UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

MAR 12 1996

Ms. Stephanie Kruse
New Mexico Environment Department
2044A Galisteo Street
Santa Fe, NM 87505

Dear Stephanie:

Enclosed please find a copy of the Administrative Record for the Philips Semiconductors permit modification. The Administrative Record is divided into exhibits which are separated by dividers. EPA supplies only "tabless" dividers, so you may want to insert new dividers later. If you have any questions about the Administrative Record, please feel free to call me at (214) 665-6650.

Sincerely yours,

Nancy R. Morlock
Environmental Engineer

Enclosure

RECEIVED
MAR 18 1996

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 100% Recycled Paper (40% Postconsumer)

ADMINISTRATIVE RECORD INDEX
PHILIPS SEMICONDUCTORS, INC.
PERMIT MODIFICATION

REFERENCES FOR THE PROPOSED PERMIT MODIFICATION

Exhibit A-1	(May 18, 1981 correspondence from Signetics/Philips concerning discovery of abandoned landfill)
Exhibit A-2	(July 6, 1981 correspondence from EPA concerning deadline extension request)
Exhibit A-3	(April 11, 1985 record of communication)
Exhibit A-4	(May 22, 1985 Information Regarding Potential Releases from Solid Waste Management Units, completed by Signetics/Philips)
Exhibit A-5	(May 22, 1985 EPA review of Solid Waste Management Units)
Exhibit A-6	(September 23, 1985 Preliminary Assessment Facility Checklist, completed by EPA)
Exhibit A-7	(April 1, 1986 Hazardous Waste Management Permit)
Exhibit A-8	(June 1987 Baseline Ground-Water Investigation report prepared for Signetics/Philips)
Exhibit A-9	(October 26, 1992 RCRA Facility Assessment Report)
Exhibit A-10	(December 29, 1992 Corrective Action Stabilization Questionnaire, completed by EPA)
Exhibit A-11	(April 16, 1993 correspondence from Philips regarding proposed permit modification)
Exhibit A-12	(April 26, 1993 Site Inspection Report, prepared for EPA by Fluor Daniel, Inc.)
Exhibit A-13	(July 21, 1994 correspondence from Philips concerning current groundwater monitoring results)
Exhibit A-14	(August 8, 1994 correspondence from EPA requesting ground water level data)
Exhibit A-15	(August 16, 1994 correspondence from Philips concerning monitoring well water depths)
Exhibit A-16	(Monitoring well contaminant level graphs submitted by Philips)
Exhibit A-17	(Summary of Analytical Data, 9/19/88 through 3/16/94, prepared by EPA)

Exhibit A-18	(April 24, 1995 notification of proposed permit modification)
Exhibit A-19	(Modified Hazardous Waste Management Permit; Public Notice; and Fact Sheet)
Exhibit B-1	(The Merck Index, Tenth Addition, 1983, pages 1315, 1377, 1378)
Exhibit B-2	(Public Notice of Draft Permit; Public Notice of Final Permit; Response to Comments; Statement of Basis; Fact Sheet)
Exhibit B-3	(March 30, 1993 correspondence from Philips confirming April 5, 1993 meeting)
Exhibit B-4	(May 31, 1994 correspondence from Philips concerning possible conversion to 90-day accumulator status)

F:\USER\NMORLOCK\PHILIPS.IDX

Exhibit A-1

RECEIVED

MAY 21

EPA
REGION VI
OFFICE OF

II

signetics
a subsidiary of U.S. Philips Corporation

Signetics Corporation
P.O. Box
811 E. Arques Avenue
Sunnyvale, California
Telephone

May 18, 1981

Environmental Protection Agency
Region VI
1201 Elm Street
First International Building
Dallas, Texas 75270

Subject: Closure Post Closure Plans

Signetics Corporation
9201 Pan American Fwy.
P.O. Box 10272
Albuquerque, New Mexico 87184

Reference: Interim Permit - NMD 000709782

Good Morning:

The following is submitted to validate this request for an extension of due date for filing and completion of necessary documentation and plans required by Section 265 of FR33243 for subject site.

During excavation necessary for building construction, an abandoned land fill site was uncovered. Signetics immediately retained a Consultant, Energy Resource Company, INC (ERCO) to establish the history, extent, content, condition and to determine the environmental impacts, if any, of this discovered, abandoned fill site.

ERCO immediately became active at the site by:

A. Researching public and private records to determine:

1. Operational dates. (November 6, 1980 letter, from City of Albuquerque, stating that the landfill was closed in 1965 is attached.)

2. Known or suspected contents of material deposited.

3. Geological structure of site and nearby surrounding area.

RECEIVED

MAY 1981

4. Ground water and run off conditions.

5. Meterological Data.

6. Water sources, aquafiers and wells

B. Establishing and Supervising:

1. A site excavation program.

2. EP Toxicity analysis of samples gathered.

3. Disposal, under controlled conditions, of excavated material at local operating landfill site.

Data uncovered to date reveals only trace quantities of pesticides and metals. All levels measured are found to be below EP Toxicity levels. Geological conditions are still under investigation but indications exist that the site may overlay a clay barrier whose density will grossly inhibit transference of ground water to the known aquafier.

Since we cannot at this time categorically deny nor state that hazardous materials do or do not exist in this closed landfill site, we request extension of time necessary to prepare adequate, accurate closure and post closure plans and estimates.

Should data being gathered indicate or discover hazardous material then Signetics will place into operation, as required, any or a combination of any or all of the following:

1. A ground water monitoring program.

2. An air sampling and monitoring program.

3. A program designed to excavate, sample, analyze and perform planned, controlled disposal of evacuated material in accordance with existing regulations.

At the completion of existing ongoing tests and data gathering and should the conclusions indicate it is warranted, then a Closure/Post Closure Plan considering the following steps will be detailed and instituted.

Closure Plan for facility covered by Interim Permit #NMD 000709782

Plan will include

Description of closure of the facility

Maximum waste inventory

Decontamination procedures

Facility Closure schedule

Underground tanks or containments will be removed and replaced with Virgin fill as required.

EPA will be notified if plan is amended or altered

Notification will occur at least 180 days prior to closure of the facility

No material will be accepted after 90 days prior to closure of the facility

Closure will be completed in 180 days

Post Closure Plan for facility covered by Interim Permit #NMD 000709782

Care must be for 30 years after closure of the facility

Plan will include

Ground water monitoring, if applicable

Air monitoring, if applicable

Maintenance and monitoring of any containment

Period of care will be as determined by EPA/State

Security as required

No use of land will be allowed which would expose waste or damage any containment system

Thank you for your understanding of the situation and granting of the necessary extension.

Cordially yours,

Alan D. Selditch
Manager, Environmental Affairs Group

ADS:kc

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
David Rusk

November 6, 1980

Mr. James E. Stokes, Manager
Corporate Facilities
Signetics Corporation
811 East Arques Avenue
Sunnyvale, California 94086

Dear Mr. Stokes:

This letter is provided at this request of Sigretics Corporation. It confirms that the city waste disposal site formally used by the City of Albuquerque on land now owned by Signetics Corporation was officially opened in 1963 and closed in 1965

Signed by:

Montrose G. Simms
Assistant Director
Finance & Management Department
City of Albuquerque

Signed by:

Abe Montano
Solid Waste Systems Manager
Refuse Division
City of Albuquerque

With the authorization of:

James C. Jaramillo
Chief Administrative Officer
City of Albuquerque

With the authorization of:

Jack Scott, Director
Department of Services
City of Albuquerque

Exhibit A-2

Jun 1981

Alan D. Selditch, Manager
Environmental Affairs Group
Signetics Corporation
P.O. Box 9052
811 E. Arques Avenue
Sunnyvale, California 94086

Dear Mr. Selditch:

In correspondence with the U.S. Environmental Protection Agency (EPA), Region 6, dated May 18, 1981, Signetics Corporation requested an extension of the due date for closure and post-closure plans to be filed at their facility,EPA I.D.# 000709782. As specified by 40 CFR §265, Subpart G, an interim status facility was required to have such plans on site on May 19, 1981. As stated in Signetics Corporation's letter, this extension is necessary to complete an ongoing site study to assess whether or not an abandoned landfill, uncovered during site evacuation, contains hazardous waste. In a phone conversation with Mr. Ed Nalepka, of my staff, you stipulated an extension date to March 1, 1982. The EPA is unable to approve this request at this time for the following reasons:

In reviewing Signetics Corporation's facility file pursuant totthis request a question developed as to whether or not this facility qualifies as being in existance on November 19, 1980. The criteria for an existing facility is outlined in 40 CFR §260.10 and §122.3 as amended January 9, 1981, FR Vol. 46, No. 6. Those requirements necessary for an existing facility to qualify for interim status can be found in 40 CFR §122.23

The EPA has reviewed the site inspection report conducted on December 3, 1980, at Signetics Corporation's facility and Signetics Corporation's Part A application. The inspection report filed with the EPA states that this is a new plant currently under construction, only land clearing had been started. There was not a Signetics Corporation representative present at the time of the inspection to consult. In contract, the Part A application stated that this facility was in operation as of November 15, 1980. Until this discrepancy between these reports can be resolved we are unable to address the extension mentioned above. If Signetics Corporation files as a new facility all such plans have no specific filing deadline and are covered under 40 CFR §264, Subpart G. The section of concern in Subpart G, 264.112, states that closure and post-closure plans must be submitted with the permit application in accordance with 40 CFR, §122.25(a)(13). As a new facility no extension is necessary. However you must comply with 40 CFR §122.22(b), as amended on January 9, 1981, FR Vol. 46, No. 6.

6E-GR:ENalepka:mvr:x3274:06-17-81
Changes made 06-30-81:mvr

6EOGR
Olschewsky

Any questions you have in this matter can be directed to Ed Nalepka at 214/767-3274.

The abandoned landfill covered during excavation is of particular interest to the Uncontrolled Sites Program of the EPA. This section of the agency has the responsibility of locating and investigating abandoned waste sites to determine their hazard potential. This investigation (should a hazard exist at the site), includes the complete site characterization from reviewing all available site information and mapping of the site to sample gathering and analysis. From the information described in your letter of May 18, 1981, Signetics Corporation appears to be proceeding well in site characterization. We at the EPA would like to work with Signetics Corporation to complete this task and have this landfill properly catalogued. For further information concerning the Uncontrolled Site Program please contact Ms. Jo Johnson-Ballard, 214/767-3274.

In addition during our round one review, it was noted that the Part A application on file with the EPA is incomplete. On Form 3, page 4 of 5, Section VIII or IX (circled in red) needs to be completed. The Part A is enclosed so that you may complete this form and return it to the EPA, Region 6 office promptly.

We are looking forward to working with Signetics Corporation to resolve the above deficiencies in a quick and efficient manner. Please contact my staff for any assistance.

Sincerely,
ORIGINAL SIGNED BY

Robert B. Elliott
Chief, General Enforcement Branch (6E-G)

Enclosure

Exhibit A-3

RECORD OF COMMUNICATION

☒ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)

(Record of item checked above)

TO:	FROM:	DATE
Jamie Wright	Jerry McAuerdson Signetics Corp.	4-11-85
		TIME

SUBJECT

Status of Part B / draft permit

SUMMARY OF COMMUNICATION

Signetics had received a letter from Boyd Hamilton (NMEID) indicating that EPA was receiving a copy of their draft permit. Jerry wanted to know what kind of "review" we were going to do on it and why the permit was not issued. I informed Jerry that RCRA had been reauthorized and was amended, NMEID does not have the personnel or authority to implement the amendments. Therefore, it would be done by EPA. If NMEID had issued there permit it would not be a RCRA permit. EPA would be requesting the additional information within the next two weeks. When Signetics responded EPA would move toward re-public notice and issuance of a RCRA permit as quickly as possible. I asked about the city landfill cell which is/was on their property. Jerry indicated that the only cell on the property had been completely removed and the one EID was concerned about is not on Signetics property but adjacent to the property boundary.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES

Dave O.

EPA Form 1300-6 (7-72) REPLACES EPA HQ FORM 8300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

Exhibit A-4

NMD000709782
PART B

RECEIVED GAW-HT
MAY 22 1985

Attachment 5

RECEIVED
MAY 22 1985
HAZARDOUS MATERIALS BRANCH

Attachment 2

INFORMATION REGARDING POTENTIAL RELEASES FROM

SOLID WASTE MANAGEMENT UNITS

FACILITY NAME: Signetics Corporation

EPA I.D. NUMBER NMD000709782

LOCATION City Albuquerque

State New Mexico

1. Are there any of the following solid waste management units (existing or closed) at your facility?

	YES	NO
° Landfill		X
° Surface Impoundment		X
° Land Farm or Land Treatment		X
° Waste Pile		X
° Incinerator		X
° Storage Tank (Above Ground)	X	
° Storage Tank (Underground)		X
° Container Storage Area	X	
° Injection Wells		X
° Wastewater Treatment Units	X	
° Transfer Stations		X
° Waste Recycling Operations		X

2. If there are "Yes" answers to any of the items in Number 1 above, please provide a description of the wastes that were stored, treated or disposed of at any time in each unit. In particular, please focus on whether or not the wastes would be considered as hazardous wastes or hazardous constituents under RCRA. Also, include any available data on quantities or volumes of wastes disposed of and the dates of disposal. Please also provide a description of each unit and include capacity, dimensions, location at the facility, and provide a topographic map which has a scale drawing of the facility showing the location of the unit or units.

NOTE: Hazardous wastes are those identified in 40 CFR Part 261. Hazardous constituents are those listed in Appendix VIII of 40 CFR Part 261.

3. For the units noted above in Number 1, and also those hazardous waste units in your Part B application, please describe for each unit any data available on any prior or continuing releases of hazardous wastes or hazardous constituents to the environment that may have occurred in the past or still be occurring.

   Please provide the following information:

   a. Date of release
   b. Type of waste released
   c. Quantity or volume of waste released
   d. Describe nature of release (i.e., spill, overflow, ruptured pipe or tank, etc.)

4. In regard to the prior releases described above in Number 3, please provide (for each unit) any analytical data that may be available which would describe the nature and extent of environmental contamination of hazardous wastes or constituents present in contaminated soil or groundwater.

Signature and Certification

As with reports in RCRA Permit Applications, submittal of this information must contain the following certification and signature by a principal executive officer of at least the level of Vice President, or by a duly authorized representative of that person:

> I certify, under penalty of law, that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

J.R. McGerigle
Signature

John R. McGerigle, Plant Manager
Name and Title (Typed)

Signetics Corporation
NMD000709782
Albuquerque
New Mexico

1.	Storage Tank (Above Ground)	See RCRA Part B Application
	Container Storage Area	See RCRA Part B Application
	Wastewater Treatment Units	There were no units existing before the facility was built. The present wastewater units are not governed by RCRA per Environmental Improvement Division, State of New Mexico. Enclosed is a summary of the acid neutralization system installed at Signetics-Albuquerque.

2. None required.

3. There is no prior or continuing releases of hazardous waste.

4. There has been no environmental contamination of hazardous waste.

Exhibit A-5

NMD000709782

SOLID WASTE MANAGEMENT UNITS

Facility: Signetics Corp.

EPA I.D. Number: NMD000709782 II. B. 1.

CERCLA Number: —

Date of Review: 5-22-85 Revision No.: 0

Part B submitted: (Y) N
Date : 9-8-84
Status : Reviewed: ✓
Complete: ✓
Draft Permit: 2-15-85 State only
Other:

Closure Requested: Full: Y (N)
Partial: Y (N)

Closure Plan Submitted: Y (N) U
Post-Closure Plan Submitted: Y (N) U N/A

SWMU's: Conflicting Information:

None:
Information adequate: Y N
Certification Submitted: Y N date:
Part B Reviewed: Y N N/R
File Search: Y N

Yes: RW 9-23-85
No. of units: 15
Types: Hazardous: storage facility
Non-hazardous:
Unknown:
Information adequate: (Y) N U
IRP: Y N (N/A)
Status:
Releases: Y (N) U
Additional Information required/requested by: Date:

Evidence of contamination: NO

Date	Location	SWMU's	Characteristics	Remedial Action

Facility:
EPA I.D. Number:

Topographic Map: Submitted: Y N
Complete: Y N
All units included on map: Y N

Deficient Information:

Unit Addressed in Exposure Info: N/A

Preliminary Assessment: ~~N/A~~ N

Site Investigation: N

Attachments:

Facility:
EPA I.D. Number:

Summary:

Proceed with draft permit for storage facility

Have certification of SWMU's

Exhibit A-6

PRELIMINARY ASSESSMENT FACILITY CHECKLIST

Facility: Signetics Corporation Reviewer: Jamie Wright

EPA ID #: NMD000709782 Date: 9-23-85

HAZIT #: _____

Waste Management Units: (attach PA unit checklist for each unit)

1. RCRA Regulated Units (include status)
   Chemical Storage #2 - S01 3 5000 gallon tanks - S02
   Flammable Storage #4 - S01 2 fiberglass, 1 steel

2. Solid Waste Management Units (include status):
   elementary acid neutralization tank w/ discharge to municipal sewer.

Reviewed Documents :

1. RCRA: Part A ✓ Part B ✓ Draft Permit ✓

2. CERCLA: Notification NO date _____

   Mitre Model _____ date _____ HRS _____

   Remedial Investigation _____ date _____

   Feasibility Study _____ date _____

   Record of Decision _____ date _____

3. Inspection Reports: (Agency, date of inspection)
   9/9/82 RCRA - not operational - EPA

   Inspection of 4-24-85 - no violations RCRA - EID

4. Enforcement Actions: (Agency, date of action)
   ~~9/9/82 EPA RCRA~~
   EPA C.O. 9-20-82 RCRA ; closure insurance violations
   EPA C.O 9-16-83 RCRA closure / post-closure assurance violations

5. Exposure Information: N/A

6. Other Information: (Aerial photos, Federal/State Agencies, TSCA/OSHA/NPDES permits, local contractors, etc...)

Site Description:

See facility map Attachment 1

Manufacturer of integrated circuits

Waste Analysis - Attachment 3

Process Information - Attachment 4

SWMU's - Attachment E

Summary:

No problems have been discovered during RCRA inspection at the facility which indicate that prior releases may have occurred. The NHEID CERCLA staff verified in early 1985 that the old municipal landfill is not on Signetics - property and what was has been removed. No further action is necessary at this site.

