 4955 feet above msl. The maximum water level difference seen over almost the whole area of interest (between NCLF-5 and MW-4, a distance of 2,700 feet) is only a total of approximately 10 feet.

Table 2-13. Water Level Elevation Data Quarterly Groundwater Sampling Event April 2002

Well Location	Well Casing Elevation	Depth to Water	Static Water Table Elevation
MW-1	5168.70	211.40	4957.30
MW-2	5159.36	198.84	4960.52
MW-4	5182.94	227.05	4955.89
MW-5	5168.70 [a]	217.75	4950.95
MW-6	5186.00 [a]	238.87	4947.13
NCLF-2	5162.64	201.50	4961.14
NCLF-3	5162.43	206.62	4955.81
NCLF-4	5196.30	245.85	4950.45
NCLF-5	5129.77	165.85	4963.92
NCLF-6	5138.98	173.15	4965.83
NCLF-7	5162.86	211.93	4950.93
NCLF-8	5163.45	207.83	4955.62
NCLF-9	5160.00 [a]	265.92	4894.08

[a] The elevation of the top of well casing has been estimated for these wells based on the surveyed elevations of other area wells.

Well MW-6 was installed roughly 300 feet north of well MW-3 and well NCLF-4 is located roughly 1,000 feet south of MW-3. The anomalous water levels seen in these wells suggest that some significant hydrogeologic feature or change occurs moving east from the central portion of the Philips site towards the Interstate 25 corridor. It is unlikely that a change in geologic materials with differing hydraulic properties would occur in such a sharply demarcated line and observation of materials during drilling did not indicate a substantial difference in the

sediments encountered in these areas. Likewise, it is unlikely that such a dramatic change in the static water level elevation, the apparent hydraulic gradient, and the apparent direction of groundwater flow exists without there being some other mitigating circumstance when a predictable and consistent condition exists in such a broad area to the west. Instead, it is likely that these perturbances in static water level represent a geologic structural feature (i.e., basin bounding fault zone) that is a hydraulically less conductive than the basin fill sediments to the west. This hydraulically less permeable zone maintains apparently disconnected static water levels on either side of it because groundwater flow through the area is retarded.

As discussed above, water level measurements from the other Philips and NCLF monitoring well locations are all consistent with each other. Those data depict an overall groundwater flow direction to the southeast with a fairly flat hydraulic gradient (0.003 ft/ft). If the data from MW-3, MW-6, and NCLF-4 are considered with the data from the other locations, the groundwater flow direction would essentially make a 90 degree turn across the eastern 500 feet of the site, changing to a northeast direction and having a hydraulic gradient of greater than 0.01 ft/ft.

Analytical Groundwater Data

A summary of the quarterly groundwater analytical data from the first three quarters of 2002 is presented in Table 2 14. During the full sampling event of all monitoring wells during the second quarter only four wells displayed PCE concentrations exceeding the 5 μg/L MCL and two of those wells only exceeded the MCL by a slight amount. No well contained a concentration of greater than 10 μg/L PCE. The highest levels were observed in Philips well MW-2 and the COA well NCLF-2 with concentrations of 7.4 and 6.8 μg/L, respectively. These wells represent the two most upgradient wells located on or immediately adjacent to the Philips site. The COA well NCLF-6, located roughly 1,300 feet upgradient of the Philips site contained a PCE concentration of 2.5 μg/L, which is below the MCL but does constitute a positive detection commensurate with levels that have been detected in that well since its installation.

Well MW-1 which has historically contained the highest PCE concentrations contained a level of 5.5 μg/L during the second quarter of 2002. Well MW-5, which was installed as part of the current RFI and is constructed as a counterpart to existing well MW-1 with a deeper screen interval, displayed a very low level of PCE (0.24 μg/L), which is well below the MCL. These MW-5 results indicate that the vertical extent of PCE contamination in the central portion of the Philips site has been delineated.

As a whole the PCE concentrations in the Philips and NCLF wells in 2002 were essentially the same as during the last comprehensive sampling event in April 2001 and generally slightly lower than during the comprehensive April 2000 sampling event. This indicates that the current PCE concentrations observed, at levels one half to one third of the historically observed levels, seem to now represent true, stabilizing concentrations. If PCE concentrations continue to decrease, even by small amounts, few wells may soon exceed the EPA MCL of 5 μg/L.

Philips submits regular reports to the NMED with the quarterly groundwater sample results.

Table 2-14. Summary of Tetrachloroethene Concentrations from Philips and NCLF Wells 1st, 2nd, and 3rd Quarters 2002

	PCE Concentration		
Date	**January 2002**	**April 2002 [a]**	**July 2002**
MW-1	NS [a]	5.5	NS
MW-2	NS	7.4	NS
MW-3 [b]	NS	NS	NS
MW-4	NS	4.9	NS
MW-5	ND [c]	0.24	ND
MW-6	ND	0.31	ND
NCLF-2	NS	6.8	NS
NCLF-3	NS	5.2	NS
NCLF-4	NS	3.6	NS
NCLF-5	NS	ND	NS
NCLF-6	NS	2.5	NS
NCLF-7	1.4	2	1.6
NCLF-8	3.2	3.4	2.9
NCLF-9	1.3	1.2	0.8

[a] Beginning in the year 2000 data the sampling frequency for wells that had more than 8 quarters of sampling was reduced to annually. The annual event occurs in the second quarter of each year (April). An NS designates wells that are not sampled in other quarters for this reason.

[b] Well MW-3 is no longer samplable because the static water level has dropped below the screen interval of the well. The remaining dry well is scheduled for abandonment.

[c] ND indicates PCE was not detected in a given well during the sampling event.

Notes: 1. Analyses performed using EPA Method 601, 8010, or 8260.
2. ND = Analyte not detected

Source: Data obtained from Philips Semiconductors central files.

2.3.4.3 Surface Soil Sampling

On June 16, 2002, five surface soil locations were collected at the Philips Semiconductors facility. The soil samples were collected from holes that were hand dug to 8 inches in depth using a decontaminated stainless steel trowel. Soil from the 0- to 8-inch interval was homogenized in a stainless steel bowl and placed into sample containers. Samples were analyzed for pesticides and SVOCs to further evaluate the apparent detections indicated by the 1992 EPA site investigation.

Sample locations were approximately in the same areas indicated in the RFI Work Plan. Sample Site 1 (S-1) was located on the west side of the Philips site, near San Mateo Boulevard in a well disturbed area. Site 2 (S-2) was near the AMAFCA ditch that borders the northern edge of the Philips site, just south of a subsurface fiber optic cable. The site had been recently disturbed from the cable installation. Site 3 (S-3) was in an open area east of one of the facility parking

lots and in a landscaped area. The small shrubs and vegetation in the area indicated that the site had not been as recently disturbed as the other locations in recent years. The Site 4 (S-4) sample location was moved slightly east of the area depicted in the RFI Work Plan to an area that had some small vegetation and appeared minimally disturbed in recent years. Site 5 (S-5) was in a restricted area and located between buildings and heavy equipment in a recently disturbed area. Sample locations are shown on Figure 2-9.

Seven SVOCs, di-n-butylphthalate, benzo(b)fluoranthene, chrysene, fluoranthene, pyrene, benzo(a)pyrene, and benzo(k)fluoranthene, were detected, all at concentrations well below the NMED screening levels. Positive detection results are summarized in Table 2-15. Practical quantitation limits for compounds are given for each sample to demonstrate the nondetections represent concentrations below the screening levels. The full analytical report is provided in Appendix D. The SVOC concentrations detected could potentially be associated with materials from the asphalt parking lot and/or surface water runoff impacts from the asphalt parking areas. No pesticide concentrations were detected in any of the surface soil samples. The issue of detected concentrations of pesticides in diluted samples from a 1992 EPA site investigation had previously been an issue of concern.

Table 2-15. Surface Soil Sampling Results
July 2002
(Concentrations in mg/kg)

Detected Compound [a]	Sample Location											
	NMED Residential Screening Level	S-1	PQLs for S-1	S-2	PQLs for S-2	S-3	PQLs for S-3	S-4	S-4 Dup	PQLs for S-4, S-4 DUP	S-5	PQLs for S-5
Di-n-butyl phthalate	6,100	ND	1.0	ND	ND	ND	ND	0.13	0.3	0.1	ND	0.1
Benzo(b) fluoranthene	6.2	1.2	1.0	0.42	0.2	0.21	0.2	ND	ND	0.1	ND	0.1
Chrysene	610	1	1.0	0.32	0.2			ND	ND	0.1	ND	0.1
Fluoranthene	2,300	1.4	1.0	0.42	0.2	0.27	0.2	ND	ND	0.1	ND	0.1
Pyrene	1,800	1	1.0	0.38	0.2	0.22	0.2	ND	ND	0.1	ND	0.1
Benzo(a) pyrene	0.62	ND	1.0	0.25	0.2	ND	ND	ND	ND	0.1	ND	0.1
Benzo(k) fluoranthene	62	ND	1.0	0.21	0.2	ND	ND	ND	ND	0.1	ND	0.1

[a] Only those compounds with positive detections above the MDL are presented in the table. The full analytical results are provided in the Appendix D.

2.3.4.4 Subsurface Soil Sampling

As previously discussed, during advancement of the boreholes for new monitoring wells MW-5 and MW-6, split spoon samples were collected for general lithologic observation and samples for laboratory analysis were additionally collected from select intervals, as specified in the RFI Work Plan. At location MW-5 samples were submitted to Hall Environmental Analysis Laboratories from the 30-foot bgs and 200-foot bgs intervals for analysis for VOCs via EPA Method 8260, SVOCs via EPA Method 8270, organochlorine pesticides via EPA Method 8081, and RCRA metals via EPA Methods 6010B and 7471. No VOCs, SVOCs, or organochlorine pesticides were detected. Four RCRA metals (arsenic, barium, chromium, and lead) were

detected at concentrations consistent with typical background levels in Rio Grande Basin sediments. Full analytical results are contained in Appendix D.

At location MW-6 samples were submitted to Hall Environmental Analysis Laboratories from the 30-foot bgs and 220-foot bgs intervals for analysis for the same parameters. As at the MW-5 location no significant levels of VOCs, SVOCs, or organochlorine pesticides were detected. A single detection of toluene (0.052 mg/kg) occurred in the 30-foot bgs sample at the MW-6 location. Also, low levels of di-n-butylphthalate (2.5 mg/kg at 30 feet bgs and 0.4 mg/kg at 220 feet bgs) were present in the MW-6 samples. The concentrations of both toluene and di-n-butylphthalate were all well below the applicable NMED soil screening levels. Toluene is a common petroleum hydrocarbon-related compound and it would not be unexpected for low levels to occur in landfill materials or in near landfill soils. Di-n-butylphthalate is a pervasive compound associated with plastics and therefore would not be unexpected in landfill materials and/or could be associated with contamination from the sampler's or lab technician's nitrile gloves. No organochlorine pesticides were detected. Five RCRA metals (arsenic, barium, cadmium, chromium, lead) were detected at levels consistent with typical background levels in Rio Grande Basin sediments. Full analytical results are contained in Appendix D.

2.3.4.5 Hydrogeologic Data Evaluation

The RFI Work Plan indicated that slug testing activities would be performed as part of the RFI with the goal of generating site-specific hydrogeologic data on the hydraulic properties of the aquifer at the site. Based on discussions with the NMED in 2002, it was determined that the aquifer at the Philips facility is generally consistent in characteristic with other known portions of the Albuquerque Basin regional aquifer. The NMED agreed that sufficient regional data on aquifer characteristics exists such that site-specific slug testing at the Philips site was not required.

Based on previous investigations by Thorn, McAda, and Kernodle of the USGS (1993,1995), the hydrogeologic unit that exists in the area of the Philips site is the Upper Santa Fe Formation coarse axial channel deposits. Hydraulic conductivity in the area of the Philips site is estimated to be roughly 30 ft/day as cited in *Simulation of Ground-Water Flow in the Albuquerque Basin, Central New Mexico 1910-1994, with Projections to 2020* (Kernodle, McAda, Thorn, 1995). In this publication, the elevation of the base of Model Layer 1 is roughly 4960 feet above msl, and the hydraulic conductivities for both layers 1 and 2 is cited as roughly 30 ft/day. The elevation of the static water table in most of the Philips and COA NCLF wells ranges from 4950 to 4965 feet above msl, indicating that correlation with the hydraulic conductivity of layers 1 and 2 of the regional model in this area is appropriate. Additionally, regional city groundwater production wells in the area are indicated as having transmissivity values ranging between 19,970 square feet per day (ft^2/day) to 65,260 ft^2/day in that same reference. A citation from the 1981 ERCO report for the Philips site also cited a hydraulic conductivity range for the sediments at the site of 10^{-3} to 10^{-6} centimeter per second (cm/sec) or approximately 28 to 0.028 ft/day. The upper end of this range is consistent with the 30 ft/day value indicated in the Albuquerque Basin regional model.

Hydrogeologic properties from COA production wells in the general area are summarized in Table 2-16 to provide an overview of basic hydraulic characteristics of the aquifer.

Table 2-16. Regional Hydrogeologic Data Applicable to Philips Site Hydrogeology

General Value for Geologic Formation in Area				
Upper Santa Fe Axial Channel Deposits		Hydraulic Conductivity – 30 ft/day		
COA Well	Transmissivity (ft^2/day)	Depth to Water (ft)	Elevation of Static Water (ft)	Well Total Depth (ft)
Vol Andia 1	55,610	243	4901	972
Vol Andia 2	65,260	317	4891	852
Vol Andia 5	40,470	208	4904	900
Vol Andia 6	51,320	275	4903	984
Webster 1	42,080	512	4924	1484
Webster 2	19,970	465	4922	1450
Philips MW-5	-	265	4900	301.5
Philips MW-6	-	234	4956	262

Source: *Simulation of Ground-Water Flow in the Albuquerque Basin, Central New Mexico 1910-1994, with Projections to 2020* (Kernodle, McAda, Thorn, 1995)

2.3.5 Conceptual Model

2.3.5.1 Nature and Extent of Contamination

The final conceptual model is generally consistent with the preliminary model that had been developed based on the historic investigations and data collection. Horizontal delineation of PCE in the groundwater remains complete with the installation of MW-6 to reestablish the eastern delineation point of groundwater contamination after MW-3 went dry. Continued groundwater sampling of all monitoring wells has confirmed the overall decrease in PCE concentrations in all wells and continues to indicate the occurrence of PCE in wells located considerably upgradient from the Philips site property boundary.

With the installation of Philips well MW-5, a deeper monitoring well adjacent to the historically most contaminated water table well MW-1, the vertical extent of groundwater contamination has been delineated in the central portion of the Philips property. Concentrations of PCE in well MW-5 have been less than 1 μg/L, considerably less than the EPA MCL. Overall, the concentrations of PCE in the groundwater beneath the Philips site and the adjacent properties is the only significant contaminant of concern that could present a risk to human health or the environment.

The nature and extent of surface and subsurface soil contamination at the Philips site has essentially been delineated. Surface soil sampling in July 2002 to reevaluate the issues of elevated SVOCs and pesticide concentrations in previously collected samples has indicated that only low levels of SVOCs, all well below the NMED soil screening levels, exist in these areas and no pesticides were detected. Previously collected subsurface soil samples from the former CML site had never indicated the presence of any anthropogenic contamination and the additional data collected during the recent RFI activities further confirmed this conclusion. The conceptual model regarding surface and subsurface contamination at the Philips site is that there is no significant anthropogenic contamination related to the activities at the former CML.

The nature and extent of landfill-related gases such as methane and/or subsurface gases related to waste that had been disposed of in the former CML has been delineated. A 12-year methane monitoring program, terminated in 1993, led Philips to conclude that methane does not continue to be a concern at the former CML after methane ceased to be detected at the various monitoring points. It would not be unexpected for methane generation in a former municipal landfill to reduce with time as decomposable materials were consumed and/or drainage improvements or changes reduced the wastes contact with infiltrating water which is necessary for decomposition and methane generation to occur. The soil gas investigation conducted as part of the current RFI indicated that the levels of contaminants of concern (i.e., chlorinated solvents) that may be acting as a transport mechanism for PCE to the groundwater are limited in magnitude and extent throughout the former CML cells both on and off the Philips site. Low levels of PCE were detected in scattered sample locations across the Philips site and on the private properties located north of San Diego Avenue that overlie the northern cells of the former CML. The low concentrations and the absence of a consistent pattern of detections suggested the detections were related to very minor sources of solvents that would be expected to exist in a domestic waste landfill and did not depict a conceptual model of a vast subsurface soil gas plume that may be transporting contaminant mass laterally in all directions and over 200 feet vertically to the groundwater table.

2.3.5.2 Fate and Transport

Fate and Transport of Primary COC — PCE

As indicated in the discussion of the nature and extent of contamination the primary contaminant of concern related to the former CML at the Philips site is the presence of PCE in the groundwater at levels in excess of the EPA MCL. Therefore, only the potential fate and transport and risk to human health and the environment of the PCE in groundwater is considered here. The concentrations of PCE in the regional aquifer groundwater that have been identified beneath the Philips site and adjacent properties are being and will continue to be transported through the aquifer with the regional groundwater flow. However, the decrease and stabilization of PCE concentrations on and around the Philips site to fairly low levels, with only a few locations now displaying levels in excess of the EPA MCL, suggest that with continued migration and transport in the aquifer, natural degradation and dilution of these low concentrations may result in downgradient concentrations that are very low to essentially nondetect. This is confirmed by the downgradient delineation of the plume at well NCLF-9, where very low PCE concentrations are observed and have been stable for 3 years, suggesting that at and beyond this point the plume is adequately diluted to simply attenuate to nondetect. Additionally, the presence of PCE detections in COA monitoring wells located upgradient of the Philips site suggests that the former CML cells and waste materials located at the Philips site may not be the only source of PCE contamination in the groundwater and/or perhaps not a source at all. Therefore, the fate and transport of otherwise existing regional groundwater contamination may be unrelated to Philips site.

2.4 Screening Assessments

As indicated previously the only contaminant of concern related to the former CML at the Philips site that has been carried through to the screening assessment phase is the presence of PCE in the groundwater at levels in excess of the EPA MCL. The nature and extent and fate and transport of minor concentrations of soil contaminants, methane, and/or landfill soil gases have been investigated by this and previous investigation and found to be either nonoccurring, no

longer occurring, or of such insignificant levels that they are not attributable to anthropogenic effects related to the former CML operations at the Philips site. Therefore, only the concentrations of PCE in groundwater have been considered here as possibly presenting a threat to human health or the environment.

2.4.1 Human Health

The depth of groundwater (roughly 200 feet bgs) does not provide a mechanism for direct exposure of human receptors to the PCE. However, since the PCE does occur in the regional aquifer that is the source of local municipal drinking water exposure may occur through pumping and distribution of degraded groundwater.

Concentrations of PCE in the groundwater in excess of the EPA MCL of 5 µg/L continue to persist in monitoring wells located at the Philips site and in COA monitoring wells located on properties in the area of the Philips site. The EPA MCL represents the threshold above which there is considered risk to human health. And while concentrations above the MCL do exist in the area of the Philips site concentrations further downgradient, in the areas where human receptor exposure may occur, are less than the MCL.

Water supply wells that occur within a 1-mile radius of the former CML site were identified by conducting searches of the New Mexico State Engineer Office well records during the Work Plan phase. Thirty-nine wells were identified within a 1-mile radius of the portions of the former CML on the Philips site including residential, community, commercial, irrigation, and exploration wells. A table presented in Appendix E lists the nonmonitoring wells identified within a 1-mile radius of the former CML and the associated Figure E-1 shows the approximate well locations.

The nearest residential well that has been identified is approximately 0.5 mile downgradient and southeast of the site (33, Figure E-1). Five additional residential wells are downgradient and within a 1-mile radius of the site. Several other residential wells are located transgradient or upgradient wells of the site. The nearest municipal wells are outside the 1-mile radius in the COA Coronado wellfield, approximately 1.5 mile southeast of the former CML areas on the Philips site. The nearest commercial or irrigation well is approximately 0.5 mile upgradient and west of the site (29, Figure E-1). There are six additional irrigation and commercial wells within a 1-mile radius of the site: three upgradient and three downgradient. Two irrigation wells listed in the table are not shown on Figure E-1 because they lack a detailed location reference. There are two exploration wells approximately 0.25 mile downgradient and east of the site (12 and 13, Figure E-1), and there are three wells for which no use is identified (9, 10 and 11, Figure E-1).

The most distal detection of PCE occur in COA monitoring wells NCLF-7 and NCLF-9 at concentrations of roughly 1.6 and 0.7 µg/L, respectively (July 2002 sampling event). The well locations are roughly 1,500 to 2,000 feet downgradient of the Philips site to the south and southeast and the detected concentrations are well below the EPA MCL. Therefore, the nearest residential wells, approximately 2,500 feet downgradient, are even beyond these downgradient monitoring wells and therefore would not be expected to be impacted by PCE concentrations in excess of the MCL. Furthermore, the wells NCLF-7 and NCLF-9 will continue to act as sentinel wells monitoring the downgradient propagation of any higher PCE concentrations that might adversely impact the closest domestic wells. The same rationale applies to the even further downgradient location of the COA Coronado wellfield municipal wells. Also, the various

commercial and irrigation wells in the area are also located even further from and/or upgradient of the Philips site and likewise do not represent a likely source of exposure to human receptors.

Therefore, a likely pathway for exposure of human receptors to PCE concentrations in the groundwater in excess of the EPA MCL does not exist and therefore the screening assessment indicates the risk posed to human health by contamination associated with the former CML on the Philips property is low.

2.4.2 Ecological Receptors

As with the human health assessment, the depth of groundwater (roughly 200 feet bgs) does not provide a mechanism for direct exposure of ecological receptors to the PCE. The only potential pathway for these contaminants to reach ecological receptors would be via exposure to groundwater pumped and distributed by humans. However, as discussed in the human health assessment, the distance to apparent well locations where humans may pump and distribute or irrigate with groundwater is sufficient enough that PCE concentrations would be expected to be essentially absent. Therefore, there is no pathway for exposure to ecological receptors and there is no risk presented by the PCE in groundwater to such receptors.

2.4.3 Risk Assessments

Since the human health and ecological screening assessments did not indicate any likely pathways for exposure to the PCE contaminant of concern in the groundwater, it was felt that there is no need to conduct in-depth human health or ecological risk assessments.

2.5 Conclusions and Recommendations

The recent RFI activities that have been performed during 1999 through 2002, along with the vast amount of other data that have been collected during past and ongoing investigations indicate that the only significant contaminant of concern related to the operation of the former CML cells on the now Philips site is the presence of elevated levels of PCE in the regional groundwater. However, ongoing monitoring of the PCE concentrations in Philips and COA installed wells has delineated the horizontal and vertical extent of the PCE. The delineation indicates that PCE concentrations in excess of the EPA MCL are unlikely to impact distally located domestic or municipal wells and therefore a complete pathway for exposure to unacceptable PCE levels does not exist for human or ecological receptors. Therefore, No Further Action (NFA) regarding additional investigation or remediation at CAU #8, the former CML cells located on the Philips Semiconductors property is proposed.

2.6 No Further Action Proposal

Evaluation of CAU #8 for no further action has been additionally considered using the *HSWA/CA-Related Permit Modifications, No Further Action Proposals* guidance provided by the NMED (Section II.B.4.a (4) (a), Page 1, March 3, 1998). An NFA proposal is based upon one of the five NFA criteria provided by NMED (Section II.B.4.a (4) (b), Page 1, March 3, 1998). These criteria are:

1. The CAU cannot be located, does not exist, or is a duplicate CAU.

2. The CAU has never been used for the management (i.e., generation, treatment, storage, and/or disposal) of RCRA solid waste or hazardous wastes and/or constituents or other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances.

3. No release to the environment has occurred or is likely to occur in the future from the CAU.

4. A release from the CAU to the environment occurred, but the CAU was characterized and/or remediated under another authority (such as the NMED's Underground Storage Tank [UST] or Groundwater Quality Bureaus), which adequately addressed RCRA corrective action, and documentation, such as a closure letter, is available.

5. The CAU has been characterized or remediated in accordance with current applicable State or Federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

2.6.1 NFA Rationale

As presented in this report, a number of historical investigations have occurred at CAU #8, former CML located on the Philips Semiconductors site in addition to the most recent RFI activities presented here. These investigations have determined that there has not been a significant release of contaminants from this CAU to the surface or subsurface soils. Likewise there is no significant source of landfill gases or landfill waste that pose any type of unacceptable risk to human health or the environment. The only specific contaminant of concern that presents a potential risk to human health or the environment is the presence of PCE in the groundwater underlying the Philips site and other area properties. The PCE concentrations in the groundwater have been adequately characterized in accordance applicable regulations, and the available data indicate that the contaminant poses an acceptable level of risk under current and projected future land use.

2.6.2 NFA Criterion

This proposal for NFA for the CAU #8, former CML at the Philips Semiconductors site is based upon NMED's NFA Criterion 5: The CAU has been characterized or remediated in accordance with current applicable State or Federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Section 3.
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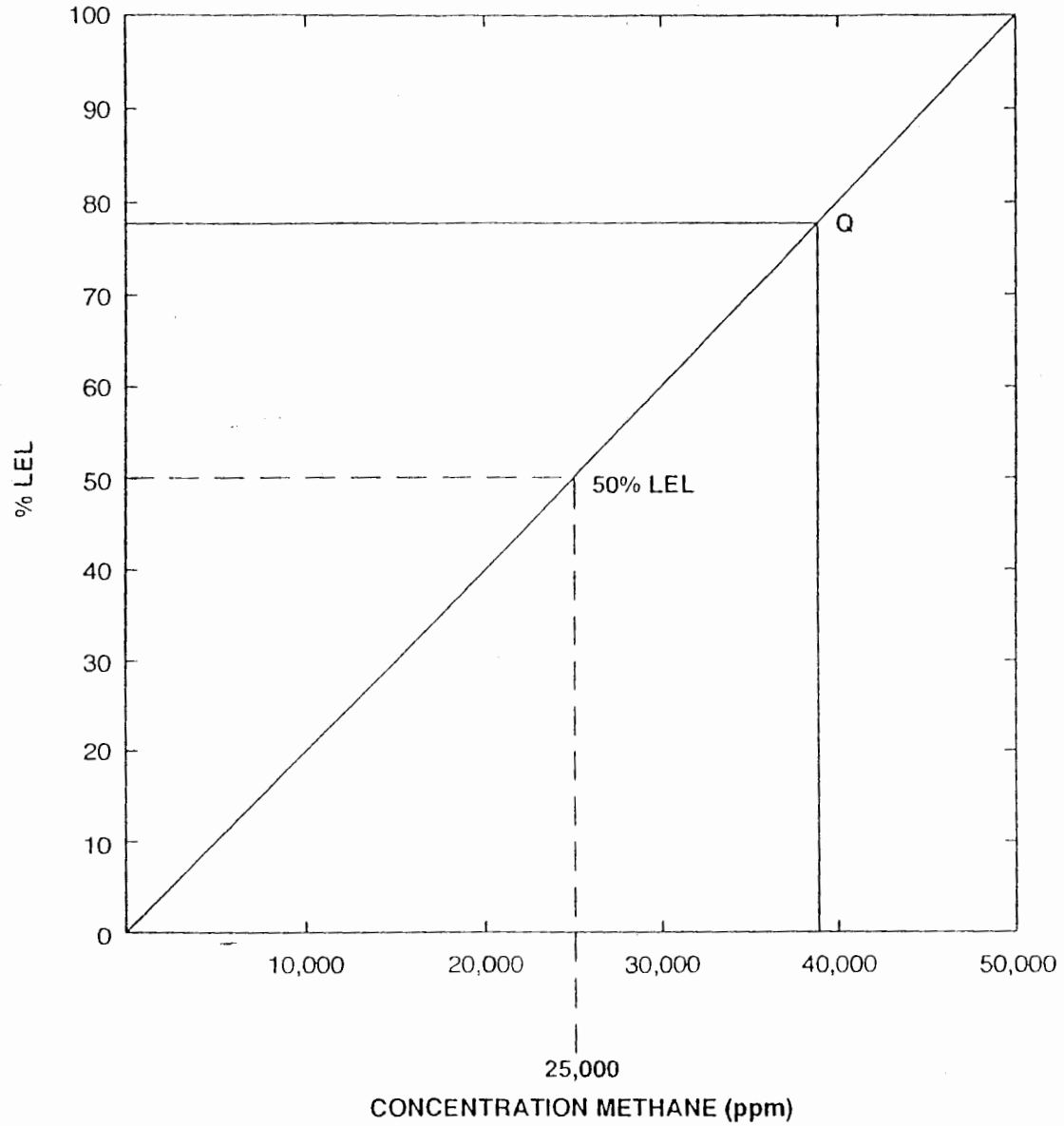
Appendix A.
Methane Monitoring Data

Appendix A
Methane Monitoring Data

This appendix presents monitoring data for outdoor methane gas vents and indoor monitoring points surrounding and within the Philips facility. Outdoor methane gas vents were monitored from February 1983 to May 1993, and indoor methane gas vents were monitored between June 1990 to September 1991. The methane monitoring was a voluntary program that ceased in May 1993, because there was no longer any significant detection of methane in the vents. The highest outdoor detection of 39,000 parts per million (ppm) (78 percent lower explosive limit [LEL]) occurred on October 20, 1989, from Vent 35. The second highest outdoor detection of 28,500 ppm (57 percent LEL) occurred on October 15, 1990, from Vent 21. Indoor monitoring data levels never exceeded 500 ppm. The most recent data available show that levels are at or below 500 ppm (1 percent LEL) in all vents. There is a direct correlation between methane concentration in ppm and percent LEL (Figure A-1).