Recommended Actions: (indicate all applicable)

1. No Further Action ✓
2. Site Investigation _____
3. Remedial Investigation _____
4. Corrective Action _____
5. Referral for Health Assessment _____

Attac next 1

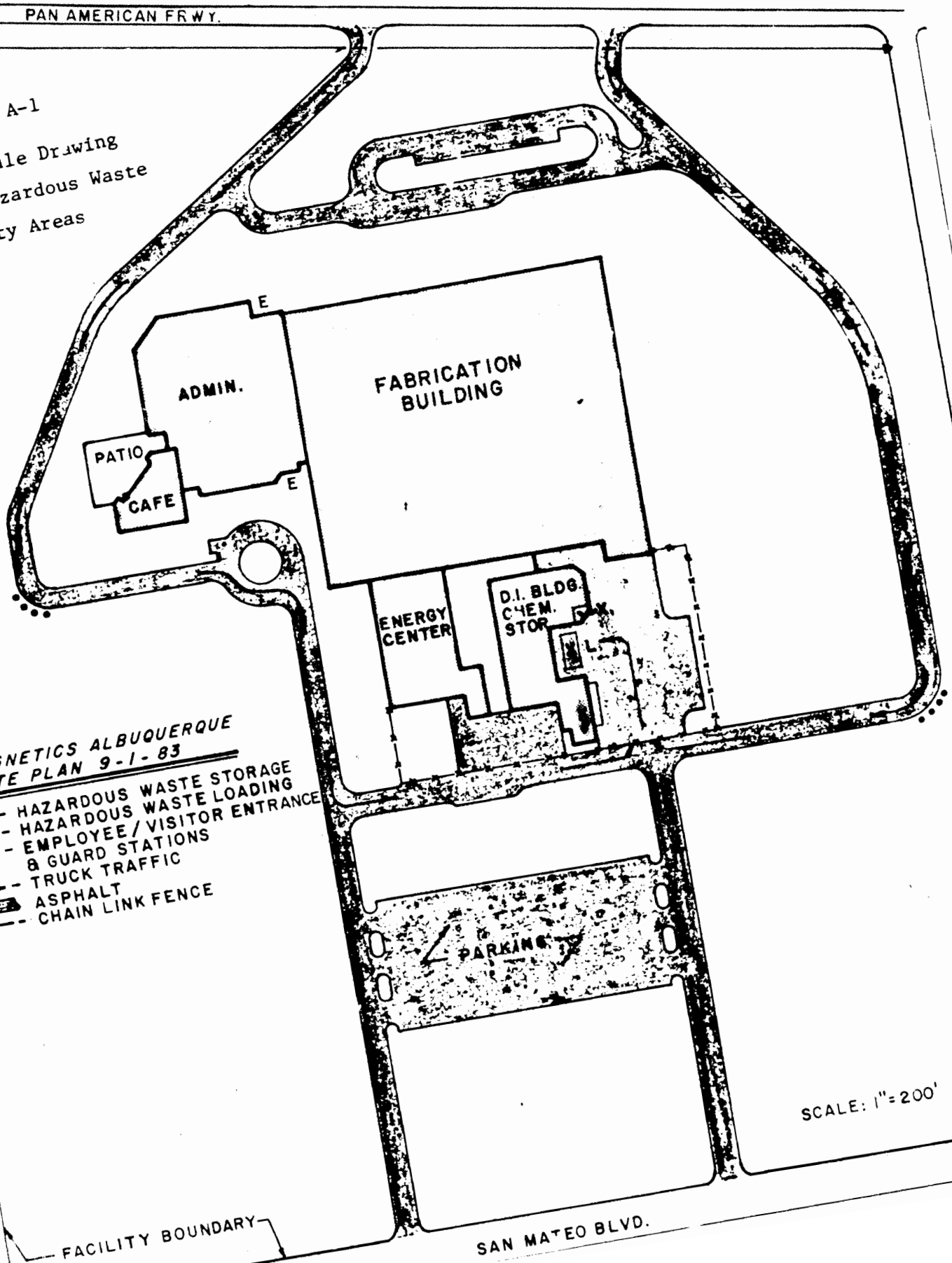
N

I-25 INTERSTATE FRWY

PAN AMERICAN FRWY.

EXHIBIT A-1

acility Scale Drawing
icating Hazardous Waste
Activity Areas



SIGNETICS ALBUQUERQUE
SITE PLAN 9-1-83

X - HAZARDOUS WASTE STORAGE
L - HAZARDOUS WASTE LOADING
E - EMPLOYEE / VISITOR ENTRANCE & GUARD STATIONS
TRUCK TRAFFIC
ASPHALT
CHAIN LINK FENCE

SCALE: 1" = 200'

Attachment 2

PRELIMINARY ASSESSMENT UNIT CHECKLIST

Unit: Chemical Storage #2

Reviewer: Jamie Wright

EPA #: NMD000709782

Date: 9/23/85

Hazit #: _____

Waste Management Unit: (include type and status)

X, on Facility Map, to be permitted for RCRA

1. RCRA: 55 gal. drum storage of solid waste contaminated with Hg or Arsenic Capacity 64 drums

2. SWMU:

Evidence of Release: (eg. sampling data, visual inspections, etc.)

No IE indicated during RI + inspections

Pollutant Dispersal Pathways: (groundwater, surface water, air)

Waste Characteristics: (type, quantity, fate, toxicity)

D004, D009 in 1984 had 2 drums of each, EP Toxic

Target Populations of Concern: (human, environment)

workers

Documents Reviewed:

Part A, Part B, draft permit

Summary:

The storage area has not had any problems in the past with releases as indicated by inspections. The area also meets the runon - runoff requirements of §264. What is stored is solid not liquid, therefore run off should not be a problem anyway. The area seems to indicate no prior problems and further action is not necessary

Recommended Actions: (indicate all applicable)

1. No Further Action ✓
2. Site Investigation _____
3. Remedial Investigation _____
4. Corrective Action _____
5. Referral for Health Assessment _____

PRELIMINARY ASSESSMENT UNIT CHECKLIST

Unit: Flammable Storage #4 Reviewer: Jamie Wright

EPA #: NMD000709782 Date: 9/23/85

Hazit #: _____

Waste Management Unit: (include type and status)

1. RCRA: X_3 on Facility Map, to be permitted
   55 gal. drum storage of ignitable waste, capacity - 36 drums
2. ~~SWMU~~:

Evidence of Release: (eg. sampling data, visual inspections, etc.)
None indicated on RCRA inspection reports

Pollutant Dispersal Pathways: (groundwater, surface water, air)
fire, explosion creating a fire fighting situation w/ runoff to soil if larger quantities of water are required and air if fire

Waste Characteristics: (type, quantity, fate, toxicity)
solvents, during 1984 had 15 drums, D001 and F003

Target Populations of Concern: (human, environment)
workers

Documents Reviewed:

Part A, Part B
draft permit

Summary:

The storage area has not had any problems in the past with releases as indicated by inspections. There is no indication of problems with operating and/or maintenance procedures indicated. The area meets any applicable non-runoff requirements of §264. The storage area seems to have no prior problems and further action is not necessary.

Recommended Actions: (indicate all applicable)

1. No Further Action ✓
2. Site Investigation _____
3. Remedial Investigation _____
4. Corrective Action _____
5. Referral for Health Assessment _____

PRELIMINARY ASSESSMENT UNIT CHECKLIST

Unit: Tank #3

Reviewer: Jamie Wright

EPA #: NMD000709782

Date: 9-23-85

Hazit #: _____

Waste Management Unit: (include type and status)

1. RCRA: 5000 gal tank, bought in 1982, supported vertically in an underground covered concrete vault which has been coated w/ a chemically-resistant resin, it is a steel tank, to be permitted for RCRA

2. ~~SWMU~~: located on facility map as X_2

Evidence of Release: (eg. sampling data. visual inspections, etc.)

None indicated from RCRA inspection

Pollutant Dispersal Pathways: (groundwater, surface water, air) air, if fire, if tank leaks, the concrete vault holds over 9000 gal. (192% of tank) the tank and the vault can easily be inspected, as part of the contingency plan the vault will be pumped out, the liner is compatable, no problems should occur unless the waste ignites and overflow of the vault results.

Waste Characteristics: (type, quantity, fate, toxicity)

Ignitable Solvent Waste. in 1984 generated approximately 40,000 gal., waste is pumped out and sent off-site to a TSD, waste is D001, F003

Target Populations of Concern: (human, environment)

workers.

Documents Reviewed:

Part A, Part B, draft permit

Summary:

No problems have been detected during inspections at the facility regarding releases or operating/maintenance procedures. No prior problems seem to have occurred and further action is not necessary.

Recommended Actions: (indicate all applicable)

1. No Further Action ✓
2. Site Investigation _____
3. Remedial Investigation _____
4. Corrective Action _____
5. Referral for Health Assessment _____

PRELIMINARY ASSESSMENT UNIT CHECKLIST

Unit: Tank # 4

Reviewer: James Wright

EPA #: NMD000709782

Date: 9-23-85

Hazit #: _____

Waste Management Unit: (include type and status)

1. RCRA: 5000 gal tank, boug + June 1982, supported vertically in underground concrete vault that has been ~~treated~~ coated w/ a chemically resistant resin, fiberglass tank to be permitted

2. SWMU: X_2 on Facility Map

Evidence of Release: (eg. sampling data. visual inspections, etc.)

None indicated from RCRA inspection.

Pollutant Dispersal Pathways: (groundwater, surface water, air)

Concrete vault holds over 9000 gal. (192% capacity of tank) little chance of overflow, liner is compatable

Waste Characteristics: (type, quantity, fate, toxicity)

Buffered Oxide Etch Waste: 1984 30,000 gal generated; approximately. D002, corrosive and toxic, waste is sent off-site to a TSD

Target Populations of Concern: (human, environment)

Workers

Documents Reviewed:

Part A, Part B, draft permit

Summary:

No problems have been detected during inspection at the facility regarding releases or operating/maintenance procedures. No prior problems seem to have occurred and further action is not necessary.

Recommended Actions: (indicate all applicable)

1. No Further Action ✓
2. Site Investigation _____
3. Remedial Investigation _____
4. Corrective Action _____
5. Referral for Health Assessment _____

PRELIMINARY ASSESSMENT UNIT CHECKLIST

Unit: Tank #5

Reviewer: Jane H Wright

EPA #: NMD000709782

Date: 9-23-85

Hazit #: _____

Waste Management Unit: (include type and status)

1. RCRA: 5000 gallon fiberglass tank supported vertically in an underground chemically-resistant concrete vault. x_2 on facility map, to be permitted

2. ~~SWMU~~:

Evidence of Release: (eg. sampling data, visual inspections, etc.)
None indicated in RCRA inspections

Pollutant Dispersal Pathways: (groundwater, surface water, air)
Concrete vault holds over 9000 gallons, little chance for overflow, liner is compatable.

Waste Characteristics: (type, quantity, fate, toxicity)
Hydrofluoric Acid Waste, 1984 approximate generation of 50,000 gal, corrosive and toxic, D002, waste sent off-site to a TSD.

Target Populations of Concern: (human, environment)
Workers

Documents Reviewed:

Part A, Part B, draft permit.

Summary:

No problems have been detected during inspections at the facility regarding releases [redacted] or operating/maintenance problems. No prior problems seem to have occurred and further action is not necessary.

Recommended Actions: (indicate all applicable)

1. No Further Action ✓
2. Site Investigation _____
3. Remedial Investigation _____
4. Corrective Action _____
5. Referral for Health Assessment _____

Exhibit A-7

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
HAZARDOUS WASTE MANAGEMENT PERMIT

PERMITTEE: Signetics Corporation

LOCATION: 9201 Pan American Freeway, N.E.

Albuquerque, New Mexico 87113

ID NUMBER: NMD000709782

PERMIT NUMBER: NMD000709782-1

EFFECTIVE DATE: April 1, 1986

EXPIRATION DATE: April 1, 1996

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6901, et seq.) and the Hazardous and Solid Waste Amendments of 1984 (HSWA), a permit is issued to Signetics Corporation (hereafter called the permittee) to operate a hazardous waste storage facility at the location stated above.

The permittee must comply with all the terms and conditions of this permit. This permit consists of the conditions contained herein (including the attachments). Applicable provisions are those which are in effect on the date of issuance of this permit. (See 40 CFR 270.32(c))

This permit is based in part on the provisions of Sections 206, 212, and 224 of HSWA which modified Sections 3004 and 3005 of RCRA. These require corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage, or disposal facility seeking a permit, regardless of the time at which the waste was placed in such unit and provide the authority to review and modify the permit at any time. This permit is also based on the assumption that all information contained in the permit application is accurate and that the facility will be operated as specified in the permit application. The permit application consists of information submitted on August 9, 1984 (and revised on February 4, 1985).

Any inaccuracies found in the information may be grounds for the termination or modification of this permit (see 40 CFR 270.41, 270.42, and 270.43) and potential enforcement action.

Issued this _____ day of _____

by _____
Dick Whittington, Regional Administrator

A. STANDARD

A.1 Effect of Permit.
The permittee is allowed to store hazardous waste in accordance with the conditions of this permit. Any treatment, storage, or disposal of any hazardous waste not authorized in this permit is prohibited. Any hazardous waste treatment, storage, or disposal process not authorized in this permit is prohibited. Compliance with this permit will be considered compliance, for purposes of enforcement, with Subtitle C of the Resource Conservation and Recovery Act (RCRA). A full RCRA permit consists of this permit which addresses the provisions of the Hazardous and Solid Waste Amendments of 1984 (HSWA) and the State of New Mexico permit which addresses the portion of the RCRA program for which the State is authorized. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Section 7003 of RCRA (42 U.S.C. 6973), Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq., commonly known as CERCLA), or any other law governing protection of public health or the environment.

.2 Permit Actions.
This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 270.41, 270.42, 270.43, and in HSWA Section 212. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the permittee, does not stay the applicability or enforceability of any permit condition. Review of any application for a permit renewal shall consider improvements in the state of control and measurement technology as well as changes in applicable regulations.

A.3 Duration of Permit.
This permit is effective for a period of ten (10) years unless terminated, revoked, or reissued.

A.4 Severability.
The provisions of this permit are severable. If any provision of this permit is held invalid, the remainder of this permit shall not be affected thereby. If the application of any provision of this permit is held invalid, the application of such provision to other circumstances shall not be affected thereby.

A.5 Duty to Comply.
The permittee shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit. Any permit noncompliance constitutes a violation of RCRA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application.

A.6 Duty to Reapply.
If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must submit a new application for a new permit at least one hundred eighty (180) days before this permit expires.

A.7 Permit Expiration.
This permit and all conditions herein will remain in effect beyond the permit's expiration date if the permittee has complied with condition A.6 and through no fault of the permittee, the Regional Administrator has not issued a new permit as set forth in 40 CFR 124.15.

A.8 Need To Halt Or Reduce Activity Not A Defense.
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

A.9 Duty to Mitigate.
In the event of noncompliance with this permit, the permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

A.10 Proper Operation and Maintenance.
The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, adequate spare parts inventory, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of a back-up or auxiliary facility or similar systems only when necessary to achieve compliance with the conditions of the permit.

A.11 Duty to Provide Information.
The permittee shall furnish to the Regional Administrator, within a reasonable time, any relevant information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this permit.

A.12 Inspection and Entry.
The permittee shall allow the Regional Administrator, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

(a) Enter at reasonable times upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(d) Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by RCRA, any substances or parameters at any location.

A.13 Retention of Records.
The permittee shall maintain records to show compliance with this permit for three (3) years after this permit is terminated or reissued. This time period is automatically extended during the course of any unresolved enforcement action. This time period may be extended at the request of the Regional Administrator at any time.

A.14 Notices of Planned Physical Facility Changes.
The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Physical alterations or additions shall include all hazardous and solid waste activities and underground tanks. Construction of new units may not begin until a permit or permit modification has been issued.

A.15 Anticipated Noncompliance.
The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

A.16 Transfer of Permits.
This permit may be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to 40 CFR 270.41(b)(2) or 270.42(d). Before transferring ownership or operation of the facility, the permittee shall notify the new owner or operator in writing of the requirements of 40 CFR 264 and 40 CFR 270.

A.17 Twenty-four Hour Reporting of Hazardous Noncompliance.
The permittee shall report to the Regional Administrator any noncompliance which may endanger human health or the environment. Any information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which must be reported orally within twenty-four (24) hours:

(a) Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

(b) Any information of a release or discharge of hazardous waste, or of a fire or explosion from the facility, which could threaten the environment or human health outside the facility. The description of the occurrence and its cause shall include:

(i) Name, address, and telephone number of the owner or operator;

(ii) Name, address, and telephone number of the facility;

(iii) Date, time, and type of incident;

(iv) Name and quantity of material(s) involved;

(v) The extent of injuries, if any;

(vi) An assessment of actual or potential hazard to the environment and human health outside the facility, where this is applicable; and

(vii) Estimated quantity and disposition of recovered material that resulted from the incident.

A.18 Follow-up Written Report of Hazardous Noncompliance.
A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance (including exact dates and times), and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee need not comply with the five day written notice requirement if the Regional Administrator waives that requirement and the permittee submits a written report within fifteen (15) days of the time the permittee becomes aware of the circumstances.

A.19 Other Noncompliance.
At the time monitoring reports are submitted, the permittee shall report all other instances of noncompliance not otherwise required to be reported. The reports shall contain the information listed in condition A.17.

A.20 Other Information.
Where the permittee becomes aware that he or she failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, the permittee shall promptly submit such facts or information. The term, "permit application", includes the information submitted on solid waste management units.

A.21 Signatory Requirement.
All reports or other information requested by the Regional Administrator shall be signed and certified according to 40 CFR 270.11.

B. SPECIFIC

B.1 Permitted Process Units.
The processs units include container storage area number four (4) which holds a maximum of 36 fifty-five (55) gallon containers, container storage area number two (2) which holds a maximum of 64 fifty-five (55) gallon containers, and three (3) 5,000 gallon tanks.

B.2 Waste Minimization.
The permittee shall certify annually by October 1 for the previous year ending August 31, that the permittee:

(a) Has a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the permittee's facility's operation to the degree determined to be economically practicable; and

(b) that the proposed method of treatment, storage, or disposal is that practicable method currently available to the permittee which minimizes the present and future threat to human health and the environment.

The certification is to be included in the operating record.

B.3 Dust Suppression.
The permittee shall comply with 40 CFR 266.23(b).

B.4 Solid Waste Management Units.
The permittee has determined that the facility contains no solid waste management units other than the RCRA regulated units identified in B.1. If the permittee becomes aware of any additional solid waste management unit, the permittee must:

(a) Immediately notify the Regional Administrator in accordance with condition A.20; and

(b) submit within forty-five (45) days of becoming aware of a solid waste management unit, preliminary assessment information for the solid waste management unit to determine if there has been or is currently a release from the unit. The permittee is to contact the Regional Administrator for guidance regarding the required information to be submitted. Based upon this information, the Regional Administrator will modify this permit as necessary.

B.5 Definitions.

(a) Release -
any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposal into the environment.

(b) Solid waste management unit -
any landfill, surface impoundment, waste pile, land treatment unit, incinerator, tank (including storage, treatment, and accumulation tanks), container storage units, injection wells, wastewater treatment units, elementary neutralization units, transfer stations, and recycling units that received solid or hazardous waste at any time.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

FEB 13 1986

Mr. John C. Peterson
FIeld Supervisor
Ecological Services, USFWS
U.S. Department of the Interior
Fish and Wildlife Service
P.O. Box 4487
Albuquerque, New Mexico 87196

Dear Mr. Peterson:

Thank you for your comments regarding the Environmental Protection Agency's (EPA's) portion of the Resource Conservation and Recovery Act (RCRA) permit for Signetics Corporation and McKesson Chemical Company both in Albuquerque, New Mexico. Enclosed are EPA's responses to all comments received during the comment period.

The State of New Mexico is authorized to operate a hazardous waste management program in lieu of the Federal program for those portions of RCRA in effect prior to the passage of the Hazardous and Solid Waste Amendments of 1984 (HSWA). HSWA imposes additional requirements on hazardous waste management facilities which will be administered and enforced by the EPA until the State of New Mexico receives additional authorization for these requirements. Therefore, both the EPA and the New Mexico Environmental Improvement Division (EID) must issue a permit to hazardous waste facilities. The EID announced its tentative decision to issue a permit to both facilities on February 11, 1985, and the EPA on November 24, 1985.

The Administrator of EPA Region 6 considered all comments made during the public comment period when making his decision to issue the EPA's portion of the final permit to McKesson Chemical Company and to Signetics Corporation. Enclosed, for your information, is a copy of the EPA's portion of the final permit for the storage of hazardous waste which will be issued to Signetics Corporation and McKesson Chemical Company.

Any commentor may petition the Administrator of EPA to review any condition of EPA's portion of the final RCRA permit for Signetics Corporation or McKesson Chemical if they believe that any condition of the permit is

6H-CP:WRIGHT:revisions by jb on 1/23/86:7/8941:DISK #3:FILE CODE:

CONCURRENCES

SYMBOL	6H-CP							
SURNAME	Rubin							
DATE								

EPA Form 1320-1 (12-70)

OFFICIAL FILE COPY

•U.S. GPO 1985-467-853

inappropriate or that EPA's decision to issue the final permit is inappropriate. Requests for such a review must be received on or before March 31, 1986, and should be sent to:

Office of the Administrator
Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

If you have any questions, please call me or Ms. Jamie Wright, of my staff, at (214) 767-8941.

Sincerely yours,

William N. Rhea, Chief
Hazardous Waste Compliance Branch

Enclosures

cc: Peter Pache
New Mexico Environmental Improvement
Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

FEB 13 1986

Enclosed, for your information, is the final Environmental Protection Agency (EPA), Region 6 portion of the Resource Conservation and Recovery Act (RCRA) permit for Signetics Corporation in Albuquerque. After considering all comments received by EPA regarding the draft permit, the Regional Administrator made a decision to issue EPA's portion of the final RCRA permit to the facility.

Exhibit A-8 copy

BASELINE GROUND-WATER INVESTIGATION
SIGNETICS CORPORATION
ALBUQUERQUE, NEW MEXICO

Prepared for

SIGNETICS CORPORATION

June 1987

Prepared by

EMCON Associates
1921 Ringwood Avenue
San Jose, California 95131

Project 377-16.01

FIELD AND LABORATORY PROCEDURES

FIELD PROCEDURES

Locations

Exploratory borings and wells were located with respect to the extent of waste fill as defined by ERCO (1981). One exploratory boring was placed within each of the defined fill areas (Borings EB-1 and EB-2). Two monitoring wells (MW-1 and MW-3) were placed outside former refuse areas and two monitoring wells (MW-2 and MW-4) were placed adjacent to them. Locations relative to existing site features are shown in Figure 2.

Drilling

Boreholes were drilled by air- and mud-rotary methods using a Gardener Denver rotary drilling rig equipped with 5-1/8- and 7-7/8-inch-diameter tricone bits. Before drilling commenced, the equipment was properly steam cleaned and the condition of the equipment was inspected by an EMCON geologist.

Exploratory Borings EB-1 and EB-2 were drilled with a 5-1/8-inch-diameter bit using air-rotary methods. The air compressor was fitted with a special filter to inhibit lubricants from entering the borehole. Monitoring Wells MW-1 through MW-4 were drilled with a 7-7/8-inch-diameter bit using air- and mud-rotary methods. Air was used in the upper portion of the hole. Mud was introduced to stabilize the hole at greater depths and to help lift and remove drilling cuttings. A pure bentonite mud mix was employed during drilling. A series of mud pits was constructed at each well location. Mud viscosity was monitored during drilling by using a Marsh funnel and controlled by adding pure bentonite or water. Water used during drilling and steam cleaning was obtained from the City of Albuquerque distribution system.

Drill rods, bits, casing, samplers, and pipe wrenches were cleaned and inspected so that all visible signs of contamination were removed. A vegetable-based grease was used for lubrication during drilling. A daily log of operations was maintained by an EMCON geologist throughout the drilling program.

Soil Sampling and Geologic Logging

Geologic logs are presented in Appendix A. Soil samples were logged in accordance with the Unified Soil Classification System. Samples of cuttings were obtained from the mud slurry at intervals of 5 to 10 feet for purposes of geologic logging. In addition, core and drive samples were collected for physical and chemical analysis and for geologic logging. Drive samples to be submitted for analysis of chemical and physical parameters were collected with a 2-inch I.D. split-spoon sampler equipped with brass liners. Samples submitted for chemical analysis were retained in the brass liner, covered by Teflon tape, and immediately stored on ice for shipment to the laboratory with appropriate chain-of-custody documentation.

Well Completion and Development

Well completion details, discussed below, are presented in Appendix A and summarized in Table 1. Following completion of drilling, the mud viscosity within the 7-7/8-inch-diameter borehole was reduced by adding water. Well casings consisting of 2-inch-diameter, flush-coupled, Schedule 40 polyvinyl chloride (PVC) pipe were then installed. Each monitoring well contains 30 feet of well screen consisting of 0.02-inch, machine-slotted PVC pipe. Sand pack consisting of clean CSSI 8x12 silica sand was tremmied into the annular spacing to avoid bridging of the material. The sand pack extends from the bottom of the wells to a minimum of 5 feet above the top of well screens. A filter pack consisting of a fine silica mesh was added above the sand pack. The remainder of the well annulus was then sealed by a 5- to 10-foot bentonite plug and backfilled with grout containing 3 percent

Table 1

MONITORING WELL COMPLETION DETAILS

Well	Total Depth (feet)	Screened Interval (feet)	Sand Pack[1] Interval (feet)	Filter Pack[2] Interval (feet)	Seal[3] Interval (feet)	Backfill[4] Interval (feet)
MW-1	247	199.5 to 229.5	180.5 to 247.0	179.0 to 180.5	174.0 to 179.0	0 to 174.0
MW-2	245	199.5 to 229.5	189.0 to 245.0	188.5 to 189.0	180.0 to 188.5	0 to 180.0
MW-3	260	209.5 to 239.5	196.5 to 260.0	194.0 to 196.5	180.0 to 194.0	0 to 180.0
MW-4	260	209.5 to 239.5	199.5 to 260.0	198.5 to 199.5	188.5 to 198.5	0 to 188.5

1. CSSI 8x12 silica sand
2. Fine silica sand
3. Bentonite
4. Grout with 3 percent bentonite

bentonite. A lockable surface casing was then set aboveground in the center of a 2.5-foot-wide concrete pad at the surface. The concrete pads are completed with protective steel posts at each corner.

Wells were developed using both air and mechanical surging, with the exception of Wells MW-1 and MW-3. Well MW-1 was developed by air surging only, whereas Well MW-3 was developed by air surging and bailing. All downhole equipment was steam cleaned and inspected by the EMCON geologist prior to insertion in the well annulus. Wells were developed until water was clear to translucent and free of sand. A small amount of fine suspended matter was noted at the completion of development at Well MW-3.

Well Survey

Well locations and elevations were surveyed by WayJohn Surveying of Albuquerque, New Mexico, on June 4, 1987. Surveyed locations and elevation data are shown in Drawing A-1 of Appendix A. Ground-surface, top of casing, and water-level elevations are summarized below in Table 2.

Table 2

WELL ELEVATION DATA

Well Designation	Ground-Surface Elevation	Top of Casing Elevation	Ground-Water Elevation (6/19/87)
MW-1	5168.17	5168.70	4968.10
MW-2	5158.15	5159.36	4969.70
MW-3	5185.48	5186.43	4963.24
MW-4	5182.46	5182.94	4965.32

Ground-Water Sampling

A dedicated, low-discharge (1/2-gpm) submersible pump constructed of stainless steel, Teflon, and PVC materials was installed in each well. Prior to sampling, each well was purged by removing a minimum of three casing volumes of ground water with the dedicated pump. Purged water was monitored for pH, specific conductance, and temperature until these parameters had stabilized in order to determine that ground water representative of the aquifer had entered the well.

Ground-water samples were collected from the pump's Teflon discharge line into the appropriate EPA-approved containers. All samples were placed on ice and transported directly to the laboratory with appropriate chain-of-custody documentation.

LABORATORY PROCEDURES

Physical and Mechanical Testing

Selected site soils were analyzed for Atterberg Limit determinations and grain-size distribution. The objective of the laboratory programs was to classify and determine physical and mechanical properties of representative site soils. American Society for Testing and Materials (ASTM) standard test methods were used. Results are presented in Appendix B.

Ground-Water Analyses

The purpose of the ground-water sampling and analysis was to establish baseline water quality information for the Signetics site and to assess the impact of potential leachate migration on ground-water quality. Ground-water samples were collected following completion and development of Monitoring Wells MW-1, MW-2, MW-3, and MW-4.

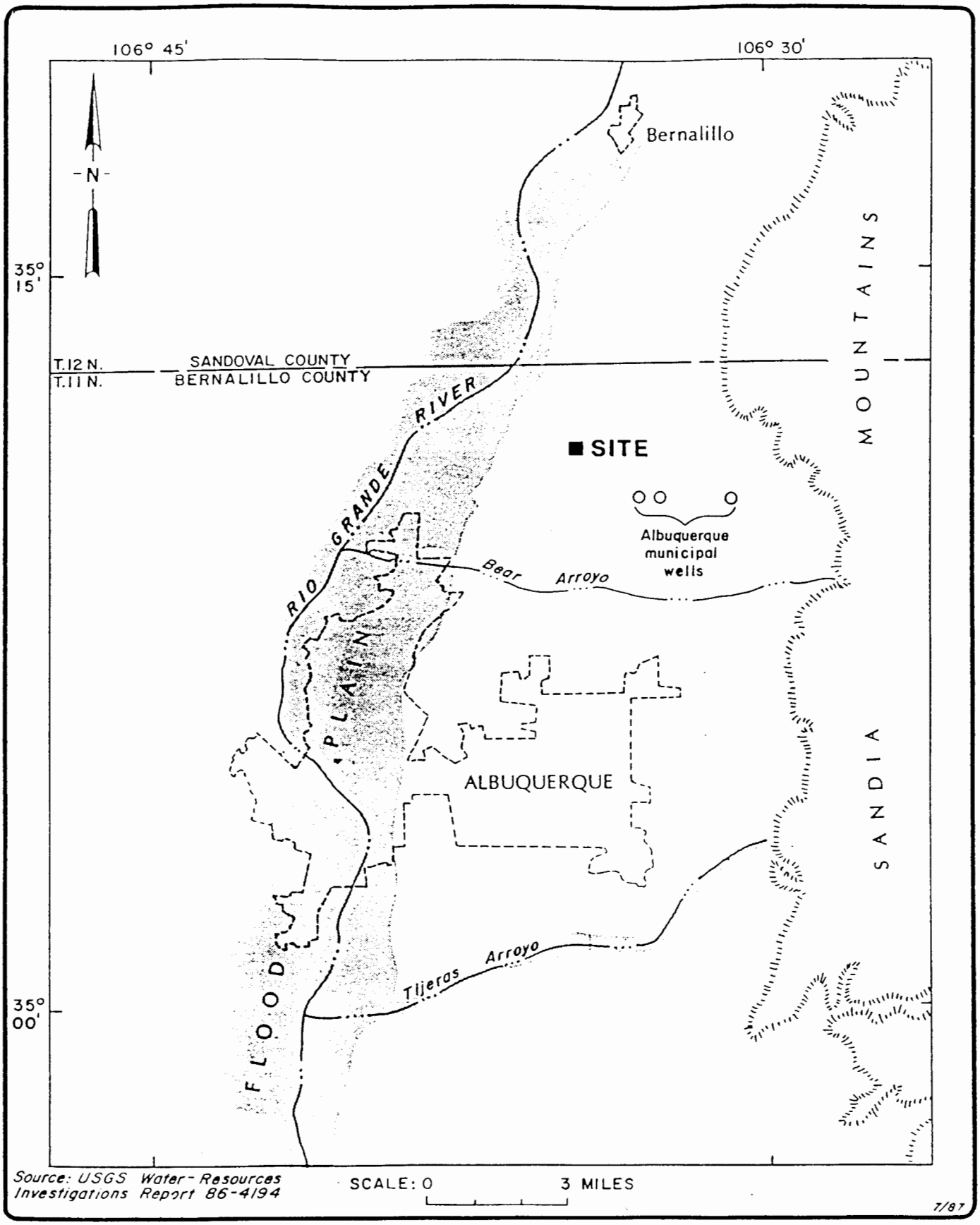
Results of the ground-water analyses are summarized in Table 4. Analytical results for most of the basic water quality and inorganic parameters are consistent with the range of values observed in area wells, based upon data supplied by the SNMEID (1986). However, elevated values for several parameters were detected for the sample from Monitoring Well MW-1. Elevated values for pH, electrical conductivity, total dissolved solids, alkalinity, and calcium for Monitoring Well MW-1 are believed to be due to cement grout accidentally introduced into formation water during well construction. The anomolously low magnesium value for Monitoring Well MW-1 is due to the high pH of the water; the solubility of magnesium decreases at high pH. Prolonged purging of the well prior to the next sampling event should cause these parameters to return to normal, or previous, levels.

The elevated values of total Kjeldahl nitrogen (TKN) and ammonia nitrogen for Monitoring Well MW-1 are not believed to be due to the grout contamination. TKN is a measure of organic nitrogen. Common sources of organic nitrogen and ammonia in ground water, such as leachate or raw sewage, also cause elevated levels of total organic

carbon (TOC). As the value of TOC for Monitoring Well MW-1 is not elevated, the levels of TKN and ammonia nitrogen are not due to the common sources. Other potential sources for organic nitrogen and ammonia include synthetic organic compounds; however, no organic compounds capable of causing the indicated levels of TKN and ammonia nitrogen were detected in the analyses for volatile and semivolatile organic compounds. The TKN and ammonia nitrogen results for Monitoring Well MW-1 are anomalous and inconsistent with other analytical results for the well and, thus, may reflect analytical problems.

Trace concentrations of PCE were detected in three monitoring wells (MW-1, MW-2, and MW-4). It is unlikely that the PCE concentrations have resulted from landfill leachate migration. The landfill was closed in 1965, several years prior to the patenting of PCE and at least one decade prior to the widespread use of PCE by industry. There are several potential sources for PCE near the facility which need to be evaluated with respect to the stability of the gradient direction.