Monitoring of 35 outdoor methane gas vents began in February 1983. In March 1987, Vents 30 and 31 were removed for construction and were no longer available for monitoring. Vent 29 was knocked over during construction in September 1987 and was not monitored during that period. Monitoring on Vent 29 resumed in March 1988 after it was repaired. Vents 32 through 35 were not monitored in May 1993. As of October 1999, 28 outdoor methane vents exist at the site (Figure 2-6).



LEGEND

Q = Highest data point measured as of May 1993
LEL = Lower explosive limit
ppm = Parts per million

Figure A-1

Lower Explosive Limit vs Methane Concentration

FORM B — OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 3 TIME: 10:50Am DATE: 9/17/87

ATE TLV CALIBRATED: 8/10/87

VENT	ppm Methane
1	<16
2	<16
3	<16
4	<16
5	79
6	<16
7	<16
8	63
9	<16
10	<16
11	<16
12	25
13	<16
14	<16
15	<16
16	<16
17	<16
18	32
19	<16
20	221
21	<16
22	<16
23	<16
24	<16
25	158
26	<16
27	<16
28	316
29	knocked over
30	dug out
31	dug out
32	<16
33	<16
34	<16
35	<16

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 4 TIME: 10:50am DATE: 11/11/87

DATE TLV CALIBRATED: 8/10/87

VENT #	ppm Hexane	x 1.58 =	ppm Methane
1	<10	=	<16
2	<10	=	<16
3	<10	=	<16
4	<10	=	<16
5	1000	=	1580
6	6200	=	9796
7	<10	=	<16
8	35	=	55
9	210	=	332
10	<10	=	<16
11	400	=	632
12	410	=	648
13	<10	=	<16
14	~~400~~ 100	=	158
15	<10	=	<16
16	400	=	632
17	400	=	632
18	300	=	474
19	410	=	648
20	250	=	395
21	790	=	1248
22	10	=	16
23	2000	=	3160
24	<10	=	<16
25	<10	=	<16
26	<10	=	<16
27	<10	=	~~585~~ <16
28	370	=	585
29		=	
30		=	
31		=	
32	310	=	490
33	<10	=	<16
34	1000	=	1580
35	>10000	=	>15800

FORM B — OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 4 TIME: 10:50 AM DATE: 11/11/87

TE TLV CALIBRATED: 8/10/87

VENT	ppm Methane
1	<16
2	<16
3	<16
4	<16
5	1580
6	9796
7	<16
8	55
9	332
10	<16
11	632
12	648
13	<16
14	158
15	<16
16	632
17	632
18	474
19	648
20	395
1	1248
22	16
23	3160
24	<16
25	<16
26	<16
27	<16
28	585
29	dug out
30	during
31	Construction
32	490
33	<16
34	1580
35	>15800

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 1 TIME: 11:00AM DATE: 3/9/88

DATE EXOTOX CALIBRATED: 12/87

VENT #	~~%~~ % LEL	x 500 =	ppm Methane
1	0	=	<500
2	0	=	<500
3	0	=	<500
4	0	=	<500
5	0	=	<500
6	0	=	<500
7	0	=	<500
8	0	=	<500
9	0	=	<500
10	0	=	<500
11	0	=	<500
12	1	=	500
13	0	=	<500
14	0	=	<500
15	0	=	<500
16	1	=	500
17	1	=	500
18	0	=	<500
19	0	=	<500
20	0	=	<500
21	1	=	500
22	1	=	500
23	1	=	500
24	0	=	<500
25	1	=	500
26	0	=	<500
27	0	=	<500
28	1	=	500
29	0	=	<500
32	0	=	<500
33	0	=	<500
34	1	=	500
35	1	=	500

FORM B — OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 1 TIME: 11:00AM DATE: 3/9/88

DATE EXOTOX CALIBRATED: 12/87

VENT	ppm Methane
1	<500
2	<500
3	<500
4	<500
5	<500
6	<500
7	<500
8	<500
9	<500
10	<500
11	<500
12	500
13	<500
14	<500
15	<500
16	500
17	500
18	<500
19	<500
20	<500
21	500
22	500
23	500
24	<500
25	500
26	<500
27	<500
28	500
29	<500
32	<500
33	<500
34	500
35	500

Sampling points #30 and #31 were taken out during construction.

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 2 TIME: 10:50 Am DATE: 5/9/88

DATE EXOTOX CALIBRATED: 6/87

VENT #	90 LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	<1		=	<500
6	<1		=	<500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	<1		=	<500
13	<1		=	<500
14	<1		=	<500
15	<1		=	<500
16	<1		=	<500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	<1		=	<500
24	<1		=	<500
25	<1		=	<500
26	<1		=	<500
27	1		=	500
28	<1		=	<500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	<1		=	<500
35	<1		=	<500

FORM B OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 2 TIME: 10:30 Am DATE: 5/9/88

DATE EXOTOX CALIBRATED: 6/87

VENT	ppm Methane
1	<500
2	<500
3	<500
4	<500
5	<500
6	<500
7	<500
8	<500
9	<500
10	<500
11	<500
12	<500
13	<500
14	<500
15	<500
16	<500
17	<500
18	<500
19	<500
20	<500
21	<500
22	<500
23	<500
24	<500
25	<500
26	<500
27	500
28	<500
29	<500
32	<500
33	<500
34	<500
35	<500

Sampling points #30 and #31 were taken out during construction.

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 3 TIME: 12:30pm DATE: 9/7/88

DATE EXOTOX CALIBRATED: 6/87

VENT #	90 LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	<1		=	<500
6	1		=	500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	1		=	500
13	<1		=	<500
14	<1		=	<500
15	<1		=	<500
16	<1		=	<500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	1		=	500
24	<1		=	<500
25	1		=	500
26	<1		=	<500
27	<1		=	<500
28	<1		=	<500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	<1		=	<500
35	2		=	1000

FORM B — OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 3 TIME: 12:30 pm DATE: 9/7/88

DATE EXOTOX CALIBRATED: 6/87

VENT	ppm Methane
1	<500
2	<500
3	<500
4	<500
5	<500
6	500
7	<500
8	<500
9	<500
10	<500
11	<500
12	500
13	<500
14	<500
15	<500
16	<500
17	<500
18	<500
19	<500
20	<500
21	500
22	<500
23	500
24	<500
25	<500
26	<500
27	<500
28	<500
29	<500
32	<500
33	<500
34	<500
35	1000

Sampling points #30 and #31 were taken out during construction.

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 4 TIME: 10:15 AM DATE: 11/30/88

DATE EXOTOX CALIBRATED: 9/88

VENT #	90 LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	<1		=	<500
6	<1		=	<500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	<1		=	<500
13	<1		=	<500
14	<1		=	<500
15	<1		=	<500
16	<1		=	<500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	<1		=	<500
24	<1		=	<500
25	1		=	500
26	<1		=	<500
27	<1		=	<500
28	1		=	500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	<1		=	<500
35	<1		=	<500

FORM B OUTDOOR METHANE MONITORING REPORT FORM

JARTER: 4 TIME: 10:15 Am DATE: 11/30/88

DATE EXOTOX CALIBRATED: 9/88

VENT	ppm Methane
1	<500
2	<500
3	<500
4	<500
5	<500
6	<500
7	<500
8	<500
9	<500
10	<500
11	<500
12	<500
13	<500
14	<500
15	<500
16	<500
17	<500
18	<500
19	<500
20	<500
21	<500
22	<500
23	<500
24	<500
25	500
26	<500
27	<500
28	500
29	<500
32	<500
33	<500
34	<500
35	<500

Sampling points #30 and #31 were taken out during construction.

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 1 TIME: 1:00 pm DATE: 2/23/89

DATE EXOTOX CALIBRATED: 9/88

VENT #	90 LEL	x 500	=	ppm Methane
1	~~0~~ <1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	~~0~~ 5		=	2500
6	<1		=	<500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	1		=	500
13	<1		=	<500
14	1		=	500
15	<1		=	<500
16	1		=	500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	1		=	500
21	1		=	500
22	<1		=	<500
23	3		=	1500
24	1		=	500
25	<1		=	<500
26	<1		=	<500
27	<1		=	<500
28	<1		=	<500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	<1		=	<500
35	1		=	500

FORM B — OUTDOOR METHANE MONITORING REPORT FORM

JARTER: 1 TIME: 1:00pm DATE: 2/23/89

DATE EXOTOX CALIBRATED: 9/88

VENT	ppm Methane
1	<500
2	<500
3	<500
4	<500
5	2500
6	<500
7	<500
8	<500
9	<500
10	<500
11	<500
12	500
13	<500
14	500
15	<500
16	500
17	<500
18	<500
19	<500
20	500
21	500
22	<500
23	1500
24	500
25	<500
26	<500
27	<500
28	<500
29	<500
32	<500
33	<500
34	<500
35	500

Sampling points #30 and #31 were taken out during construction.

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 2 TIME: 9:50 Am DATE: 6/28/89

DATE EXOTOX CALIBRATED: 4/28/89

VENT #	90 LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	<1		=	<500
6	<1		=	<500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	<1		=	<500
13	<1		=	<500
14	<1		=	<500
15	<1		=	<500
16	<1		=	<500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	<1		=	<500
24	<1		=	<500
25	<1		=	<500
26	<1		=	<500
27	<1		=	<500
28	<1		=	<500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	<1		=	<500
35	<1		=	<500

FORM B OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 2 TIME: 9:50 Am DATE: 6/28/89

DATE EXOTOX CALIBRATED: 4/28/89

VENT	ppm Methane
1	<500
2	<500
3	<500
4	<500
5	<500
6	<500
7	<500
8	<500
9	<500
10	<500
11	<500
12	<500
13	<500
14	<500
15	<500
16	<500
17	<500
18	<500
19	<500
20	<500
21	<500
22	<500
23	<500
24	<500
25	<500
26	<500
27	<500
28	<500
29	<500
32	<500
33	<500
34	<500
35	<500

Sampling points #30 and #31 were taken out during construction.

FORM B — OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 3rd TIME: 1:30pm DATE: 9-18-89

DATE EXOTOX CALIBRATED: 4-20-89 analyst: B. Stroge, R. Hill, C. Wellborne

VENT	ppm Methane
1	<500 ppm
2	<500 "
3	<500
4	<500
5	<500
6	5500
7	2000
8	<500
9	<500
10	<500
11	<500
12	500
13	<500
14	<500
15	<500
16	<500
17	<500
18	<500
19	<500
20	3500
21	8500
22	1500
23	2500
24	<500
25	<500
26	<500
27	<500
28	<500
29	<500
32	<500
33	<500
34	<500
35	8000

Sampling points #30 and #31 were taken out during construction.

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

JARTER: 4th TIME: 1:30pm DATE: 10-20-89

DATE EXOTOX CALIBRATED: 4-28-89 ANALYST: C Weber, B. Stange

VENT #	% LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	1		=	500
4	<1		=	<500
5	18		=	9000
6	4		=	2000
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	<1		=	<500
13	<1		=	<500
14	<1		=	<500
15	1		=	500
16	1		=	500
17	1		=	500
18	1		=	500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	5		=	2500
24	<1		=	<500
25	<1		=	<500
26	<1		=	<500
27	<1		=	<500
28	<1		=	<500
29	1		=	500
32	<1		=	<500
33	<1		=	<500
34	2		=	1000
35	78		=	39000

FORM A INDOOR METHANE MONITORING WORKSHEET

QUARTER: 2 TIME: 1:30 DATE: 6-13-90

DATE EXOTOX CALIBRATED: 5-24-90 ANALYST: Bertha M. Stange

LOCATION	% LEL	x 500	=	ppm Methane
1. Tunnel, Seams	0		=	0
2. Energy Center, Boiler #1	0		=	0
3. Energy Center, Boiler #2	0		=	0
4. Energy Center, Boiler Gas Line	0		=	0
5. Shipping & Receiving SW Corner	0		=	0
6. Spacer in Hall between old labs	0		=	0
7. Drilled hole in floor, FAB 24	0		=	0
8. Cracks in floor, FAB 24	0		=	0
9. East Side of South Tunnel, Cu pipe	1		=	500
10. North End of T-Tunnel, Cu rod	1		=	500
11. Crack in West end of North Tunnel, near door	0		=	0
12. Crack in floor in DI, near West door	0		=	0
13. Crack near Chemical Loading Dock	0		=	0

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

UARTER: 2 TIME: 10:30 DATE: 6-13-90

DATE EXOTOX CALIBRATED: 5-24-90 ANALYST: Bertha M. Stange

VENT #	% LEL	x 500	=	ppm Methane
1	0		=	0
2	0		=	0
3	0		=	0
4	0		=	0
5	0		=	0
6	0		=	0
7	0		=	0
8	0		=	0
9	0		=	0
10	1		=	500
11	1		=	500
12	1		=	500
13	1		=	500
14	1		=	500
15	1		=	500
16	1		=	500
17	1		=	500
18	1		=	500
9	0		=	0
20	0		=	0
21	0		=	0
22	0		=	0
23	0		=	0
24	1		=	500
25	1		=	500
26	0		=	0
27	0		=	0
28	0		=	0
29	0		=	0
32	0		=	0
33	0		=	0
34	0		=	0
35	0		=	0

35 <500

INDOOR METHANE POINTS

	6-13-90 ppm Methane
1. Tunnel, Seams	<500
2. Energy Center, Boiler #1	<500
3. Energy Center, Boiler #2	<500
4. Energy Center Boiler Gas Line	<500
5. Shipping & Rec. SW corner	<500
6. Spacer in hall bet. old labs	<500
7. Drilled hole in floor,FAB 24	<500
8. Cracks in floor, FAB 24	<500
9. East side of South tunnel, Cu pipe	500
10. North end of T-tunnel, Cu rod	500
11. Crack in West end of N tunnel, near door	<500
12. Crack in floor in DI, West door	<500
13. Crack near chemical loading dock	<500

TO: Gary Mavrakis, Karl Giron
From: Bertha M. Stange
Date: June 14, 1990
Subj: Methane Monitoring Quarter 2

This report will mark the beginning of a new report since the indoor monitoring worksheet has been completely changed. I'm also going to be sending this to Karl so he will know what I am doing concerning environmental tasks. Those points measuring zero are reported as <500ppm. Vents 30 and 31 are not available anymore.

OUTSIDE METHANE POINTS

VENT #	6-13-90 ppm Methane
1	<500
2	<500
3	<500
4	<500
5	<500
6	<500
7	<500
8	<500
9	<500
10	500
11	500
12	500
13	500
14	500
15	500
16	500
17	500
18	500
19	<500
20	<500
21	<500
22	<500
23	<500
24	500
25	500
26	<500
27	<500
28	<500
29	<500
32	<500
33	<500
34	<500

FORM A INDOOR METHANE MONITORING WORKSHEET

QUARTER: Bed TIME: 2:00pm DATE: 10/15/90

DATE EXOTOX CALIBRATED: 5/24/90 ANALYST: D. Bradshaw

LOCATION	% LEL	x 500	=	ppm Methane
1. Tunnel, Seams	0		=	<500
2. Energy Center, Boiler #1	0		=	<500
3. Energy Center, Boiler #2	0		=	<500
4. Energy Center, Boiler Gas Line	0		=	<500
5. Shipping & Receiving SW Corner	0		=	<500
6. Spacer in Hall between old labs	1		=	500
7. Drilled hole in floor, FAB 24	0		=	<500
8. ~~Cracks~~ Seams in floor, FAB 24	0		=	<500
9. East Side of South Tunnel, Cu pipe	1		=	500
10. North End of T-Tunnel, Cu rod	0		=	<500
11. Crack in West end of North Tunnel, near door	0		=	<500
12. Crack in floor in DI, near West door	0		=	<500
13. Crack near Chemical Loading Dock	0		=	<500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

JARTER: 4 TIME: 10. AM DATE: 10/15/90

DATE EXOTOX CALIBRATED: 5/24/90 ANALYST: D Bradshaw

VENT #	% LEL	x 500	=	ppm Methane
1	0		=	<500
2	0		=	<500
3	0		=	<500
4	0		=	<500
5	10		=	5000
6	0		=	<500
7	0		=	<500
8	0		=	<500
9	0		=	<500
10	0		=	<500
11	0		=	<500
12	0		=	<500
13	0		=	<500
14	0		=	<500
15	0		=	<500
16	0		=	<500
17	0		=	<500
18	0		=	<500
19	0		=	<500
20	22		=	11000
21	57		=	28,500
22	6		=	3,000
23	11		=	5,500
24	0		=	<500
25	0		=	<500
26	0		=	<500
27	0		=	<500
28	0		=	<500
29	0		=	<500
32	0		=	<500
33	0		=	<500
34	0		=	<500
35	0		=	<500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 1 TIME: 1400 DATE: 1-31-91

DATE EXOTOX CALIBRATED: 12-04-90 ANALYST: K. Luhr

VENT #	% LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	<1		=	<500
6	<1		=	<500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	<1		=	<500
13	<1		=	<500
14	<1		=	<500
15	<1		=	<500
16	<1		=	<500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	<1		=	<500
24	<1		=	<500
25	<1		=	<500
26	<1		=	<500
27	<1		=	<500
28	<1		=	<500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	<1		=	<500
35	<1		=	<500

FORM A INDOOR METHANE MONITORING WORKSHEET

QUARTER: 1 TIME: 1130 am DATE: 2-7-91

DATE EXOTOX CALIBRATED: 12-04-90 ANALYST: K. Luhr / C. Weber

LOCATION	% LEL	x 500	=	ppm Methane
1. Tunnel, Seams	<1		=	<500
2. Energy Center, Boiler #1	<1		=	<500
3. Energy Center, Boiler #2	<1		=	<500
4. Energy Center, Boiler Gas Line	<1		=	<500
5. Shipping & Receiving SW Corner	<1		=	<500
6. Spacer in Hall between old labs	<1		=	<500
7. Drilled hole in floor, FAB 24	<1		=	<500
8. Cracks in floor, FAB 24	<1		=	<500
9. East Side of South Tunnel, Cu pipe	<1		=	<500
10. North End of T-Tunnel, Cu rod	<1		=	<500
11. Crack in West end of North Tunnel, near door	<1		=	<500
12. Crack in floor in DI, near West door	<1		=	<500
13. Crack near Chemical Loading Dock	<1		=	<500

FORM A INDOOR METHANE MONITORING WORKSHEET

QUARTER: 2 TIME: 2:30 pm DATE: 5-7-91

DATE EXOTOX CALIBRATED: 12-4-90 ANALYST: K. Urbahl

LOCATION	% LEL	x 500	=	ppm Methane
1. Tunnel, Seams	<1		=	<500
2. Energy Center, Boiler #1	1		=	500
3. Energy Center, Boiler #2	<1		=	<500
4. Energy Center, Boiler Gas Line	<1		=	<500
5. Shipping & Receiving SW Corner	<1		=	<500
6. Spacer in Hall between old labs	<1		=	<500
7. Drilled hole in floor, FAB 24	<1		=	<500
8. Cracks in floor, FAB 24	<1		=	<500
9. East Side of South Tunnel, Cu pipe	<1		=	<500
10. North End of T-Tunnel, Cu rod	<1		=	<500
11. Crack in West end of North Tunnel, near door	<1		=	<500
12. Crack in floor in DI, near West door	<1		=	<500
13. Crack near Chemical Loading Dock	<1		=	<500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 2 TIME: 2:30 pm DATE: 5-7-91

DATE EXOTOX CALIBRATED: 12-4-90 ANALYST: K. URBAN

VENT #	% LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	<1		=	<500
6	<1		=	<500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	1		=	500
13	<1		=	<500
14	<1		=	<500
15	<1		=	<500
16	<1		=	<500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	<1		=	<500
24	<1		=	<500
25	1		=	500
26	1		=	500
27	<1		=	<500
28	<1		=	<500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	1		=	<500
35	<1		=	<500

FORM A — INDOOR METHANE MONITORING WORKSHEET

QUARTER: 3 TIME: _____ DATE: 9-25-91

DATE EXOTOX CALIBRATED: 9-11-91 ANALYST: D BRADSHAW, K URBAN

LOCATION	% LEL	x 500 =	ppm Methane
1. Tunnel, Seams	<1.0	=	<500
2. Energy Center, Boiler #1	<1.0	=	<500
3. Energy Center, Boiler #2	<1.0	=	<500
4. Energy Center, Boiler Gas Line	<1.0	=	<500
5. Shipping & Receiving SW Corner	<1.0	=	<500
6. Spacer in Hall between old labs	<1.0	=	<500
7. Drilled hole in floor, FAB 24	<10	=	<500
8. Cracks in floor, FAB 24	<1.0	=	<500
9. East Side of South Tunnel, Cu pipe	<1.0	=	<500
10. North End of T-Tunnel, Cu rod	<1.0	=	<500
11. Crack in West end of North Tunnel, near door	<1.0	=	<500
12. Crack in floor in DI, near West door	<1.0	=	<500
13. Crack near Chemical Loading Dock	<1.0	=	<500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 3 TIME: 2:30 PM DATE: 9-23-91

DATE EXOTOX CALIBRATED: 9-11-91 ANALYST: KEN URBAN / D. BRADSHAW

VENT #	% LEL	x 500 =	ppm Methane
1	<1.0	=	< 500
2	<1.0	=	< 500
3	<1.0	=	< 500
4	<1.0	=	< 500
5	<1.0	=	< 500
6	<1.0	=	< 500
7	<1.0	=	< 500
8	<1.0	=	< 500
9	<1.0	=	< 500
10	<1.0	=	< 500
11	<1.0	=	< 500
12	<1.0	=	< 500
13	<1.0	=	< 500
14	<1.0	=	< 500
15	<1.0	=	< 500
16	<1.0	=	< 500
17	<1.0	=	< 500
18	<1.0	=	< 500
19	<1.0	=	< 500
20	<1.0	=	< 500
21	5.0	=	2500
22	<1.0	=	<500
23	12.0	=	6000
24	<1.0	=	< 500
25	<1.0	=	< 500
26	<1.0	=	< 500
27	<1.0	=	< 500
28	<1.0	=	< 500
29	<1.0	=	< 500
32	<1.0	=	<500
33	<1.0	=	< 500
34	<1.0	=	< 500
35	<1.0	=	< 500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 4 TIME: 1:30 pm DATE: 12-19-91

DATE EXOTOX CALIBRATED: 9-11-91 ANALYST: K. URBAN

VENT #	% LEL	x 500	=	ppm Methane
1	< 1.0		=	< 500
2	< 1.0		=	< 500
3	< 1.0		=	< 500
4	< 1.0		=	< 500
5	< 1.0		=	< 500
6	< 1.0		=	< 500
7	< 1.0		=	< 500
8	< 1.0		=	< 500
9	< 1.0		=	< 500
10	< 1.0		=	< 500
11	< 1.0		=	< 500
12	< 1.0		=	< 500
13	< 1.0		=	< 500
14	< 1.0		=	< 500
15	< 1.0		=	< 500
16	< 1.0		=	< 500
17	< 1.0		=	< 500
18	< 1.0		=	< 500
19	< 1.0		=	< 500
20	< 1.0		=	< 500
21	< 1.0		=	< 500
22	< 1.0		=	< 500
23	< 1.0		=	< 500
24	< 1.0		=	< 500
25	< 1.0		=	< 500
26	< 1.0		=	< 500
27	< 1.0		=	< 500
28	< 1.0		=	< 500
29	< 1.0		=	< 500
32	< 1.0		=	< 500
33	< 1.0		=	< 500
34	< 1.0		=	< 500
35	< 1.0		=	< 500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 1 TIME: 1:30 pm DATE: 1-30-92

DATE EXOTOX CALIBRATED: 9-11-91 ANALYST: K. URBAN

VENT #	% LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	<1		=	<500
6	<1		=	<500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<500
12	<1		=	<500
13	<1		=	<500
14	<1		=	<500
15	<1		=	<500
16	<1		=	<500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	<1		=	<500
24	<1		=	<500
25	<1		=	<500
26	<1		=	<500
27	<1		=	<500
28	<1		=	<500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	<1		=	<500
35	<1		=	<500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: QII TIME: 10 AM DATE: 6-26-92

DATE EXOTOX CALIBRATED: 3-19-92 ANALYST: D Bradshaw

VENT #	% LEL	x 500	=	ppm Methane
1	<1		=	< 500
2	<1		=	< 500
3	<1		=	< 500
4	<1		=	< 500
5	<1		=	< 500
6	<1		=	< 500
7	<1		=	< 500
8	<1		=	< 500
9	<1		=	< 500
10	<1		=	< 500
11	<1		=	< 500
12	<1		=	< 500
13	<1		=	< 500
14	<1		=	< 500
15	1		=	500
16	<1		=	< 500
17	<1		=	< 500
18	<1		=	< 500
19	1		=	500
20	1		=	500
21	1		=	500
22	1		=	500
23	<1		=	< 500
24	<1		=	< 500
25	<1		=	< 500
26	<1		=	< 500
27	<1		=	< 500
28	<1		=	< 500
29	<1		=	< 500
32	<1		=	< 500
33	<1		=	< 500
34	<1		=	< 500
35	<1		=	< 500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 3 TIME: 2:30pm DATE: 9-21-92

DATE EXOTOX CALIBRATED: 3-19-92 ANALYST: D. Bradshaw

VENT #	% LEL	x 500	=	ppm Methane
1	<1		=	<500
2	<1		=	<500
3	<1		=	<500
4	<1		=	<500
5	<1		=	<500
6	<1		=	<500
7	<1		=	<500
8	<1		=	<500
9	<1		=	<500
10	<1		=	<500
11	<1		=	<50
12	<1		=	<500
13	<1		=	<500
14	<1		=	<500
15	<1		=	<500
16	<1		=	<500
17	<1		=	<500
18	<1		=	<500
19	<1		=	<500
20	<1		=	<500
21	<1		=	<500
22	<1		=	<500
23	<1		=	<500
24	<1		=	<500
25	<1		=	<500
26	<1		=	<500
27	<1		=	<500
28	<1		=	<500
29	<1		=	<500
32	<1		=	<500
33	<1		=	<500
34	<1		=	<500
35	<1		=	<500

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: II TIME: 10:00 AM DATE: 5-12-93

DATE EXOTOX CALIBRATED: 10/92 ANALYST: K. Urban, D. Bradshaw

VENT #	% LEL	x 500	=	ppm Methane
1	Ø		=	<500
2	Ø		=	<500
3	Ø		=	<500
4	Ø		=	<500
5	Ø		=	<500
6	Ø		=	<500
7	Ø		=	<500
8	Ø		=	<500
9	Ø		=	<500
10	Ø		=	<500
11	Ø		=	<500
12	Ø		=	<500
13	Ø		=	<500
14	Ø		=	<500
15	Ø		=	<500
16	Ø		=	<500
17	Ø		=	<500
18	Ø		=	<500
19	Ø		=	<500
20	Ø		=	<500
21	Ø		=	<500
22	Ø		=	<500
23	Ø		=	<500
24	Ø		=	<500
25	Ø		=	<500
26	Ø		=	<500
27	Ø		=	<500
28	Ø		=	<500
29	Ø		=	<500
32			=	
33			=	
34			=	
35			=	

Methane Monitoring April 11, 1983 8:30AM

Point #	Hex reading ppm	Methane reading ppm
	0	0
	0	0
	0	0
	0	0
	60	94.8
	120 water drops present on screen	189.6
	0	0
	0	0
	40	63.2
	10	15.8
	10	15.8
	10	15.8
	0	0
	0	0
	0	0
	160	252.8
	150	237
	120	189.6
	100	158
	240	3792
	60	94.8
	0	0
	0	0
	0 water drops present on screen	0
	0	0
	0	0
	0	0
	0	0
	20	31.6
	60	94.8
	0	0
	30	47.4
	0	0
	0	0
	100	158

Methane Monitoring April 11, 1983 8:30 AM

Vent #	Hex reading ppm	Methane reading ppm
1	0	0
2	0	0
3	0	0
4	0	0
5	60	94.8
6	120 water drops present on screen	189.6
7	0	0
8	0	0
9	40	63.2
10	10	15.8
11	10	15.8
12	10	15.8
13	0	0
14	0	0
15	0	0
16	160	252.8
17	150	237
18	120	189.6
19	100	158
20	240	3792
1	60	94.8
2	0	0
3	0	0
4	0 water drops present on screen	0
5	0	0
6	0	0
7	0	0
8	0	0
9	20	31.6
10	60	94.8
1	0	0
2	30	47.4
3	0	0
4	0	0
5	100	158

vent #	Tick RATE 0	Low	Med	High	LIGHTS & ALARM Slight	Medium	Alarm	Comments
1	✓							
2			✓					
3		✓						
4	✓							
5	✓							
6				✓		✓		odor detectable
7	✓							
8	✓							
9		✓						
10			✓					
11			✓					
12			✓					
13	✓							
14		✓						
15		✓						
16		✓						
17		✓						
18		✓						
19				✓				
20				✓				
21				✓				
22		✓						
23				✓	✓			odor present
24 *				✓			✓	odor, alarm light almost immediate
25	✓							
26		✓						
27			✓					
28				✓				
29		✓						
30	✓							
31				✓				
32				✓				
33				✓				
34				✓				

* Alarm light indicates potentially hazardous atmosphere, 50% of the L.E.L., vent area and eliminate sources of heat + flame

[illegible] vents takes about 1 hour ± 15 min.