110169



Source: USGS Water-Resources Investigations Report 86-4194

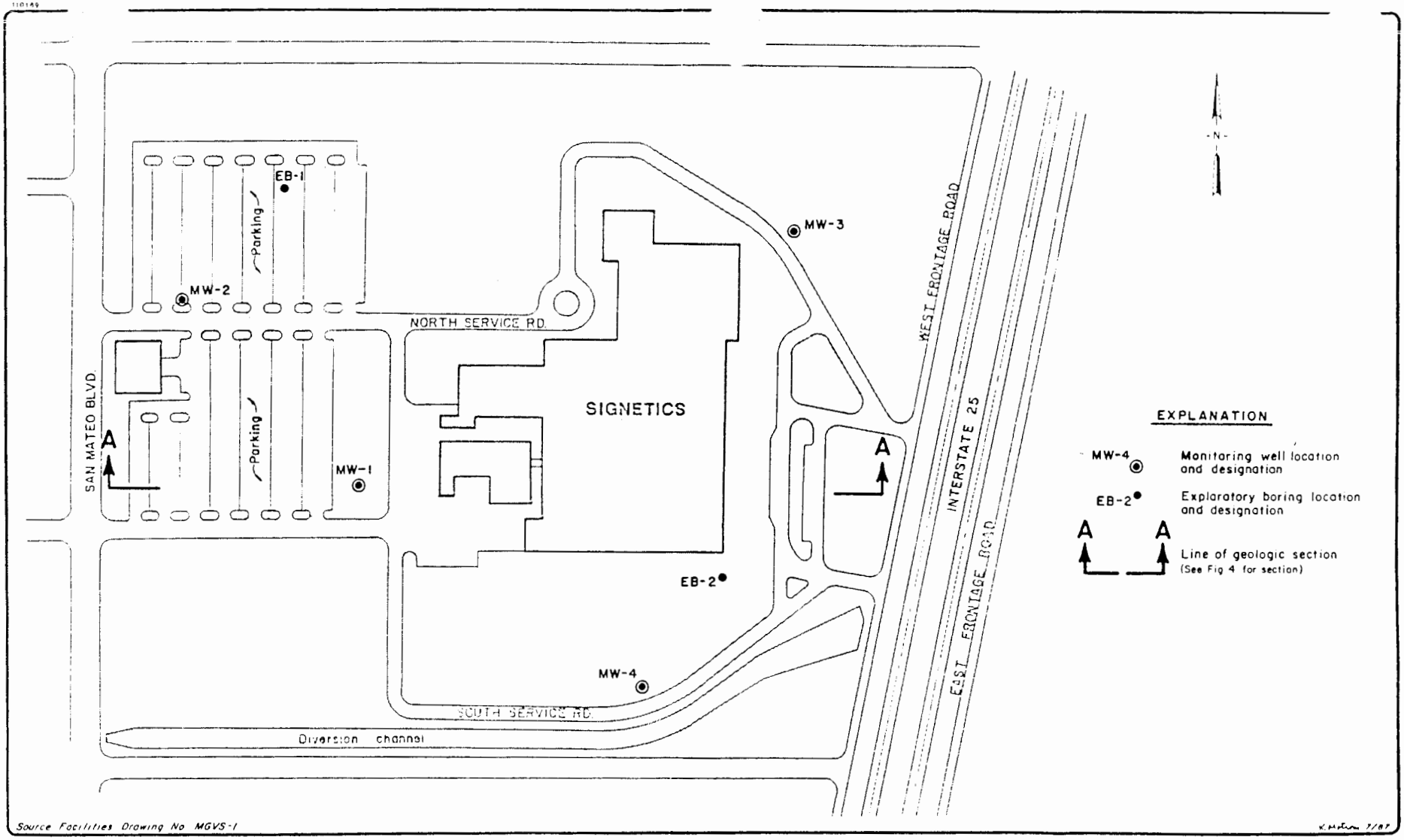
EMCON Associates

SIGNETICS CORPORATION
NEW MEXICO FACILITY
ALBUQUERQUE, NEW MEXICO

SITE LOCATION MAP

FIGURE 1

PROJECT NO. 377-16.01



EMCON Associates

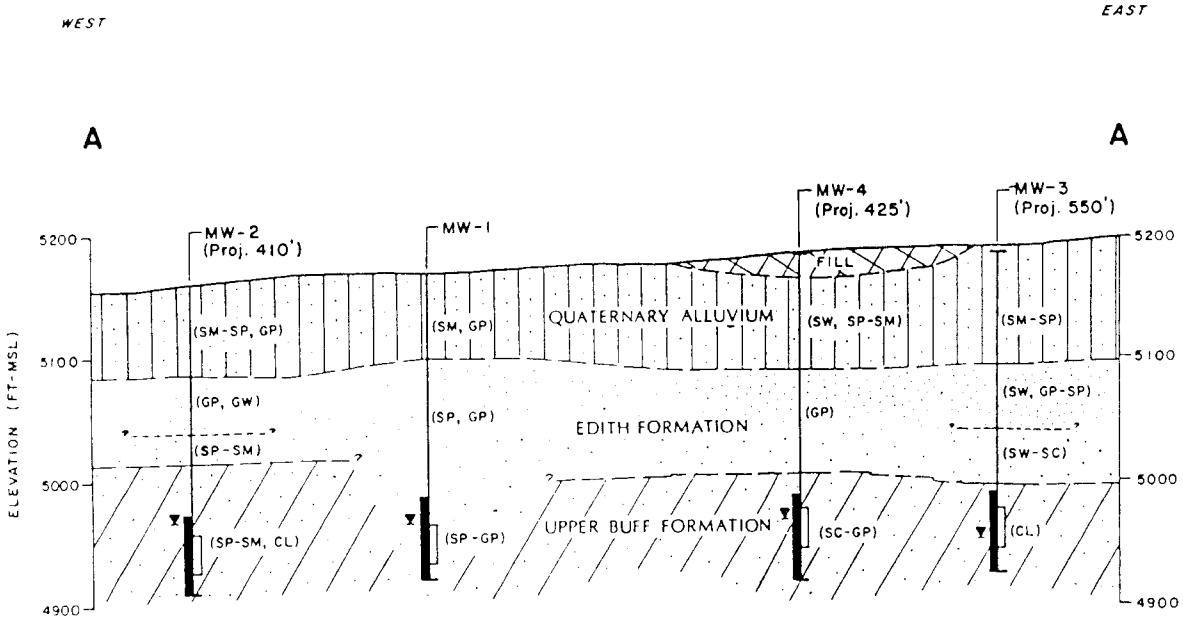
Scale: 0 200 400 600 800 Feet

SIGNETICS CORPORATION
NEW MEXICO FACILITY
ALBUQUERQUE, NEW MEXICO

MONITORING WELL AND BORING LOCATION MAP

FIGURE 2

PROJECT NO. 377 - 16.01



EXPLANATION

QUATERNARY ALLUVIUM – SANDS and GRAVELS (SM-GP)

Upper / Lower — EDITH FORMATION - upper coarse unit of SANDS and GRAVELS (SW-GP); lower fine unit of SANDS (SW-SC)

UPPER BUFF FORMATION – CLAYS and GRAVELS (CL, GP)

MW-1 — Well designation
Borehole
(CL) — USCS classification
Static water level
Screened interval
Gravel pack

NOTE: Formation contacts are inferred by depth, soil color, and general soil characteristics

EMCON Associates

Scale: 0 200 400 600 800 Feet (Horizontal)

SIGNETICS CORPORATION
NEW MEXICO FACILITY
ALBUQUERQUE, NEW MEXICO

GEOLOGIC CROSS SECTION A–A

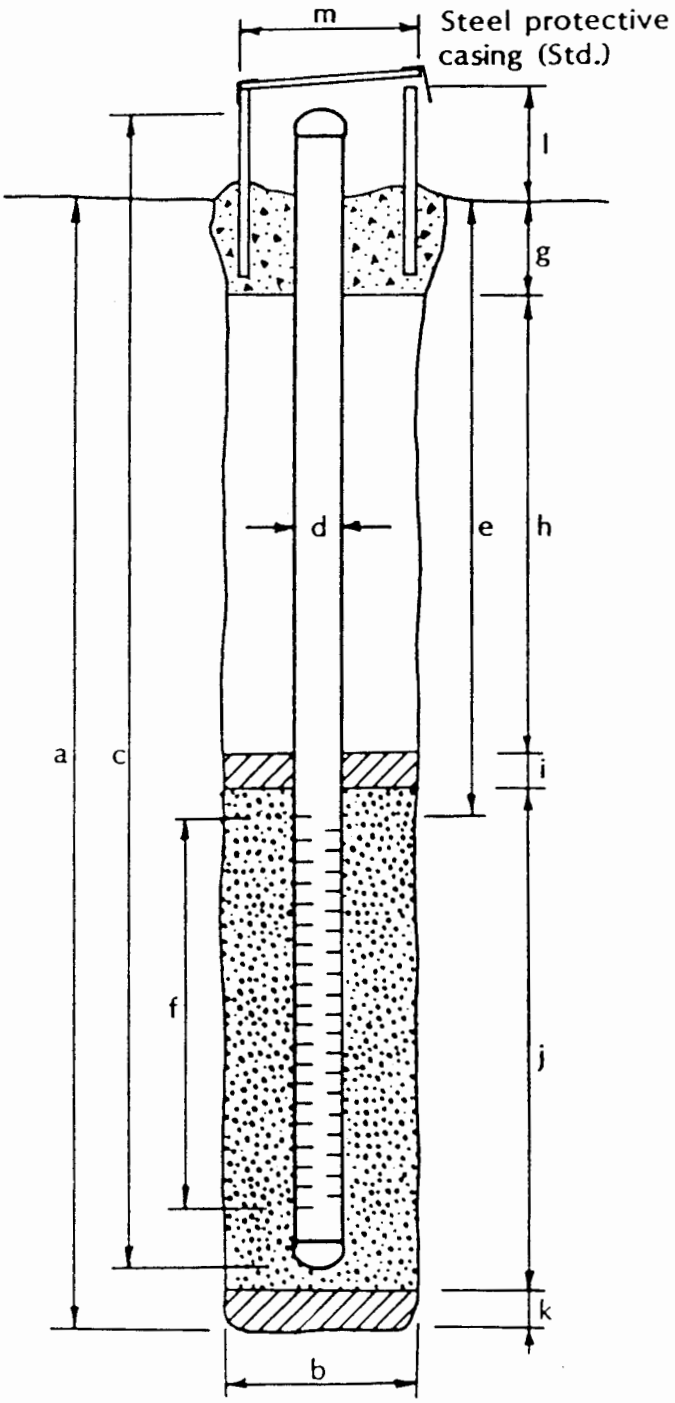
FIGURE 4

PROJECT NO. 377 – 16.01

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

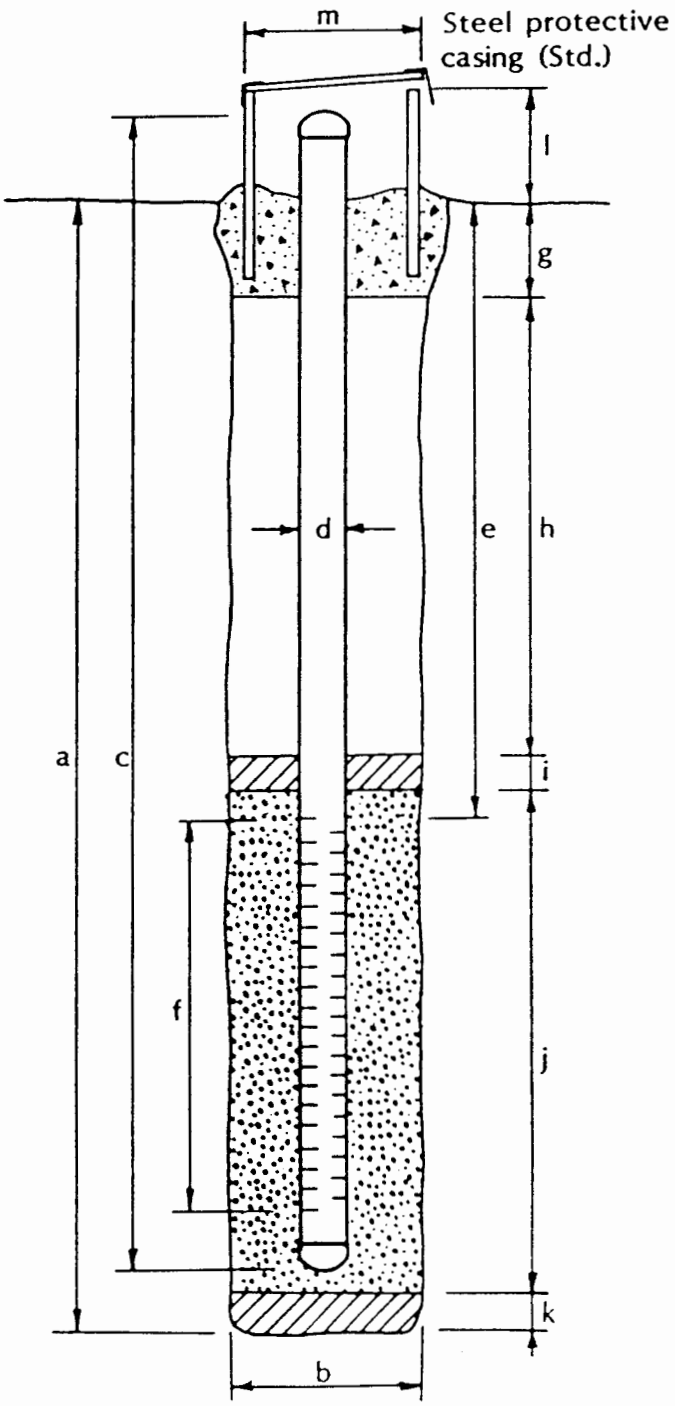
c. Casing length 230 ft.
Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 199.5 ft.
f. Perforated length 30 ft.
Perforated interval from 199.5 to 229.5 ft.
Perforation type Machine Slotted
Perforation size 0.02 inch
g. Surface seal 3 ft.
Seal material Cement w/ 3% Bentonite
h. 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

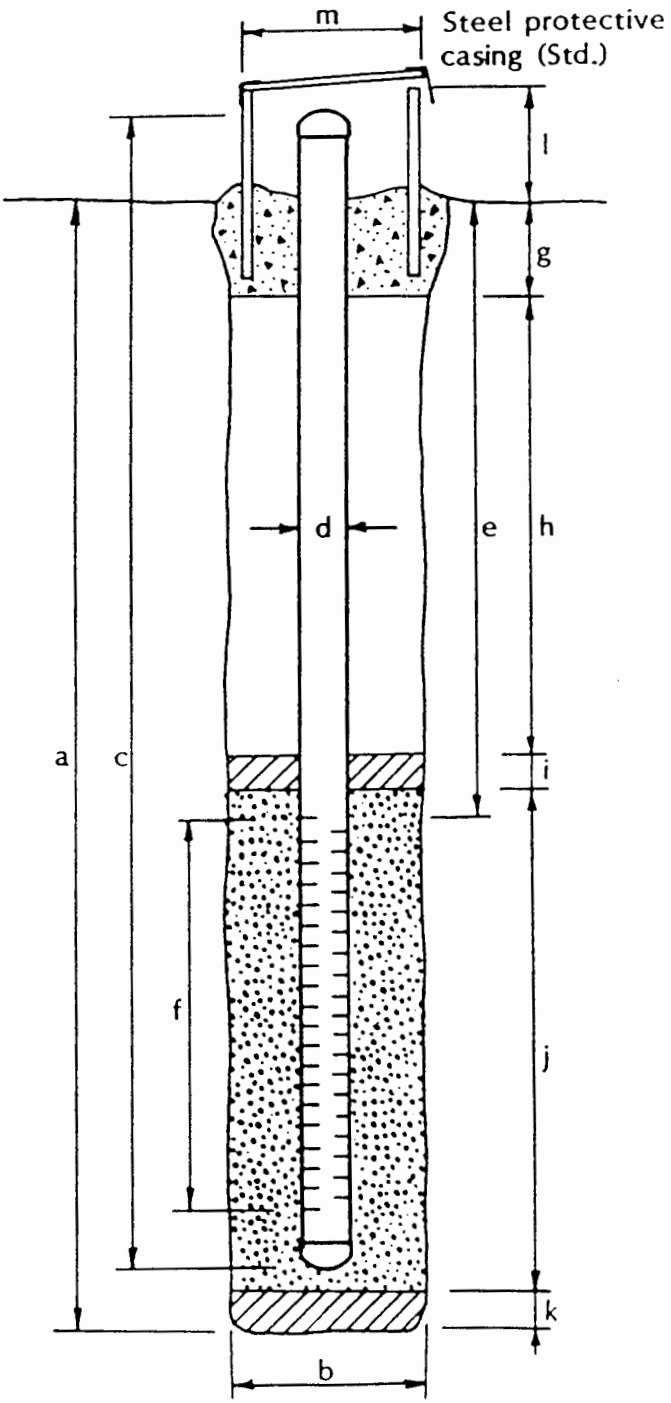
c. Casing length 240 ft.
Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 200 ft.
f. Perforated length 30 ft.
Perforated interval from 200 to 230 ft.
Perforation type Machine Slot
Perforation size 0.02 inch
g. Surface seal 6 ft.
Seal material Grout w/ 3% Bentonite
h. Backfill 174 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

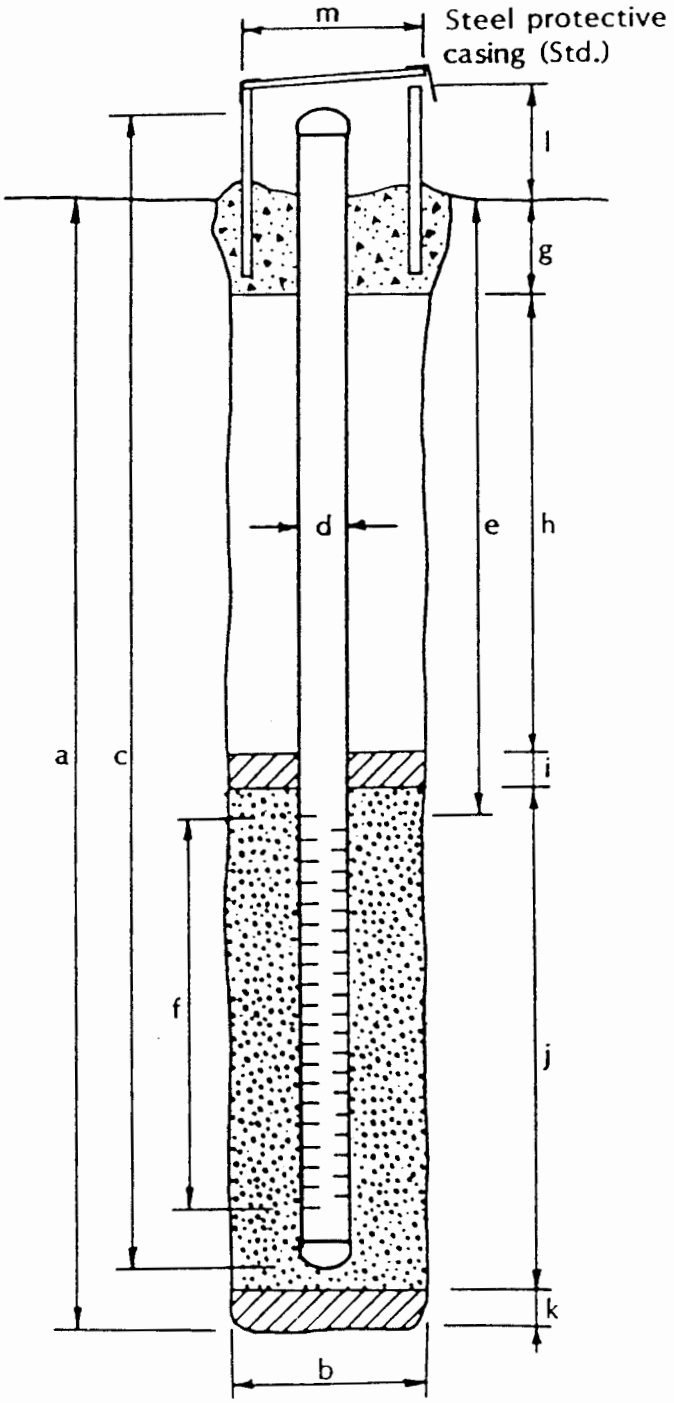
c. Casing length 240.5 ft.
Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 209.5 ft.
f. Perforated length 30 ft.
Perforated interval from 209.5 to 239.5 ft.
Perforation type Machine Slotted
Perforation size 0.02 inch
g. Surface seal 8 ft.
Seal material Cement w/ 3% Bentonite
h. 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

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

SIGNETICS

OCTOBER 17, 1988

Reviewed by: Cindy Ingram

Cindy Ingram

Allen J. Medine, Ph.D.