[illegible] time on 2/23/93 at 2:30 pm + 3:42 pm Instrument used, [illegible]

OUTDOOR METHANE MONITORING

Point #	2/24/83	2/28/83	3/17/83	4/11/83	5/5/83*	10/24/83*	2/1/84*	4/11/84*
1	0 ppm	0 ppm	0 ppm	0 ppm	1 ppm	0 ppm	158 ppm	16
2	0	0	0	0	17	0	474	16
3	0	0	63	0	114	0	474	16
4	0	0	0	0	4	8	16	16
5	158	1896	221	95	1580-3160	95	395	16
6	948	16	316	190	3160-4740	0	1422	16
7	0	0	0	0	16	16	16	16
8	32	0	0	0	32	63	16	16
9	174	0	63	63	16	0	158	47
10	190	190	237	16	158	16	16	16
11	237	206	237	16	300	0	253	190
12	221	126	221	16	332	0	253	221
13	0	0	0	0	16	0	16	16
14	221	0	126	0	284	0	221	111
15	190	0	0	0	190	0	126	63
16	174	174	0	253	348	0	221	221
17	316	158	190	237	316	0	205	190
18	284	111	126	190	253	0	174	190
19	253	111	0	158	379	111	174	63
20	790	0	284	3792	379	63	253	316
21	3476	0	0	95	790-884	0	158	316
22	6636	0	474	0	1580-2528	0	95	458
23	379	0	158-1517	0	6320-7110	0	190	379
24	0	0	4424	0	8848	0	7900	632
25	253	126	0	0	16	126	16	32
26	0	0	0	0	16	0	16	16
27	126	158	95	0	348	0	221	16
28	316	0	174	0	379	0	284	16
29	442	221	300	32	427	0	348	363
30	253	0	253	95	442	0	284	142
31	253	0	142	0	395	0	221	16
32	442	95	284	47	695	0	316	16
33	253	111	0	0	316-474	16	16	253
34	253	0	253	0	442	0	190	16
35	253	0	253	158	395	0	300	221

_____ = Highest Daily Data Point

* Sniffer calibrated to a hexane standard.

[illegible]EL 25,000 ppm

Signetics-A[illegible]iquerque
April [illegible]4

METHANE MONITORING

QUARTER: 1 TIME: 1100 hrs DATE: 11 Feb 85

TLV CALIBRATED: ✓ DATE: 14 Dec 84

VENT#	ppm HEXANE	x 1.58	ppm Methane
1	<10	=	< 16
2	<10	=	< 16
3	<10	=	< 16
4	<10	=	< 16
5	<10	=	< 16
6	<10	=	< 16
7	<10	=	< 16
8	<10	=	< 16
9	<10	=	< 16
10	<10	=	< 16
11	<10	=	< 16
12	<10	=	< 16
13	<10	=	< 16
14	<10	=	< 16
15	<10	=	< 16
16	<10	=	< 16
17	<10	=	< 16
18	<10	=	< 16
19	<10	=	< 16
20	20	=	32
21	<10	=	< 16
22	<10	=	< 16
23	<10	=	< 16
24	<10	=	< 16
25	20	=	32
26	<10	=	< 16
27	<10	=	< 16
28	<10	=	< 16
29	<10	=	< 16
30	<10	=	< 16
31	<10	=	< 16
32	<10	=	< 16
33	<10	=	< 16
34	<10	=	< 16
35	<10	=	< 16

METHANE MONITORING

QUARTER: 2 TIME: 1130hrs DATE: 14 June 85

TLV CALIBRATED: 15 March 85 DATE: 15 March 85

VENT#	ppm HEXANE	x 1.58	ppm Methane
1	<10	=	<16
2	<10	=	<16
3	<10	=	<16
4	<10	=	<16
5	20	=	32
6	70	=	111
7	<10	=	<16
8	<10	=	<16
9	<10	=	<16
10	<10	=	<16
11	<10	=	<16
12	<10	=	<16
13	<10	=	<16
14	80	=	126
15	20	=	32
16	100	=	158
17	80	=	126
18	60	=	95
19	60	=	95
20	60	=	95
21	100	=	158
22	70	=	111
23	80	=	126
24	330	=	521
25	30	=	47
26	<10	=	<16
27	<10	=	<16
28	<10	=	<16
29	60	=	95
30	40	=	63
31	20	=	32
32	160	=	253
33	<10	=	<16
34	50	=	79
35	<10	=	<16

METHANE MONITORING

QUARTER: 4 TIME: 14:30hrs DATE: 30-1-85

TLV CALIBRATED: Yes DATE: June 12 1984

VENT#	ppm HEXANE	x 1.58	ppm Methane
1	<10	=	<16
2	<10	=	<16
3	<10	=	<16
4	<10	=	<16
5	8,100	=	12,798
6	>10,000	=	>15,800
7	<10	=	<16
8	<10	=	<16
9	180	=	284
10	280	=	442
11	220	=	348
12	340	=	537
13	<10	=	<16
14	240	=	379
15	130	=	205
16	260	=	411
17	170	=	269
18	200	=	316
19	275	=	435
20	1,200	=	1,896
21	2,800	=	4,424
22	2,400	=	3,792
23	9,000	=	14,220
24	540	=	853
25	>10,000	=	>15,800
26	<10	=	<16
27	380	=	600
28	100	=	158
29	390	=	616
30	300	=	474
31	180	=	284
32	720	=	1,138
33	100	=	158
34	960	=	1,517
35	>10,000	=	>15,800

METHANE MONITORING

QUARTER: 1 TIME: 1100 hrs DATE: 1/15/86

TLV CALIBRATED: yes DATE: Jan. 6, 1986

VENT#	ppm HEXANE	x 1.58	ppm Methane
1	<10	=	<16
2	<10	=	<16
3	<10	=	<16
4	<10	=	<16
5	80	=	126
6	140	=	221
7	<10	=	<16
8	<10	=	<16
9	20	=	32
10	<10	=	<16
11	<10	=	<16
12	<10	=	<16
13	<10	=	<16
14	<10	=	<16
15	<10	=	<16
16	140	=	221
17	120	=	190
18	100	=	158
19	<10	=	<16
20	120	=	190
21	<10	=	<16
22	<10	=	<16
23	260	=	411
24	<10	=	<16
25	<10	=	<16
26	<10	=	<16
27	<10	=	<16
28	<10	=	<16
29	60	=	95
30	<10	=	<16
31	<10	=	<16
32	200	=	316
33	<10	=	<16
34	<10	=	<16
35	820	=	1,296

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 23 TIME: 12:30 DATE: 6/25/86

DATE TLV CALIBRATED: 4/9/86 Next Due 7/13/86

VENT #	ppm Hexane	x 1.58 =	ppm Methane
1	<10	=	<16
2	<10	=	<16
3	22	=	35
4	<10	=	<16
5	12 (110) 2nd measurement	=	174
6	200 (320) 2nd "	=	506
7	<10	=	<16
8	<10	=	<16
9	90	=	142
10	80	=	126
11	100	=	~~158~~ 158
12	110	=	174
13	<10	=	<16
14	<10	=	<16
15	<10	=	<16
16	110	=	174
17	100	=	158
18	80	=	126
19	100	=	158
20	100	=	158
21	140	=	221
22	250	=	395
23	2000	=	3160
24	1200	=	1896
25	600	=	948
26	<10	=	<16
27	100	=	158
28	100	=	158
29	110	=	174
30	110	=	174
31	80	=	126
32	80	=	126
33	70	=	111
34	300	=	474
35	3000	=	4740

FORM B — OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 3 TIME: 12:30 DATE: 6/28/86

DATE TLV CALIBRATED: 4/8/86 Next Due 7/13/86

VENT	ppm Methane
1	< 16
2	< 16
3	35
4	< 16
5	174
6	506
7	< 16
8	< 16
9	142
10	126
11	158
12	174
13	< 16
14	< 16
15	< 16
16	174
17	158
18	126
19	158
20	~~126~~ 158 JP
21	221
22	395
23	3160
24	1896
25	948
26	< 16
27	158
28	158
29	174
30	174
31	126
32	126
33	111
34	474
35	4740

SIGNETICS ABQ FSCM 18324 861-1086 02/18/85

Analysis Performed by Jeff Pitt

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 4 TIME: 2:00 DATE: [illegible]

DATE TLV CALIBRATED: Oct 8 1986, Due Jan 11, 1987

VENT #	ppm Hexane	x 1.58 =	ppm Methane
1	<10	=	<16
2	35	=	55
3	30	=	47
4	<10	=	<16
5	120	=	190
6	<10	=	<16
7	<10	=	<16
8	40	=	63
9	30	=	47
10	<10	=	<16
11	<10	=	<16
12	<10	=	<16
13	<10	=	<16
14	10	=	16
15	<10	=	<16
16	90	=	142
17	60	=	95
18	60	=	95
19	<10	=	<16
20	<10	=	<16
21	90	=	142
22	80	=	126
23	80	=	126
24	<10	=	<16
25	<10	=	<16
26	10	=	16
27	50	=	79
28	<10	=	<16
29	<10	=	<16
30	60	=	dug out
31	<10	=	
32	100	=	95
33	<10	=	<16
34		=	158
35		=	<16

FORM B — OUTDOOR METHANE MONITORING REPORT FORM

QUARTER: 1 TIME: 1:15 PM DATE: 3/4/87

DATE TLV CALIBRATED: 2/25/87

VENT	ppm Methane
1	<16
2	<16
3	<16
4	<16
5	<16
6	47
7	<16
8	<16
9	24
10	<16
11	<16
12	40
13	<16
14	<16
15	<16
16	47
17	16
18	24
19	95
20	63
21	63
22	79
23	126
24	63
25	32
26	<16
27	32
28	<16
29	24
30	–
31	–
32	47
33	190
34	<16
35	<16

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 1 TIME: 1:15pm DATE: 3/4/87

DATE TLV CALIBRATED: 2/25/87

VENT #	ppm Hexane	x 1.58 =	ppm Methane
1	<10	=	<16
2	<10	=	<16
3	<10	=	<16
4	<10	=	<16
5	<10	=	<16
6	30	=	47
7	<10	=	~~[illegible]~~ <16
8	<10	=	<16
9	15	=	24
10	<10	=	<16
11	<10	=	<16
12	25	=	40
13	<10	=	46
14	<10	=	<16
15	<10	=	<16
16	30	=	47
17	10	=	16
18	15	=	24
19	60	=	95
20	40	=	63
21	40	=	63
22	50	=	79
23	80	=	126
24	40	=	63
25	20	=	32
26	<10	=	<16
27	20	=	32
28	<10	=	<16
29	15	=	24
30	–	=	–
31	–	=	–
32	30	=	47
33	120	=	190
34	<10	=	<16
35	<10	=	<16

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 2 TIME: 10:30 Am DATE: 6/1/87

DATE TLV CALIBRATED: 5/26/87

VENT #	ppm Hexane	x 1.58 =	ppm Methane
1	<10	=	< 16
2	<10	=	< 16
3	<10	=	< 16
4	<10	=	< 16
5	<10	=	< 16
6	<10	=	< 16
7	<10	=	< 16
8	28	=	44
9	<10	=	< 16
10	10	=	16
11	<10	=	< 16
12	<10	=	< 16
13	<10	=	< 16
14	<10	=	< 16
15	<10	=	< 16
16	40	=	63
17	50	=	79
18	<10	=	< 16
19	<10	=	< 16
20	<10	=	< 16
21	<10	=	< 16
22	<10	=	< 16
23	<10	=	< 16
24	<10	=	< 16
25	<10	=	< 16
26	< 10	=	< 16
27	<10	=	< 16
28	<10	=	< 16
29	<10	=	< 16
30	—	=	—
31	—	=	—
32	<10	=	< 16
33	<10	=	< 16
34	<10	=	< 16
35	<10	=	< 16

FORM A — OUTSIDE METHANE MONITORING WORKSHEET

QUARTER: 3 TIME: 10:50 AM DATE: 9/17/87

DATE TLV CALIBRATED: 8/10/87

VENT #	ppm Hexane	x 1.58 =	ppm Methane
1	<10	=	<16
2	<10	=	<16
3	<10	=	<16
4	<10	=	<16
5	50	=	79
6	<10	=	<16
7	<10	=	~~4~~ <16
8	40	=	63
9	<10	=	<16
10	<10	=	<16
11	<10	=	<16
12	16	=	25
13	<10	=	<16
14	<10	=	<16
15	<10	=	<16
16	<10	=	<16
17	<10	=	<16
18	20	=	32
19	<10	=	<16
20	140	=	221
21	<10	=	<16
22	<10	=	<16
23	<10	=	<16
24	<10	=	<16
25	100	=	158
26	10	=	16
27	<10	=	<16
28	200	=	316
29 Knocked over		=	
30	dug out	=	
31	dug out	=	
32	<10	=	<16
33	<10	=	<16
34	<10	=	<16
35	100	=	158

Instrument: TLV Sniffer model - TLV - Standard Date of test 2/24/83

	PPM reading Hexane	x confer. =	methane	comments
	0	x 1.58 =	0	
2	0		0	
3	0		0	
4	0		0	
5	100		158	
6	600		948	
7	0		0	
8	20		31.6	
9	110		173.8	
10	120		189.6	
	150		237.	
	140		221.2	
	0		0	
	140		221.2	
15	120		189.6	
16	110		173.8	
17	200		316	
18	180		284.4	
19	160		252.8	
20	500		790	
21	2200		3,476	
22	4200		6,636	
	240		379.2	
24	0		0	
	160		252.8	
	0		0	
	80		126.4	
2	200		316	
	280		442.4	
	160		252.8	
	160		252.8	
	280		442.4	
	160		252.8	
7	160		252.8	
	160		252.8	

Instrument - TLV Sniffer model - TLV - Standard Date of test 2/24

Point no.	PPM readings Hexane	x conf. fac. =	Methane
1	0	x 1.58 =	0
2	0		0
3	0		0
4	0		0
5	100		158
6	620		948
7	0		0
8	20		31.6
9	110		173.8
10	120		189.6
11	150		237.
12	140		221.2
13	0		0
14	140		221.2
15	120		189.6
16	110		173.8
17	200		316
18	180		284.4
19	160		252.8
20	500		790
21	2200		3,476
22	4200		6,636
23	240		379.2
24	0		0
25	160		252.8
26	0		0
27	80		126.4
28	200		316
29	280		442.4
30	160		252.8
31	160		252.8
32	280		442.4
33	160		252.8
34	160		252.8
35	160.		252.8

comments
WARM, dry, not very windy

2/23/83 mon
3:45pm – 4:45pm
cold, cloudy, windy

#	Hex	× 1.58 = Meth ppm	
1 ✓	0	0	
2 ✓	0	0	
3	0	0	
4 ✓	0	0	
5 ✓	1200	1,896	
6	10	15.8	
7 ✓	0	0	
8 ✓	0	0	
9	0	0	
10 ✓	120	189.6	
11 ✓	130	205.4	
12	80	126.4	
13 ✓	0	0	
14 ✓	0	0	
15	0	0	
16 ✓	110	173.8	
[illegible] ✓	100	158	
18	70	110.6	
19 ✓	70	110.6	
20 ✓	0	0	
21	0	0	
22 ✓	0	0	
23 ✓	0	0	
24	0 ?	0	when odor present reading off of 10ppm scale
25 ✓	80	126.4	when went to 100ppm scale, no odor, no reading
26 ✓	0	0	
27	100	158	
28 ✓	0	0	
29 ✓	140	221.2	
30	0	0	
31 ✓	0	0	
32 ✓	60	94.8	
33	70	110.6	
[illegible]	0	0	
[illegible] ✓	0	0	

METHANE readings 3/17/83

ppm H2X	x 1.58	Methane ppm
0		0
0		0
40		63.2
0		0
140		221.2
200		316
0		0
0		0
40		63.2
150		237.
150		237
140		221.2
0		0
80		126.4
0		0
140		221.2
120		189.6
80		126.4
0		0
180		284.4
0		0
300		474
100 → 960		158 — 1516.8 max
2800 warm		4424
0		0
0		0
60		94.8
110		173.8
190		300.2
160		252.8
90		142.2
180		284.4
0		0
160		252.8
160		252.8

VENT #

5 May '83

Hexane ppm

< 1 ppm

11

72 ppm

< 1 ppm

1000 – 2000

2000 - 3000

<10

20

<10

100

190

210

<10

180

120

220

200

160

140

240

500 – 560

1000 – 1600

4000 – 4500

5600

<10

<10

220

240

270

280

250

380-440

200 - 300

280

250

5/5/83

5/5

Outside Methane monitoring

Vent #	methane ppm
1	<1
2	~~17.38~~ 17
3	~~113.76~~ 114
4	<1
5	1580 – 3160
6	3160 – 4740
7	~~<15.8~~ <16
8	~~31.6~~ 32
9	~~<15.8~~ <16
10	158
11	300 ~~.2~~
12	332 ~~.8~~
13	~~<15.8~~ <16
14	~~284.4~~ 284
15	~~189.6~~ 190
16	~~347.6~~ 348
17	316
18	~~252.8~~ 253
19	~~379.2~~ 379
20	~~379.2~~ 379
21	790 – 884 ~~.8~~
22	1580 – 2528
23	6320 – 7110
24	8848
25	~~<15.8~~ <16
26	~~<15.8~~ <16
27	~~347.6~~ 348
28	~~379.2~~ 379
29	~~426.6~~ 427
30	~~442.4~~ 442
31	395
32	600.4 – 695.2
33	316 – 474
34	~~442.4~~ 442
35	395

< ≥3

VENT II

METHANE 24 Oct 83

1.58 conversion

	<1
2	<10
3	<10
4	5
5	60
6	<10
7	10
8	40
9	<10
10	10
11	<10
12	<10
13	<10
14	<10
15	<10
16	<10
[illegible]	<10
[illegible]	<10
19	70
20	40
21	<10
22	<10
23	<10
24	<10
25	80
26	<10
27	<10
28	<10
29	<10
30	<10
31	<10
32	<10
33	10
34	<10
	<10

Methane Monitoring

Outside Vents 1 February, 1984

Vent #	Methane ppm
1	158
2	474
3	474
4	<16
5	395
6	1,422
7	<16
8	<16
9	158
10	<16
11	253
12	253
13	<16
14	221
15	126
16	221
17	205
18	174
19	174
20	253
21	158
22	95
23	190
24	7,900
25	<16
26	<16
27	221
28	284
29	348
30	284
31	221
32	316
33	<16
34	190
35	300

METHANE MONITORING

QUARTER: 4 TIME: 1000hrs DATE: 5 Nov 84

TLV CALIBRATED: yes DATE: 2 Nov 84

VENT#	ppm HEXANE	x 1.58	ppm Methane
1	<10	=	<16
2	<10	=	<16
3	<10	=	<16
4	<10	=	<16
5	<10	=	<16
6	40	=	63
7	<10	=	<16
8	<10	=	<16
9	<10	=	<16
10	<10	=	<16
11	<10	=	<16
12	<10	=	<16
13	<10	=	<16
14	<10	=	<16
15	<10	=	<16
16	<10	=	<16
17	<10	=	<16
18	<10	=	<16
19	<10	=	<16
20	<10	=	<16
21	<10	=	<16
22	<10	=	<16
23	<10	=	<16
24* needs repair uplifting	<10	=	<16
25	60	=	95
26	<10	=	<16
27	<10	=	<16
28	<10	=	<16
29	<10	=	<16
30	<10	=	<16
31	<10	=	<16
32	<10	=	<16
33	<10	=	<16
34	<10	=	<16
35	<10	=	<16

OUTDOOR METHANE MONITORING

Vent #	2/24/83	2/28/83	3/17/83	4/11/83	5/5/83*	10/24/83*	2/1/84*
1	0 ppm	0 ppm	0 ppm	0 ppm	1 ppm	0 ppm	158 ppm
2	0	0	0	0	17	0	474
3	0	0	63	0	114	0	474
4	0	0	0	0	4	8	16
5	158	1896	221	95	1580-3160	95	395
6	948	16	316	190	3160-4740	0	1422
7	0	0	0	0	16	16	16
8	32	0	0	0	32	63	16
9	174	0	63	63	16	0	158
10	190	190	237	16	158	16	16
11	237	206	237	16	300	0	253
12	221	126	221	16	332	0	253
13	0	0	0	0	16	0	16
14	221	0	126	0	284	0	221
15	190	0	0	0	190	0	126
16	174	174	0	253	348	0	221
17	316	158	190	237	316	0	205
18	284	111	126	190	253	0	174
19	253	111	0	158	379	111	174
20	790	0	284	3792	379	63	253
21	3476	0	0	95	790-884	0	158
22	6636	0	474	0	1580-2528	0	95
23	379	0	158-1517	0	6320-7110	0	190
24	0	0	4424	0	8848	0	7900
25	253	126	0	0	16	126	16
26	0	0	0	0	16	0	16
27	126	158	95	0	348	0	221
28	316	0	174	0	379	0	284
29	442	221	300	32	427	0	348
30	253	0	253	95	442	0	284
31	253	0	142	0	395	0	221
32	442	95	284	47	695	0	316
33	253	111	0	0	316-474	16	16
34	253	0	253	0	442	0	190
35	253	0	253	158	395	0	300

_____ = Highest Daily Data Point

* Sniffer calibrated to a hexane standard.

5C .EL 25,000 ppm

Signetics-Al'·querque
March

Appendix B.
Soil Gas Survey Data Report

Rocky teg Mountain

teg Rocky Mountain
Project Narrative Report
teg Project Number: 9388
Tuesday, December 14, 1999
teg Client: CH2M Hill Inc.
Client Contact: Sharon Minchak

Sample Receipt:
The samples for this project were received from December 6 to December 11, 1999 from the teg Rocky Mountain Field Services Division. The samples and their containers appeared to be in good condition and a chain of custody form was completed to log the samples into the mobile lab.

Holding Times:
All samples were prepared and analyzed within the method required holding times.

Methodology:
The determinations for halogenated and BTEX compounds were carried out using modified SW-846 method 8021. Samples were introduced into the instruments by method 5030 (purge and trap.) The determinations for fixed gasses were carried out using method 3C.

Laboratory Equipment:
The laboratory is equipped with two Finnigan/Tremetrics model 9001 gas chromatographs interfaced with Tekmar LSC 2000 purge and trap units. Each GC has FID, PID, and ELCD detectors mounted on the instrument. At any one time, two detectors are active on each instrument. Each detector has associated with it particular classes of compounds for which it is the primary means of identification and quantification. The other active detector on the instrument is sometimes used to confirm the identification performed by the primary detector.
The laboratory is also equipped with a Carle 111 gas chromatograph. This instrument has a TCD detector and data acquisition is done using Peak Simple software.

Calculations:
All the detectors on the gas chromatographs in the mobile laboratory are calibrated to respond to absolute masses (in nanograms) of analyte. Calculations are then carried out by the data system to compute the actual concentration of the analyte in the original sample. The default volume of sample for purge and trap is 40 mL. Dividing nanograms of analyte by milliliters of sample is equivalent to µg/L.
The default volume of sample for fixed gas analysis of vapors is 1.0 mL. The instrument is calibrated in percent, and the results are then normalized to 100%.

Calibration:
The analytical work for this project was carried out using teg level II QC and employed a three point initial calibration. On each additional project day the calibration was verified with a mid-level continuing calibration verification.

400 Corporate Circle, Suite R • Golden, CO 80401 • (303) 278-1911 • FAX (303) 278-0104 • Email: tegrkymt@aol.com

Method Blanks:
A method blank is used after each calibration run to verify system cleanliness and after hot samples at the discretion of the analyst.

Analysis Comments:
Sample SG-24 was initially reported as 18µg/L. This was incorrect and due to a calculation error. The correct result is shown with the data.

Jan Tallen for Graham Jackson 12/16/99
Analyst\Date

Jan Tallen 12/16/99
Reviewer\Date

teg Rocky Mountain
400 Corporate Circle
Suite R
Golden, CO 80401

FINAL DATA

303-278-1911
Fax 303-278-0104
E- Mail: Lab@ tegrockymountain.com

CH2M HILL PROJECT

PHILIPS FACILITY

TREMETRICS 9001 GC / TEKMAR LSC 2000 PURGE & TRAP
VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/6/99	12/6/99	12/6/99	12/6/99	12/6/99	12/6/99	12/6/99	12/6/99	12/6/99
SAMPLE	BLANK	BLANK	SG-1	SG-9	SG-19	SG-20	SG-10	SG-2	SG-3
SAMPLE AMOUNT (cc or mL)	10	10	40	40	40	40	40	40	40
MATRIX	WATER	WATER	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
BENZENE (µg/L)	ND	ND	ND	3.90	ND	ND	ND	ND	ND
TOLUENE (µg/L)	ND	ND	0.85	1.35	0.61	1.31	0.51	1.07	ND
ETHYLBENZENE (µg/L)	ND	ND	0.55	1.20	ND	1.20	0.58	1.12	ND
m&p-XYLENES (µg/L)	ND	ND	0.55	1.84	0.38	1.79	ND	ND	ND
o-XYLENE (µg/L)	ND	ND	0.65	1.34	ND	1.33	ND	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	1.0	1.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	ND	NA	ND	1.1	10.4	11.8	ND	0.6	ND
OXYGEN (%)	ND	NA	21.8	20.8	8.7	7.3	21.2	21.5	21.8
NITROGEN (%)	ND	NA	77.1	77.7	80.3	80.0	76.6	77.4	78.0
METHANE (%)	ND	NA	8.1	ND	ND	ND	1.6	ND	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

J INDICATES ESTIMATED QUANTITATION
NA INDICATES NOT ANALYZED
ND INDICATES NOT DETECTED AT SPECIFIED REPORTING LIMIT

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ANALYSES PERFORMED BY: G. JACKSON

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CH2M HILL PROJECT

PHILIPS FACILITY

TREMETRICS 9001 GC / TEKMAR LSC 2000 PURGE & TRAP
VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/6/99	12/6/99	12/6/99	12/6/99	12/6/99	12/6/99	12/6/99	12/7/99	12/7/99
SAMPLE	SG-11	SG-21	SG-22	SG-12	SG-4	SG-5	SG-13	BLANK	BLANK
SAMPLE AMOUNT (cc or mL)	40	40	40	40	40	40	40	10	10
MATRIX	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	WATER	WATER
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	3.85	ND	ND
TOLUENE (µg/L)	ND	ND	ND	ND	ND	ND	1.05	ND	ND
ETHYLBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	1.12	ND	ND
m&p-XYLENES (µg/L)	1.52	ND	1.54	ND	ND	ND	1.58	ND	ND
o-XYLENE (µg/L)	ND	ND	1.22	ND	ND	ND	1.25	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.0	1.0
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	ND	6.8	6.5	3.0	ND	1.8	9.8	ND	ND
OXYGEN (%)	21.4	14.1	13.8	18.6	22.0	20.9	12.8	ND	ND
NITROGEN (%)	77.6	78.1	78.8	77.6	76.8	76.2	76.0	ND	ND
METHANE (%)	ND	1.1	1.0	ND	ND	1.0	1.5	ND	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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ND INDICATES NOT DETECTED AT SPECIFIED REPORTING LIMIT

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CH2M HILL PROJECT

PHILIPS FACILITY

TREMETRICS 9001 GC / TEKMAR LSC 2000 PURGE & TRAP
VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99
SAMPLE	SG-23	SG-8	SG-6	SG-7	SG-16	SG-15	SG-26	SG-17	SG-18
SAMPLE AMOUNT (cc or mL)	40	40	40	40	40	40	40	40	40
MATRIX	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE (µg/L)	0.54	0.52	ND	1.02	ND	ND	ND	ND	1.00
ETHYLBENZENE (µg/L)	ND	ND	ND	1.10	ND	ND	ND	ND	ND
m&p-XYLENES (µg/L)	0.27	ND	ND	1.53	ND	ND	ND	ND	1.52
o-XYLENE (µg/L)	ND	ND	ND	1.23	ND	ND	ND	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	32.4	2.3	4.1	2.4	14.1	8.9	37.0	12.1	29.6
OXYGEN (%)	2.6	22.4	21.7	22.6	15.0	18.6	2.2	16.2	4.6
NITROGEN (%)	63.7	74.2	74.2	75.0	70.9	72.5	59.3	70.8	65.3
METHANE (%)	1.3	1.0	ND	ND	ND	ND	1.6	ND	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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CH2M HILL PROJECT

PHILIPS FACILITY

TREMETRICS 9001 GC / TEKMAR LSC 2000 PURGE & TRAP
VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/7/99	12/8/99	12/8/99
SAMPLE	SG-28	SG-14	SG-24	SG-33	SG-32	SG-31	SG-30	BLANK	BLANK
SAMPLE AMOUNT (cc or mL)	40	40	40	40	40	40	40	10	10
MATRIX	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	WATER	WATER
BENZENE (µg/L)	ND	ND	ND	3.85	ND	3.85	ND	ND	ND
TOLUENE (µg/L)	ND	1.01	0.65	1.02	ND	1.08	0.50	ND	ND
ETHYLBENZENE (µg/L)	0.72	ND	ND	1.12	ND	1.12	0.54	ND	ND
m&p-XYLENES (µg/L)	ND	1.51	ND	1.53	ND	1.56	ND	ND	ND
o-XYLENE (µg/L)	ND	ND	ND	1.22	ND	1.25	ND	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	2.41	1.32	ND	ND	ND	ND	ND
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.0	1.0
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	42.8	9.9	37.6	31.3	25.2	27.1	2.5	ND	NA
OXYGEN (%)	1.6	17.8	1.7	2.9	10.3	8.4	22.2	ND	NA
NITROGEN (%)	29.5	71.5	60.1	59.3	63.8	63.4	74.5	ND	NA
METHANE (%)	26.2	ND	ND	6.5	ND	1.1	ND	ND	NA
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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ANALYSES PERFORMED BY: G. JACKSON