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: SAMPLE POINT #1
Lab ID: 001770-0001-SA Enseco ID: 1014186
Matrix: AQUEOUS Sampled: 19 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: 23 SEP 88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane (Methylbromide)	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	30	ug/L	1.0
Tetrachloroethene	30	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND=Not Detected
-=Not Applicable

Reported By: Mike Hoffman Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: SAMPLE POINT #2
Lab ID: 001770-0002-SA Enseco ID: 1014187
Matrix: AQUEOUS Sampled: 20 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: 23 SEP 88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane (Methylbromide)	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	14	ug/L	1.0
Tetrachloroethene	14	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND=Not Detected
=Not Applicable

Reported By: Mike Hoffman Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: SAMPLE POINT #3
Lab ID: 001770-0003-SA Enseco ID: 1014188
Matrix: AQUEOUS Sampled: 19 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: 23 SEP 88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane (Methylbromide)	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
omodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	30	ug/L	1.0
Tetrachloroethene	30	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND=Not Detected
NA=Not Applicable

Reported By: Mike Hoffman Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: TRIP BLANK
Lab ID: 001770-0004-SA
Enseco ID: 1014189
Matrix: AQUEOUS
Sampled: 19 SEP 88
Received: 21 SEP 88
Authorized: 21 SEP 88
Prepared: NA
Analyzed: 23 SEP 88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane (Methylbromide)	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
omodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND=Not Detected
NA=Not Applicable

Reported By: Mike Hoffman
Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #1
Lab ID: 004978-0001-SA Enseco ID: 1038564
Matrix: AQUEOUS Sampled: 16 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: NA Analyzed: 23 MAY 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	25	ug/L	1.0
Tetrachloroethene	25	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Duane Newell Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #2
Lab ID: 004978-0002-SA Enseco ID: 1038565
Matrix: AQUEOUS Sampled: 16 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: NA Analyzed: 23 MAY 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
omodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	14	ug/L	1.0
Tetrachloroethene	14	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Duane Newell Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #4
Lab ID: 004978-0003-SA Enseco ID: 1038566
Matrix: AQUEOUS Sampled: 17 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: NA Analyzed: 23 MAY 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	9.2	ug/L	1.0
Tetrachloroethene	9.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Duane Newell Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: WELL #1
Lab ID: 006599-0002-SA Enseco ID: 1052714
Matrix: AQUEOUS Sampled: 13 SEP 89 Received: 15 SEP 89
Authorized: 15 SEP 89 Prepared: NA Analyzed: 19 SEP 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	15	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: William Sullivan Approved By: Kim Zilis

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: WELL #2
Lab ID: 006599-0001-SA Enseco ID: 1052713
Matrix: AQUEOUS Sampled: 13 SEP 89 Received: 15 SEP 89
Authorized: 15 SEP 89 Prepared: NA Analyzed: 19 SEP 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
romodichloromethane	ND	ug/L	1.0
,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.9	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: William Sullivan Approved By: Kim Zilis

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: WELL #4
Lab ID: 006599-0003-SA Enseco ID: 1052715
Matrix: AQUEOUS Sampled: 14 SEP 89 Received: 15 SEP 89
Authorized: 15 SEP 89 Prepared: NA Analyzed: 19 SEP 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.8	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: William Sullivan Approved By: Kim Zilis

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: TRIP BLANK
Lab ID: 006599-0004-SA Enseco ID: 1052716
Matrix: AQUEOUS Sampled: Unknown Received: 15 SEP 89
Authorized: 15 SEP 89 Prepared: NA Analyzed: 19 SEP 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	1.0	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: William Sullivan Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #1
Lab ID: 007771-0001-SA Enseco ID: 1062243
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: NA Analyzed: 12 DEC 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	17	ug/L	1.0
Tetrachloroethene	17	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: William Sullivan Approved By: Barbara Sullivan

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #3
Lab ID: 007771-0002-SA Enseco ID: 1062244
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: NA Analyzed: 12 DEC 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: William Sullivan Approved By: Barbara Sullivan

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #4
Lab ID: 007771-0003-SA Enseco ID: 1062245
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: NA Analyzed: 12 DEC 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	17	ug/L	1.0
Tetrachloroethene	17	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: William Sullivan Approved By: Barbara Sullivan

copy

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 008888-0001-SA Enseco ID: 1070426
Matrix: AQUEOUS Sampled: 28 MAR 90 Received: 30 MAR 90
Authorized: 30 MAR 90 Prepared: NA Analyzed: 03 APR 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	33
Bromomethane	ND	ug/L	33
Vinyl chloride	ND	ug/L	6.7
Chloroethane	ND	ug/L	33
Methylene chloride	ND	ug/L	33
1,1-Dichloroethene	ND	ug/L	3.3
1,1-Dichloroethane	ND	ug/L	3.3
trans-1,2-Dichloroethene	ND	ug/L	3.3
Chloroform	ND	ug/L	3.3
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	6.7
1,2-Dichloroethane	ND	ug/L	6.7
1,1,1-Trichloroethane	ND	ug/L	3.3
Carbon tetrachloride	ND	ug/L	3.3
Bromodichloromethane	ND	ug/L	6.7
1,2-Dichloropropane	ND	ug/L	6.7
trans-1,3-Dichloropropene	ND	ug/L	6.7
Trichloroethene	ND	ug/L	3.3
Chlorodibromomethane	ND	ug/L	6.7
cis-1,3-Dichloropropene	ND	ug/L	13
1,1,2-Trichloroethane	ND	ug/L	6.7
EDB (1,2-Dibromoethane)	ND	ug/L	13
Bromoform	ND	ug/L	33
1,1,2,2-Tetrachloroethane	ND	ug/L	6.7
Tetrachloroethene	13	ug/L	3.3
Chlorobenzene	ND	ug/L	13

ND = Not detected
NA = Not applicable

Reported By: Nathaniel Biah Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: TRIP BLANK
Lab ID: 008888-0002-SA Enseco ID: 1070427
Matrix: AQUEOUS Sampled: Unknown Received: 30 MAR 90
Authorized: 30 MAR 90 Prepared: NA Analyzed: 04 APR 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Nathaniel Biah Approved By: Kim Zilis

Enseco
A CORNING COMPANY

Halogenated Volatile Organics

Method 8010

lient Name: Signetics
lient ID: GROUNDWATER WELL #1
ab ID: 009979-0001-SA Enseco ID: 1079645
atrix: AQUEOUS Sampled: 12 JUN 90 Received: 14 JUN 90
uthorized: 14 JUN 90 Prepared: NA Analyzed: 15 JUN 90

arameter	Result	Units	Reporting Limit
hloromethane	ND	ug/L	5.0
romomethane	ND	ug/L	5.0
inyl chloride	ND	ug/L	1.0
hloroethane	ND	ug/L	5.0
ethylene chloride	ND	ug/L	5.0
,1-Dichloroethene	ND	ug/L	0.50
,1-Dichloroethane	ND	ug/L	0.50
rans-1,2-Dichloroethene	ND	ug/L	0.50
hloroform	ND	ug/L	0.50
,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
,2-Dichloroethane	ND	ug/L	1.0
,1,1-Trichloroethane	ND	ug/L	0.50
arbon tetrachloride	ND	ug/L	0.50
romodichloromethane	ND	ug/L	1.0
, hloropropane	ND	ug/L	1.0
r ,3-Dichloropropene	ND	ug/L	1.0
richloroethene	ND	ug/L	0.50
ibromochloromethane	ND	ug/L	1.0
is-1,3-Dichloropropene	ND	ug/L	2.0
,1,2-Trichloroethane	ND	ug/L	1.0
DB (1,2-Dibromoethane)	ND	ug/L	2.0
romoform	ND	ug/L	5.0
,1,2,2-Tetrachloroethane	ND	ug/L	1.0
etrachloroethene	20	ug/L	0.50
hlorobenzene	ND	ug/L	2.0

= Not detected
t applicable

ed By: Nathaniel Biah Approved By: Greg Gustina

Enseco
A CORNING Company

Halogenated Volatile Organics

Method 8010

:lient Name: Signetics
:lient ID: GROUNDWATER WELL #2
.ab ID: 009979-0002-SA Enseco ID: 1079647
latrix: AQUEOUS Sampled: 13 JUN 90 Received: 14 JUN 90
\uthorized: 14 JUN 90 Prepared: NA Analyzed: 15 JUN 90

Parameter	Result	Units	Reporting Limit
:hloromethane	ND	ug/L	5.0
3romomethane	ND	ug/L	5.0
'inyl chloride	ND	ug/L	1.0
:hloroethane	ND	ug/L	5.0
lethylene chloride	ND	ug/L	5.0
,1-Dichloroethene	ND	ug/L	0.50
,1-Dichloroethane	ND	ug/L	0.50
rans-1,2-Dichloroethene	ND	ug/L	0.50
hloroform	ND	ug/L	0.50
,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
,2-Dichloroethane	ND	ug/L	1.0
,1,1-Trichloroethane	ND	ug/L	0.50
arbon tetrachloride	ND	ug/L	0.50
'romodichloromethane	ND	ug/L	1.0
'hloropropane	ND	ug/L	1.0
1,3-Dichloropropene	ND	ug/L	1.0
richloroethene	ND	ug/L	0.50
ibromochloromethane	ND	ug/L	1.0
is-1,3-Dichloropropene	ND	ug/L	2.0
,1,2-Trichloroethane	ND	ug/L	1.0
DB (1,2-Dibromoethane)	ND	ug/L	2.0
romoform	ND	ug/L	5.0
,1,2,2-Tetrachloroethane	ND	ug/L	1.0
etrachloroethene	13	ug/L	0.50
hlorobenzene	ND	ug/L	2.0

) = Not detected
A t applicable

:, ced By: Nathaniel Biah Approved By: Greg Gustina

Enseco
A CORNING Company

Halogenated Volatile Organics

Method 8010

:lient Name: Signetics
:lient ID: GROUNDWATER WELL #3
.ab ID: 009979-0003-SA Enseco ID: 1079658
latrix: AQUEOUS Sampled: 13 JUN 90 Received: 14 JUN 90
uthorized: 14 JUN 90 Prepared: NA Analyzed: 15 JUN 90

'arameter	Result	Units	Reporting Limit
:hloromethane	ND	ug/L	5.0
'romomethane	ND	ug/L	5.0
'inyl chloride	ND	ug/L	1.0
hloroethane	ND	ug/L	5.0
lethylene chloride	ND	ug/L	5.0
,1-Dichloroethene	ND	ug/L	0.50
,1-Dichloroethane	ND	ug/L	0.50
rans-1,2-Dichloroethene	ND	ug/L	0.50
hloroform	ND	ug/L	0.50
,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
,2-Dichloroethane	ND	ug/L	1.0
,1,1-Trichloroethane	ND	ug/L	0.50
:arbon tetrachloride	ND	ug/L	0.50
'romodichloromethane	ND	ug/L	1.0
chloropropane	ND	ug/L	1.0
.,3-Dichloropropene	ND	ug/L	1.0
oroethene	ND	ug/L	0.50
ibromochloromethane	ND	ug/L	1.0
is-1,3-Dichloropropene	ND	ug/L	2.0
,1,2-Trichloroethane	ND	ug/L	1.0
DB (1,2-Dibromoethane)	ND	ug/L	2.0
romoform	ND	ug/L	5.0
,1,2,2-Tetrachloroethane	ND	ug/L	1.0
etrachloroethene	ND	ug/L	0.50
hlorobenzene	ND	ug/L	2.0

D = Not detected
A = Not applicable

.ed By: Nathaniel Biah Approved By: Greg Gustina

Enseco
A CORNING Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #4
Lab ID: 009979-0004-SA Enseco ID: 1079659
Matrix: AQUEOUS Sampled: 12 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: NA Analyzed: 15 JUN 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Br[illegible]ichloromethane	ND	ug/L	1.0
1[illegible] chloropropane	ND	ug/L	1.0
t[illegible]-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	8.1	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND Not detected
[illegible] ot applicable

Reported By: Nathaniel Biah Approved By: Greg Gustina

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #1
Lab ID: 010988-0001-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	17	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 010988-0004-SA
Matrix: AQUEOUS Sampled: 13 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	12
Bromomethane	ND	ug/L	12
Vinyl chloride	ND	ug/L	2.5
Chloroethane	ND	ug/L	12
Methylene chloride	ND	ug/L	12
1,1-Dichloroethene	ND	ug/L	1.2
1,1-Dichloroethane	ND	ug/L	1.2
trans-1,2-Dichloroethene	ND	ug/L	1.2
Chloroform	ND	ug/L	1.2
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	2.5
1,2-Dichloroethane	ND	ug/L	2.5
1,1,1-Trichloroethane	ND	ug/L	1.2
Carbon tetrachloride	ND	ug/L	1.2
Bromodichloromethane	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	2.5
ans-1,3-Dichloropropene	ND	ug/L	2.5
ichloroethene	ND	ug/L	1.2
ibromochloromethane	ND	ug/L	2.5
cis-1,3-Dichloropropene	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	2.5
EDB (1,2-Dibromoethane)	ND	ug/L	5.0
Bromoform	ND	ug/L	12
1,1,2,2-Tetrachloroethane	ND	ug/L	2.5
Tetrachloroethene	11	ug/L	1.2
Chlorobenzene	ND	ug/L	5.0

ND = Not detected
NA = Not applicable

ported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #3
Lab ID: 010988-0003-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #4
Lab ID: 010988-0002-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
ichloroethene	ND	ug/L	0.50
ibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	7.6	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

orted By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: TRIP BLANK
Lab ID: 010988-0005-SA
Matrix: AQUEOUS Sampled: Unknown Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 009979

JUNE 28, 1990

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 012745

DECEMBER 29, 1990

Reviewed by: _____
Joel E. Holtz

_____
Sue Dalla

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

lient Name: Signetics
lient ID: GROUNDWATER WELL #1
ab ID: 012745-0001-SA
atrix: AQUEOUS Sampled: 05 DEC 90 Received: 07 DEC 90
uthorized: 07 DEC 90 Prepared: NA Analyzed: 11 DEC 90

arameter	Result	Units	Reporting Limit
hloromethane	ND	ug/L	5.0
romomethane	ND	ug/L	5.0
inyl chloride	ND	ug/L	1.0
hloroethane	ND	ug/L	5.0
ethylene chloride	ND	ug/L	5.0
,1-Dichloroethene	ND	ug/L	0.50
,1-Dichloroethane	ND	ug/L	0.50
rans-1,2-Dichloroethene	ND	ug/L	0.50
hloroform	ND	ug/L	0.50
,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
,2-Dichloroethane	ND	ug/L	1.0
,1,1-Trichloroethane	ND	ug/L	0.50
arbon tetrachloride	ND	ug/L	0.50
romodichloromethane	ND	ug/L	1.0
,2-Dichloropropane	ND	ug/L	1.0
r ,3-Dichloropropene	ND	ug/L	1.0
r oroethene	ND	ug/L	0.50
ibromochloromethane	ND	ug/L	1.0
is-1,3-Dichloropropene	ND	ug/L	2.0
,1,2-Trichloroethane	ND	ug/L	1.0
DB (1,2-Dibromoethane)	ND	ug/L	2.0
romoform	ND	ug/L	5.0
,1,2,2-Tetrachloroethane	ND	ug/L	1.0
etrachloroethene	24	ug/L	0.50
hlorobenzene	ND	ug/L	2.0

urrogate	Recovery	
romochloromethane	99	%

) = Not detected
= Not applicable

ed By: Tina Pieper Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

ent Name: Signetics
ent ID: GROUNDWATER WELL #2
) ID: 012745-0004-SA
:rix: AQUEOUS Sampled: 06 DEC 90 Received: 07 DEC 90
:horized: 07 DEC 90 Prepared: NA Analyzed: 11 DEC 90

·ameter	Result	Units	Reporting Limit
oromethane	ND	ug/L	5.0
›momethane	ND	ug/L	5.0
ıyl chloride	ND	ug/L	1.0
oroethane	ND	ug/L	5.0
.hylene chloride	ND	ug/L	5.0
-Dichloroethene	ND	ug/L	0.50
-Dichloroethane	ND	ug/L	0.50
ıns-1,2-Dichloroethene	ND	ug/L	0.50
oroform	ND	ug/L	0.50
,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
'-Dichloroethane	ND	ug/L	1.0
,1-Trichloroethane	ND	ug/L	0.50
·bon tetrachloride	ND	ug/L	0.50
›modichloromethane	ND	ug/L	1.0
'-Dichloropropane	ND	ug/L	1.0
ın[illegible]3-Dichloropropene	ND	ug/L	1.0
[illegible]ethene	ND	ug/L	0.50
›r[illegible]chloromethane	ND	ug/L	1.0
;-1,3-Dichloropropene	ND	ug/L	2.0
,2-Trichloroethane	ND	ug/L	1.0
3 (1,2-Dibromoethane)	ND	ug/L	2.0
›moform	ND	ug/L	5.0
,2,2-Tetrachloroethane	ND	ug/L	1.0
:rachloroethene	15	ug/L	0.50
orobenzene	ND	ug/L	2.0

·rogate	Recovery	
›mochloromethane	88	%

= Not detected
= Not applicable

›· By: Tina Pieper Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

ient Name: Signetics
ient ID: GROUNDWATER WELL #3
b ID: 012745-0003-SA
trix: AQUEOUS Sampled: 06 DEC 90 Received: 07 DEC 90
thorized: 07 DEC 90 Prepared: NA Analyzed: 11 DEC 90

rameter	Result	Units	Reporting Limit
loromethane	ND	ug/L	5.0
omomethane	ND	ug/L	5.0
yl chloride	ND	ug/L	1.0
loroethane	ND	ug/L	5.0
hylene chloride	ND	ug/L	5.0
l-Dichloroethene	ND	ug/L	0.50
l-Dichloroethane	ND	ug/L	0.50
ns-1,2-Dichloroethene	ND	ug/L	0.50
loroform	ND	ug/L	0.50
,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
2-Dichloroethane	ND	ug/L	1.0
,1-Trichloroethane	ND	ug/L	0.50
bon tetrachloride	ND	ug/L	0.50
om hloromethane	ND	ug/L	1.0
oropropane	ND	ug/L	1.0
in ,3-Dichloropropene	ND	ug/L	1.0
chloroethene	ND	ug/L	0.50
romochloromethane	ND	ug/L	1.0
-1,3-Dichloropropene	ND	ug/L	2.0
,2-Trichloroethane	ND	ug/L	1.0
(1,2-Dibromoethane)	ND	ug/L	2.0
moform	ND	ug/L	5.0
,2,2-Tetrachloroethane	ND	ug/L	1.0
rachloroethene	ND	ug/L	0.50
orobenzene	ND	ug/L	2.0

rogate	Recovery	
mochloromethane	94	%

= detected
= applicable

ored By: Tina Pieper Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

lient Name: Signetics
lient ID: GROUNDWATER WELL #4
ab ID: 012745-0002-SA
atrix: AQUEOUS Sampled: 05 DEC 90 Received: 07 DEC 90
uthorized: 07 DEC 90 Prepared: NA Analyzed: 11 DEC 90

arameter	Result	Units	Reporting Limit
loromethane	ND	ug/L	5.0
omomethane	ND	ug/L	5.0
nyl chloride	ND	ug/L	1.0
loroethane	ND	ug/L	5.0
thylene chloride	ND	ug/L	5.0
1-Dichloroethene	ND	ug/L	0.50
1-Dichloroethane	ND	ug/L	0.50
ans-1,2-Dichloroethene	ND	ug/L	0.50
loroform	ND	ug/L	0.50
1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
2-Dichloroethane	ND	ug/L	1.0
1,1-Trichloroethane	ND	ug/L	0.50
rbon tetrachloride	ND	ug/L	0.50
omodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
a 3-Dichloropropene	ND	ug/L	1.0
oethene	ND	ug/L	0.50
b chloromethane	ND	ug/L	1.0
s-1,3-Dichloropropene	ND	ug/L	2.0
1,2-Trichloroethane	ND	ug/L	1.0
B (1,2-Dibromoethane)	ND	ug/L	2.0
omoform	ND	ug/L	5.0
1,2,2-Tetrachloroethane	ND	ug/L	1.0
trachloroethene	11	ug/L	0.50
lorobenzene	ND	ug/L	2.0

rogate	Recovery	
omochloromethane	100	%

= Not detected
= Not applicable

By: Tina Pieper Approved By: Jeff Lowry

Enseco
A CORNING Company

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 019899

JANUARY 10, 1991

Reviewed by: _____
Kathy McKeeta

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #1
Lab ID: 019471-0002-SA
Matrix: AQUEOUS Sampled: 04 DEC 91 Received: 06 DEC 91
Authorized: 06 DEC 91 Prepared: NA Analyzed: 10 DEC 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	13	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	132	%

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Robert Noga

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 019471-0001-SA
Matrix: AQUEOUS Sampled: 04 DEC 91 Received: 06 DEC 91
Authorized: 06 DEC 91 Prepared: NA Analyzed: 10 DEC 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.3	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	126	%

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Robert Noga

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #3
Lab ID: 019899-0002-SA
Matrix: AQUEOUS Sampled: 17 DEC 91 Received: 19 DEC 91
Authorized: 19 DEC 91 Prepared: NA Analyzed: 27 DEC 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
[illegible]loroethene	ND	ug/L	0.50
[illegible]omochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	111	%

ND = Not detected
NA = Not applicable

[illegible]orted By: Bret Collins Approved By: Robert Noga

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #4
Lab ID: 019899-0001-SA
Matrix: AQUEOUS Sampled: 17 DEC 91 Received: 19 DEC 91
Authorized: 19 DEC 91 Prepared: NA Analyzed: 27 DEC 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
s-1,3-Dichloropropene	ND	ug/L	1.0
chloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	134	%

ND = Not detected
NA = Not applicable

rted By: Bret Collins Approved By: Robert Noga

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Trip Blank
Lab ID: 019899-0003-TB
Matrix: AQUEOUS Sampled: Unknown Received: 19 DEC 91
Authorized: 19 DEC 91 Prepared: NA Analyzed: 27 DEC 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
' 2-Dichloropropane	ND	ug/L	1.0
ns-1,3-Dichloropropene	ND	ug/L	1.0
ichloroethene	ND	ug/L	0.50
ıibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

ɔorted By: Bret Collins Approved By: Robert Noga

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 014454

APRIL 30, 1991

Enseco

Reviewed by: Joel E. Holtz

Joel E. Holtz

Sue Dalla

Halogenated Volatile Organics

Method 8010

Name: Signetics
lient ID: Well #1/ Groundwater
ab ID: 014454-0002-SA
atrix: AQUEOUS Sampled: 09 APR 91 Received: 11 APR 91
uthorized: 11 APR 91 Prepared: NA Analyzed: 22 APR 91

arameter	Result	Units	Reporting Limit
nloromethane	ND	ug/L	5.0
romomethane	ND	ug/L	5.0
inyl chloride	ND	ug/L	1.0
nloroethane	ND	ug/L	5.0
ethylene chloride	ND	ug/L	5.0
1-Dichloroethene	ND	ug/L	0.50
1-Dichloroethane	ND	ug/L	0.50
ans-1,2-Dichloroethene	ND	ug/L	0.50
loroform	ND	ug/L	0.50
1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
2-Dichloroethane	ND	ug/L	1.0
1,1-Trichloroethane	ND	ug/L	0.50
rbon tetrachloride	ND	ug/L	0.50
omodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
ans 1,3-Dichloropropene	ND	ug/L	1.0
i oethene	ND	ug/L	0.50
b chloromethane	ND	ug/L	1.0
s-1,3-Dichloropropene	ND	ug/L	2.0
1,2-Trichloroethane	ND	ug/L	1.0
B (1,2-Dibromoethane)	ND	ug/L	2.0
omoform	ND	ug/L	5.0
1,2,2-Tetrachloroethane	ND	ug/L	1.0
trachloroethene	11	ug/L	0.50
lorobenzene	ND	ug/L	2.0

rogate	Recovery	
omochloromethane	75	%

= Not detected
= Not applicable

By: Tina Pieper Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

ient Name: Signetics
ient ID: Well #2/ Groundwater
ıb ID: 014454-0001-SA
ıtrix: AQUEOUS Sampled: 09 APR 91 Received: 11 APR 91
ıthorized: 11 APR 91 Prepared: NA Analyzed: 22 APR 91

rameter	Result	Units	Reporting Limit
loromethane	ND	ug/L	5.0
omomethane	ND	ug/L	5.0
nyl chloride	ND	ug/L	1.0
loroethane	ND	ug/L	5.0
thylene chloride	ND	ug/L	5.0
1-Dichloroethene	ND	ug/L	0.50
1-Dichloroethane	ND	ug/L	0.50
ans-1,2-Dichloroethene	ND	ug/L	0.50
loroform	ND	ug/L	0.50
1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
2-Dichloroethane	ND	ug/L	1.0
1,1-Trichloroethane	ND	ug/L	0.50
rbon tetrachloride	ND	ug/L	0.50
omodichloromethane	ND	ug/L	1.0
2-[illegible]hloropropane	ND	ug/L	1.0
[illegible],3-Dichloropropene	ND	ug/L	1.0
[illegible]oroethene	ND	ug/L	0.50
bromochloromethane	ND	ug/L	1.0
s-1,3-Dichloropropene	ND	ug/L	2.0
1,2-Trichloroethane	ND	ug/L	1.0
B (1,2-Dibromoethane)	ND	ug/L	2.0
omoform	ND	ug/L	5.0
1,2,2-Tetrachloroethane	ND	ug/L	1.0
trachloroethene	4.7	ug/L	0.50
lorobenzene	ND	ug/L	2.0

rrogate	Recovery	
omochloromethane	81	%

= Not detected
[illegible]ot applicable

[illegible]ed By: Tina Pieper Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Well #3/ Groundwater
Lab ID: 014454-0004-SA
Matrix: AQUEOUS Sampled: 10 APR 91 Received: 11 APR 91
Authorized: 11 APR 91 Prepared: NA Analyzed: 23 APR 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
ns-1,3-Dichloropropene	ND	ug/L	1.0
chloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	73	%

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

lient Name: Signetics
lient ID: Well #4/ Groundwater
ab ID: 014454-0003-SA
atrix: AQUEOUS Sampled: 10 APR 91 Received: 11 APR 91
uthorized: 11 APR 91 Prepared: NA Analyzed: 22 APR 91

arameter	Result	Units	Reporting Limit
loromethane	ND	ug/L	5.0
omomethane	ND	ug/L	5.0
nyl chloride	ND	ug/L	1.0
loroethane	ND	ug/L	5.0
thylene chloride	ND	ug/L	5.0
1-Dichloroethene	ND	ug/L	0.50
1-Dichloroethane	ND	ug/L	0.50
ans-1,2-Dichloroethene	ND	ug/L	0.50
loroform	ND	ug/L	0.50
1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
2-Dichloroethane	ND	ug/L	1.0
1,1-Trichloroethane	ND	ug/L	0.50
rbon tetrachloride	ND	ug/L	0.50
omodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
ar 3-Dichloropropene	ND	ug/L	1.0
i oethene	ND	ug/L	0.50
b. chloromethane	ND	ug/L	1.0
s-1,3-Dichloropropene	ND	ug/L	2.0
1,2-Trichloroethane	ND	ug/L	1.0
3 (1,2-Dibromoethane)	ND	ug/L	2.0
omoform	ND	ug/L	5.0
1,2,2-Tetrachloroethane	ND	ug/L	1.0
trachloroethene	5.7	ug/L	0.50
orobenzene	ND	ug/L	2.0

rogate	Recovery	
omochloromethane	72	%

= Not detected
= Not applicable

By: Tina Pieper Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Trip blank
Lab ID: 014454-0005-TB
Matrix: AQUEOUS Sampled: 10 APR 91 Received: 11 APR 91
Authorized: 11 APR 91 Prepared: NA Analyzed: 23 APR 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
arbon tetrachloride	ND	ug/L	0.50
romodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	73	%

D = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Mike Hoffman

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 015418

JUNE 26, 1991

Reviewed by: Joel E. Holtz

Joel E. Holtz

Sue Dalla

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Ground Water Well #1
Lab ID: 015418-0001-SA
Matrix: AQUEOUS Sampled: 12 JUN 91 Received: 14 JUN 91
Authorized: 14 JUN 91 Prepared: NA Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	14	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	81	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Ground Water Well #2
Lab ID: 015418-0002-SA
Matrix: AQUEOUS Sampled: 12 JUN 91 Received: 14 JUN 91
Authorized: 14 JUN 91 Prepared: NA Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	87	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Ground Water Well #3
Lab ID: 015418-0003-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 14 JUN 91
Authorized: 14 JUN 91 Prepared: NA Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
chloroethene	ND	ug/L	0.50
bromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	84	%

ND = Not detected
NA = Not applicable

orted By: Bret Collins Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Ground Water Well #4
Lab ID: 015418-0004-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 14 JUN 91
Authorized: 14 JUN 91 Prepared: NA Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
?-Dichloropropane	ND	ug/L	1.0
ıns-1,3-Dichloropropene	ND	ug/L	1.0
·ichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.5	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	81	%

ND = Not detected
ı = Not applicable

eported By: Bret Collins Approved By: Mike Hoffman

Enseco

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 017075

SEPTEMBER 27, 1991

Reviewed by: Debbie Fazio

Debbie Fazio

4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUND WATER/WELL #1
Lab ID: 017075-0001-SA
Matrix: AQUEOUS Sampled: 11 SEP 91 Received: 13 SEP 91
Authorized: 13 SEP 91 Prepared: NA Analyzed: 18 SEP 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	12	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	114	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUND WATER/WELL #2
Lab ID: 017075-0002-SA
Matrix: AQUEOUS Sampled: 11 SEP 91 Received: 13 SEP 91
Authorized: 13 SEP 91 Prepared: NA Analyzed: 20 SEP 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	11	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	98	%

ND = Not detected
NA = Not applicable

eported By: Bret Collins Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUND WATER/WELL #3
Lab ID: 017075-0003-SA
Matrix: AQUEOUS Sampled: 11 SEP 91 Received: 13 SEP 91
Authorized: 13 SEP 91 Prepared: NA Analyzed: 20 SEP 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	114	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mike Hoffman

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUND WATER/WELL #4
Lab ID: 017075-0004-SA
Matrix: AQUEOUS Sampled: 11 SEP 91 Received: 13 SEP 91
Authorized: 13 SEP 91 Prepared: NA Analyzed: 20 SEP 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	7.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	111	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mike Hoffman

Rocky Mountain
Analytical Laboratory

Enseco
A CORNING Company

ANALYTICAL RESULTS

FOR

SIGNETICS COMPANY

ENSECO-RMAL NO. 021811

APRIL 16, 1992

Reviewed by: Kathy L. McKeeta

Dave Roberts

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #1
Lab ID: 021811-0002-SA
Matrix: AQUEOUS Sampled: 25 MAR 92 Received: 27 MAR 92
Authorized: 27 MAR 92 Prepared: NA Analyzed: 07 APR 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	13	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	76	%

ND = Not detected
NA = Not applicable

Reported By: Lori Pacheco Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #2
Lab ID: 021811-0001-SA
Matrix: AQUEOUS Sampled: 25 MAR 92 Received: 27 MAR 92
Authorized: 27 MAR 92 Prepared: NA Analyzed: 07 APR 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.5	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	57	%

ND = Not detected
NA = Not applicable

Reported By: Lori Pacheco Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #3
Lab ID: 021811-0004-SA
Matrix: AQUEOUS Sampled: 26 MAR 92 Received: 27 MAR 92
Authorized: 27 MAR 92 Prepared: NA Analyzed: 08 APR 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	71	%

ND = Not detected
NA = Not applicable

Reported By: Lori Pacheco Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #4
Lab ID: 021811-0003-SA
Matrix: AQUEOUS Sampled: 26 MAR 92 Received: 27 MAR 92
Authorized: 27 MAR 92 Prepared: NA Analyzed: 07 APR 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	4.7	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	76	%

ND = Not detected
NA = Not applicable

Reported By: Lori Pacheco Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Trip Blank
Lab ID: 021811-0005-TB
Matrix: AQUEOUS Sampled: Unknown Received: 27 MAR 92
Authorized: 27 MAR 92 Prepared: NA Analyzed: 08 APR 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	86	%

ND = Not detected
NA = Not applicable

Reported By: Lori Pacheco Approved By: Mike Hoffman

Rocky Mountain
Analytical Laboratory

Enseco
A CORNING Company

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 022991

JUNE 19, 1992

Reviewed by: Kathy McKeeta

Dave Roberts

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303 422-6611 Fax: 303 451-7171

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #1
Lab ID: 022911-0001-SA
Matrix: AQUEOUS Sampled: 19 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 28 MAY 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	86	%

ND = Not detected
NA = Not applicable

Reported By: Anne Yardy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #2
Lab ID: 022911-0002-SA
Matrix: AQUEOUS Sampled: 19 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 28 MAY 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	8.7	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	83	%

ND = Not detected
NA = Not applicable

Reported By: Anne Yardy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #3
Lab ID: 022911-0003-SA
Matrix: AQUEOUS Sampled: 20 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 28 MAY 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	91	%

ND = Not detected
NA = Not applicable

Reported By: Anne Yardy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #4
Lab ID: 022911-0004-SA
Matrix: AQUEOUS Sampled: 20 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 28 MAY 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	4.8	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	77	%

ND = Not detected
NA = Not applicable

Reported By: Anne Yardy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Trip Blank
Lab ID: 022911-0005-SA
Matrix: AQUEOUS
Authorized: 21 MAY 92

Sampled: Unknown
Prepared: NA

Received: 21 MAY 92
Analyzed: 01 JUN 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	16	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	4.6	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper

Approved By: Mike Hoffman

copy

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 025301

OCTOBER 21, 1992

Enseco
A Corning Company

Reviewed by: Kathy McKeeta

Dave Roberts

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303 421-6611 Fax: 303 431-7171

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #1
Lab ID: 025301-0002-SA
Matrix: AQUEOUS Sampled: 22 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 05 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	11	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	106	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Audrey Verniero

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #2
Lab ID: 025301-0001-SA
Matrix: AQUEOUS Sampled: 22 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 05 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	10	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	104	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Audrey Verniero

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #3
Lab ID: 025301-0004-SA
Matrix: AQUEOUS Sampled: 23 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 05 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	220	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Audrey Verniero

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #4
Lab ID: 025301-0003-SA
Matrix: AQUEOUS Sampled: 23 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 16 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
`,2-Dichloropropane	ND	ug/L	1.0
rans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.5	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	94	%

ND = Not detected
NA = Not applicable

eported By: Stan Dunlavy Approved By: Audrey Verniero

Rocky Mountain
Analytical Laboratory

COPY

Enseco
A CORNING Company

ANALYTICAL RESULTS

FOR

PHILIPS SEMICONDUCTORS

ENSECO-RMAL NO. 027075

JANUARY 21, 1993

Reviewed by: Kathy McKeeta

Randy Greaves

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax 303/451-7171

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #1
Lab ID: 027075-0001-SA
Matrix: AQUEOUS Sampled: 06 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 19 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
ichloroethene	ND	ug/L	0.50
ibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	124	%

ND = Not detected
NA = Not applicable

oorted By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #2
Lab ID: 027075-0002-SA
Matrix: AQUEOUS
Authorized: 08 JAN 93

Sampled: 06 JAN 93
Prepared: NA

Received: 08 JAN 93
Analyzed: 19 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
rans-1,3-Dichloropropene	ND	ug/L	1.0
richloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	7.1	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	110	%

ND = Not detected
NA = Not applicable

ported By: Bret Collins

Approved By: Mark Pokorny

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #3
Lab ID: 027075-0003-SA
Matrix: AQUEOUS Sampled: 07 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 19 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
rans-1,3-Dichloropropene	ND	ug/L	1.0
richloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

:ported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #4
Lab ID: 027075-0004-SA
Matrix: AQUEOUS Sampled: 07 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 20 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.4	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip Blank
Lab ID: 027075-0005-SA
Matrix: AQUEOUS Sampled: 07 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 20 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	112	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Exhibit A-9

U.S. Environmental Protection Agency
Office of Solid Waste
Contract No. 68-W9-0041

RCRA Implementation Contract
Zone II
Regions VI-X

PRC Environmental Management, Inc.

In Association with:
NUS Corporation
ICF Technology, Inc.
Versar, Inc.
Ecology & Environment, Inc.
HydroGeoLogic, Inc.

PRC Environmental Management, Inc.
1 Dallas Centre
350 North St. Paul Street
Suite 2600
Dallas, TX 75201
214-754-8765
Fax 214-922-9715

April 27, 1993

Ms. Nancy Morlock
Work Assignment Manager
U.S. EPA Region 6
1445 Ross avenue
Dallas, TX 75202

Re: EPA Contract No. 68-W9-0041
Work Assignment No. R2652
Project No. 01
Signetics Corporation, RCRA Facility Assessment - Report additions

Dear Ms. Morlock:

Please find enclosed the additional information EPA requested for inclusion in the above referenced RFA report. The additions include a table (Table 6-2) summarizing the ground-water analytical data, copies of the monitoring well construction logs, and revised figures 2-2, 3-1, and 4-2. In addition, PRC has enclosed the revised table of contents, references, and text pages.

If you have any questions, please call me at (214) 754-8765.

Sincerely,

Stephen D. Phillips, P.G.
Regional Liaison

Enclosures

cc: T. Reilly, EPA Regional Project Officer
File

contains recycled fiber and is recyclable

RCRA FACILITY ASSESSMENT REPORT
SIGNETICS CORPORATION
ALBUQUERQUE, NEW MEXICO
NMD000709782

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 6
Allied Bank Tower 12th Floor
1445 Ross Avenue
Dallas, Texas 75202

Prepared by

PRC Environmental Management, Inc.
350 North St. Paul
Suite 2600
Dallas, Texas 75201

EPA contract No. 68-W9-0041

Work Assignment No. R2652

October 26, 1992

TABLE OF CONTENTS

Sheet 1 of 2

Section		Page
DISCLAIMER		i
1.0	INTRODUCTION	1
1.1	PURPOSE OF THE RCRA FACILITY ASSESSMENT	1
2.0	FACILITY DESCRIPTION	1
2.1	FACILITY LOCATION	2
2.2	FACILITY OPERATIONS AND HAZARDOUS WASTE MANAGEMENT	5
2.2.1	Summary of Wastes Handled	7
2.2.2	Identification of Solid Waste Management Units	10
2.3	REGULATORY STATUS	12
2.3.1	RCRA Permits	12
2.3.2	Air Permits	14
2.3.3	Water Permits	14
3.0	ENVIRONMENTAL SETTING	15
3.1	LAND USE	15
3.2	CLIMATE	16
3.3	TOPOGRAPHY AND SURFACE WATER	16
3.4	SOILS	17
3.5	GEOLOGY	19
3.6	GROUND WATER	20
4.0	SOLID WASTE MANAGEMENT UNITS	21
4.1	SWMU NO. 1 - SEGREGATED WASTE DRAINS	21
4.2	SWMU NO. 2 - TANK 3	23
4.3	SWMU NO. 3 - TANK 4	25
4.4	SWMU NO. 4 - TANK 5	27
4.5	SWMU NO. 5 - FLAMMABLE STORAGE 4 (FS-4)	29
4.6	SWMU NO. 6 - CHEMICAL STORAGE 2 (CS-2)	31
4.7	SWMU NO. 7 - NEUTRALIZATION WASTEWATER TREATMENT SYSTEM	33
4.8	SWMU NO. 8 - CORONADO MUNICIPAL LANDFILL	37
5.0	AREAS OF CONCERN	40
6.0	HUMAN AND ENVIRONMENTAL TARGETS	40

TABLE OF CONTENTS

Sheet 2 of 2

Section		Page
6.1	AIR	41
6.2	SOIL	41
6.3	SURFACE WATER	42
6.4	SUBSURFACE GAS	43
6.5	GROUND WATER	43
7.0	CONCLUSIONS AND RECOMMENDATIONS	44
REFERENCES		51

Attachments

A Visual Site Inspection Summary

B Visual Site Inspection Photographs

C Signetics Monitoring Well Construction Logs

LIST OF FIGURES

Figure		Page
2-1	Facility Location	3
2-2	Facility Layout	4
2-3	Signetics Systems Center Building	6
3-1	Ground-Water Elevation Contours and Arroyo Storm Water Drainage	18
4-1	Wastewater Treatment Facility	34
4-2	Municipal Landfill Locations	38

LIST OF TABLES

Tables		Page
2-1	Solid Wastes	8
2-2	Hazardous Waste Transporters and TSD Facilities	11
2-3	Solid Waste Management Units (SWMUs)	13
6-1	Water Wells in a Three Mile Radius of Signetics Corporation Facility	45
6-2	Signetics Ground-water Monitoring Well Analytical Results	46
7-1	SWMU Summary	48

DISCLAIMER

This report was prepared for the U.S. Environmental Protection Agency (EPA), Region 6 by PRC Environmental Management, Inc. in fulfillment of Contract No. 68-W9-0041, Work Assignment No. R2652. The opinions, findings, and conclusions expressed herein are those of the contractor and not necessarily those of EPA or other cooperating agencies. Mention of company or product names is not to be considered as an endorsement by EPA.