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CH2M HILL PROJECT

PHILIPS FACILITY

TREMETRICS 9001 GC / TEKMAR LSC 2000 PURGE & TRAP
VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99
SAMPLE	SG-29	SG-35	SG-37	SG-36	SG-38	SG-41	SG-42	SG-48	SG-53
SAMPLE AMOUNT (cc or mL)	40	40	40	40	40	40	40	40	40
MATRIX	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	3.92	3.87
TOLUENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	1.25	1.16
ETHYLBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	1.23	1.18
m&p-XYLENES (µg/L)	ND	ND	ND	ND	ND	ND	ND	1.91	1.66
o-XYLENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	1.36	1.29
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	0.94	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	1.45	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	1.10	1.05	1.34	1.07	1.37	ND	1.40	ND
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	19.2	2.5	1.3	1.2	2.7	6.0	7.9	25.4	5.2
OXYGEN (%)	8.4	20.5	21.3	21.8	20.7	17.6	15.6	2.8	18.2
NITROGEN (%)	71.5	76.3	74.8	75.4	75.6	75.5	75.3	64.4	74.6
METHANE (%)	ND	ND	2.6	1.6	1.0	ND	1.3	7.5	2.0
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99	12/8/99	12/9/99
SAMPLE	SG-54	SG-47	SG-43	SG-44	SG-49	SG-50	SG-55	SG-56	BLANK
SAMPLE AMOUNT (cc or mL)	40	40	40	40	40	40	40	40	10
MATRIX	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	WATER
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	3.95	ND	ND
TOLUENE (µg/L)	2.87	0.54	ND	0.57	ND	ND	1.22	ND	ND
ETHYLBENZENE (µg/L)	0.63	0.64	ND	0.60	ND	ND	1.32	ND	ND
m&p-XYLENES (µg/L)	ND	ND	ND	ND	ND	ND	2.21	ND	ND
o-XYLENE (µg/L)	ND	ND	ND	ND	ND	ND	1.42	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	ND	1.01	ND	ND	ND	ND	ND
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.0
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	24.8	26.7	3.0	1.7	7.3	3.9	20.1	16.3	ND
OXYGEN (%)	2.7	2.2	20.2	21.6	16.2	19.2	4.3	7.5	ND
NITROGEN (%)	66.6	53.3	74.9	75.8	75.0	75.0	68.7	74.9	ND
METHANE (%)	5.9	17.9	1.9	ND	1.5	1.9	6.9	1.2	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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DATE	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99
SAMPLE	BLANK	SG-57	SG-51	SG-45	SG-40	SG-46	SG-52	SG-58	SG-59
SAMPLE AMOUNT (cc or mL)	10	40	40	40	40	40	40	40	40
MATRIX	WATER	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
m&p-XYLENES (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-XYLENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	0.78	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	2.65	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	1.27	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	ND	1.31	ND	1.32	ND	ND	2.23
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	1.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	NA	1.4	1.4	2.0	17.8	18.8	16.9	1.7	9.6
OXYGEN (%)	NA	22.4	22.5	21.9	5.6	3.6	5.2	22.0	13.7
NITROGEN (%)	NA	75.8	76.1	75.3	76.4	72.0	74.5	75.7	76.1
METHANE (%)	NA	ND	ND	ND	ND	5.5	3.4	ND	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

J INDICATES ESTIMATED QUANTITATION
NA INDICATES NOT ANALYZED
ND INDICATES NOT DETECTED AT SPECIFIED REPORTING LIMIT

ANALYSES PERFORMED ONSITE IN TEG'S MOBILE LABORATORY
ANALYSES PERFORMED BY: G. JACKSON

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CH2M HILL PROJECT

PHILIPS FACILITY

TREMETRICS 9001 GC / TEKMAR LSC 2000 PURGE & TRAP
VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99	12/9/99	12/10/99
SAMPLE	SG-60	SG-61	SG-62	SG-63	SG-64	SG-70	SG-65	SG-66	BLANK
SAMPLE AMOUNT (cc or mL)	40	40	40	40	40	40	40	40	10
MATRIX	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	WATER
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
m&p-XYLENES (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-XYLENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	ND	ND	1.27	ND	1.17	1.44	ND
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.0
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	1.1	10.3	1.8	ND	ND	ND	ND	ND	ND
OXYGEN (%)	22.8	13.5	21.9	22.6	22.9	22.8	23.1	23.0	ND
NITROGEN (%)	75.6	75.7	75.2	75.3	75.9	75.7	75.2	75.3	ND
METHANE (%)	ND	ND	1.1	1.2	ND	ND	1.1	1.1	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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PHILIPS FACILITY

TREMETRICS 9001 GC / TEKMAR LSC 2000 PURGE & TRAP
VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99
SAMPLE	BLANK	SG-67	SG-72	SG-73	SG-74	SG-71	SG-35.5	SG-36.5	SG-37.5
SAMPLE AMOUNT (cc or mL)	10	40	40	40	40	40	40	40	40
MATRIX	WATER	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
m&p-XYLENES (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-XYLENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	1.42
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	1.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	NA	ND	ND	ND	ND	ND	1.2	1.0	2.4
OXYGEN (%)	NA	21.8	22.2	22.0	22.1	22.2	21.2	21.4	19.5
NITROGEN (%)	NA	77.7	77.5	77.2	77.6	77.2	77.3	77.3	77.9
METHANE (%)	NA	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99	12/10/99	12/11/99
SAMPLE	SG-24 SOU	VENT 23	VENT 9	VENT 12	VENT 18	SG-24 EAST	SG-24 NOR	SG-24 WEST	BLANK
SAMPLE AMOUNT (cc or mL)	40	40	40	40	40	40	40	40	10
MATRIX	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	WATER
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
m&p-XYLENES (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-XYLENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	1.38	ND	ND	ND	ND	ND	ND	1.42	ND
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.0
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	14.1	13.2	2.9	7.0	2.9	3.1	ND	15.2	ND
OXYGEN (%)	4.9	7.0	18.8	13.5	19.0	19.0	21.8	5.6	ND
NITROGEN (%)	80.7	79.2	78.0	79.3	77.8	77.5	77.2	78.8	ND
METHANE (%)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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ANALYSES PERFORMED BY: G. JACKSON

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TREMETRICS 9001 GC / TEKMAR LSC 2000 PURGE & TRAP
VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/11/99	12/11/99	12/11/99	12/11/99	12/11/99	12/11/99	12/11/99	12/11/99	12/11/99
SAMPLE	BLANK	SG-82	SG-83	SG-84	SG-85	SG-86	SG-87	SG-93	SG-92
SAMPLE AMOUNT (cc or mL)	10	40	40	40	40	40	40	40	40
MATRIX	WATER	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
BENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE (µg/L)	ND	1.03	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
m&p-XYLENES (µg/L)	ND	1.63	ND	1.53	ND	ND	ND	ND	ND
o-XYLENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	4.26	1.07	1.75	1.75	1.54	1.14	1.47	2.07
CHLOROBENZENE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	1.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Fixed Gas: (Normalized)									
CARBON DIOXIDE (%)	NA	18.9	2.0	2.0	2.6	8.6	ND	ND	5.6
OXYGEN (%)	NA	3.2	20.3	20.3	19.7	13.9	22.2	21.9	16.9
NITROGEN (%)	NA	77.4	77.0	76.9	76.6	76.7	77.4	76.4	76.8
METHANE (%)	NA	ND	ND	ND	1.1	ND	ND	1.4	ND
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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VOLATILE HALOGENATED AND AROMATIC HYDROCARBONS (EPA Method 8021M) AND FIXED GASSES

DATE	12/11/99	12/11/99	12/11/99	12/11/99
SAMPLE	SG-91	SG-90	SG-89	SG-88
SAMPLE AMOUNT (cc or mL)	40	40	40	40
MATRIX	VAPOR	VAPOR	VAPOR	VAPOR
BENZENE (µg/L)	ND	ND	ND	ND
TOLUENE (µg/L)	1.05	ND	1.11	ND
ETHYLBENZENE (µg/L)	1.36	1.36	1.46	0.59
m&p-XYLENES (µg/L)	2.52	ND	2.91	0.87
o-XYLENE (µg/L)	1.47	0.68	1.55	0.66
(DCE) 1,1-DICHLOROETHENE (µg/L)	ND	ND	ND	ND
METHYLENE CHLORIDE (µg/L)	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND
(DCA) 1,1-DICHLOROETHANE (µg/L)	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE (µg/L)	ND	ND	ND	ND
CHLOROFORM (µg/L)	ND	ND	ND	ND
1,1,1,-TRICHLORORETHANE (µg/L)	ND	ND	ND	ND
CARBON TETRACHLORIDE (µg/L)	ND	ND	ND	ND
1,2-DICHLOROETHANE (µg/L)	ND	ND	ND	ND
(TCE) TRICHLOROETHENE (µg/L)	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE (µg/L)	ND	ND	ND	ND
(PCE) TETRACHLOROETHENE (µg/L)	ND	ND	ND	1.02
CHLOROBENZENE (µg/L)	ND	ND	ND	ND
1,1,1,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE (µg/L)	ND	ND	ND	ND
REPORTING LIMIT (µg/L)	0.25	0.25	0.25	0.25
Fixed Gas: (Normalized)				
CARBON DIOXIDE (%)	3.8	1.3	1.1	12.0
OXYGEN (%)	18.6	21.1	21.2	9.9
NITROGEN (%)	76.1	76.8	77.1	76.9
METHANE (%)	1.4	ND	ND	1.2
REPORTING LIMIT (%)	1.0	1.0	1.0	1.0

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ANALYSES PERFORMED ONSITE IN TEG'S MOBILE LABORATORY
ANALYSES PERFORMED BY: G. JACKSON

TEG ROCKY MOUNTAIN

Chain of Custody Record

Client: CH2M HILL

Address:

Phone: Fax:

Project Manager:

TEG Project #: 9388 Date: 12-6-99 Page 1 of 1 Control #:

Client Project Number:

Project Name:

Project Address:

SAMPLE INFORMATION (*see reverse for helpful information)

Sampler Name:

Signature:

Sample Disposal Instructions: ____ TEG Disposal @ $5.00 each ____ Return to Client ____ Pickup

TEG USE ONLY: Laboratory ID	Sample Identification	Depth	Date	Time	Matrix*	Container #	Container Size	Container Type*	Preserv. Type*	TAT*	VOC-8021	TVH-8015	TEH-8015	TRPH-418.1	BTEX-8020	Fixed
	SG-1	13'	12-6-99	0930	Vapor	1	1L	Tedlar			X					X
	SG-9	8'	12-6-99	1040	Vapor	1	1L	Tedlar			X					X
	SG-19	6'	12-6-99	1105	Vapor	1	1L	Tedlar			X					X
	SG-20	15'	12-6-99	1132	Vapor	1	1L	Tedlar			X					X
	SG-10	15'	12-6-99	1210	Vapor	1	1L	Tedlar			X					X
	SG-2	15'	12-6-99	1348	Vapor	1	1L	Tedlar			X					X
	SG-3	15'	12-6-99	1414	Vapor	1	1L	Tedlar			X					X
	SG-11	8'	12-6-99	1435	Vapor	1	1L	Tedlar			X					X
	SG-21	15'	12-6-99	1458	Vapor	1	1L	Tedlar			X					X
	SG-22	15'	12-6-99	1521	Vapor	1	1L	Tedlar			X					X
	SG-12	15'	12-6-99	1545	Vapor	1	1L	Tedlar			X					X
	SG-4	9'	12-6-99	1610	Vapor	1	1L	Tedlar			X					X
	SG-5	15'	12-6-99	1630	Vapor	1	1L	Tedlar			X					X
	SG-13	12'	12-6-99	1704	Vapor	1	1L	Tedlar			X					X

Analyses Requested*

Comments:

1. Relinquished by (print): William Chenault
Signature: WILLIAM J. LEFEVRE
Date: 12/13/99 Time: 17:30

1. Received by (print): Graham Jackson
Signature:
Date: 12/13/99 Time: 1730

2. Relinquished by (print):
Signature:
Date: Time:

2. Received by (print):
Signature:
Date: Time:

Pink: Client's Field Copy

Yellow: Return with Report

White: File Copy

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TEG ROCKY MOUNTAIN

Chain of Custody Record

Client: CH2M Hill
Address:
Phone: Fax:
Project Manager:

TEG Project #: 9388 Date: 12-7-99 Page 1 of 1 Control #:
Client Project Number:
Project Name:
Project Address:

SAMPLE INFORMATION (*see reverse for helpful information)

Sampler Name:
Signature:

Sample Disposal Instructions: ____ TEG Disposal @ $5.00 each ____ Return to Client ____ Pickup

TEG USE ONLY ☑	Laboratory ID	Sample Identification	Depth	Date	Time	Matrix*	Container #	Container Size	Container Type*	Preserv. Type*	TAT*	VOC-8021	TVH-8015	TEH-8015	TRPH-418.1	BTEX-8020	Fixed Gas					
		SG-23	12'	12-7-99	0842	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-6	15'	12-7-99	0915	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-7	12'	12-7-99	0940	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-8	15'	12-7-99	1010	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-15	12'	12-7-99	1040	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-16	12'	12-7-99	1113	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-26	15'	12-7-99	1145	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-17	15'	12-7-99	1257	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-18	11'	12-7-99	1325	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-28	14'	12-7-99	1350	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-14	15'	12-7-99	1425	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-24	15'	12-7-99	1450	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-33	15'	12-7-99	1525	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-32	15'	12-7-99	1604	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-31	15'	12-7-99	1633	Vapor	1	1L	Tedlar	—	—	X					X					
		SG-30	10'	12-7-99	1710	Vapor	1	1L	Tedlar	—	—	X					X					

Analyses Requested*

Comments:

1. Relinquished by (print): WILLIAM J. LEFEVRE / CH2M HILL
Signature: Wm J Lefevre
Date: 12-7-99 Time: 17:30

1. Received by (print): Graham Jackson
Signature:
Date: 12-7-99 Time: 1730

2. Relinquished by (print):
Signature:
Date: Time:

2. Received by (print):
Signature:
Date: Time:

Pink: Client's Field Copy
Yellow: Return with Report
White: File Copy

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teg Transglobal Environmental Geochemistry **Chain of Custody Record** PO #:_____

Client: CH2M Hill
Address:
Phone: FAX:
Client Project #: Project Manager:

Date: 12-8-99 Page 1 Of 2
TEG Project #: 9388 Outside Lab #:
Location: Philips Soil Gas Survey
Collector: Date of Collection:

Sample #	Depth	Time	Sample Type	Container Type	VOA 8010	VOA 8020	VOA 8240	Semi Vol 8270	TRPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (gas & diesel)	PNA 610/8100	PEST/PCB's 8080	HEX Chrome	Organic Lead	Total Lead	pH	Metals	Fixed Gas	SO21 Short				Field Notes	Total # of containers
SG-29	15'	0825	Vapor	Tedlar																X	X					1
SG-35	12'	0855	"	"																X	X					1
SG-36	9'	0920	"	"																X	X					1
SG-37	9'	0945	"	"																X	X					1
SG-38	12'	1023	"	"																X	X					1
SG-41	15'	1057	"	"																X	X					1
SG-42	15'	1125	"	"																X	X					1
SG-48	15'	1242	"	"																X	X					1
SG-54	15'	1312	"	"																X	X					1
SG-53	15'	1332	"	"																X	X					.
SG-47	15'	1355	"	"																X	X					1
SG-43	15'	1423	"	"																X	X					1
SG-44	9'	1448	"	"																X	X					1
SG-49	13'	1510	"	"																X	X					1
SG-50	15'	1532	"	"																X	X					1

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
[signature]	12/8/99 17:01		
Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
		[signature]	12-8-99 1700

Total # of containers:
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold

Notes:

Turn around time:_____

Sample disposal Instructions: ___ *TEG Disposal @ $2.00 each* ___ *Return to client* ___ *Pickup*

teg Transglobal Environmental Geochemistry **Chain of Custody Record** PO #:_____

Client: CH2M Hill Date: 12-8-99 Page 2 Of 2

Address: TEG Project #: Outside Lab #:

Phone: FAX: Location:

Client Project #: Project Manager: Collector: Date of Collection:

Sample #	Depth	Time	Sample Type	Container Type	VOA 8010	VOA 8020	VOA 8240	Semi Vol 8270	TRPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (gas & diesel)	PNA 610/8100	PEST/PCB's 8080	HEX Chrome	Organic Lead	Total Lead	pH	Metals	Fixed Gas	8021 Short				Field Notes	Total # of containers
SG-~~53~~ 56	15'	1606	Vapor	Tedlar																X	X					1
SG-56	9'	1632	"	"																X	X					1

12/8/99

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
[signature]	12/8/99 17:00		
Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
		[signature]	12-8-99 1700

Total # of containers:
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold

Notes:

Turn around time:_____

Sample disposal Instructions: ___ ***TEG Disposal @ $2.00 each*** ___ ***Return to client*** ___ ***Pickup***

TEG ROCKY MOUNTAIN

Chain of Custody Record

Client: CH2M Hill
Address:
Phone: Fax:
Project Manager:

TEG Project #: 9388 Date: 12-9-99 Page 1 of 1 Control #:
Client Project Number:
Project Name:
Project Address:

SAMPLE INFORMATION (*see reverse for helpful information)

Sampler Name:
Signature:

Sample Disposal Instructions: ____ TEG Disposal @ $5.00 each ____ Return to Client ____ Pickup

TEG USE ONLY Laboratory ID	Sample Identification	Depth	Date	Time	Matrix*	Container #	Container Size	Container Type*	Preserv. Type*	TAT*	VOC-8021	TVH-8015	TEH-8015	TRPH-418.1	BTEX-8020	Fixed
	SG-57	12'	12-9-99	0816	Vapor	1	1L	Tedlar	—	—	X					X
	SG-57	12'	"	0842	"	"	"	"	—	—	X					X
	SG-45	12'	"	0922	"	"	"	"	—	—	X					X
	SG-40	12'	"	1007	"	"	"	"	—	—	X					X
	SG-46	16'	"	1044	"	"	"	"	—	—	X					X
	SG-52	9'	"	1109	"	"	"	"	—	—	X					X
	SG-58	7'	"	1140	"	"	"	"	—	—	X					X
	SG-59	15'	12-9-99	1242	"	"	"	"	—	—	X					X
	SG-60	9'	"	1308	"	"	"	"	—	—	X					X
	SG-61	9'	"	1400	"	"	"	"	—	—	X					X
	SG-62	10'	"	1429	"	"	"	"	—	—	X					X
	SG-63	10'	"	1448	"	"	"	"	—	—	X					X
	SG-64	12'	"	1523	"	"	"	"	—	—	X					X
	SG-70	9'	"	1550	"	"	"	"	—	—	X					X
	SG-65	8'	"	1620	"	"	"	"	—	—	X					X
	SG-66	15	"	1643	"	"	"	"	—	—	X					X

Comments:

1. Relinquished by (print): [illegible] / CH2M Hill
Signature:
Date: 12-9-99 Time: 17:00

1. Received by (print): Graham Jackson
Signature:
Date: 12-9-99 Time: 1700

2. Relinquished by (print):
Signature:
Date: Time:

2. Received by (print):
Signature:
Date: Time:

White: File Copy Yellow: Return with Report Pink: Client's Field Copy

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TEG ROCKY MOUNTAIN

Chain of Custody Record

Client: CH2M Hill
Address:
Phone: Fax:
Project Manager:

TEG Project #: 9388 Date: 12-10-99 Page 1 of 1 Control #:
Client Project Number:
Project Name: Philips Soil Gas Survey
Project Address:

SAMPLE INFORMATION (*see reverse for helpful information)

Sampler Name:
Signature:

Sample Disposal Instructions: ____ TEG Disposal @ $5.00 each ____ Return to Client ____ Pickup

TEG USE ONLY ☑	Laboratory ID	Sample Identification	Depth	Date	Time	Matrix*	Container #	Container Size	Container Type*	Preserv. Type*	TAT*	VOC-8021	TVH-8015	TEH-8015	TRPH-418.1	BTEX-8020	Fixed					
		SG-67	12'	12-10-99	0818	Vapor	1	1L	Tedlar			X					X					
		SG-72	13'	"	0843	"	"	"	"			X					X					
		SG-73	12'	"	0909	"	"	"	"			X					X					
		SG-74	12'	"	0934	"	"	"	"			X					X					
		SG-71	12'	"	1002	"	"	"	"			X					X					
		SG-35.5	12'	"	1042	"	"	"	"			X					X					
		SG-36.5	12'	"	1109	"	"	"	"			X					X					
		SG-37.5	12'	"	1139	"	"	"	"			X					X					
		SG-24 South	12'	"	1327	"	"	"	"			X					X					
		Vent 23	15'	"	1450	"	"	"	"			X					X					
		Vent 9	3'	"	1506	"	"	"	"			X					X					
		Vent 12	3'	"	1520	"	"	"	"			X					X					
		Vent 18	8'	"	1531	"	"	"	"			X					X					
		SG-24 East	12'	"	1604	"	"	"	"			X					X					
		SG-24 North	12'	"	1641	"	"	"	"			X					X					
		SG-24 West	12'	"	1703	"	"	"	"			X					X					

Analyses Requested*

Comments:

1. Relinquished by (print): [illegible]
Signature:
Date: 12/11/99 Time: 13:00

1. Received by (print): Graham Jackson
Signature:
Date: 12-11-99 Time: 1311

2. Relinquished by (print):
Signature:
Date: Time:

2. Received by (print):
Signature:
Date: Time:

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TEG ROCKY MOUNTAIN

Chain of Custody Record

Client: CH2M Hill
Address:
Phone: Fax:
Project Manager:

TEG Project #: 7388 Date: 12-11-99 Page 1 of 1 Control #:
Client Project Number:
Project Name:
Project Address:

SAMPLE INFORMATION (*see reverse for helpful information)

Sampler Name:
Signature:

Sample Disposal Instructions: ____ TEG Disposal @ $5.00 each ____ Return to Client ____ Pickup

TEG USE ONLY ☑	Laboratory ID	Sample Identification	Depth	Date	Time	Matrix*	Container #	Container Size	Container Type*	Preserv. Type*	TAT*	VOC-8021	TVH-8015	TEH-8015	TRPH-418.1	BTEX-8020	Fixed
		SG-82	15'	12-11-99	0820	Vapor	1	1L	Tedlar			X					X
		SG-83	12'	↓	0853	↓	↓	↓	↓			X					X
		SG-84	11'	↓	0913	↓	↓	↓	↓			X					X
		SG#85	12'	↓	0935	↓	↓	↓	↓			X					X
		SG-86	12'	↓	1007	↓	↓	↓	↓			X					X
		SG-87	11'	↓	1030	↓	↓	↓	↓			X					X
		SG-~~92~~ 93	10'	↓	1049	↓	↓	↓	↓			X					X
		SG-92	10'	↓	1121	↓	↓	↓	↓			X					X
		SG-91	11'	↓	1141	↓	↓	↓	↓			X					X
		SG-90	12'	↓	1159	↓	↓	↓	↓			X					X
		SG-~~88~~ 89	10'	↓	1230	↓	↓	↓	↓			X					X
		SG-88	9'	↓	1265	↓	↓	↓	↓			X					X

Analyses Requested*

Comments:

1. Relinquished by (print):	1. Received by (print): Graham Jackson
Signature: Wm R Ferrell	Signature:
Date: 12-11-99 Time: 13:00	Date: 12-11-99 Time: 1311
2. Relinquished by (print):	2. Received by (print):
Signature:	Signature:
Date: Time:	Date: Time:

Pink: Client's Field Copy
Yellow: Return with Report
White: File Copy

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Appendix C.
Soil Boring Logs and Construction Diagrams

PROJECT NUMBER	WELL NUMBER
15445.WI.01	Phillips MW-05 SHEET 1 OF 1

CH2MHILL

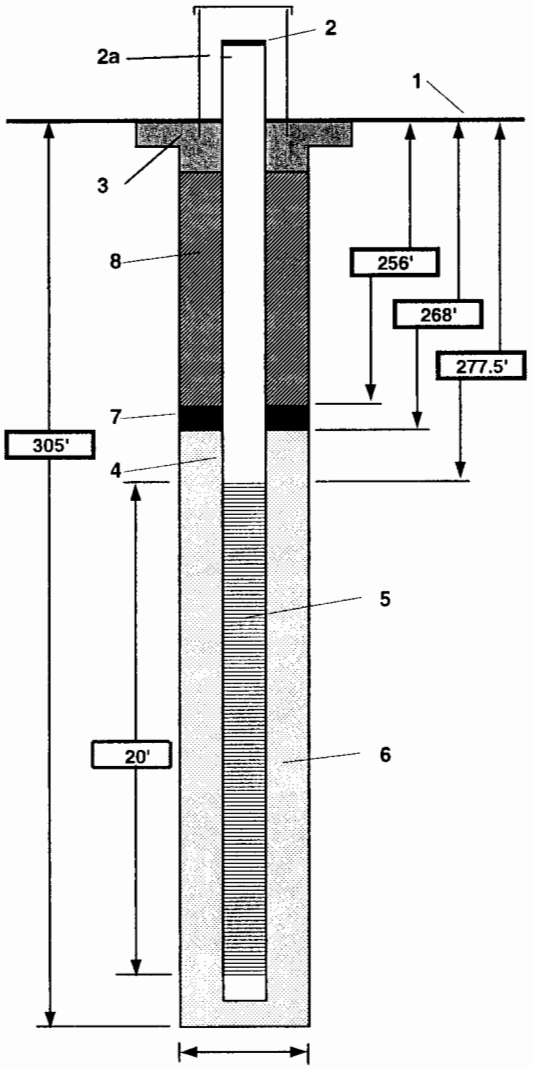
WELL COMPLETION DIAGRAM

PROJECT : Philips RFI LOCATION : ~35 ' NW of Phillips MW-01

DRILLING CONTRACTOR : THF/Alton Schoonmaker

DRILLING METHOD AND EQUIPMENT USED : 0' - 240' BGS ARCH/Tricone, 240' - 305' BGS Mud Rotary/Tricone

WATER LEVELS : 216.8' btoc START : 06/15/2001 END : 07/02/2001 LOGGER : W. Lindell



0 to 250 ft. : 9.5"
250 to 305 ft. : 8 3/8"

1- Ground elevation at well	5165' msl (estimated from USGS Topo)
2- Top of casing elevation	5168' msl (estimated from USGS Topo)
a) vent hole?	NA
3- concrete pad dimensions	3'x3' concrete pad w/concrete filled steel bumper posts
4- Dia./type of well casing	4" Sch 80, Boart-Longyear, ASTM F480-88
5- Type/slot size of screen	20' of 0.020" Slot 4" Dia. Sched 80 PVC
6- Type screen filter	10 X 20 Silica Sand, Oglebay Norton.
a) Quantity used	15 Bags
7- Type of seal	Bentonite: Coated Pellets & 3/8" chips
a) Quantity used	10 gal. Pellets, 5 sacks Chips
8- Grout	Bentonite slurry
a) Grout mix used	QuickGrout granular bentonite grout
b) Method of placement	From top of seal by tremmie pipe
c) Vol. of well casing grout	
Development method	Bail, Swab, Pump
Development time	5-3/4 Hrs. bailed, 3-1/2 Hrs. pumped
Estimated purge volume	55 gallons bailed, 1050 gallons pumped

Comments
1' sump in bottom of well
Kink in well at about 40' bgs
3" bailer with 3-1/2" check valve fits, Grundfos SQ pump fits.
TD = 301.5 BTOC on 07/02/2001

Illustration not to scale

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
154445.WI.01	MW-05	SHEET 1 OF 6

SOIL BORING LOG

PROJECT : Phillips Semiconductor RFI — LOCATION : 25' N.W. of MW-1 on West side of site.
ELEVATION : — DRILLING CONTRACTOF THF/Alton Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA — START : 05/24/2001 — END: — LOGGER BJL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis	Time
0	0-1	Cuttings			Gravelly, silty Clay (CL) red-brown medium stiff, moist.	05/24/2001	1500
	1-5	Cuttings			SAA without gravel		
	5-6.5	1.5	SS	8-8-20	Sandy Silt, (SM) Lt. Brown	0.0 ppm VOC	1540
	6-9				Silt, (ML) light brown, loose, moist		
	9-10.5	1.5	SS	5/18	Silt (ML) red-brown, very moist, packed	CO = 3 ppm, VOC = 0.2 ppm @	1615
10							
	15	0	SS	60/5	Granitic Gravel (GW), with silt. (Cuttings)		
20	20-21.5	0.5	SS	6-7-7	Gravelly Silt, (ML) light brown, moist, granitic, 1/2 in. granuals.	VOC = 0.0 ppm End of day, 5/24/01	1750
	21.5-25				S.A.A.	Begin 5/25/01	
	25-26.5	1.5	SS	5-4-14	Silty, Clayey Sand, (GM-CL) light brown, moist, granitic.	0 ppm VOC/PID 19.9% O2	1140
30	30-31	1.0	SS	4-5-7	Gravelly, Sandy Silt, (ML) light brown, moist, granitic sub angular fine-grain gravels	0 ppm VOC/PID 19% O2	1200
	30-42	Cuttings	RCRA/VOC/SVOC/Pest		S.A.A.		
40							1232
	42-44	Cuttings			Well Graded Sand(SW) w/ buff colored silt and gravel, dry.		
	44-56	Cuttings			Sandy Silt, (SM) light brown, moist		
50							
	56-83				Poorly Graded Sand (SP) orange-brown, moist, fine,w/ lenses of lean Clay (CL)		1315

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
154445.WI.01	MW-05	SHEET 2 OF 6

SOIL BORING LOG

PROJECT : Phillips Semiconductor RFI LOCATION : 25' N.W. of MW-1 on West side of site.
ELEVATION : DRILLING CONTRACTOR THF/Alton Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA START : 05/24/2001 END: LOGGER BJL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
60	56-80	Cuttings			Poorly Graded Sand (SP) orange-brown, moist, with lenses of lean Clay (CL)	
70		Cuttings			S.A.A.	
80	80-83				Silty Sand, (SM) red-brown, moist	1352
	83-84				Sand (SP) buff color, fine, dry	
	84-85				Well Graded Sand (SW) buff colored	
	85-100				Gravel (GW) fine to medium, well rounded, up to 2 cm	
90						End of day, 5/28/01 1710
100	100-111				Gravel (GW)Edith gravels, well rounded	Start of day, 5/29/01
						Drillers change out bit to a down-whole hammer @ 109 ft.
110	111-119				Silty Sand (SP-SM) light brown, moist, fine	1120

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
154445.WI.01	MW-05	SHEET 3 OF 6

SOIL BORING LOG

PROJECT : Phillips Semiconductor RFI LOCATION : 25' N.W. of MW-1 on West side of site.
ELEVATION : DRILLING CONTRACTOF THF/Alton Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA START : 05/24/2001 END: LOGGER BJL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
120	119-125	Cuttings			Gravel (GW) dry, Edith gravels, well rounded, partly cemented	1255
	125-133	Cuttings			Well Graded Gravel (GW) dry,with sand, less cemented than above	
130						1350
	133-136	Cuttings			Sand (SP) light brown, moist, fine with occ. coarse sand	
	136-138	Cuttings			Lean Clay (CL) light brown, moist, enterbeded with fine sand	
	138-144	Cuttings			Sand (SP) light brown, moist, with occ. Coarse sand	
140						1440
150	150-151.5	1.5	SS	10-22-17	Silty Sand (SM) Lt. brown, moist, fine, with occ fine gravel	VOCs = 0.5 ppm, O2 = 20.6% End of day 5/29/01 1650 Start new day 5/30/01 0830
	154-155	Cuttings			Clayey Sand (SC) moist, alternating layers of sand and clay	
	155-164				Well Graded Silty Sand (SW-SM) buff color	
160						0920
	164-172	Cuttings			Sand (SP) buff color, dry, fine, with fine well rounded gravel	
170						1004
	173-183	Cuttings			Well Graded Sand (SW) buff color, dry	

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
154445.WI.01	MW-05	SHEET 4 OF 6

SOIL BORING LOG

PROJECT : Phillips Semiconductor RFI LOCATION : 25' N.W. of MW-1 on West side of site.
ELEVATION : DRILLING CONTRACTOF THF/Alton Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA START : 05/24/2001 END: LOGGER BJL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
180	183-193	Cuttings			Well Graded Sand (SW) dry, with fine gravel	1305
190	193-200	Cuttings			Poorly Graded Sand (SP) buff color, moist, fine	1405
200	200-201	1.0	SS	7-10-11	Sand, fine, buff color, moist. (SP)	0.0 ppm VOC/PID 1450
		RCRA/VOC/SVOC/Pest				
	206-212	Cuttings			Sand, coarse, with fine gravel, moist. (SP)	
210	212-213.5	1.5	SS	3-7-21	Poorly Graded Sand (SP) buff colored, very moist, fine	1600 At or near water table End of day, 5/30/01 Starting new day, 5/31/01
220	226-233	Cuttings			Poorly Graded Sand (SP) buff colored, moist, coarse, with fine gravel	0810
230	233-234	Cuttings			Silty Sand (SM) saturated, fine	0850
	234-244	Cuttings			Silty, Gravelly Sand (SM-GM) moist, coarse sand with fine gravel and silt, mixed lithology	

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
154445.WI.01	MW-05	SHEET 5 OF 6

SOIL BORING LOG

PROJECT : Phillips Semiconductor RFI — LOCATION : 25' N.W. of MW-1 on West side of site.