This document is intended to assist EPA and state personnel in developing requirements for a Resource Conservation and Recovery Act (RCRA) - regulated facility owner or operator to conduct a RCRA Facility Investigation (RFI) pursuant to Title 40, Code of Federal Regulations (CFR), Part 264. EPA will not necessarily limit the RFI or other requirements to those that correspond with the recommendations set forth herein. EPA and state personnel must exercise their technical judgement in using the RCRA Facility Assessment (RFA) report, as well as other relevant information, in determining what RFI or other requirements to include in a permit or order.

EXECUTIVE SUMMARY

The Signetics Corporation Albuquerque facility (EPA ID. No. NMD000709782) is located at the northern boundary of the city of Albuquerque, New Mexico, is a subsidiary of North American Phillips Company, and is primarily a manufacturer of metal oxide semiconductor integrated circuits (IC). The site is bordered on the east by the Pan American Freeway (Interstate 25), to the north by vacant land, to the south by private businesses, and to the west by manufacturing facilities. There is a residential area to the southwest of Signetics.

The construction of the plant began in 1978 and operations began in 1982, with full operation status being reached in 1983. The production of ICs has remained the principle activity at the facility with expansion activities currently occurring and changes in process equipment and chemical use ongoing. Expansion activities have involved the construction of additional production areas (clean rooms) with more stringent levels of cleanliness and installation of greater levels of equipment automation to improve production efficiency.

All production areas are within the Signetics facilities fabrication building as are the wastewater treatment facility and hazardous waste storage areas. As a result of these production activities, Signetics generates four classes of hazardous waste; corrosive (D002), toxic (D004 and D009), ignitable (D001), and listed (F002 and F003). These wastes are either treated and disposed of into the City of Albuquerque Publicly Owned Treatment Works (POTW) (D002 wastes) or are stored on site prior to shipment to a permitted disposal facility (D001, D004, D009, F002, and F003 wastes) (Signetics, 1980b).

An etching step in the manufacture of ICs produces waste hydrofluoric acid and buffered oxide etch (hydrofluoric acid and ammonium fluoride solution) which is transferred through a segregated drainage system to the facility's Neutralization Wastewater Treatment System. Subsequent IC cleaning steps utilize acid solutions of nitric and sulfuric acid. These spent acidic solutions are also treated in the wastewater treatment system. A mixed solvent waste, Solvent I, contains ignitable (D001) and listed (F003 and F002) wastes from an IC photo stripping process. This waste is stored in a 5,000-gallon tank prior to shipment to a Treatment, Storage, and Disposal Facility (TSDF) for use in a waste fuels program. A second waste, Solvent II, also contains ignitable and listed hazardous

waste constituents (F003). Solvent II waste is primarily waste photolithographic chemicals that are stored in 55-gallon drums in a secure storage room. Toxic wastes include; arsenic contaminated gloves, containers, and rags from IC "doping" activities, and mercury waste in the form of mercury lamps and broken thermometers that are classified as D004 and D009 hazardous wastes, respectively. These wastes, which are stored separately on site in 55-gallon drums, are ultimately shipped to commercial TSDFs by permitted transporters (Signetics, 1980b).

The Signetics Corporation Albuquerque facility submitted RCRA Part A and Part B Permit applications to EPA Region 6 on August 14, 1980. The permit applications listed six hazardous wastes generated and stored at the facility. These wastes included three stored-in-bulk quantities, including waste Solvent I stored in 5,000-gallon Tank 3, waste hydrofluoric acid stored in 5,000-gallon Tank 4, and waste buffered oxide etch stored in 5,000-gallon Tank 5. The other three wastes were identified as drummed ignitable (Solvent II) stored in 55-gallon drums in Flammable Storage 4, and arsenic- and mercury-contaminated wastes stored in separate 55-gallon drums in Chemical Storage 2 (Signetics, 1980b). The facility operated under interim status until receiving a draft RCRA hazardous waste storage permit from the State of New Mexico on February 11, 1985 and a final 10-year hazardous waste permit on April 1, 1986 (EPA, 1985 and NMEID, 1986). Signetics is an indirect discharger of neutralized acid wastewater into the City of Albuquerque's POTW and operates under a city wastewater discharge permit number 2023A-3, which is current until July 31, 1993 (Albuquerque, 1991). The facility is also permitted for air emissions and was granted Air Quality Permit Number 166 on December 15, 1986 by the City of Albuquerque (Albuquerque, 1992a).

During the Visual Site Inspection (VSI) and Preliminary Review (PR), PRC identified eight Solid Waste Management Units (SWMU) at Signetics Corporation. Of these, five are active and three are inactive. No areas of concern (AOC) were identified. PRC recommends further investigation at one SWMU, the abandoned Coronado Municipal Landfill.

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC), received Work Assignment No. R2652 from the U.S. Environmental Protection Agency (EPA) under Contract No. 68-W9-0041 to conduct RCRA facility assessments (RFA) and visual site inspections (VSI) of RCRA facilities permitted to store and treat hazardous wastes. Under this Work Assignment, PRC is contracted to provide technical support on a RFA/VSI of the Signetics Corporation (Signetics) facility in Albuquerque, New Mexico.

This report describes the findings of a PR and a VSI. It includes (1) a description of the facility and its SWMUs, (2) an identification of waste release potential through various contaminant migration pathways, and (3) a summary of conclusions and recommendations regarding further EPA activity, i.e., the need for an RFI.

1.1 . PURPOSE OF THE RCRA FACILITY ASSESSMENT

The purpose of the RFA is to identify environmental releases or potential releases from SWMUs that may require corrective action. The RFA is the first step in implementing the corrective action provisions of the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA. Specifically, Sections 3004(u), 3004 (v), and 3008(h) grant EPA the authority to initiate corrective action for releases of hazardous wastes and constituents from SWMUs at RCRA-regulated facilities. An RFA generally consists of three steps; a PR, a VSI, and if necessary, a Sampling Visit (SV). A sampling visit is conducted only when available information is insufficient to support a recommendation for a RCRA Facility Investigation (RFI). The RFA at Signetics did not include sampling.

2.0 FACILITY DESCRIPTION

This section of the RFA report describes the location of the facility and its historical and current operations, provides a list of the identified SWMUs and AOCs, and describes the sources and types of wastes managed at the facility.

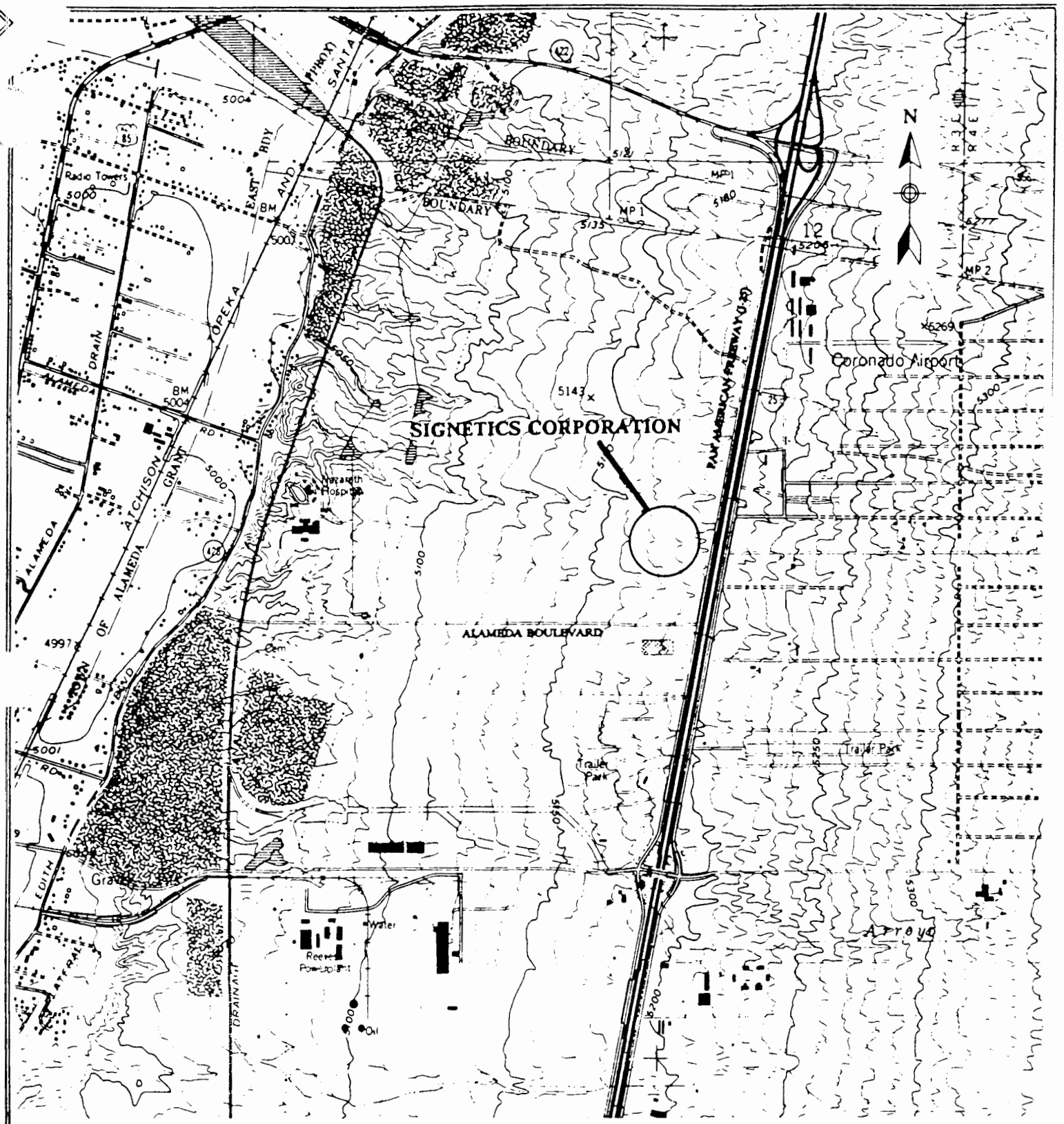
2.1 FACILITY LOCATION

The Signetics Corporation facility is located at the north edge of the city of Albuquerque, at the northwest juncture of the Pan American Freeway (Interstate 25) and Alameda Boulevard (Figure 2-1). The facility is on an approximately 60-acre plot obtained from the City of Albuquerque in an industrial bond process (Figure 2-2) (EPA, 1986). The site is situated close to the north boundary of the Elena Gallegos Land Grant, within the city limits, and just south of the Sandia Pueblo Land Grant boundary. The facility is bordered on the east by the freeway, on the north by vacant land, to the south by private businesses, principally Western Power and Construction, Inc., and to the west by Honeywell, Inc., a manufacturing facility. There is a residential area to the southwest of Signetics. The geographic coordinates of the facility are north 35° 05' 020" latitude and west 106° 39' 015" longitude. Figure 2-2 illustrates the layout of the Signetics facility.

The Signetics Albuquerque facility, a subsidiary of North American Philips Company, manufactures metal oxide semiconductor ICs from silicon wafers in its 470,000 square foot (ft^2) plant utilizing various masking, etching, cleaning, oxidation, metallization, and doping processes. The facility operates on a 24-hour per day schedule and has approximately 1,006 employees. All manufacturing processes are conducted inside the fabrication building in two clean room production areas designated as Fab 22 and Fab 23. Construction is currently ongoing to create additional manufacturing capacity.

Standard facility data are provided below:

Facility Location:	Intersection of the Pan American Freeway (Interstate 25) and Alameda Boulevard, Bernalillo County, New Mexico
Facility Address:	Signetics Corporation 9201 Pan American Freeway, N.E. Albuquerque, New Mexico 87113
Facility Contact:	Gary Mavrakis Material/Environmental Compliance Manager
Telephone:	(505) 822-7188



0 1000 2000

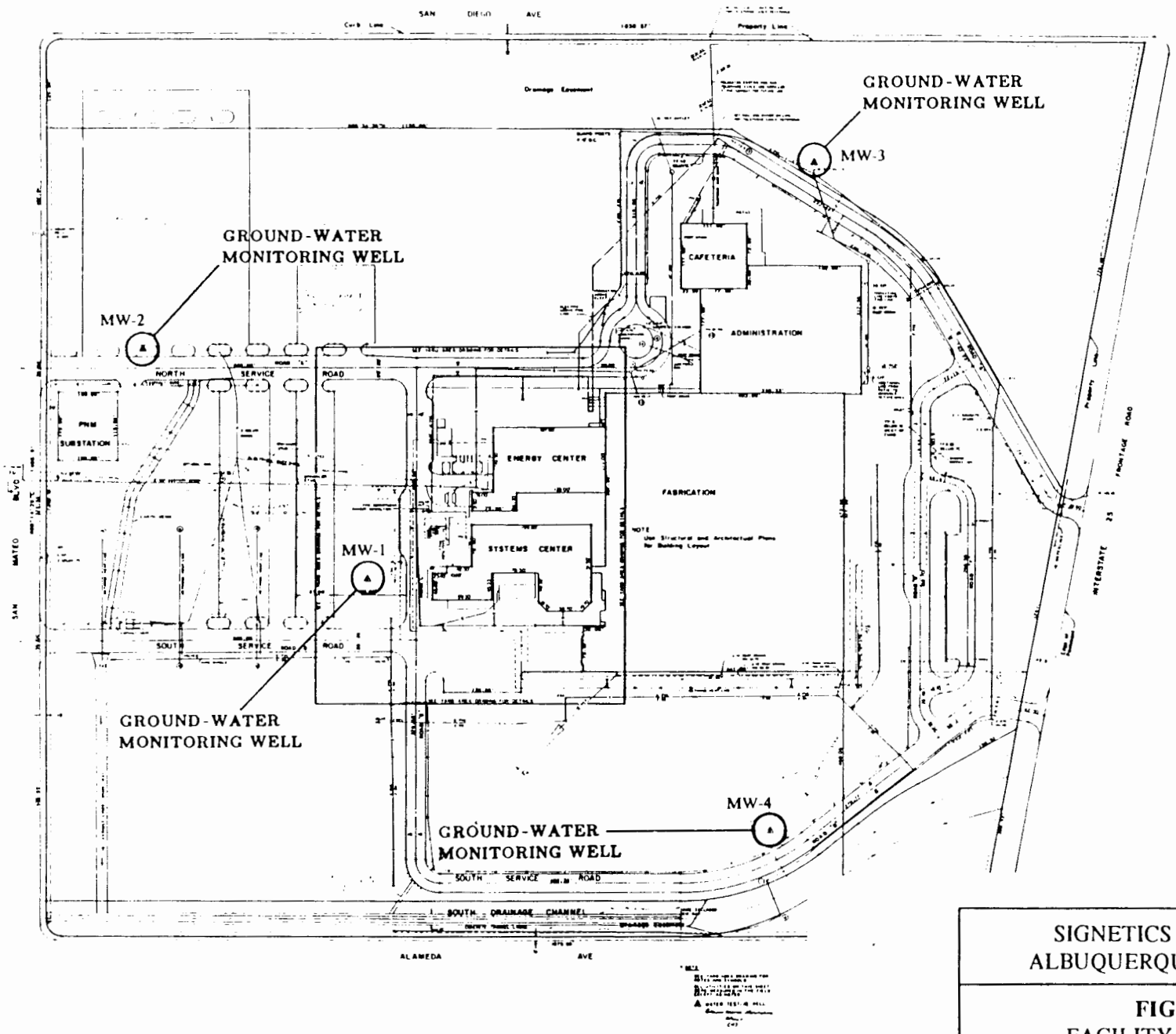
SCALE IN FEET

SOURCE: USGS - NEW MEXICO, ALAMEDA QUADRANGLE, PHOTO-REVISED 1972

SIGNETICS CORPORATION
ALBUQUERQUE, NEW MEXICO

FIGURE 2-1
FACILITY LOCATION MAP

PRC Environmental Management, Inc.



NO SCALE

SIGNETICS CORPORATION
ALBUQUERQUE, NEW MEXICO

FIGURE 2-2
FACILITY LAYOUT MAP

SO[illegible] SIGNETICS, ALBUQUERQUE, NEW MEXICO

PRC Environmental Mana[illegible], Inc.