ELEVATION : — DRILLING CONTRACTOF THF/Alton Schoonmaker

DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon

WATER LEVELS : NA — START : 05/24/2001 — END: — LOGGER BJL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
240						1055
	244-	Cuttings			Well Graded Sand (SW) buff color, saturated,coarse to fine sand with silt	End of day, last Air Rotory advance.
250						1700 Start New Day 6/11/01 Beginning of Mud Rotary drilling
	255				Well Graded Sand (SW) buff color, saturated,coarse to fine sand with silt and occ. Fine gravel, mixed lithology.	900
260						
	262				Clayey Gravel (GC) Well graded gravel with Lt. Brown clay and coarse, very angular sand.	1045
	265	Mud Rotorary Cuttings			Well graded Gravel (GW) with well graded, very angular Sand (SW)	
	268				Well Graded Clayey Gravel (GC) with Lt. Brown, moist, soft, lean clay and coarse to medium sand. Mixed litology.	
270						
	269				Clayey Gravel (GC) Fine to coarse gravel with apparent lenses of Lt. Br. Soft, Lean clay and coarse to medium sand.	
	275				S.A.A.	1104
280						
	282				S.A.A. w/ fine sand	1134
290						
	295				Well Graded Clayey Sand (SC) w/ Lt. Brown, moist, soft, lean clay with fine gravel.	1250

CH2MHILL

PROJECT NUMBER

154445.WI.01 | MW-05 SHEET 6 OF 6

SOIL BORING LOG

PROJECT : Phillips Semiconductor RFI LOCATION : 25' N.W. of MW-1 on West side of site.

ELEVATION : DRILLING CONTRACTOF THF/Alton Schoonmaker

DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon

WATER LEVELS : NA START : 05/24/2001 END: LOGGER BJL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
290						
	295				Well Graded Clayey Sand (SC) w/ Lt. Brown, moist, soft, lean clay with fine gravel.	
	298				Well Graded Sand (SW) with Lt. Brown, moist, soft, Clay (CL)	
300						
	305-306				Clay (CL) Lt. Brown, moist, soft, with medium Sand (SP), angular, mixed lithology.	End of boring @ 306 ft. bgs 1340

PROJECT NUMBER	WELL NUMBER	
15445.WI.01	Phillips - 06	SHEET 1 OF 1

CH2MHILL

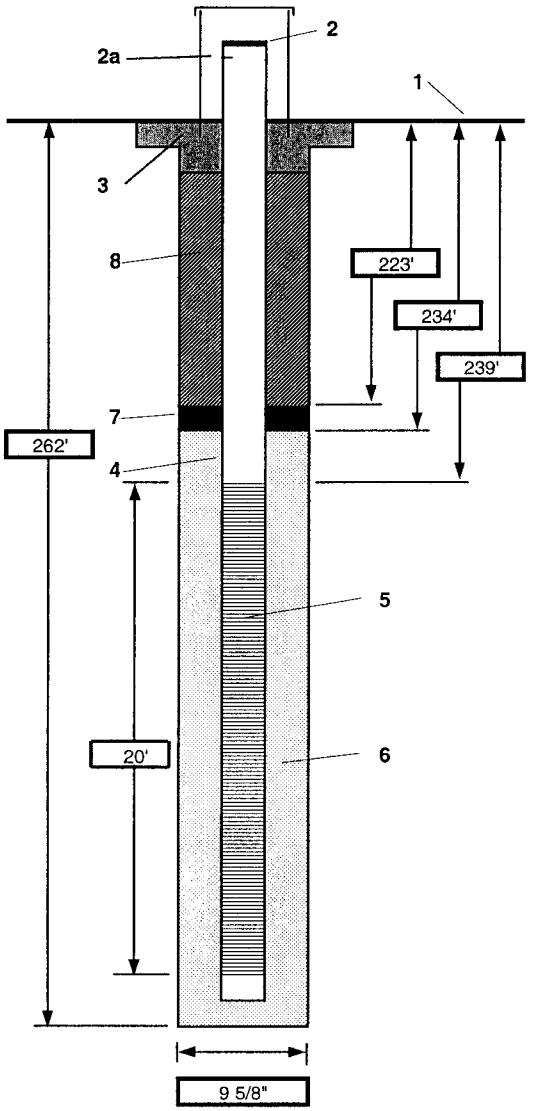
WELL COMPLETION DIAGRAM

PROJECT : Coronado Landfill RIFS LOCATION : NE of Philips Semiconductor plant

DRILLING CONTRACTOR : THF/Alton Schoonmaker

DRILLING METHOD AND EQUIPMENT USED : ARCH/Tricone

WATER LEVELS : 239.4' btoc START : END : LOGGER : W. Lindell



1- Ground elevation at well	5190' msl (estimated from USGS Topo)
2- Top of casing elevation	5193' msl (estimated from USGS Topo)
a) vent hole?	NA
3- concrete pad dimensions	3' x 3', 45' deep
4- Dia./type of well casing	4" Sch 80, Boart-Longyear, ASTM F480-88
5- Type/slot size of screen	20' of 0.020" Slot 4" Dia. Sched 80 PVC
6- Type screen filter	10 X 20 Silica Sand, Oglebay Norton.
a) Quantity used	15 Bags
7- Type of seal	3/8" Bentonite chips
a) 10 gal. Pellets, 5 sacks Chips	5 sacks Chips
8- Grout	Bentonite slurry
a) Grout mix used	QuickGrout granular bentonite grouting
b) Method of placement	From bottom of borehole by tremmie pipe
c) Vol. of well casing grout	
Development method	Bail, Swab, Pump
Development time	3 Hrs. Bailed, 1 Hr. 10 mins. pumped
Estimated purge volume	55 gallons bailed, 350 gallons pumped

Comments 1' sump in bottom of well
small amounts of bentonite in well at about 175'
slight kink in well in screened zone

Illustration not to scale

CH2MHILL	PROJECT NUMBER 154445.WI.01	BORING NUMBER MW-06 SHEET 1 OF 5
	SOIL BORING LOG	

PROJECT : Phillips Semiconductor RFI, (Coronado Landfill) LOCATION : Northeast corner of site near I-25
ELEVATION : DRILLING CONTRACTOR : THF/Altion Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA START : 06/15/2001 END: LOGGER : WRL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis	Time
0	0-3	Cuttings			Silty sand (SM) Lt. Brown, moist, fine, w/ occ. Fine gravel, mixed lithology		1509
	5-6.5	1.5	SS	12-18-22	Well graded silty sand (SM) Lt.brown, moist, fine to coarse sand w/ coarse gravel	0.2 PPM VOC	1550
	8-10	Cuttings			Well graded sand (SW) Tan, dry, w/ silt and occ. fine gravel		1635
10	10-11.5	1.5	SS	18-17-18	Well graded sand (SW) Lt. brown, dry, coarse grained to fine sand w/ silt, and occ. fine gravel, (less than 3%)	CO: 6 PPM, VOCs: 1.4 PPM, O2: 20.4 %	1117
	15-16.5	1.5	SS	6-15-12	S.A.A.	CO: 14 PPM, VOCs: 0.0 PPM, O2: 21 %	1145
20	20-21.5	1.5	SS	6-6-12	Well graded sand (SW) Buff color, dry, with fine gravel, trace silt	CO: 2 PPM, VOCs: 0.0 PPM, O2: 21%	1215
	25-26.5	1.5	SS	10-15-14	Sandy silt (ML) Lt. brown, slighty moist, silt w/ very fine sand and occ. coarse sand and fine gravel	CO: 2 PPM, VOCs: 0.6 PPM, O2: 20.6%	1237
30	30-31.5	1.5	SS	4-8-8	Sandy silt (ML) Lt. Brown, moist, matrix is fine sand, w/ occ. coarse sand	CO: 2 PPM, VOCs: 0.8 PPM, O2: 20.6%	
	33	Cuttings			Well graded silty sand (SM) Buff color, slightly moist, w/ trace silt.		1345
40	40	Cuttings			Poorly graded sand (SP) Lt. buff colored, dry, fine-grained, trace medium sand, trace silt		
	45	Cuttings			Poorly graded sand (SP) Lt. buff colored, dry, fine-grained		1407
50	50	Cuttings			Well graded sand (SW) Light buff colord, dry, trace silt, mixed lithology		
	55	Cuttings			Sandy silt (ML) Buff color, moist, w/ fine sand		1445
	59	Cuttings			Sandy silt (ML) Buff color, moist, w/ fine gravel		1505

CH2MHILL	PROJECT NUMBER 154445.WI.01	BORING NUMBER MW-06 SHEET 2 OF 5
	SOIL BORING LOG	

PROJECT : Phillips Semiconductor RFI, (Coronado Landfill) LOCATION : Northeast corner of site near I-25
ELEVATION : DRILLING CONTRACTOR : THF/Altion Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA START : 06/15/01 END: LOGGER : WRL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
60	60	Cuttings			Sandy silt (ML) buff color, moist, w/ fine sand	1505
	64	Cuttings			S.A.A.	
	68	Cuttings			Sandy silt (ML) buff color, moist, w/ fine & fine gravel	
70						1525
	72	Cuttings			Well graded silty sand (SM) Buff colored, dry	
	78	Cuttings			Well graded silty sand (SM) Buff colored, dry slightly moist, w/ fine gravel	
80	80	Cuttings			Well Graded Silty Sand (SW/SM) Buff colored, dry, w/ occ. Coarse gravel	1620
	84	Cuttings			S.A.A.	
	88	Cuttings			Sandy silt (ML) red-brown, moist, fine grained with coarse and medium sand.	End of day, 6/16/01 1650
90						Start New Day, 6/18/01
	93	Cuttings			Silty, sandy clay (CL) Lt. brown, moist, w/ fine sand, clay observed as pellets, plyable.	
	96	Cuttings			Well graded silty sand (SM/SW) buff colored, dry, angular, mixed lithology.	
	98	Cuttings			Well graded sand (SW) dry,trace silt, fine gravel	
100	100	Cuttings			Poorly graded gravel (GP) dry, coarse trace silt	0930
	102	Cuttings			Well graded gravel (GW)	
	105	Cuttings			Well graded gravels (GW) Dry, mixed lithology, w/ Well graded sand (SW) trace silt	
110						
	113	Cuttings			S.A.A.	

CH2MHILL	PROJECT NUMBER 154445.WI.01	BORING NUMBER MW-06 SHEET 3 OF 5
	SOIL BORING LOG	

PROJECT : Phillips Semiconductor RFI, (Coronado Landfill) LOCATION : Northeast corner of site near I-25
ELEVATION : DRILLING CONTRACTOR : THF/Altion Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA START : 06/15/01 END: LOGGER : WRL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
120		Cuttings			Well graded gravels (GW) dry, mixed lithology, angular, w/ Well graded sand (SW) trace silt	1455
	124	Cuttings			Gravelly sand (SW) dry, gray matrix of fine sand with well graded, angular gravel	
	127	Cuttings			Well graded sand (SP) dry, gray, angular, fine to medium grained w/ fine gravel	
130						1625
	133	Cuttings			Well graded sand (SW) dry, mixed lithology, w/fine angular gravel	
140		Cuttings			Well graded gravels (GW) w/ well graded sand and silt	1650
	145	Cuttings			S.A.A.	
	148	Cuttings			Silt sand and gravel mixture (GM) matrix is fine sand and silt	
150						1730
	154	Cuttings			Silty sand (SM) medium brown, with coarse sand and gravel	
160						1805 End of 6/19/01 Start of 6/20/01
	168	Cuttings			Silty, clayey sand (SM/SC) buff color, silty-clay mixture is dk. brown, coarse to medium sands w/ fine gravel	
170						0910

CH2MHILL	PROJECT NUMBER 154445.WI.01	BORING NUMBER MW-06 SHEET 4 OF 5
	SOIL BORING LOG	

PROJECT : Phillips Semiconductor RFI, (Coronado Landfill) LOCATION : Northeast corner of site near I-25
ELEVATION : DRILLING CONTRACTOR : THF/Altion Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA START : 06/15/01 END: LOGGER : WRL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
180	28-Jun	Cuttings			Well graded sand (SW) with fine gravel, trace silty clay	1010
190	190	Cuttings			Silty clayey sand (SM / SC) fine sand matrix w/ coarse sand, fine gravel	1145
						Ending Water Injection 1400
200	200	Cuttings			Poorly graded sand (SP) buff color, fine grained, dry w/ trace silt	
	200-201.5	1.5	SS	4-8-15		CO=4, VOC= 0.3, O2= 20.5 1540
					Silty, gravelly, sand (SM) gray-brown, moist, fine grained sand, with rounded, fine gravel	
	203	Cuttings			Fine sand and silt (SP-SM) Lt. brown, moist, occ. coarse sand	
	205	Cuttings			Well graded gravel (GW) moist, with well graded sand, trace silt.	Water Injection resumed to improve circulation and recovery
210						
	213	Cuttings			Sandy clay (CL), light brown, wet	
220	220-221.5	1.5	SS		Sandy clay (CL), light brown, wet	VOC=3.5 ppm
		RCRA/VOC/SVOC/Pest				
	228	Cuttings			Fat clay lens	
230						
	235	Cuttings			Silty sand (SM) light brown w/gravel < 0.5 cm	

CH2MHILL	PROJECT NUMBER	BORING NUMBER	
	154445.WI.01	MW-06	SHEET 5 OF 5
	SOIL BORING LOG		

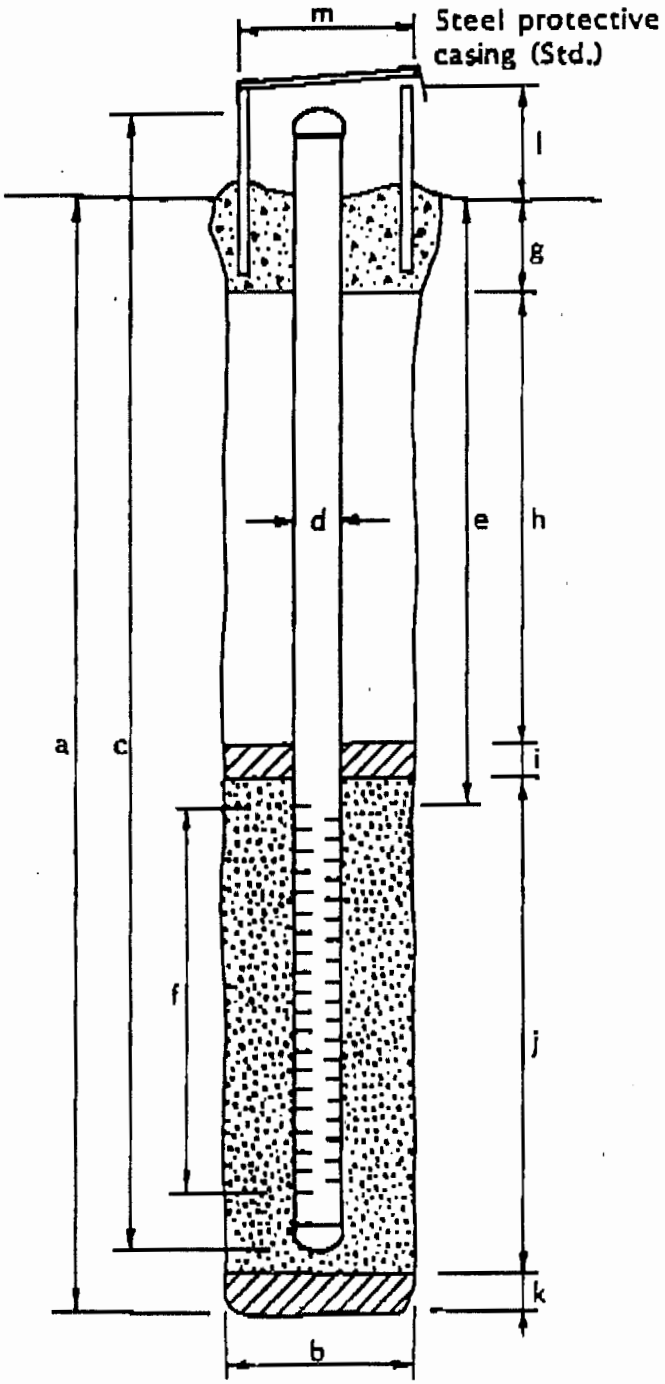
PROJECT : Phillips Semiconductor RFI, (Coronado Landfill) LOCATION : Northeast corner of site near I-25
ELEVATION : DRILLING CONTRACTOR : THF/Altion Schoonmaker
DRILLING METHOD AND EQUIPMENT USED : Air Rotory/ Driven Casing w/18" slit spoon
WATER LEVELS : NA START : 06/15/01 END: LOGGER : WRL

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Headspace Analysis Time
240						
	242	Cuttings			Poorly graded gravel (GP) < 0.5 cm, angular	
250	250	Cuttings			Lean clay (CL) wet	
	254	Cuttings			Silty clay (CL) light brown, wet	Add water to get cuttings return
	258	Cuttings			Silty sandy clay (CL) wet	
260		Cuttings			Silty sandy clay (CL) wet	
270						
280						
290						
300						

WELL DETAILS

PROJECT NUMBER 377-16.01
PROJECT NAME Signetics
COUNTY Bernalillo Co., NM
WELL PERMIT NO. N/A

BORING / WELL NO. MW-1
TOP OF CASING ELEV. 5168.70
GROUND SURFACE ELEV. 5168.17
DATUM Mean Sea Level



EXPLORATORY BORING

a. Total depth 247 ft.
b. Diameter 7 7/8 in.
Drilling method Air/Mud Rotary

WELL CONSTRUCTION

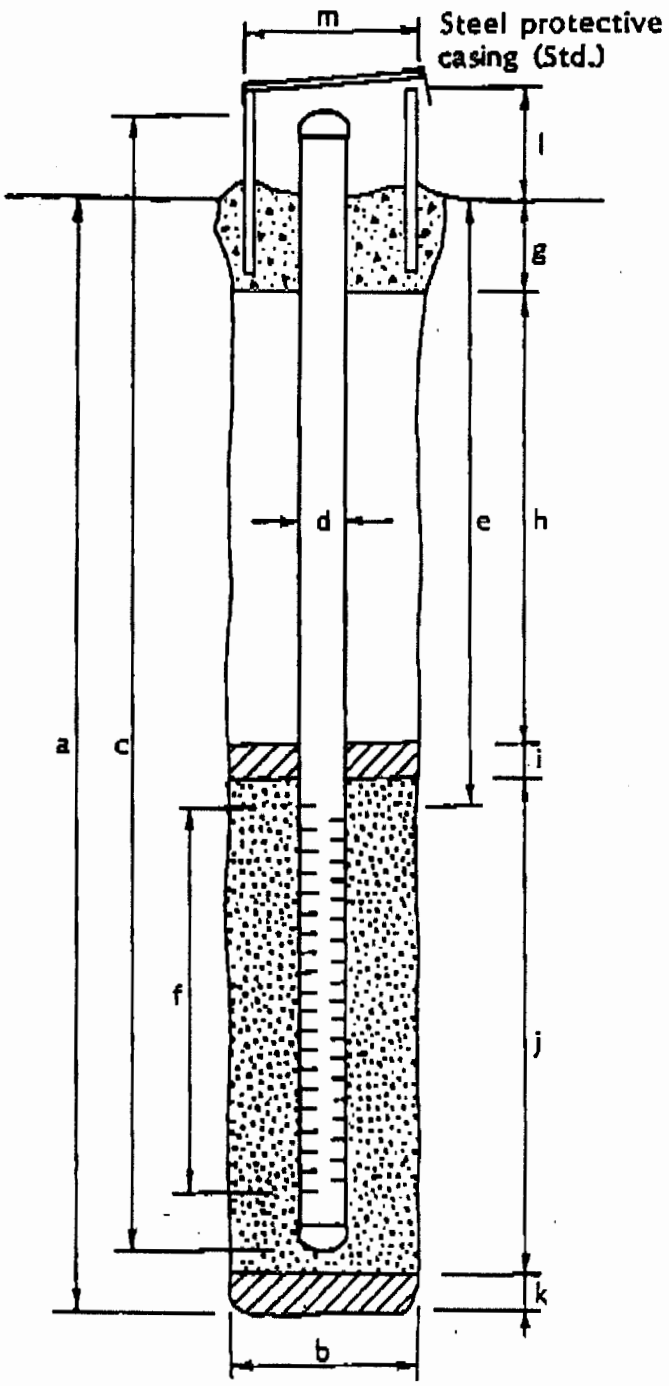
c. Casing length 230 ft.
Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 199.5 ft.
f. Perforated length 30 ft.
Perforated interval from 199.5 to 229.5 ft.
Perforation type Machine Slotted
Perforation size 0.02 inch
g. Surface seal 3 ft.
Seal material Cement w/ 3% Bentonite
h. Backfill 171 ft.
Backfill material Cement w/ 3% Bentonite
i. Seal 5 ft.
Seal material Bentonite
j. Gravel pack ± 68 ft.
Pack material CSSI 8x12 Sand
k. Bottom seal N/A ft.
Seal material N/A
l. Casing height * .5 ft.
m. Protective casing diameter 10 in.

± includes filter pack
* top of PVC casing

WELL DETAILS

PROJECT NUMBER 377-16.01
PROJECT NAME Signetics
COUNTY Bernalillo Co., NM
WELL PERMIT NO. N/A

BORING / WELL NO. MW-2
TOP OF CASING ELEV. 5159.36
GROUND SURFACE ELEV. 5158.15
DATUM Mean Sea Level



EXPLORATORY BORING

a. Total depth 245 ft.
b. Diameter 7 7/8 in.
Drilling method Air/Mud Rotary

WELL CONSTRUCTION

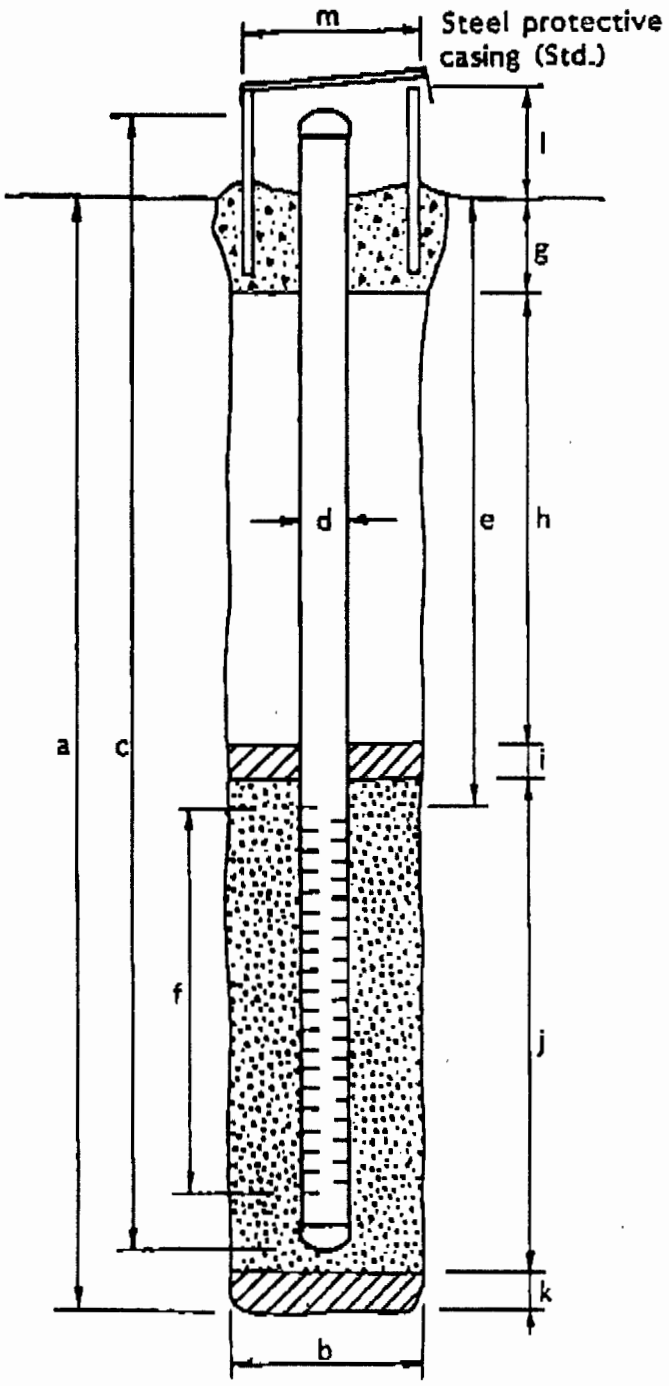
c. Casing length 240 ft.
Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 200 ft.
f. Perforated length 30 ft.
Perforated interval from 200 to 230 ft.
Perforation type Machine Slot
Perforation size 0.02 inch
g. Surface seal 6 ft.
Seal material Grout w/ 3% Bentonite
h. Backfill 174 ft.
Backfill material Grout w/ 3% Bentonite
i. Seal 8.5 ft.
Seal material Volclay Bentonite
j. Gravel pack ± 56.5 ft.
Pack material CSSI 8x12 Sand
k. Bottom seal N/A ft.
Seal material N/A
l. Casing height * 1.0 ft.
m. Protective casing diameter 10 in.

± includes filter pack (.5') and natural pack (9.5')
* top of PVC casing

WELL DETAILS

PROJECT NUMBER 377-16.01
PROJECT NAME Signetics
COUNTY Bernalillo Co., NM
WELL PERMIT NO. N/A

BORING / WELL NO. MW-3
TOP OF CASING ELEV. 5186.43
GROUND SURFACE ELEV. 5185.48
DATUM Mean Sea Level



EXPLORATORY BORING

a. Total depth 260 ft.
b. Diameter 7 7/8 in.
Drilling method Air/Mud Rotary

WELL CONSTRUCTION

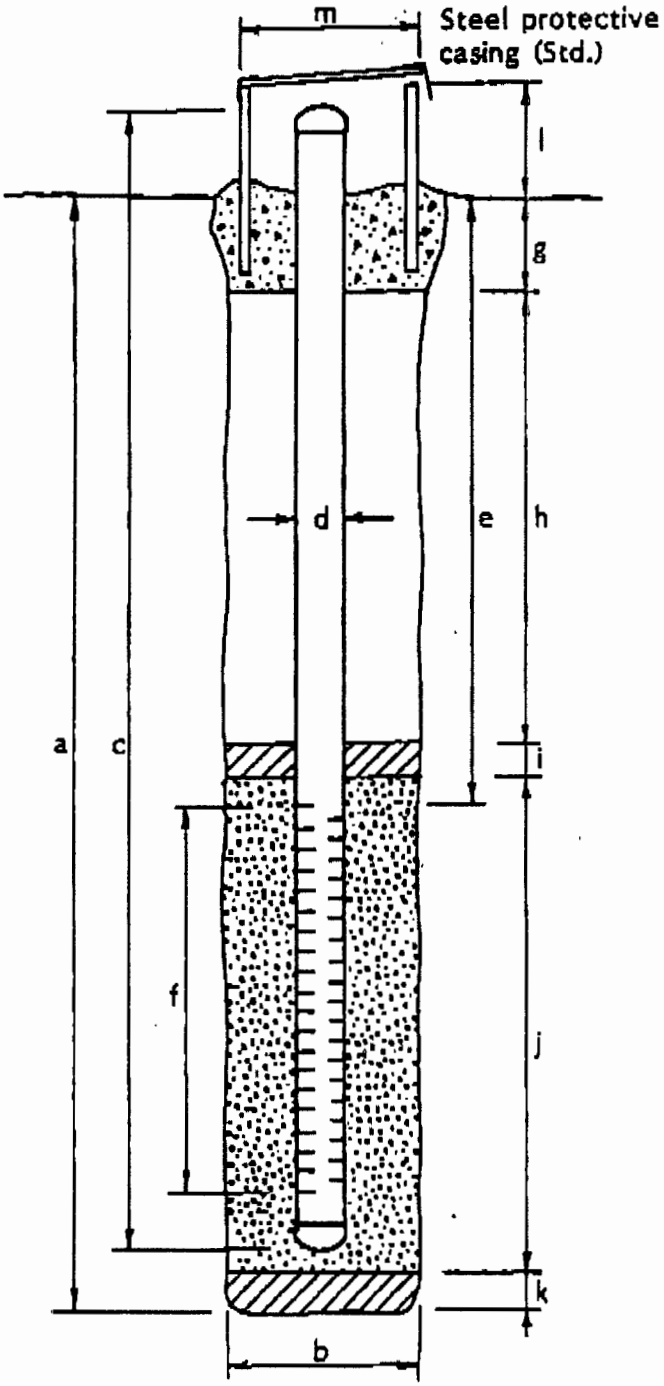
c. Casing length 240.5 ft.
Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 209.5 ft.
f. Perforated length 30 ft.
Perforated interval from 209.5 to 239.5 ft.
Perforation type Machine Slotted
Perforation size 0.02 inch
g. Surface seal 8 ft.
Seal material Cement w/ 3% Bentonite
h. Backfill 172 ft.
Backfill material Cement w/ 3% Bentonite
i. Seal 14 ft.
Seal material Bentonite
j. Gravel pack ± 66 ft.
Pack material CSSI 8x12 Sand
k. Bottom seal N/A ft.
Seal material N/A
l. Casing height * 1.0 ft.
m. Protective casing diameter 10 in.

± includes filter pack (2.5 ft) and natural pack (6 ft)
* top of PVC casing

WELL DETAILS

PROJECT NUMBER 377-16.01
PROJECT NAME Signetics
COUNTY Bernalillo Co., NM
WELL PERMIT NO. N/A

BORING / WELL NO. MW-4
TOP OF CASING ELEV. 5182.94
GROUND SURFACE ELEV. 5182.46
DATUM Mean Sea Level



EXPLORATORY BORING

a. Total depth 260 ft.
b. Diameter 7 7/8 in.
Drilling method Air/Mud Rotary

WELL CONSTRUCTION

c. Casing length 240 ft.
Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 209.5 ft.
f. Perforated length 30 ft.
Perforated interval from 209.5 to 239.5 ft.
Perforation type Machine Slotted
Perforation size 0.02 inch
g. Surface seal 19 ft.
Seal material Cement w/ 3% Bentonite
h. Backfill 169.5 ft.
Backfill material Cement w/3% Bentonite
i. Seal 10 ft.
Seal material Bentonite
j. Gravel pack± 61.5 ft.
Pack material CSSI 8x12 Sand
k. Bottom seal N/A ft.
Seal material N/A
l. Casing height * .5 ft.
m. Protective casing diameter 10 in.

± includes filter pack
* top of PVC casing

Construction details for monitoring wells at Nazareth/Coronado landfills. Values are in feet.

WELL	NCLF-1	NCLF-2	NCLF-3	NCLF-4	NCLF-5	NCLF-6	NCLF-7	NCLF-8
LOCATION (USGS SYSTEM)	11.03.11.413	11.03.12.313	11.03.12.333	11.03.12.343	11.03.11.423	11.03.11.244	11.03.13.113	11.03.12.333
LOCATION (SPC X-COORDINATE)	397770	400342	400059	401280	398728	399663	400131	400087
LOCATION (SPC Y-COORDINATE)	1525598	1525670	1524161	1524333	1525759	1526448	1523045	1524155
TOP OF SCREEN	135	196	195	237	162	166	210	240
BOTTOM OF SCREEN	175	216	215	257	182	186	230	260
BOTTOM OF CASING	180	221	220	262	187	191	235	265
BOTTOM OF BOREHOLE	185	230	230	280	200	205	250	275
TOP OF FILTER PACK	130	187	188	228	157	160	202	234
TOP OF BENTONITE PELLETS	128	182 (est.)	184	221	154	158	—	—
LAND SURFACE ELEVATION	—	5162.99	5160.75	5194.69	5128.76	5139.55		
REFERENCE ELEVATION (top of PVC)	5107.59	5162.64	5162.43	5196.3	5129.77	5138.98		
DEPTH TO WATER (below top of PVC)	140.29	198.58	203.94	242.87	164.5	171.47		
WATER TABLE ELEVATION	4967.30	4964.06	4958.49	4953.43	4965.27	4967.51		
BOTTOM OF SUMP (below top of PVC)	181.44	222.74	221.89	264.4	187.5	191		

ID: AUG 31'99 10:20 No.004 P.03

Appendix D.
Subsurface Soil Sample Data

Hall Environmental Analysis Laboratory

COVER LETTER

July 08, 2002

Sharon Minchak
CH2M Hill
6001 Indian School Rd. NE Suite 350
Albuquerque, NM 87110
TEL: (505) 884-5600
FAX (505) 883-7507

RE: Philips

Order No.: 0206070

Dear Sharon Minchak:

Hall Environmental Analysis Laboratory received 7 samples on 6/12/02 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-01

Client Sample ID: S-4 Philips
Collection Date: 6/12/02 11:30:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA METHOD 8081: PESTICIDES						Analyst: **GT**
4,4´-DDD	ND	0.0020		mg/Kg	1	7/4/02
4,4´-DDE	ND	0.0020		mg/Kg	1	7/4/02
4,4´-DDT	ND	0.0020		mg/Kg	1	7/4/02
Aldrin	ND	0.0020		mg/Kg	1	7/4/02
alpha-BHC	ND	0.0020		mg/Kg	1	7/4/02
beta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Chlordane	ND	0.10		mg/Kg	1	7/4/02
delta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Dieldrin	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan I	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan II	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan sulfate	ND	0.0020		mg/Kg	1	7/4/02
Endrin	ND	0.0020		mg/Kg	1	7/4/02
Endrin aldehyde	ND	0.0020		mg/Kg	1	7/4/02
gamma-BHC	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor epoxide	ND	0.0020		mg/Kg	1	7/4/02
Methoxychlor	ND	0.0020		mg/Kg	1	7/4/02
Toxaphene	ND	0.10		mg/Kg	1	7/4/02
Surr: Decachlorobiphenyl	93.8	75.5-103		%REC	1	7/4/02
Surr: Tetrachloro-m-xylene	82.3	62.2-91.6		%REC	1	7/4/02
EPA METHOD 8270D: SEMIVOLATILES						Analyst: **CS**
Acenaphthene	ND	0.10		mg/Kg	1	6/21/02
Acenaphthylene	ND	0.10		mg/Kg	1	6/21/02
Aniline	ND	0.10		mg/Kg	1	6/21/02
Anthracene	ND	0.10		mg/Kg	1	6/21/02
Benz(a)anthracene	ND	0.10		mg/Kg	1	6/21/02
Benzidine	ND	0.20		mg/Kg	1	6/21/02
Benzo(a)pyrene	ND	0.10		mg/Kg	1	6/21/02
Benzo(b)fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Benzo(g,h,i)perylene	ND	0.10		mg/Kg	1	6/21/02
Benzo(k)fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Benzoic acid	ND	0.50		mg/Kg	1	6/21/02
Benzyl alcohol	ND	0.20		mg/Kg	1	6/21/02
Bis(2-chloroethoxy)methane	ND	0.10		mg/Kg	1	6/21/02
Bis(2-chloroethyl)ether	ND	0.10		mg/Kg	1	6/21/02
Bis(2-chloroisopropyl)ether	ND	0.10		mg/Kg	1	6/21/02
Bis(2-ethylhexyl)phthalate	ND	0.10		mg/Kg	1	6/21/02
4-Bromophenyl phenyl ether	ND	0.10		mg/Kg	1	6/21/02
Butyl benzyl phthalate	ND	0.10		mg/Kg	1	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-01

Client Sample ID: S-4 Philips
Collection Date: 6/12/02 11:30:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Carbazole	ND	0.10		mg/Kg	1	6/21/02
4-Chloro-3-methylphenol	ND	0.20		mg/Kg	1	6/21/02
4-Chloroaniline	ND	0.20		mg/Kg	1	6/21/02
2-Chloronaphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Chlorophenol	ND	0.10		mg/Kg	1	6/21/02
4-Chlorophenyl phenyl ether	ND	0.10		mg/Kg	1	6/21/02
Chrysene	ND	0.10		mg/Kg	1	6/21/02
Di-n-butyl phthalate	0.13	0.10	B	mg/Kg	1	6/21/02
Di-n-octyl phthalate	ND	0.10		mg/Kg	1	6/21/02
Dibenz(a,h)anthracene	ND	0.10		mg/Kg	1	6/21/02
Dibenzofuran	ND	0.10		mg/Kg	1	6/21/02
1,2-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
1,3-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
1,4-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
3,3'-Dichlorobenzidine	ND	0.10		mg/Kg	1	6/21/02
Diethyl phthalate	ND	0.10		mg/Kg	1	6/21/02
Dimethyl phthalate	ND	0.10		mg/Kg	1	6/21/02
2,4-Dichlorophenol	ND	0.10		mg/Kg	1	6/21/02
2,4-Dimethylphenol	ND	0.10		mg/Kg	1	6/21/02
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	6/21/02
2,4-Dinitrophenol	ND	0.50		mg/Kg	1	6/21/02
2,4-Dinitrotoluene	ND	0.10		mg/Kg	1	6/21/02
2,6-Dinitrotoluene	ND	0.10		mg/Kg	1	6/21/02
Fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Fluorene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorobenzene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorobutadiene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorocyclopentadiene	ND	0.10		mg/Kg	1	6/21/02
Hexachloroethane	ND	0.10		mg/Kg	1	6/21/02
Indeno(1,2,3-cd)pyrene	ND	0.10		mg/Kg	1	6/21/02
Isophorone	ND	0.10		mg/Kg	1	6/21/02
2-Methylnaphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Methylphenol	ND	0.10		mg/Kg	1	6/21/02
4-Methylphenol	ND	0.10		mg/Kg	1	6/21/02
N-Nitrosodi-n-propylamine	ND	0.10		mg/Kg	1	6/21/02
N-Nitrosodiphenylamine	ND	0.10		mg/Kg	1	6/21/02
Naphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Nitroaniline	ND	0.50		mg/Kg	1	6/21/02
3-Nitroaniline	ND	0.50		mg/Kg	1	6/21/02
4-Nitroaniline	ND	0.20		mg/Kg	1	6/21/02
Nitrobenzene	ND	0.10		mg/Kg	1	6/21/02
2-Nitrophenol	ND	0.10		mg/Kg	1	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-01

Client Sample ID: S-4 Philips
Collection Date: 6/12/02 11:30:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
4-Nitrophenol	ND	0.10		mg/Kg	1	6/21/02
Pentachlorophenol	ND	0.50		mg/Kg	1	6/21/02
Phenanthrene	ND	0.10		mg/Kg	1	6/21/02
Phenol	ND	0.10		mg/Kg	1	6/21/02
Pyrene	ND	0.10		mg/Kg	1	6/21/02
Pyridine	ND	0.10		mg/Kg	1	6/21/02
1,2,4-Trichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
2,4,5-Trichlorophenol	ND	0.10		mg/Kg	1	6/21/02
2,4,6-Trichlorophenol	ND	0.10		mg/Kg	1	6/21/02
Surr: 2,4,6-Tribromophenol	81.5	26-156		%REC	1	6/21/02
Surr: 2-Fluorobiphenyl	70.2	23.6-111		%REC	1	6/21/02
Surr: 2-Fluorophenol	61.1	21.5-107		%REC	1	6/21/02
Surr: 4-Terphenyl-d14	105	30-220		%REC	1	6/21/02
Surr: Nitrobenzene-d5	67.3	25.3-115		%REC	1	6/21/02
Surr: Phenol-d6	66.1	25.2-115		%REC	1	6/21/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-02

Client Sample ID: S-4 Philips Dup
Collection Date: 6/12/02 11:30:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA METHOD 8081: PESTICIDES						Analyst: **GT**
4,4'-DDD	ND	0.0020		mg/Kg	1	7/4/02
4,4'-DDE	ND	0.0020		mg/Kg	1	7/4/02
4,4'-DDT	ND	0.0020		mg/Kg	1	7/4/02
Aldrin	ND	0.0020		mg/Kg	1	7/4/02
alpha-BHC	ND	0.0020		mg/Kg	1	7/4/02
beta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Chlordane	ND	0.10		mg/Kg	1	7/4/02
delta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Dieldrin	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan I	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan II	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan sulfate	ND	0.0020		mg/Kg	1	7/4/02
Endrin	ND	0.0020		mg/Kg	1	7/4/02
Endrin aldehyde	ND	0.0020		mg/Kg	1	7/4/02
gamma-BHC	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor epoxide	ND	0.0020		mg/Kg	1	7/4/02
Methoxychlor	ND	0.0020		mg/Kg	1	7/4/02
Toxaphene	ND	0.10		mg/Kg	1	7/4/02
Surr: Decachlorobiphenyl	98.8	75.5-103		%REC	1	7/4/02
Surr: Tetrachloro-m-xylene	81.6	62.2-91.6		%REC	1	7/4/02
EPA METHOD 8270D: SEMIVOLATILES						Analyst: **CS**
Acenaphthene	ND	0.10		mg/Kg	1	6/21/02
Acenaphthylene	ND	0.10		mg/Kg	1	6/21/02
Aniline	ND	0.10		mg/Kg	1	6/21/02
Anthracene	ND	0.10		mg/Kg	1	6/21/02
Benz(a)anthracene	ND	0.10		mg/Kg	1	6/21/02
Benzidine	ND	0.20		mg/Kg	1	6/21/02
Benzo(a)pyrene	ND	0.10		mg/Kg	1	6/21/02
Benzo(b)fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Benzo(g,h,i)perylene	ND	0.10		mg/Kg	1	6/21/02
Benzo(k)fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Benzoic acid	ND	0.50		mg/Kg	1	6/21/02
Benzyl alcohol	ND	0.20		mg/Kg	1	6/21/02
Bis(2-chloroethoxy)methane	ND	0.10		mg/Kg	1	6/21/02
Bis(2-chloroethyl)ether	ND	0.10		mg/Kg	1	6/21/02
Bis(2-chloroisopropyl)ether	ND	0.10		mg/Kg	1	6/21/02
Bis(2-ethylhexyl)phthalate	ND	0.10		mg/Kg	1	6/21/02
4-Bromophenyl phenyl ether	ND	0.10		mg/Kg	1	6/21/02
Butyl benzyl phthalate	ND	0.10		mg/Kg	1	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-02

Client Sample ID: S-4 Philips Dup
Collection Date: 6/12/02 11:30:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Carbazole	ND	0.10		mg/Kg	1	6/21/02
4-Chloro-3-methylphenol	ND	0.20		mg/Kg	1	6/21/02
4-Chloroaniline	ND	0.20		mg/Kg	1	6/21/02
2-Chloronaphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Chlorophenol	ND	0.10		mg/Kg	1	6/21/02
4-Chlorophenyl phenyl ether	ND	0.10		mg/Kg	1	6/21/02
Chrysene	ND	0.10		mg/Kg	1	6/21/02
Di-n-butyl phthalate	0.30	0.10	B	mg/Kg	1	6/21/02
Di-n-octyl phthalate	ND	0.10		mg/Kg	1	6/21/02
Dibenz(a,h)anthracene	ND	0.10		mg/Kg	1	6/21/02
Dibenzofuran	ND	0.10		mg/Kg	1	6/21/02
1,2-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
1,3-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
1,4-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
3,3'-Dichlorobenzidine	ND	0.10		mg/Kg	1	6/21/02
Diethyl phthalate	ND	0.10		mg/Kg	1	6/21/02
Dimethyl phthalate	ND	0.10		mg/Kg	1	6/21/02
2,4-Dichlorophenol	ND	0.10		mg/Kg	1	6/21/02
2,4-Dimethylphenol	ND	0.10		mg/Kg	1	6/21/02
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	6/21/02
2,4-Dinitrophenol	ND	0.50		mg/Kg	1	6/21/02
2,4-Dinitrotoluene	ND	0.10		mg/Kg	1	6/21/02
2,6-Dinitrotoluene	ND	0.10		mg/Kg	1	6/21/02
Fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Fluorene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorobenzene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorobutadiene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorocyclopentadiene	ND	0.10		mg/Kg	1	6/21/02
Hexachloroethane	ND	0.10		mg/Kg	1	6/21/02
Indeno(1,2,3-cd)pyrene	ND	0.10		mg/Kg	1	6/21/02
Isophorone	ND	0.10		mg/Kg	1	6/21/02
2-Methylnaphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Methylphenol	ND	0.10		mg/Kg	1	6/21/02
4-Methylphenol	ND	0.10		mg/Kg	1	6/21/02
N-Nitrosodi-n-propylamine	ND	0.10		mg/Kg	1	6/21/02
N-Nitrosodiphenylamine	ND	0.10		mg/Kg	1	6/21/02
Naphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Nitroaniline	ND	0.50		mg/Kg	1	6/21/02
3-Nitroaniline	ND	0.50		mg/Kg	1	6/21/02
4-Nitroaniline	ND	0.20		mg/Kg	1	6/21/02
Nitrobenzene	ND	0.10		mg/Kg	1	6/21/02
2-Nitrophenol	ND	0.10		mg/Kg	1	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-02

Client Sample ID: S-4 Philips Dup
Collection Date: 6/12/02 11:30:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
4-Nitrophenol	ND	0.10		mg/Kg	1	6/21/02
Pentachlorophenol	ND	0.50		mg/Kg	1	6/21/02
Phenanthrene	ND	0.10		mg/Kg	1	6/21/02
Phenol	ND	0.10		mg/Kg	1	6/21/02
Pyrene	ND	0.10		mg/Kg	1	6/21/02
Pyridine	ND	0.10		mg/Kg	1	6/21/02
1,2,4-Trichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
2,4,5-Trichlorophenol	ND	0.10		mg/Kg	1	6/21/02
2,4,6-Trichlorophenol	ND	0.10		mg/Kg	1	6/21/02
Surr: 2,4,6-Tribromophenol	68.2	26-156		%REC	1	6/21/02
Surr: 2-Fluorobiphenyl	77.8	23.6-111		%REC	1	6/21/02
Surr: 2-Fluorophenol	66.8	21.5-107		%REC	1	6/21/02
Surr: 4-Terphenyl-d14	99.5	30-220		%REC	1	6/21/02
Surr: Nitrobenzene-d5	76.6	25.3-115		%REC	1	6/21/02
Surr: Phenol-d6	74.0	25.2-115		%REC	1	6/21/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-03

Client Sample ID: S-1 Philips
Collection Date: 6/12/02 12:15:00 PM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA METHOD 8081: PESTICIDES						Analyst: **GT**
4,4'-DDD	ND	0.0020		mg/Kg	1	7/4/02
4,4'-DDE	ND	0.0020		mg/Kg	1	7/4/02
4,4'-DDT	ND	0.0020		mg/Kg	1	7/4/02
Aldrin	ND	0.0020		mg/Kg	1	7/4/02
alpha-BHC	ND	0.0020		mg/Kg	1	7/4/02
beta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Chlordane	ND	0.10		mg/Kg	1	7/4/02
delta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Dieldrin	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan I	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan II	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan sulfate	ND	0.0020		mg/Kg	1	7/4/02
Endrin	ND	0.0020		mg/Kg	1	7/4/02
Endrin aldehyde	ND	0.0020		mg/Kg	1	7/4/02
gamma-BHC	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor epoxide	ND	0.0020		mg/Kg	1	7/4/02
Methoxychlor	ND	0.0020		mg/Kg	1	7/4/02
Toxaphene	ND	0.10		mg/Kg	1	7/4/02
Surr: Decachlorobiphenyl	95.4	75.5-103		%REC	1	7/4/02
Surr: Tetrachloro-m-xylene	90.5	62.2-91.6		%REC	1	7/4/02
EPA METHOD 8270D: SEMIVOLATILES						Analyst: **CS**
Acenaphthene	ND	1.0		mg/Kg	10	6/24/02
Acenaphthylene	ND	1.0		mg/Kg	10	6/24/02
Aniline	ND	1.0		mg/Kg	10	6/24/02
Anthracene	ND	1.0		mg/Kg	10	6/24/02
Benz(a)anthracene	ND	1.0		mg/Kg	10	6/24/02
Benzidine	ND	2.0		mg/Kg	10	6/24/02
Benzo(a)pyrene	ND	1.0		mg/Kg	10	6/24/02
Benzo(b)fluoranthene	1.2	1.0		mg/Kg	10	6/24/02
Benzo(g,h,i)perylene	ND	1.0		mg/Kg	10	6/24/02
Benzo(k)fluoranthene	ND	1.0		mg/Kg	10	6/24/02
Benzoic acid	ND	5.0		mg/Kg	10	6/24/02
Benzyl alcohol	ND	2.0		mg/Kg	10	6/24/02
Bis(2-chloroethoxy)methane	ND	1.0		mg/Kg	10	6/24/02
Bis(2-chloroethyl)ether	ND	1.0		mg/Kg	10	6/24/02
Bis(2-chloroisopropyl)ether	ND	1.0		mg/Kg	10	6/24/02
Bis(2-ethylhexyl)phthalate	ND	1.0		mg/Kg	10	6/24/02
4-Bromophenyl phenyl ether	ND	1.0		mg/Kg	10	6/24/02
Butyl benzyl phthalate	ND	1.0		mg/Kg	10	6/24/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-03

Client Sample ID: S-1 Philips
Collection Date: 6/12/02 12:15:00 PM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Carbazole	ND	1.0		mg/Kg	10	6/24/02
4-Chloro-3-methylphenol	ND	2.0		mg/Kg	10	6/24/02
4-Chloroaniline	ND	2.0		mg/Kg	10	6/24/02
2-Chloronaphthalene	ND	1.0		mg/Kg	10	6/24/02
2-Chlorophenol	ND	1.0		mg/Kg	10	6/24/02
4-Chlorophenyl phenyl ether	ND	1.0		mg/Kg	10	6/24/02
Chrysene	1.0	1.0		mg/Kg	10	6/24/02
Di-n-butyl phthalate	ND	1.0		mg/Kg	10	6/24/02
Di-n-octyl phthalate	ND	1.0		mg/Kg	10	6/24/02
Dibenz(a,h)anthracene	ND	1.0		mg/Kg	10	6/24/02
Dibenzofuran	ND	1.0		mg/Kg	10	6/24/02
1,2-Dichlorobenzene	ND	1.0		mg/Kg	10	6/24/02
1,3-Dichlorobenzene	ND	1.0		mg/Kg	10	6/24/02
1,4-Dichlorobenzene	ND	1.0		mg/Kg	10	6/24/02
3,3'-Dichlorobenzidine	ND	1.0		mg/Kg	10	6/24/02
Diethyl phthalate	ND	1.0		mg/Kg	10	6/24/02
Dimethyl phthalate	ND	1.0		mg/Kg	10	6/24/02
2,4-Dichlorophenol	ND	1.0		mg/Kg	10	6/24/02
2,4-Dimethylphenol	ND	1.0		mg/Kg	10	6/24/02
4,6-Dinitro-2-methylphenol	ND	5.0		mg/Kg	10	6/24/02
2,4-Dinitrophenol	ND	5.0		mg/Kg	10	6/24/02
2,4-Dinitrotoluene	ND	1.0		mg/Kg	10	6/24/02
2,6-Dinitrotoluene	ND	1.0		mg/Kg	10	6/24/02
Fluoranthene	1.4	1.0		mg/Kg	10	6/24/02
Fluorene	ND	1.0		mg/Kg	10	6/24/02
Hexachlorobenzene	ND	1.0		mg/Kg	10	6/24/02
Hexachlorobutadiene	ND	1.0		mg/Kg	10	6/24/02
Hexachlorocyclopentadiene	ND	1.0		mg/Kg	10	6/24/02
Hexachloroethane	ND	1.0		mg/Kg	10	6/24/02
Indeno(1,2,3-cd)pyrene	ND	1.0		mg/Kg	10	6/24/02
Isophorone	ND	1.0		mg/Kg	10	6/24/02
2-Methylnaphthalene	ND	1.0		mg/Kg	10	6/24/02
2-Methylphenol	ND	1.0		mg/Kg	10	6/24/02
4-Methylphenol	ND	1.0		mg/Kg	10	6/24/02
N-Nitrosodi-n-propylamine	ND	1.0		mg/Kg	10	6/24/02
N-Nitrosodiphenylamine	ND	1.0		mg/Kg	10	6/24/02
Naphthalene	ND	1.0		mg/Kg	10	6/24/02
2-Nitroaniline	ND	5.0		mg/Kg	10	6/24/02
3-Nitroaniline	ND	5.0		mg/Kg	10	6/24/02
4-Nitroaniline	ND	2.0		mg/Kg	10	6/24/02
Nitrobenzene	ND	1.0		mg/Kg	10	6/24/02
2-Nitrophenol	ND	1.0		mg/Kg	10	6/24/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-03

Client Sample ID: S-1 Philips
Collection Date: 6/12/02 12:15:00 PM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
4-Nitrophenol	ND	1.0		mg/Kg	10	6/24/02
Pentachlorophenol	ND	5.0		mg/Kg	10	6/24/02
Phenanthrene	ND	1.0		mg/Kg	10	6/24/02
Phenol	ND	1.0		mg/Kg	10	6/24/02
Pyrene	1.0	1.0		mg/Kg	10	6/24/02
Pyridine	ND	1.0		mg/Kg	10	6/24/02
1,2,4-Trichlorobenzene	ND	1.0		mg/Kg	10	6/24/02
2,4,5-Trichlorophenol	ND	1.0		mg/Kg	10	6/24/02
2,4,6-Trichlorophenol	ND	1.0		mg/Kg	10	6/24/02
Surr: 2,4,6-Tribromophenol	40.8	26-156		%REC	10	6/24/02
Surr: 2-Fluorobiphenyl	75.4	23.6-111		%REC	10	6/24/02
Surr: 2-Fluorophenol	66.9	21.5-107		%REC	10	6/24/02
Surr: 4-Terphenyl-d14	134	30-220		%REC	10	6/24/02
Surr: Nitrobenzene-d5	64.0	25.3-115		%REC	10	6/24/02
Surr: Phenol-d6	57.4	25.2-115		%REC	10	6/24/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-04

Client Sample ID: S-5 Philips
Collection Date: 6/12/02 11:00:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA METHOD 8081: PESTICIDES						Analyst: **GT**
4,4´-DDD	ND	0.0020		mg/Kg	1	7/4/02
4,4´-DDE	ND	0.0020		mg/Kg	1	7/4/02
4,4´-DDT	ND	0.0020		mg/Kg	1	7/4/02
Aldrin	ND	0.0020		mg/Kg	1	7/4/02
alpha-BHC	ND	0.0020		mg/Kg	1	7/4/02
beta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Chlordane	ND	0.10		mg/Kg	1	7/4/02
delta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Dieldrin	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan I	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan II	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan sulfate	ND	0.0020		mg/Kg	1	7/4/02
Endrin	ND	0.0020		mg/Kg	1	7/4/02
Endrin aldehyde	ND	0.0020		mg/Kg	1	7/4/02
gamma-BHC	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor epoxide	ND	0.0020		mg/Kg	1	7/4/02
Methoxychlor	ND	0.0020		mg/Kg	1	7/4/02
Toxaphene	ND	0.10		mg/Kg	1	7/4/02
Surr: Decachlorobiphenyl	93.9	75.5-103		%REC	1	7/4/02
Surr: Tetrachloro-m-xylene	76.7	62.2-91.6		%REC	1	7/4/02
EPA METHOD 8270D: SEMIVOLATILES						Analyst: **CS**
Acenaphthene	ND	0.10		mg/Kg	1	6/21/02
Acenaphthylene	ND	0.10		mg/Kg	1	6/21/02
Aniline	ND	0.10		mg/Kg	1	6/21/02
Anthracene	ND	0.10		mg/Kg	1	6/21/02
Benz(a)anthracene	ND	0.10		mg/Kg	1	6/21/02
Benzidine	ND	0.20		mg/Kg	1	6/21/02
Benzo(a)pyrene	ND	0.10		mg/Kg	1	6/21/02
Benzo(b)fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Benzo(g,h,i)perylene	ND	0.10		mg/Kg	1	6/21/02
Benzo(k)fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Benzoic acid	ND	0.50		mg/Kg	1	6/21/02
Benzyl alcohol	ND	0.20		mg/Kg	1	6/21/02
Bis(2-chloroethoxy)methane	ND	0.10		mg/Kg	1	6/21/02
Bis(2-chloroethyl)ether	ND	0.10		mg/Kg	1	6/21/02
Bis(2-chloroisopropyl)ether	ND	0.10		mg/Kg	1	6/21/02
Bis(2-ethylhexyl)phthalate	ND	0.10		mg/Kg	1	6/21/02
4-Bromophenyl phenyl ether	ND	0.10		mg/Kg	1	6/21/02
Butyl benzyl phthalate	ND	0.10		mg/Kg	1	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-04

Client Sample ID: S-5 Philips
Collection Date: 6/12/02 11:00:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Carbazole	ND	0.10		mg/Kg	1	6/21/02
4-Chloro-3-methylphenol	ND	0.20		mg/Kg	1	6/21/02
4-Chloroaniline	ND	0.20		mg/Kg	1	6/21/02
2-Chloronaphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Chlorophenol	ND	0.10		mg/Kg	1	6/21/02
4-Chlorophenyl phenyl ether	ND	0.10		mg/Kg	1	6/21/02
Chrysene	ND	0.10		mg/Kg	1	6/21/02
Di-n-butyl phthalate	ND	0.10		mg/Kg	1	6/21/02
Di-n-octyl phthalate	ND	0.10		mg/Kg	1	6/21/02
Dibenz(a,h)anthracene	ND	0.10		mg/Kg	1	6/21/02
Dibenzofuran	ND	0.10		mg/Kg	1	6/21/02
1,2-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
1,3-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
1,4-Dichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
3,3'-Dichlorobenzidine	ND	0.10		mg/Kg	1	6/21/02
Diethyl phthalate	ND	0.10		mg/Kg	1	6/21/02
Dimethyl phthalate	ND	0.10		mg/Kg	1	6/21/02
2,4-Dichlorophenol	ND	0.10		mg/Kg	1	6/21/02
2,4-Dimethylphenol	ND	0.10		mg/Kg	1	6/21/02
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	6/21/02
2,4-Dinitrophenol	ND	0.50		mg/Kg	1	6/21/02
2,4-Dinitrotoluene	ND	0.10		mg/Kg	1	6/21/02
2,6-Dinitrotoluene	ND	0.10		mg/Kg	1	6/21/02
Fluoranthene	ND	0.10		mg/Kg	1	6/21/02
Fluorene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorobenzene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorobutadiene	ND	0.10		mg/Kg	1	6/21/02
Hexachlorocyclopentadiene	ND	0.10		mg/Kg	1	6/21/02
Hexachloroethane	ND	0.10		mg/Kg	1	6/21/02
Indeno(1,2,3-cd)pyrene	ND	0.10		mg/Kg	1	6/21/02
Isophorone	ND	0.10		mg/Kg	1	6/21/02
2-Methylnaphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Methylphenol	ND	0.10		mg/Kg	1	6/21/02
4-Methylphenol	ND	0.10		mg/Kg	1	6/21/02
N-Nitrosodi-n-propylamine	ND	0.10		mg/Kg	1	6/21/02
N-Nitrosodiphenylamine	ND	0.10		mg/Kg	1	6/21/02
Naphthalene	ND	0.10		mg/Kg	1	6/21/02
2-Nitroaniline	ND	0.50		mg/Kg	1	6/21/02
3-Nitroaniline	ND	0.50		mg/Kg	1	6/21/02
4-Nitroaniline	ND	0.20		mg/Kg	1	6/21/02
Nitrobenzene	ND	0.10		mg/Kg	1	6/21/02
2-Nitrophenol	ND	0.10		mg/Kg	1	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-04

Client Sample ID: S-5 Philips
Collection Date: 6/12/02 11:00:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
4-Nitrophenol	ND	0.10		mg/Kg	1	6/21/02
Pentachlorophenol	ND	0.50		mg/Kg	1	6/21/02
Phenanthrene	ND	0.10		mg/Kg	1	6/21/02
Phenol	ND	0.10		mg/Kg	1	6/21/02
Pyrene	ND	0.10		mg/Kg	1	6/21/02
Pyridine	ND	0.10		mg/Kg	1	6/21/02
1,2,4-Trichlorobenzene	ND	0.10		mg/Kg	1	6/21/02
2,4,5-Trichlorophenol	ND	0.10		mg/Kg	1	6/21/02
2,4,6-Trichlorophenol	ND	0.10		mg/Kg	1	6/21/02
Surr: 2,4,6-Tribromophenol	77.5	26-156		%REC	1	6/21/02
Surr: 2-Fluorobiphenyl	68.4	23.6-111		%REC	1	6/21/02
Surr: 2-Fluorophenol	67.8	21.5-107		%REC	1	6/21/02
Surr: 4-Terphenyl-d14	28.9	30-220	S	%REC	1	6/21/02
Surr: Nitrobenzene-d5	71.0	25.3-115		%REC	1	6/21/02
Surr: Phenol-d6	70.9	25.2-115		%REC	1	6/21/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-05

Client Sample ID: S-3 Philips
Collection Date: 6/12/02 11:45:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA METHOD 8081: PESTICIDES						Analyst: **GT**
4,4'-DDD	ND	0.0020		mg/Kg	1	7/4/02
4,4'-DDE	ND	0.0020		mg/Kg	1	7/4/02
4,4'-DDT	ND	0.0020		mg/Kg	1	7/4/02
Aldrin	ND	0.0020		mg/Kg	1	7/4/02
alpha-BHC	ND	0.0020		mg/Kg	1	7/4/02
beta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Chlordane	ND	0.10		mg/Kg	1	7/4/02
delta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Dieldrin	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan I	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan II	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan sulfate	ND	0.0020		mg/Kg	1	7/4/02
Endrin	ND	0.0020		mg/Kg	1	7/4/02
Endrin aldehyde	ND	0.0020		mg/Kg	1	7/4/02
gamma-BHC	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor epoxide	ND	0.0020		mg/Kg	1	7/4/02
Methoxychlor	ND	0.0020		mg/Kg	1	7/4/02
Toxaphene	ND	0.10		mg/Kg	1	7/4/02
Surr: Decachlorobiphenyl	100	75.5-103		%REC	1	7/4/02
Surr: Tetrachloro-m-xylene	81.4	62.2-91.6		%REC	1	7/4/02
EPA METHOD 8270D: SEMIVOLATILES						Analyst: **CS**
Acenaphthene	ND	0.20		mg/Kg	2	6/21/02
Acenaphthylene	ND	0.20		mg/Kg	2	6/21/02
Aniline	ND	0.20		mg/Kg	2	6/21/02
Anthracene	ND	0.20		mg/Kg	2	6/21/02
Benz(a)anthracene	ND	0.20		mg/Kg	2	6/21/02
Benzidine	ND	0.40		mg/Kg	2	6/21/02
Benzo(a)pyrene	ND	0.20		mg/Kg	2	6/21/02
Benzo(b)fluoranthene	0.21	0.20		mg/Kg	2	6/21/02
Benzo(g,h,i)perylene	ND	0.20		mg/Kg	2	6/21/02
Benzo(k)fluoranthene	ND	0.20		mg/Kg	2	6/21/02
Benzoic acid	ND	1.0		mg/Kg	2	6/21/02
Benzyl alcohol	ND	0.40		mg/Kg	2	6/21/02
Bis(2-chloroethoxy)methane	ND	0.20		mg/Kg	2	6/21/02
Bis(2-chloroethyl)ether	ND	0.20		mg/Kg	2	6/21/02
Bis(2-chloroisopropyl)ether	ND	0.20		mg/Kg	2	6/21/02
Bis(2-ethylhexyl)phthalate	ND	0.20		mg/Kg	2	6/21/02
4-Bromophenyl phenyl ether	ND	0.20		mg/Kg	2	6/21/02
Butyl benzyl phthalate	ND	0.20		mg/Kg	2	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-05

Client Sample ID: S-3 Philips
Collection Date: 6/12/02 11:45:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Carbazole	ND	0.20		mg/Kg	2	6/21/02
4-Chloro-3-methylphenol	ND	0.40		mg/Kg	2	6/21/02
4-Chloroaniline	ND	0.40		mg/Kg	2	6/21/02
2-Chloronaphthalene	ND	0.20		mg/Kg	2	6/21/02
2-Chlorophenol	ND	0.20		mg/Kg	2	6/21/02
4-Chlorophenyl phenyl ether	ND	0.20		mg/Kg	2	6/21/02
Chrysene	ND	0.20		mg/Kg	2	6/21/02
Di-n-butyl phthalate	0.21	0.20		mg/Kg	2	6/21/02
Di-n-octyl phthalate	ND	0.20		mg/Kg	2	6/21/02
Dibenz(a,h)anthracene	ND	0.20		mg/Kg	2	6/21/02
Dibenzofuran	ND	0.20		mg/Kg	2	6/21/02
1,2-Dichlorobenzene	ND	0.20		mg/Kg	2	6/21/02
1,3-Dichlorobenzene	ND	0.20		mg/Kg	2	6/21/02
1,4-Dichlorobenzene	ND	0.20		mg/Kg	2	6/21/02
3,3'-Dichlorobenzidine	ND	0.20		mg/Kg	2	6/21/02
Diethyl phthalate	ND	0.20		mg/Kg	2	6/21/02
Dimethyl phthalate	ND	0.20		mg/Kg	2	6/21/02
2,4-Dichlorophenol	ND	0.20		mg/Kg	2	6/21/02
2,4-Dimethylphenol	ND	0.20		mg/Kg	2	6/21/02
4,6-Dinitro-2-methylphenol	ND	1.0		mg/Kg	2	6/21/02
2,4-Dinitrophenol	ND	1.0		mg/Kg	2	6/21/02
2,4-Dinitrotoluene	ND	0.20		mg/Kg	2	6/21/02
2,6-Dinitrotoluene	ND	0.20		mg/Kg	2	6/21/02
Fluoranthene	0.27	0.20		mg/Kg	2	6/21/02
Fluorene	ND	0.20		mg/Kg	2	6/21/02
Hexachlorobenzene	ND	0.20		mg/Kg	2	6/21/02
Hexachlorobutadiene	ND	0.20		mg/Kg	2	6/21/02
Hexachlorocyclopentadiene	ND	0.20		mg/Kg	2	6/21/02
Hexachloroethane	ND	0.20		mg/Kg	2	6/21/02
Indeno(1,2,3-cd)pyrene	ND	0.20		mg/Kg	2	6/21/02
Isophorone	ND	0.20		mg/Kg	2	6/21/02
2-Methylnaphthalene	ND	0.20		mg/Kg	2	6/21/02
2-Methylphenol	ND	0.20		mg/Kg	2	6/21/02
4-Methylphenol	ND	0.20		mg/Kg	2	6/21/02
N-Nitrosodi-n-propylamine	ND	0.20		mg/Kg	2	6/21/02
N-Nitrosodiphenylamine	ND	0.20		mg/Kg	2	6/21/02
Naphthalene	ND	0.20		mg/Kg	2	6/21/02
2-Nitroaniline	ND	1.0		mg/Kg	2	6/21/02
3-Nitroaniline	ND	1.0		mg/Kg	2	6/21/02
4-Nitroaniline	ND	0.40		mg/Kg	2	6/21/02
Nitrobenzene	ND	0.20		mg/Kg	2	6/21/02
2-Nitrophenol	ND	0.20		mg/Kg	2	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-05

Client Sample ID: S-3 Philips
Collection Date: 6/12/02 11:45:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
4-Nitrophenol	ND	0.20		mg/Kg	2	6/21/02
Pentachlorophenol	ND	1.0		mg/Kg	2	6/21/02
Phenanthrene	ND	0.20		mg/Kg	2	6/21/02
Phenol	ND	0.20		mg/Kg	2	6/21/02
Pyrene	0.22	0.20		mg/Kg	2	6/21/02
Pyridine	ND	0.20		mg/Kg	2	6/21/02
1,2,4-Trichlorobenzene	ND	0.20		mg/Kg	2	6/21/02
2,4,5-Trichlorophenol	ND	0.20		mg/Kg	2	6/21/02
2,4,6-Trichlorophenol	ND	0.20		mg/Kg	2	6/21/02
Surr: 2,4,6-Tribromophenol	66.8	26-156		%REC	2	6/21/02
Surr: 2-Fluorobiphenyl	72.8	23.6-111		%REC	2	6/21/02
Surr: 2-Fluorophenol	61.1	21.5-107		%REC	2	6/21/02
Surr: 4-Terphenyl-d14	31.3	30-220		%REC	2	6/21/02
Surr: Nitrobenzene-d5	69.4	25.3-115		%REC	2	6/21/02
Surr: Phenol-d6	62.6	25.2-115		%REC	2	6/21/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-06

Client Sample ID: S-2 Philips
Collection Date: 6/12/02 12:00:00 PM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA METHOD 8081: PESTICIDES						Analyst: **GT**
4,4'-DDD	ND	0.0020		mg/Kg	1	7/4/02
4,4'-DDE	ND	0.0020		mg/Kg	1	7/4/02
4,4'-DDT	ND	0.0020		mg/Kg	1	7/4/02
Aldrin	ND	0.0020		mg/Kg	1	7/4/02
alpha-BHC	ND	0.0020		mg/Kg	1	7/4/02
beta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Chlordane	ND	0.10		mg/Kg	1	7/4/02
delta-BHC	ND	0.0020		mg/Kg	1	7/4/02
Dieldrin	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan I	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan II	ND	0.0020		mg/Kg	1	7/4/02
Endosulfan sulfate	ND	0.0020		mg/Kg	1	7/4/02
Endrin	ND	0.0020		mg/Kg	1	7/4/02
Endrin aldehyde	ND	0.0020		mg/Kg	1	7/4/02
gamma-BHC	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor	ND	0.0020		mg/Kg	1	7/4/02
Heptachlor epoxide	ND	0.0020		mg/Kg	1	7/4/02
Methoxychlor	ND	0.0020		mg/Kg	1	7/4/02
Toxaphene	ND	0.10		mg/Kg	1	7/4/02
Surr: Decachlorobiphenyl	102	75.5-103		%REC	1	7/4/02
Surr: Tetrachloro-m-xylene	84.7	62.2-91.6		%REC	1	7/4/02
EPA METHOD 8270D: SEMIVOLATILES						Analyst: **CS**
Acenaphthene	ND	0.20		mg/Kg	2	6/26/02
Acenaphthylene	ND	0.20		mg/Kg	2	6/26/02
Aniline	ND	0.20		mg/Kg	2	6/26/02
Anthracene	ND	0.20		mg/Kg	2	6/26/02
Benz(a)anthracene	ND	0.20		mg/Kg	2	6/26/02
Benzidine	ND	0.40		mg/Kg	2	6/26/02
Benzo(a)pyrene	0.25	0.20		mg/Kg	2	6/26/02
Benzo(b)fluoranthene	0.42	0.20		mg/Kg	2	6/26/02
Benzo(g,h,i)perylene	ND	0.20		mg/Kg	2	6/26/02
Benzo(k)fluoranthene	0.21	0.20		mg/Kg	2	6/26/02
Benzoic acid	ND	1.0		mg/Kg	2	6/26/02
Benzyl alcohol	ND	0.40		mg/Kg	2	6/26/02
Bis(2-chloroethoxy)methane	ND	0.20		mg/Kg	2	6/26/02
Bis(2-chloroethyl)ether	ND	0.20		mg/Kg	2	6/26/02
Bis(2-chloroisopropyl)ether	ND	0.20		mg/Kg	2	6/26/02
Bis(2-ethylhexyl)phthalate	ND	0.20		mg/Kg	2	6/26/02
4-Bromophenyl phenyl ether	ND	0.20		mg/Kg	2	6/26/02
Butyl benzyl phthalate	ND	0.20		mg/Kg	2	6/26/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-06

Client Sample ID: S-2 Philips
Collection Date: 6/12/02 12:00:00 PM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Carbazole	ND	0.20		mg/Kg	2	6/26/02
4-Chloro-3-methylphenol	ND	0.40		mg/Kg	2	6/26/02
4-Chloroaniline	ND	0.40		mg/Kg	2	6/26/02
2-Chloronaphthalene	ND	0.20		mg/Kg	2	6/26/02
2-Chlorophenol	ND	0.20		mg/Kg	2	6/26/02
4-Chlorophenyl phenyl ether	ND	0.20		mg/Kg	2	6/26/02
Chrysene	0.32	0.20		mg/Kg	2	6/26/02
Di-n-butyl phthalate	ND	0.20		mg/Kg	2	6/26/02
Di-n-octyl phthalate	ND	0.20		mg/Kg	2	6/26/02
Dibenz(a,h)anthracene	ND	0.20		mg/Kg	2	6/26/02
Dibenzofuran	ND	0.20		mg/Kg	2	6/26/02
1,2-Dichlorobenzene	ND	0.20		mg/Kg	2	6/26/02
1,3-Dichlorobenzene	ND	0.20		mg/Kg	2	6/26/02
1,4-Dichlorobenzene	ND	0.20		mg/Kg	2	6/26/02
3,3´-Dichlorobenzidine	ND	0.20		mg/Kg	2	6/26/02
Diethyl phthalate	ND	0.20		mg/Kg	2	6/26/02
Dimethyl phthalate	ND	0.20		mg/Kg	2	6/26/02
2,4-Dichlorophenol	ND	0.20		mg/Kg	2	6/26/02
2,4-Dimethylphenol	ND	0.20		mg/Kg	2	6/26/02
4,6-Dinitro-2-methylphenol	ND	1.0		mg/Kg	2	6/26/02
2,4-Dinitrophenol	ND	1.0		mg/Kg	2	6/26/02
2,4-Dinitrotoluene	ND	0.20		mg/Kg	2	6/26/02
2,6-Dinitrotoluene	ND	0.20		mg/Kg	2	6/26/02
Fluoranthene	0.42	0.20		mg/Kg	2	6/26/02
Fluorene	ND	0.20		mg/Kg	2	6/26/02
Hexachlorobenzene	ND	0.20		mg/Kg	2	6/26/02
Hexachlorobutadiene	ND	0.20		mg/Kg	2	6/26/02
Hexachlorocyclopentadiene	ND	0.20		mg/Kg	2	6/26/02
Hexachloroethane	ND	0.20		mg/Kg	2	6/26/02
Indeno(1,2,3-cd)pyrene	ND	0.20		mg/Kg	2	6/26/02
Isophorone	ND	0.20		mg/Kg	2	6/26/02
2-Methylnaphthalene	ND	0.20		mg/Kg	2	6/26/02
2-Methylphenol	ND	0.20		mg/Kg	2	6/26/02
4-Methylphenol	ND	0.20		mg/Kg	2	6/26/02
N-Nitrosodi-n-propylamine	ND	0.20		mg/Kg	2	6/26/02
N-Nitrosodiphenylamine	ND	0.20		mg/Kg	2	6/26/02
Naphthalene	ND	0.20		mg/Kg	2	6/26/02
2-Nitroaniline	ND	1.0		mg/Kg	2	6/26/02
3-Nitroaniline	ND	1.0		mg/Kg	2	6/26/02
4-Nitroaniline	ND	0.40		mg/Kg	2	6/26/02
Nitrobenzene	ND	0.20		mg/Kg	2	6/26/02
2-Nitrophenol	ND	0.20		mg/Kg	2	6/26/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-06

Client Sample ID: S-2 Philips
Collection Date: 6/12/02 12:00:00 PM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
4-Nitrophenol	ND	0.20		mg/Kg	2	6/26/02
Pentachlorophenol	ND	1.0		mg/Kg	2	6/26/02
Phenanthrene	ND	0.20		mg/Kg	2	6/26/02
Phenol	ND	0.20		mg/Kg	2	6/26/02
Pyrene	0.38	0.20		mg/Kg	2	6/26/02
Pyridine	ND	0.20		mg/Kg	2	6/26/02
1,2,4-Trichlorobenzene	ND	0.20		mg/Kg	2	6/26/02
2,4,5-Trichlorophenol	ND	0.20		mg/Kg	2	6/26/02
2,4,6-Trichlorophenol	ND	0.20		mg/Kg	2	6/26/02
Surr: 2,4,6-Tribromophenol	69.7	26-156		%REC	2	6/26/02
Surr: 2-Fluorobiphenyl	56.6	23.6-111		%REC	2	6/26/02
Surr: 2-Fluorophenol	51.6	21.5-107		%REC	2	6/26/02
Surr: 4-Terphenyl-d14	40.4	30-220		%REC	2	6/26/02
Surr: Nitrobenzene-d5	50.8	25.3-115		%REC	2	6/26/02
Surr: Phenol-d6	52.7	25.2-115		%REC	2	6/26/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-07

Client Sample ID: Philips Equipment Rinsate
Collection Date: 6/12/02 12:30:00 PM
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA METHOD 8081: PESTICIDES						Analyst: **GT**
4,4'-DDD	ND	0.040		µg/L	1	7/4/02
4,4'-DDE	ND	0.040		µg/L	1	7/4/02
4,4'-DDT	ND	0.040		µg/L	1	7/4/02
Aldrin	ND	0.040		µg/L	1	7/4/02
alpha-BHC	ND	0.040		µg/L	1	7/4/02
beta-BHC	ND	0.040		µg/L	1	7/4/02
Chlordane	ND	1.0		µg/L	1	7/4/02
delta-BHC	ND	0.040		µg/L	1	7/4/02
Dieldrin	ND	0.040		µg/L	1	7/4/02
Endosulfan I	ND	0.040		µg/L	1	7/4/02
Endosulfan II	ND	0.040		µg/L	1	7/4/02
Endosulfan sulfate	ND	0.040		µg/L	1	7/4/02
Endrin	ND	0.040		µg/L	1	7/4/02
Endrin aldehyde	ND	0.040		µg/L	1	7/4/02
gamma-BHC	ND	0.040		µg/L	1	7/4/02
Heptachlor	ND	0.040		µg/L	1	7/4/02
Heptachlor epoxide	ND	0.040		µg/L	1	7/4/02
Methoxychlor	ND	0.040		µg/L	1	7/4/02
Toxaphene	ND	1.0		µg/L	1	7/4/02
Surr: Decachlorobiphenyl	99.2	60.3-121		%REC	1	7/4/02
Surr: Tetrachloro-m-xylene	83.3	44.7-97.9		%REC	1	7/4/02
EPA METHOD 8270D: SEMIVOLATILES						Analyst: **CS**
Acenaphthene	ND	10		µg/L	1	6/25/02
Acenaphthylene	ND	10		µg/L	1	6/25/02
Aniline	ND	10		µg/L	1	6/25/02
Anthracene	ND	10		µg/L	1	6/25/02
Azobenzene	ND	10		µg/L	1	6/25/02
Benz(a)anthracene	ND	10		µg/L	1	6/25/02
Benzidine	ND	20		µg/L	1	6/25/02
Benzo(a)pyrene	ND	10		µg/L	1	6/25/02
Benzo(b)fluoranthene	ND	10		µg/L	1	6/25/02
Benzo(g,h,i)perylene	ND	10		µg/L	1	6/25/02
Benzo(k)fluoranthene	ND	10		µg/L	1	6/25/02
Benzoic acid	ND	50		µg/L	1	6/25/02
Benzyl alcohol	ND	20		µg/L	1	6/25/02
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	6/25/02
Bis(2-chloroethyl)ether	ND	10		µg/L	1	6/25/02
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	6/25/02
Bis(2-ethylhexyl)phthalate	ND	10		µg/L	1	6/25/02
4-Bromophenyl phenyl ether	ND	10		µg/L	1	6/25/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-07

Client Sample ID: Philips Equipment Rinsate
Collection Date: 6/12/02 12:30:00 PM
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Butyl benzyl phthalate	ND	10		µg/L	1	6/25/02
Carbazole	ND	10		µg/L	1	6/25/02
4-Chloro-3-methylphenol	ND	20		µg/L	1	6/25/02
4-Chloroaniline	ND	20		µg/L	1	6/25/02
2-Chloronaphthalene	ND	10		µg/L	1	6/25/02
2-Chlorophenol	ND	10		µg/L	1	6/25/02
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	6/25/02
Chrysene	ND	10		µg/L	1	6/25/02
Di-n-butyl phthalate	ND	10		µg/L	1	6/25/02
Di-n-octyl phthalate	ND	10		µg/L	1	6/25/02
Dibenz(a,h)anthracene	ND	10		µg/L	1	6/25/02
Dibenzofuran	ND	10		µg/L	1	6/25/02
1,2-Dichlorobenzene	ND	10		µg/L	1	6/25/02
1,3-Dichlorobenzene	ND	10		µg/L	1	6/25/02
1,4-Dichlorobenzene	ND	10		µg/L	1	6/25/02
3,3'-Dichlorobenzidine	ND	10		µg/L	1	6/25/02
Diethyl phthalate	ND	10		µg/L	1	6/25/02
Dimethyl phthalate	ND	10		µg/L	1	6/25/02
2,4-Dichlorophenol	ND	10		µg/L	1	6/25/02
2,4-Dimethylphenol	ND	10		µg/L	1	6/25/02
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	6/25/02
2,4-Dinitrophenol	ND	50		µg/L	1	6/25/02
2,4-Dinitrotoluene	ND	10		µg/L	1	6/25/02
2,6-Dinitrotoluene	ND	10		µg/L	1	6/25/02
Fluoranthene	ND	10		µg/L	1	6/25/02
Fluorene	ND	10		µg/L	1	6/25/02
Hexachlorobenzene	ND	10		µg/L	1	6/25/02
Hexachlorobutadiene	ND	10		µg/L	1	6/25/02
Hexachlorocyclopentadiene	ND	10		µg/L	1	6/25/02
Hexachloroethane	ND	10		µg/L	1	6/25/02
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	6/25/02
Isophorone	ND	10		µg/L	1	6/25/02
2-Methylnaphthalene	ND	10		µg/L	1	6/25/02
2-Methylphenol	ND	10		µg/L	1	6/25/02
4-Methylphenol	ND	10		µg/L	1	6/25/02
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	6/25/02
N-Nitrosodiphenylamine	ND	10		µg/L	1	6/25/02
Naphthalene	ND	10		µg/L	1	6/25/02
2-Nitroaniline	ND	50		µg/L	1	6/25/02
3-Nitroaniline	ND	50		µg/L	1	6/25/02
4-Nitroaniline	ND	20		µg/L	1	6/25/02
Nitrobenzene	ND	10		µg/L	1	6/25/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Lab Order: 0206070
Project: Philips
Lab ID: 0206070-07

Client Sample ID: Philips Equipment Rinsate
Collection Date: 6/12/02 12:30:00 PM
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
2-Nitrophenol	ND	10		µg/L	1	6/25/02
4-Nitrophenol	ND	50		µg/L	1	6/25/02
Pentachlorophenol	ND	50		µg/L	1	6/25/02
Phenanthrene	ND	10		µg/L	1	6/25/02
Phenol	ND	10		µg/L	1	6/25/02
Pyrene	ND	10		µg/L	1	6/25/02
Pyridine	ND	10		µg/L	1	6/25/02
1,2,4-Trichlorobenzene	ND	10		µg/L	1	6/25/02
2,4,5-Trichlorophenol	ND	10		µg/L	1	6/25/02
2,4,6-Trichlorophenol	ND	10		µg/L	1	6/25/02
Surr: 2,4,6-Tribromophenol	60.0	16.6-115		%REC	1	6/25/02
Surr: 2-Fluorobiphenyl	58.0	37-95.7		%REC	1	6/25/02
Surr: 2-Fluorophenol	55.9	9.54-89.8		%REC	1	6/25/02
Surr: 4-Terphenyl-d14	51.1	20.8-81.7		%REC	1	6/25/02
Surr: Nitrobenzene-d5	65.2	38-106		%REC	1	6/25/02
Surr: Phenol-d6	40.8	10.7-63.4		%REC	1	6/25/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT

Method Blank

Sample ID: **MB-2107** Batch ID: **2107** Test Code: **SW8081** Units: **mg/Kg** Analysis Date: **7/4/02** Prep Date: **6/17/02**

Client ID: Run ID: **ECD(17A)_020703A** SeqNo: **114130**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4'-DDD	ND	0.0020									
4,4'-DDE	ND	0.0020									
4,4'-DDT	ND	0.0020									
Aldrin	ND	0.0020									
alpha-BHC	ND	0.0020									
beta-BHC	ND	0.0020									
Chlordane	ND	0.10									
delta-BHC	ND	0.0020									
Dieldrin	ND	0.0020									
Endosulfan I	ND	0.0020									
Endosulfan II	ND	0.0020									
Endosulfan sulfate	ND	0.0020									
Endrin	ND	0.0020									
Endrin aldehyde	ND	0.0020									
gamma-BHC	ND	0.0020									
Heptachlor	ND	0.0020									
Heptachlor epoxide	ND	0.0020									
Methoxychlor	ND	0.0020									
Toxaphene	ND	0.10									
Surr: Decachlorobiphenyl	98.33	0	100	0	98.3	70	130	0			
Surr: Tetrachloro-m-xylene	87.39	0	100	0	87.4	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-2126** Batch ID: **2126** Test Code: **SW8081** Units: **µg/L** Analysis Date: **7/4/02** Prep Date: **6/19/02**
Client ID: Run ID: **ECD(17A)_020703A** SeqNo: **114134**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4'-DDD	ND	0.040									
4,4'-DDE	ND	0.040									
4,4'-DDT	ND	0.040									
Aldrin	ND	0.040									
alpha-BHC	ND	0.040									
beta-BHC	ND	0.040									
Chlordane	ND	1.0									
delta-BHC	ND	0.040									
Dieldrin	ND	0.040									
Endosulfan I	ND	0.040									
Endosulfan II	ND	0.040									
Endosulfan sulfate	ND	0.040									
Endrin	ND	0.040									
Endrin aldehyde	ND	0.040									
gamma-BHC	ND	0.040									
Heptachlor	ND	0.040									
Heptachlor epoxide	ND	0.040									
Methoxychlor	ND	0.040									
Toxaphene	ND	1.0									
Surr: Decachlorobiphenyl	99.6	0	100	0	99.6	60.3	121	0			
Surr: Tetrachloro-m-xylene	82.96	0	100	0	83.0	44.7	97.9	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT
Method Blank

Sample ID: **mb-2123** Batch ID: **2123** Test Code: **SW8270A** Units: **mg/Kg** Analysis Date: **6/21/02** Prep Date: **6/18/02**
Client ID: Run ID: **ELMO_020624A** SeqNo: **111574**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.10									
Acenaphthylene	ND	0.10									
Aniline	ND	0.10									
Anthracene	ND	0.10									
Benz(a)anthracene	ND	0.10									
Benzidine	ND	0.20									
Benzo(a)pyrene	0.012	0.10									J
Benzo(b)fluoranthene	0.007	0.10									J
Benzo(g,h,i)perylene	ND	0.10									
Benzo(k)fluoranthene	ND	0.10									
Benzoic acid	ND	0.50									
Benzyl alcohol	ND	0.20									
Bis(2-chloroethoxy)methane	ND	0.10									
Bis(2-chloroethyl)ether	ND	0.10									
Bis(2-chloroisopropyl)ether	ND	0.10									
Bis(2-ethylhexyl)phthalate	ND	0.10									
4-Bromophenyl phenyl ether	ND	0.10									
Butyl benzyl phthalate	ND	0.10									
Carbazole	ND	0.10									
4-Chloro-3-methylphenol	ND	0.20									
4-Chloroaniline	ND	0.20									
2-Chloronaphthalene	ND	0.10									
2-Chlorophenol	ND	0.10									
4-Chlorophenyl phenyl ether	ND	0.10									
Chrysene	ND	0.10									
Di-n-butyl phthalate	0.1555	0.10									
Di-n-octyl phthalate	ND	0.10									
Dibenz(a,h)anthracene	0.02	0.10									J

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT
Method Blank

Dibenzofuran	ND	0.10	
1,2-Dichlorobenzene	ND	0.10	
1,3-Dichlorobenzene	ND	0.10	
1,4-Dichlorobenzene	ND	0.10	
3,3'-Dichlorobenzidine	ND	0.10	
Diethyl phthalate	ND	0.10	
Dimethyl phthalate	ND	0.10	
2,4-Dichlorophenol	ND	0.10	
2,4-Dimethylphenol	ND	0.10	
4,6-Dinitro-2-methylphenol	ND	0.50	
2,4-Dinitrophenol	ND	0.50	
2,4-Dinitrotoluene	ND	0.10	
2,6-Dinitrotoluene	ND	0.10	
Fluoranthene	ND	0.10	
Fluorene	ND	0.10	
Hexachlorobenzene	ND	0.10	
Hexachlorobutadiene	ND	0.10	
Hexachlorocyclopentadiene	ND	0.10	
Hexachloroethane	ND	0.10	
Indeno(1,2,3-cd)pyrene	0.0265	0.10	J
Isophorone	ND	0.10	
2-Methylnaphthalene	ND	0.10	
2-Methylphenol	ND	0.10	
4-Methylphenol	ND	0.10	
N-Nitrosodi-n-propylamine	ND	0.10	
N-Nitrosodiphenylamine	ND	0.10	
Naphthalene	ND	0.10	
2-Nitroaniline	ND	0.50	
3-Nitroaniline	ND	0.50	
4-Nitroaniline	ND	0.20	
Nitrobenzene	ND	0.10	
2-Nitrophenol	ND	0.10	
4-Nitrophenol	ND	0.10	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT

Method Blank

Pentachlorophenol	ND	0.50						
Phenanthrene	ND	0.10						
Phenol	ND	0.10						
Pyrene	ND	0.10						
Pyridine	ND	0.10						
1,2,4-Trichlorobenzene	ND	0.10						
2,4,5-Trichlorophenol	ND	0.10						
2,4,6-Trichlorophenol	ND	0.10						
Surr: 2,4,6-Tribromophenol	4.21	0	5	0	84.2	26	156	0
Surr: 2-Fluorobiphenyl	1.99	0	2.5	0	79.6	23.6	111	0
Surr: 2-Fluorophenol	4.316	0	5	0	86.3	21.5	107	0
Surr: 4-Terphenyl-d14	2.108	0	2.5	0	84.3	30	120	0
Surr: Nitrobenzene-d5	2.225	0	2.5	0	89.0	25.3	115	0
Surr: Phenol-d6	4.431	0	5	0	88.6	25.2	115	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-2127** Batch ID: **2127** Test Code: **SW8270B** Units: **µg/L** Analysis Date: **6/25/02** Prep Date: **6/19/02**
Client ID: Run ID: **ELMO_020625A** SeqNo: **112322**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	10									
Acenaphthylene	ND	10									
Aniline	ND	10									
Anthracene	ND	10									
Azobenzene	ND	10									
Benz(a)anthracene	ND	10									
Benzidine	ND	20									
Benzo(a)pyrene	ND	10									
Benzo(b)fluoranthene	ND	10									
Benzo(g,h,i)perylene	ND	10									
Benzo(k)fluoranthene	ND	10									
Benzoic acid	ND	50									
Benzyl alcohol	ND	20									
Bis(2-chloroethoxy)methane	ND	10									
Bis(2-chloroethyl)ether	ND	10									
Bis(2-chloroisopropyl)ether	ND	10									
Bis(2-ethylhexyl)phthalate	ND	10									
4-Bromophenyl phenyl ether	ND	10									
Butyl benzyl phthalate	ND	10									
Carbazole	ND	10									
4-Chloro-3-methylphenol	ND	20									
4-Chloroaniline	ND	20									
2-Chloronaphthalene	ND	10									
2-Chlorophenol	ND	10									
4-Chlorophenyl phenyl ether	ND	10									
Chrysene	ND	10									
Di-n-butyl phthalate	ND	10									
Di-n-octyl phthalate	ND	10									

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT
Method Blank

Dibenz(a,h)anthracene	ND	10
Dibenzofuran	ND	10
1,2-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
3,3'-Dichlorobenzidine	ND	10
Diethyl phthalate	ND	10
Dimethyl phthalate	ND	10
2,4-Dichlorophenol	ND	10
2,4-Dimethylphenol	ND	10
4,6-Dinitro-2-methylphenol	ND	50
2,4-Dinitrophenol	ND	50
2,4-Dinitrotoluene	ND	10
2,6-Dinitrotoluene	ND	10
Fluoranthene	ND	10
Fluorene	ND	10
Hexachlorobenzene	ND	10
Hexachlorobutadiene	ND	10
Hexachlorocyclopentadiene	ND	10
Hexachloroethane	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Isophorone	ND	10
2-Methylnaphthalene	ND	10
2-Methylphenol	ND	10
4-Methylphenol	ND	10
N-Nitrosodi-n-propylamine	ND	10
N-Nitrosodiphenylamine	ND	10
Naphthalene	ND	10
2-Nitroaniline	ND	50
3-Nitroaniline	ND	50
4-Nitroaniline	ND	20
Nitrobenzene	ND	10
2-Nitrophenol	ND	10

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT

Method Blank

4-Nitrophenol	ND	50						
Pentachlorophenol	ND	50						
Phenanthrene	ND	10						
Phenol	ND	10						
Pyrene	ND	10						
Pyridine	ND	10						
1,2,4-Trichlorobenzene	ND	10						
2,4,5-Trichlorophenol	ND	10						
2,4,6-Trichlorophenol	ND	10						
Surr: 2,4,6-Tribromophenol	82.24	0	200	0	41.1	16.6	115	0
Surr: 2-Fluorobiphenyl	52.6	0	100	0	52.6	37	95.7	0
Surr: 2-Fluorophenol	44.92	0	200	0	22.5	9.54	89.8	0
Surr: 4-Terphenyl-d14	50.28	0	100	0	50.3	20.8	81.7	0
Surr: Nitrobenzene-d5	62.18	0	100	0	62.2	38	106	0
Surr: Phenol-d6	66.72	0	200	0	33.4	10.7	63.4	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0206070-03ams** Batch ID: **2123** Test Code: **SW8270A** Units: **mg/Kg** Analysis Date: **6/24/02** Prep Date: **6/18/02**

Client ID: **S-1 Philips** Run ID: **ELMO_020624B** SeqNo: **111877**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	2.19	1.0	2.5	0	87.6	45	110	0			
4-Chloro-3-methylphenol	2.522	2.0	5	0	50.4	45	110	0			
2-Chlorophenol	3.89	1.0	5	0	77.8	45	110	0			
1,4-Dichlorobenzene	2.06	1.0	2.5	0	82.4	45	110	0			
2,4-Dinitrotoluene	0.975	1.0	2.5	0	39.0	45	110	0			JS
N-Nitrosodi-n-propylamine	1.86	1.0	2.5	0	74.4	45	110	0			
4-Nitrophenol	1.58	1.0	5	0	31.6	45	110	0			S
Pentachlorophenol	1.895	5.0	5	0	37.9	45	110	0			JS
Phenol	3.5	1.0	5	0	70.0	45	110	0			
Pyrene	3.115	1.0	2.5	1.03	83.4	45	110	0			
1,2,4-Trichlorobenzene	1.905	1.0	2.5	0	76.2	45	110	0			
Surr: 2,4,6-Tribromophenol	3.035	0	5	0	60.7	26	156	0			
Surr: 2-Fluorobiphenyl	1.98	0	2.5	0	79.2	23.6	111	0			
Surr: 2-Fluorophenol	3.48	0	5	0	69.6	21.5	107	0			
Surr: 4-Terphenyl-d14	3.03	0	2.5	0	121	30	220	0			
Surr: Nitrobenzene-d5	1.72	0	2.5	0	68.8	25.3	115	0			
Surr: Phenol-d6	3.705	0	5	0	74.1	25.2	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID: **0206070-03amsd** Batch ID: **2123** Test Code: **SW8270A** Units: **mg/Kg** Analysis Date: **6/24/02** Prep Date: **6/18/02**

Client ID: **S-1 Philips** Run ID: **ELMO_020624B** SeqNo: **111880**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1.995	1.0	2.5	0	79.8	45	110	2.19	9.32	25	
4-Chloro-3-methylphenol	2.395	2.0	5	0	47.9	45	110	2.522	5.17	25	
2-Chlorophenol	3.165	1.0	5	0	63.3	45	110	3.89	20.6	25	
1,4-Dichlorobenzene	1.73	1.0	2.5	0	69.2	45	110	2.06	17.4	25	
2,4-Dinitrotoluene	0.91	1.0	2.5	0	36.4	45	110	0.975	0	25	JS
N-Nitrosodi-n-propylamine	1.68	1.0	2.5	0	67.2	45	110	1.86	10.2	25	
4-Nitrophenol	1.24	1.0	5	0	24.8	45	110	1.58	24.1	25	S
Pentachlorophenol	1.29	5.0	2	0	64.5	45	110	1.895	0	25	J
Phenol	3.11	1.0	5	0	62.2	45	110	3.5	11.8	25	
Pyrene	3.045	1.0	2.5	1.03	80.6	45	110	3.115	2.27	25	
1,2,4-Trichlorobenzene	1.815	1.0	2.5	0	72.6	45	110	1.905	4.84	25	
Surr: 2,4,6-Tribromophenol	2.505	0	5	0	50.1	26	156	3.035	19.1	0	
Surr: 2-Fluorobiphenyl	1.805	0	2.5	0	72.2	23.6	111	1.98	9.25	0	
Surr: 2-Fluorophenol	3.015	0	5	0	60.3	21.5	107	3.48	14.3	0	
Surr: 4-Terphenyl-d14	2.805	0	2.5	0	112	30	220	3.03	7.71	0	
Surr: Nitrobenzene-d5	1.405	0	2.5	0	56.2	25.3	115	1.72	20.2	0	
Surr: Phenol-d6	3.275	0	5	0	65.5	25.2	115	3.705	12.3	0	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory

Date: *08-Jul-02*

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-2107** Batch ID: **2107** Test Code: **SW8081** Units: **mg/Kg** Analysis Date: **7/4/02** Prep Date: **6/17/02**

Client ID: Run ID: **ECD(17A)_020703A** SeqNo: **114129**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4'-DDT	0.026	0.0020	0.025	0	104	70	130	0			
Aldrin	0.0199	0.0020	0.025	0	79.6	70	130	0			
Dieldrin	0.0222	0.0020	0.025	0	88.8	70	130	0			
Endrin	0.0217	0.0020	0.025	0	86.8	70	130	0			
gamma-BHC	0.0208	0.0020	0.025	0	83.2	70	130	0			
Heptachlor	0.0215	0.0020	0.025	0	86.0	70	130	0			

Sample ID: **LCS-2126** Batch ID: **2126** Test Code: **SW8081** Units: **µg/L** Analysis Date: **7/4/02** Prep Date: **6/19/02**

Client ID: Run ID: **ECD(17A)_020703A** SeqNo: **114132**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4'-DDT	0.575	0.040	1	0	57.5	65	108	0			S
Aldrin	0.675	0.040	1	0	67.5	65	108	0			
Dieldrin	0.86	0.040	1	0	86.0	65	108	0			
Endrin	0.945	0.040	1	0	94.5	65	108	0			
gamma-BHC	0.807	0.040	1	0	80.7	65	108	0			
Heptachlor	0.724	0.040	1	0	72.4	65	108	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID: **LCSD-2126** Batch ID: **2126** Test Code: **SW8081** Units: **µg/L** Analysis Date: **7/4/02** Prep Date: **6/19/02**

Client ID: Run ID: **ECD(17A)_020703A** SeqNo: **114133**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	0.524	0.040	1	0	52.4	65	108	0.575	9.28	18	S
Aldrin	0.71	0.040	1	0	71.0	65	108	0.675	5.05	18	
Dieldrin	0.834	0.040	1	0	83.4	65	108	0.86	3.07	18	
Endrin	0.906	0.040	1	0	90.6	65	108	0.945	4.21	18	
gamma-BHC	0.832	0.040	1	0	83.2	65	108	0.807	3.05	18	
Heptachlor	0.753	0.040	1	0	75.3	65	108	0.724	3.93	18	

Sample ID: **lcs-2123** Batch ID: **2123** Test Code: **SW8270A** Units: **mg/Kg** Analysis Date: **6/21/02** Prep Date: **6/18/02**

Client ID: Run ID: **ELMO_020624A** SeqNo: **111693**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1.441	0.10	2.5	0	57.6	45	110	0			
4-Chloro-3-methylphenol	2.755	0.20	5	0	55.1	45	110	0			
2-Chlorophenol	2.839	0.10	5	0	56.8	45	110	0			
1,4-Dichlorobenzene	1.388	0.10	2.5	0	55.5	45	110	0			
2,4-Dinitrotoluene	1.389	0.10	2.5	0	55.6	45	110	0			
N-Nitrosodi-n-propylamine	1.384	0.10	2.5	0	55.4	45	110	0			
4-Nitrophenol	2.821	0.10	5	0	56.4	45	110	0			
Pentachlorophenol	2.646	0.50	5	0	52.9	45	110	0			
Phenol	2.64	0.10	5	0	52.8	45	110	0			
Pyrene	1.571	0.10	2.5	0	62.8	45	110	0			
1,2,4-Trichlorobenzene	1.447	0.10	2.5	0	57.9	45	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: CH2M Hill
Work Order: 0206070
Project: Philips

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-2127** Batch ID: **2127** Test Code: **SW8270B** Units: **µg/L** Analysis Date: **6/25/02** Prep Date: **6/19/02**

Client ID: Run ID: **ELMO_020625A** SeqNo: **112323**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	61.62	10	100	0	61.6	43.1	89.9	0			
4-Chloro-3-methylphenol	120.5	20	200	0	60.3	44.1	93.2	0			
2-Chlorophenol	132	10	200	0	66.0	20.7	98	0			
1,4-Dichlorobenzene	51.16	10	100	0	51.2	24.1	90.7	0			
2,4-Dinitrotoluene	66.72	10	100	0	66.7	43.2	101	0			
N-Nitrosodi-n-propylamine	60.9	10	100	0	60.9	44.6	99.9	0			
4-Nitrophenol	79.14	50	200	0	39.6	11.8	60.1	0			
Pentachlorophenol	109.9	50	200	0	55.0	8.65	105	0			
Phenol	89.64	10	200	0	44.8	21.1	55.3	0			
Pyrene	74.6	10	100	0	74.6	35.7	111	0			
1,2,4-Trichlorobenzene	52.86	10	100	0	52.9	30.2	89.6	0			

Sample ID: **LCSD-2127** Batch ID: **2127** Test Code: **SW8270B** Units: **µg/L** Analysis Date: **6/25/02** Prep Date: **6/19/02**

Client ID: Run ID: **ELMO_020625A** SeqNo: **112324**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	66.54	10	100	0	66.5	43.1	89.9	61.62	7.68	30.5	
4-Chloro-3-methylphenol	132	20	200	0	66.0	44.1	93.2	120.5	9.06	28.6	
2-Chlorophenol	145.2	10	200	0	72.6	20.7	98	132	9.55	107	
1,4-Dichlorobenzene	55.4	10	100	0	55.4	24.1	90.7	51.16	7.96	62.1	
2,4-Dinitrotoluene	70	10	100	0	70.0	43.2	101	66.72	4.80	14.7	
N-Nitrosodi-n-propylamine	69.5	10	100	0	69.5	44.6	99.9	60.9	13.2	30.3	
4-Nitrophenol	86.62	50	200	0	43.3	11.8	60.1	79.14	9.03	36.3	
Pentachlorophenol	117	50	200	0	58.5	8.65	105	109.9	6.27	49	
Phenol	96.46	10	200	0	48.2	21.1	55.3	89.64	7.33	52.4	
Pyrene	74.16	10	100	0	74.2	35.7	111	74.6	0.592	16.3	
1,2,4-Trichlorobenzene	52.48	10	100	0	52.5	30.2	89.6	52.86	0.721	36.4	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
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Phone #: 884-5600

Fax #:

Project Name: Philips

Project #: David Paulson Philips

Project Manager: Sharon Minchak

Sampler: Celina Salazar

Samples Cold?: ☑ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HCl		HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B MOD (Gas/Diesel)	TPH (Method 418.1)	Volatiles Full List (8021)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Cations (Na, K, Ca, Mg)	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260 (VOA)	8270 (Semi-VOA)	Pesticide 8080		Air Bubbles or Headspace (Y or N)
6/12/02	11:30	Soil	S-4 Philips	1				0206076-1														X	X		
6/12/02	11:30	Soil	S-4 Philips DUP	1				-2														X	X		
6/12/02	12:15	Soil	S-1 Philips	1				-3														X	X		
6/12/02	11:00	Soil	S-5 Philips	1				-4														X	X		
6/12/02	11:45	Soil	S-3 Philips	1				-5														X	X		
6/12/02	12:00	Soil	S-2 Philips	1				-6														X	X		
6/12/02	12:30	Water	Philips Equipment rinsate	1				-7														X	X		

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
6/12/02	1245	Celina Salazar	Chase Thomas 6/12/02 1245
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: INVOICE Philips Semiconductor
per CS / 6/13/02 AT

Appendix E.
One-Mile Radius Groundwater Well Search
From RFI Work Plan, September 1999

Table 2-13. Wells Within 1-Mile Radius of the Former Coronado Municipal Landfill

Well Location Number	State Engineer Record Number	Location [a]	Year Drilled	Total Depth (feet bgs) [b]	Screen Interval (feet bgs) [b]	Use	Groundwater Flow Relative to Site [c]	Approximate Distance from Site (feet)
1	RG46860	T11N R3E Sec.1 310	1987	NA	NA	Residential	Upgradient	5,250 N
2	RG42744	T11N R3E Sec.1 310	1984	270	260-270	Community	Upgradient	5,000 N
3	RG60927	T11N R4E Sec.7 133	1994	720	710-720	Residential	Transgradient	4,100 NE
4	RG60928	T11N R4E Sec.7 134	1994	659	649-659	Residential	Transgradient	4,900 NE
5	RG60932	T11N R4E Sec.7 143	1994	651	641-651	Residential	Transgradient	5,250 NE
6	RG69117	T11N R4E Sec.7 311	1998	625	595-625	Residential	Transgradient	5,250 NE
7	RG63096	T11N R4E Sec.7 312	1995	625	580-620	Residential	Transgradient	5,250 NE
8	RG60443	T11N R4E Sec.7 321	1994	600	560-600	Residential	Transgradient	5,280 NE
9	RG03813 2	T11N R3E Sec.12 230	1969	NA	NA	NA	Transgradient	2,750 NE
10	RG00055-B-S	T11N R3E Sec.12 230	1969	NA	NA	NA	Transgradient	2,750 NE
11	RG03813	T11N R3E Sec.12 230	1969	NA	NA	NA	Transgradient	2,750 NE
12	RG32551-EXPL-1	T11N R3E Sec.12 430	1979	662	None	Exploration	Downgradient	1,250 E
13	RG32551 EXPL	T11N R3E Sec.12 430	1980	550	510-550	Exploration	Downgradient	1,250 E
14 [d]	RG46215	T11N R3E Sec.11	1986	NA	NA	Residential	Upgradient	NA
15 [d]	RG03399	T11N R3E Sec.11	1959	NA	NA	Residential	Upgradient	NA
16 [d]	RG28983	T11N R3E Sec.11	1977	NA	NA	Residential	Upgradient	NA
17 [d]	RG59047	T11N R3E Sec.11	1994	80	70-80	Residential	Upgradient	NA
18 [d]	RG43061	T11N R3E Sec.11	1985	NA	NA	Residential	Upgradient	NA
19	RG00929	T11N R3E Sec.11 130	1957	NA	NA	Residential	Upgradient	5,500 NW
20	RG68356	T11N R3E Sec.11 131	1997	250	238-250	Residential	Upgradient	5,700 NW
21	RG68355	T11N R3E Sec.11 131	1997	250	238-250	Residential	Upgradient	5,700 NW
22	RG61952	T11N R3E Sec.11 131	1995	120	?-120	Residential	Upgradient	5,800 NW
23	RG15018	T11N R3E Sec.11 311	1967	NA	NA	Residential	Upgradient	5,750 NW
24	RG15014	T11N R3E Sec.11 311	1967	NA	NA	Residential	Upgradient	5,650 NW
25	RG25528	T11N R3E Sec.11 313	1974	NA	NA	Residential	Upgradient	5,600 W
26	RG13102	T11N R3E Sec.11 331	1965	NA	NA	Residential	Upgradient	5,600 W
27	RG04479	T11N R3E Sec.11 334	1963	NA	NA	Commercial	Upgradient	4,750 W
28	RG04481	T11N R3E Sec.11 334	1963	NA	NA	Irrigation	Upgradient	4,750 W
29	RG04482	T11N R3E Sec.11 431	NA	NA	NA	Commercial	Upgradient	3,000 W
30 [d]	RG36315	T11N R3E Sec.13	1983	NA	NA	Commercial	Downgradient	NA
31 [d]	RG23972	T11N R3E Sec.13	1973	NA	NA	Irrigation/commercial	Downgradient	NA
32d [d]	RG27832	T11N R3E Sec.13	1976	NA	NA	Residential	Downgradient	NA
33	RG54723	T11N R3E Sec.13 232	1991	NA	NA	Residential	Downgradient	2,750 SE
34	RG00055-A-5	T11N R3E Sec.13 333	1998	NA	NA	Commercial	Downgradient	3,750 S
35	RG62070	T11N R3E Sec.13 434	1996	NA	NA	Residential	Downgradient	5,500 SE

Table 2-13. Wells Within 1-Mile Radius of the Former Coronado Municipal Landfill, continued

Well Location Number	State Engineer Record Number	Location [a]	Year Drilled	Total Depth (feet bgs) [b]	Screen Interval (feet bgs) [b]	Use	Groundwater Flow Relative to Site [c]	Approximate Distance from Site (feet)
36	RG64425	T11N R4E Sec.18 113	1996	NA	NA	Residential	Downgradient	4,150 SE
37	RG64071	T11N R4E Sec.18 133	1996	NA	NA	Residential	Downgradient	4,750 SE
38	RG54882	T11N R4E Sec.18 134	1992	NA	NA	Residential	Downgradient	5,000 SE
39	NA	T11N R3E Sec.12 444	NA	NA	NA	Irrigation/commercial	Downgradient	3,250 E

[a] Well location obtained from the New Mexico Environment Department, 1996, Letter from D. Conover to R. Abitz, New Mexico Environmental Department, Santa Fe, New Mexico. Monitoring wells are not required to be registered with the New Mexico State Engineer.
[b] Well depth and screen interval taken from New Mexico State Engineer Well Records. Total depth and screen intervals are not available for missing records.
[c] Groundwater flow relative to contours shown on Figure 2-6.
[d] Exact well location was not provided in legal description provided by the New Mexico State Engineer and is not plotted on Figure 4-1.

Note:
The location numbering system for the wells summarized in Table 4-1 is based on the State of New Mexico identification system as employed by the State Engineer Office. A number designates a well and locates its position to the nearest 10-ac tract in the land network (Table 4-1 and Figure 4-1). The location number is divided into four segments. The first segment denotes the township north or south of the New Mexico base line, the second segment indicates the range east or west of the New Mexico principal meridian, the third segment indicates the number of the section within the township, and the fourth segment indicates the 10-ac tract in which the well is situated. A section is divided into four quarters, with the first digit of the fourth segment indicating the quarter section (e.g., 2 indicates the northeast quarter section). Similarly, the quarter section is divided into four 40-ac tracts and numbered in the same manner, with the second digit of the fourth segment denoting the 40-ac tract of interest. The 40-ac tracts are divided into four 10-ac tracts, with the third digit of the fourth segment denoting the 10-ac tract. For example, well location number T11N R3E Sec.12 114 indicates the well is in the southeast 10-ac quarter of the northwest 40-ac quarter of the northwest quarter of Section 12, Township 11 North, Range 3 East.

E = East.
N = North.
NA = Not available.
NE = Northeast.
NW = Northwest.
R = Range.
S = South.
SE = Southeast.
Sec. = Section.
T = Township.
W = West.

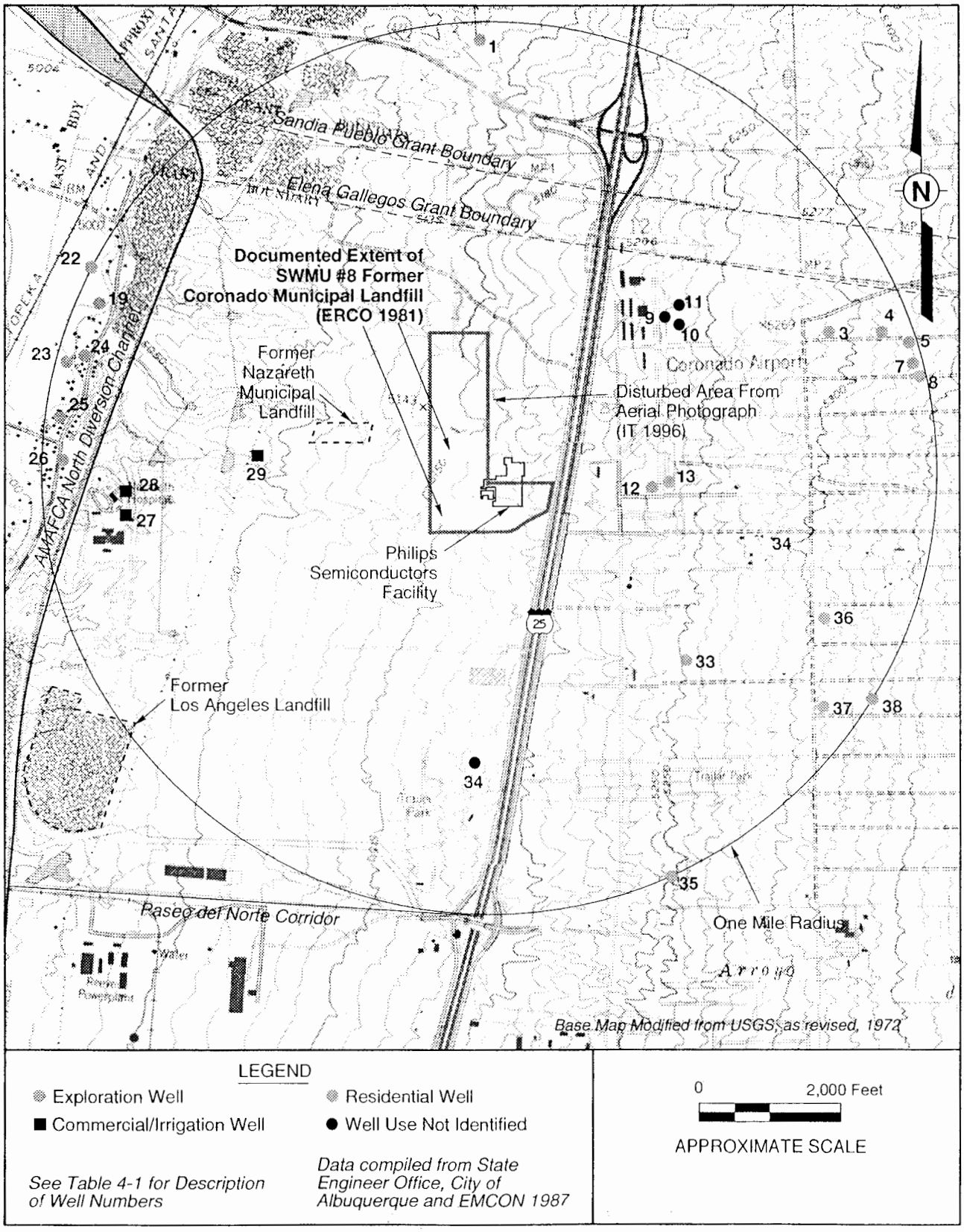

Figure E-1

Location of Recorded Groundwater Wells within One-Mile Radius of SWMU #8, Former Coronado Municipal Landfill