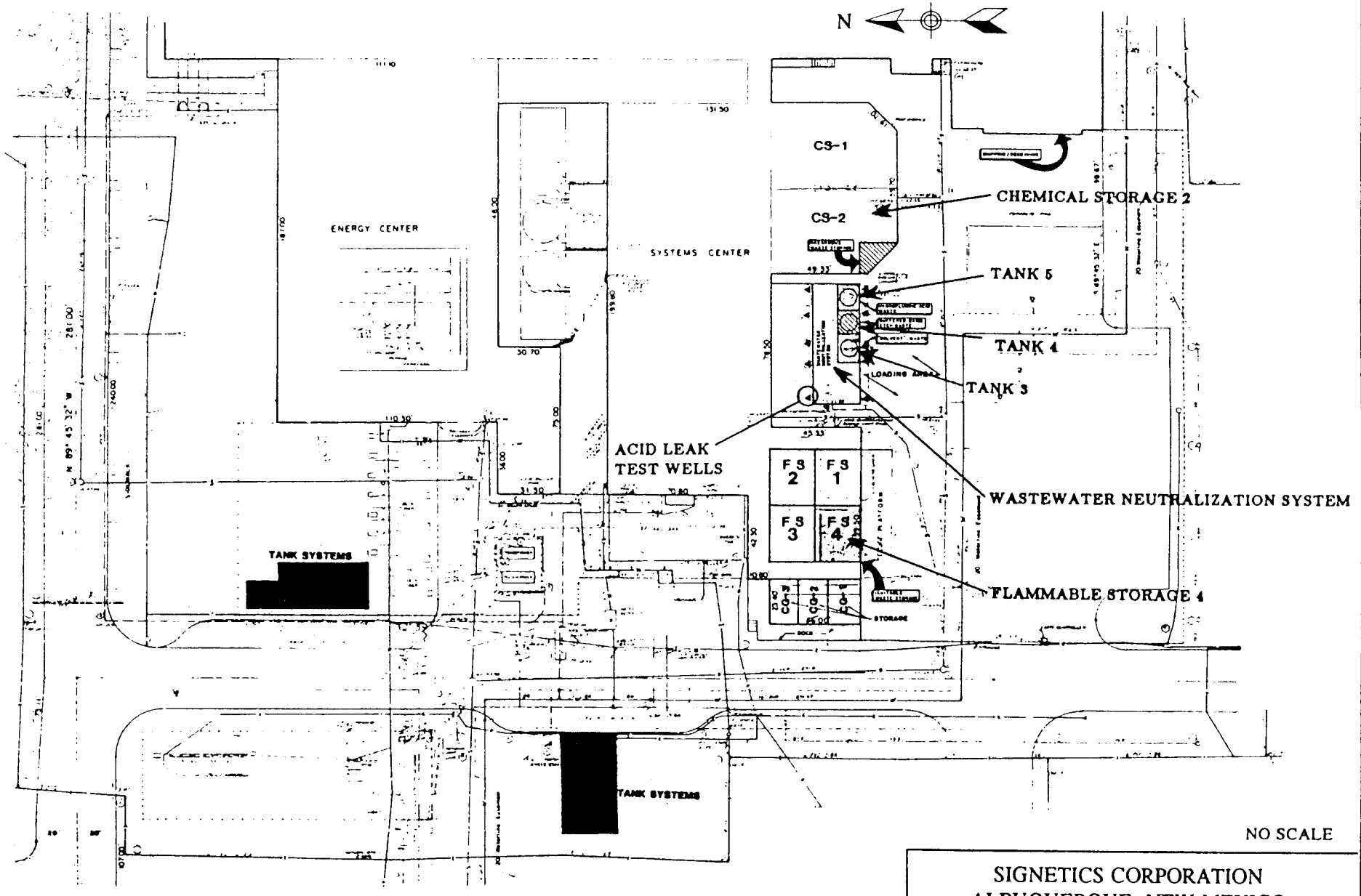
EPA ID Number:	NMD000709782
Wastewater Discharge Permit:	2023A-3
Air Permit:	166

2.2 FACILITY OPERATIONS AND HAZARDOUS WASTE MANAGEMENT

The Signetics facility underwent construction from 1978 to 1982, and became fully operational in 1983. Signetics submitted both a Part A and Part B RCRA permit applications on August 14, 1980, recognizing that the facility would be generating and storing hazardous wastes associated with the manufacture of ICs (Signetics, 1980b). The facility operated as a hazardous waste generator under interim status until receiving a 10 year hazardous waste permit from the State of New Mexico on April 1, 1986 (NMEID, 1986).

Under its Air Quality Permit 166, Signetics is permitted to annually process a maximum of 1,300,000 blank 4- and 6-inch silicon wafers. Manufacturing of the ICs occurs in the facility's fabrication building using automated manufacturing equipment. The wafers are subjected to a circuit diagram printing process using photolithographic material, the pattern is etched with hydrofluoric acid and buffered oxide etch, cleaned with acids and solvents, and impregnated with a conductive material, arsenic. The automated equipment, located in two clean room areas, Fab 22 and 23, is continuously serviced by operators.

Hazardous waste management is generally accomplished by continuous transport of waste streams from the automated manufacturing equipment through a segregated drainage system, or contained within the equipment and transported daily to a central treatment and storage area. The segregated drains are dedicated to specific waste streams and transport the wastes to a wastewater neutralization system or other SWMUs. Spent nitric and sulfuric acid, hydrofluoric acid, and buffered oxide etch solutions are transported in these drains to a wastewater neutralization facility for treatment and discharge to the City of Albuquerque POTW. The drainage system also transports waste Solvent I, a mixed solvent cleaning solution, to Tank 3 for temporary storage prior to shipment to a permitted TSDF. The wastewater treatment system and all hazardous waste SWMUs are located in the Systems Center building illustrated in Figure 2-3. The facility stores only wastes generated



NO SCALE

SIGNETICS CORPORATION
ALBUQUERQUE, NEW MEXICO

FIGURE 2-3
SIGNETICS SYSTEMS CENTER BUILDING

PRC Environmental Management, Inc.

SOI SIGNETICS, ALBUQUERQUE, NEW MEXICO

on-site and no off-site wastes are accepted (Signetics, 1980b). The segregated drainage system was designed specifically for the waste streams associated with IC production.

The contained waste stream, waste Solvent II, is a spent photolithographic solution and is collected in 5-gallon Nalgene carboys that are removed daily from the automated equipment and transported to a temporary storage room, Flammable Storage 4 (FS-4). The carboy contents are transferred to 55-gallon metal drums for on site storage until shipment to a TSDF.

Other process wastes, arsenic-contaminated material from servicing "doping" equipment and mercury-contaminated materials from broken thermometers and mercury lamps, are transported daily in separate sealed bags to a temporary storage room, Chemical Storage 2 (CS-2). The bagged wastes are placed in separate 55-gallon metal drums and stored on site until shipment to a TSDF. Signetics has received three awards from the EPA in 1988, 1989 and in 1991 for its waste management practices. The facility operates an aggressive recycling and reuse program of non-hazardous wastes generated from daily operations. In addition to standard paper, plastic, cardboard, and metal recycling; construction and maintenance materials, such as paint, are offered to employees rather than disposed of, and non-hazardous machine and pump oils are collected for reprocessing and reuse at the facility. Signetics has reported its intention to phase out the use of freon (NMED, 1991).

2.2.1 Summary of Wastes Handled

The IC manufacturing process at the Signetics plant results in several different waste streams including six hazardous wastes presented in Table 2-1 and described below. In addition to the process wastes generated, other non-hazardous wastes are generated as a result of plant maintenance and daily operations.

The majority of wastes handled at Signetics result from manufacturing activities occurring in two clean room areas, Fab 22 and 23. The IC etching step generates a hydrofluoric acid waste stream (D002) and buffered oxide etch solution (hydrofluoric acid and ammonium fluoride) waste stream (D002) that is transported to the Neutralization Wastewater Treatment System through the segregated drainage pipes. Previously, these two waste solutions were stored on site in separate 5,000-gallon tanks until sufficient quantities were accumulated for shipment to a TSDF. Signetics

TABLE 2-1
SOLID WASTES

Waste/EPA Waste Code	Source	Primary Management Unit*
Waste Solvent I/D001/F002/F003	Photolithographic Cleaning	Tank 3
Waste Solvent II/D001/F003	Photolithographic Circuit Printing	Flammable Storage 4 (FS-4)
Waste Hydrofluoric Acid/D002	Silica Oxide Etching	Tank 5 (inactive) and Neutralization Wastewater Treatment System
Waste Buffered Oxide Etch/D002	Silica Oxide Etching	Tank 4 (inactive) and Neutralization Wastewater Treatment System
Arsenic Waste/D004	IC "doping" Process	Chemical Storage 2 (CS-2)
Mercury Waste/D009	Production Activities	Chemical Storage 2 (CS-2)
Spent Nitric and Sulfuric Acid Wastewater/NA**	IC Cleaning Activities	Neutralization Wastewater Treatment System

Notes:

* Primary management unit refers to a SWMU that currently manages or formerly managed the waste.

** Nonapplicable (NA) designates nonhazardous waste.

hazardous waste storage permit limits the on-site storage capacity in each 5,000-gallon tank to 4,700 gallons (NMEID, 1986). In an agreement reached with the City of Albuquerque and the State of New Mexico in 1986, these two acid wastes are now neutralized in the Neutralization Wastewater Treatment System, along with other acidic wastewaters, and discharged into the City of Albuquerque POTW (EPA, 1988). Signetics reported the generation of approximately 50,000 gallons of waste hydrofluoric acid and 30,000 gallons of waste buffered oxide etch in 1991 (Signetics, 1992). The two 5,000-gallon tanks designated as Tank 5 for the waste hydrofluoric acid tank and Tank 4 for the buffered oxide etch waste tank are inactive, but maintained for possible future use.

A series of IC cleaning steps involve the use of acid solutions. The resultant spent nitric and sulfuric acid wastewaters are discharged through the segregated drainage system to the Neutralization Wastewater Treatment System. The neutralized wastewater effluent which includes the waste hydrofluoric and buffered oxide etch solutions, spent nitric and sulfuric acid wastewater, cooling tower blowdown, fabrication scrubber waters, and demineralizer regeneration wastewaters, is combined with the domestic wastewater and discharged into the City of Albuquerque POTW. The total quantity of acid/caustic wastewater discharged from the wastewater treatment system was reported by Signetics as approximately 160 million gallons in 1989 (Signetics, 1990).

The third hazardous waste stream generated in production activities is a mixed ignitable "Solvent I" waste with hazardous waste classifications of D001, F002, and F003. This photolithographic cleaning waste contains methanol, acetone, ethylene glycol, ethanolamine, diethylene glycol monobutyl ether, water, and occasional trace levels of chlorinated solvents (freon and 1,1,1-trichloroethane), resulting from the stripping of photolithographic material from the silica wafers. Collection of this waste stream is also through the segregated drainage system and stored in a 5,000-gallon SWMU, Tank 3 in the wastewater treatment area in the Systems Center building. The Solvent I waste is stored on site until shipped to a licensed commercial TSDF where it is utilized in a fuels program (Signetics, 1980b). Signetics reported the shipment of approximately 20,000 gallons of Solvent I waste in 1991 (Signetics, 1992). The 1986 hazardous waste storage permit under which Signetics operates, specifies a maximum storage limit of 4,700 gallons of waste Solvent I in Tank 3 prior to shipment to an off site TSDF (NMEID, 1986).

A fourth hazardous waste, "Solvent II", with hazardous waste classifications D001 and F003, is a waste photolithographic solution consisting of a mixture of proprietary vendor formulations of positive photoresists which include cellosolve acetate, glycol esters, and acetone. This waste stream is collected from individual automated IC manufacturing machines daily in 5-gallon Nalgene carboys and segregated into 55-gallon steel drums and stored in Flammable Storage 4 (FS-4). Room FS-4 is a designated SWMU for this waste (Signetics, 1980b). The drummed waste is stored for transport to a TSDF for use in a fuels program. Signetics reported the generation of 160 drums of Solvent II waste in 1991 (Signetics, 1992). The maximum allowable number of drums permitted in FS-4 under the provisions of Signetics hazardous waste storage permit, is 36 drums (NMEID, 1986).

The fifth and sixth hazardous waste streams associated with production activities are hazardous by characteristics of toxicity. The impregnation of the etch circuit diagrams with conductive material involves the use of arsine gas and results in the generation of arsenic contaminated gloves, containers, and rags with hazardous classification D004. A smaller hazardous waste stream with hazardous classification D009, mercury contaminated waste, includes used lamp bulbs, broken thermometers, and spill containment material. These two wastes are stored in separate 55-gallon steel drums in Chemical Storage 2 (CS-2), which is permitted to hold a maximum of 64 drums of these hazardous wastes (NMEID, 1986). The drummed arsenic waste is stored until sufficient quantity has accumulated to justify shipment. There was only one partially filled drum of mercury waste and no shipments had been made at the time of the VSI. Signetics reported the generation of 25 drums of arsenic-contaminated wastes in 1991 (Signetics, 1992).

Signetics uses only permitted hazardous waste transporters and TSDFs for the removal and disposal of the wastes generated at the Albuquerque facility. Three transporters and three TSDFs (Table 2-2) were identified by Signetics as companies whose services are currently used (Signetics, 1991).

2.2.2 Identification of Solid Waste Management Units

As a result of this RFA, a total of eight SWMUs have been identified at the Signetics facility. The definition of a SWMU adopted in this RFA reflects current EPA policy as stated in the July 15, 1985, Codification Rule (50 CFR 28701), the RCRA Facility Assessment Guidance Document

TABLE 2-2
HAZARDOUS WASTE TRANSPORTERS AND TSD FACILITIES

Company Name	Address	EPA ID Number
Transporters		
ENSECO	No Address	ARD069748192
Chemical Waste Management, Inc.	No Address	ILD099202681
RINCHEM Company, Inc.	No Address	NMD002208627
TSD Facilities		
ENSECO	American Oil Road El Dorado, AR 71730	ARD069784192
Oil & Solvent Process Company	9131 East 96th Ave. Henderson, CO 80640	COD980591184
Cameron-Yakima	1414 S. 1st Street Yakima, WA 98901	WAD009477175

(October 1986), and other recent policy directives from the Office of Solid Waste and Emergency Response (OSWER). A SWMU is defined as any discernable waste management unit at a RCRA facility from which hazardous constituents might migrate. The definition does not include accidental spills from production areas and units in which wastes have not been managed (such as product storage areas). Table 2-3 presents a summary of the regulatory and operating status for all SWMUs identified at the facility.

2.3 REGULATORY STATUS

This section summarizes the regulatory status of the hazardous waste management units at the Signetics facility, as could be determined from the files reviewed and from facility personnel. In this section, we present information on permits and other environmental compliance issues under city, state, and federal regulations.

2.3.1 RCRA Permits

The normal operation of the Signetics facility results in the generation of hazardous wastes by characteristics of corrosivity (D002), ignitability (D001), toxicity (D004 and D009), and listed solvent wastes (F002 and F003). These hazardous wastes, along with other non-hazardous wastes (nitric/sulfuric acid wastewater) are treated on site for disposal in the City of Albuquerque POTW or stored on site prior to transport to an approved TSDF.

Signetics submitted a RCRA Part A and Part B applications to EPA Region 6 on August 14, 1980. The facility operated under interim status until February 11, 1985 when the New Mexico Environmental Improvement Department (NMEID) granted tentative approval for a hazardous waste storage permit and then gave final approval for the 10 year permit on April 1, 1986 (Signetics 1980a, Signetics 1980b, and NMEID 1986). As a result of a 1986 agreement with the City of Albuquerque and the State of New Mexico, the hydrofluoric acid and buffered etch wastes previously stored on site in regulated SWMUs, are now discharged to the wastewater neutralization system. SWMU Nos. 3 and 4, storage tanks for these wastes, are now inactive but are maintained for possible future use (EPA, 1988). Signetics has previously made minor amendments to their Part B permit in 1986 and 1988 to reflect changes in facility structures (NMEID, 1988b, Signetics, 1986, and Signetics, 1988).

TABLE 2-3

SOLID WASTE MANAGEMENT UNITS (SWMUs)

SWMU Number	SWMU Name	RCRA Hazardous Waste Management Unit*	Status
1	Segregated Drains	Unregulated	Active
2	Tank 3	Regulated	Active
3	Tank 4	Regulated	Inactive
4	Tank 5	Regulated	Inactive
5	Flammable Storage 4 (FS-4)	Regulated	Active
6	Chemical Storage 2 (CS-2)	Regulated	Active
7	Neutralization Wastewater Treatment System	Unregulated	Active
8	Coronado Municipal Landfill	Unregulated	Inactive

Note:

* A RCRA hazardous waste management unit is one that currently requires or formerly required submittal of a RCRA Part A or Part B permit application.

The Part B permit is currently being amended to reflect changes in Signetics personnel with responsibilities under this permit.

Regulatory compliance orders and notice of violations received by Signetics have generally dealt with minor regulatory documentation requirement issues. The only penalty assessed against Signetics occurred in 1983 and was in regard to the corporation's failure to submit documentation of closure and post-closure assurance (EPA, 1983a and EPA, 1983b).

2.3.2 Air Permits

The City of Albuquerque, Engineering/Air Monitoring Section, Air Pollution Control Division issued Air Quality Permit 166 to the Signetics facility on December 15, 1986. The permit has since been amended one time in 1987 to raise the levels of permitted volatile organic compound (VOC) and arsenic emissions, and the maximum annual silicon wafer processing volume. The permit requires air quality monitoring of VOCs, arsenic, and acid emissions from the facility. Signetics is required to submit quarterly reports (Albuquerque, 1992a).

Since the 1986 issuance of the original air permit, no notices of violations have been issued in response to submitted quarterly reports or facility inspections. The City of Albuquerque has routinely received submitted notifications from Signetics of stack air scrubber equipment upgrades and modifications (Albuquerque, 1992a).

2.3.3 Water Permits

The Signetics facility discharges process-related wastewater into the City of Albuquerque POTW after treatment and falls under the category of an indirect wastewater discharger; not requiring an NPDES permit. The City of Albuquerque is required to have an NPDES permit for its wastewater treatment plant effluent and regulates the wastewater discharges into the POTW. Signetics has a City of Albuquerque wastewater discharge permit 2023A-3 that regulates discharge of acid wastewater from the facility wastewater treatment system and is effective until July 31, 1993. The wastewater effluent from the wastewater treatment system is combined with general facility wastewater and discharged into the City's POTW (Albuquerque, 1991).

As required under the permit granted by the City of Albuquerque, the facility routinely monitors effluent from the wastewater treatment system. Quarterly reports are submitted to the Wastewater Utility Division's Southside Wastewater Treatment Plant documenting performance of the Signetics wastewater treatment process. Between July 1990 and July 1991 there were several instances where collected effluent samples exceeded the maximum concentration limits permitted under Permit 2023A-3 (Albuquerque, 1992b). The excursions usually involved excessive levels of fluoride, pH, and in one report, nickel. Additionally, Signetics has reported incidents of pH excursions resulting from wastewater treatment equipment failure and human error (Albuquerque, 1992b). To date, the facility has only been cautioned to take corrective action where necessary to ensure that it stays within the permitted limits. No notices of violation have been issued to Signetics for these permit violations.

3.0 ENVIRONMENTAL SETTING

This section describes the environmental setting of the Signetics site and the water resources of the Albuquerque, New Mexico area. The information provides a basis for evaluating potential impacts on human health and the environment from existing or potential releases of hazardous materials to the environment from the SWMUs identified at Signetics. The following subsections describe the land use, climate, topography and surface water, soils, geology, and ground water of the site.

3.1 LAND USE

Signetics Albuquerque facility is located approximately 8 miles east of the Rio Grande River in the north part of the City of Albuquerque. Land use in the vicinity of the facility is a mixture of industrial, private business, and residential. Signetics is bordered by open, undeveloped land to the north; on the east by the Pan American Freeway (Interstate 25); to the south by Western Power and Construction, Inc., and other private businesses; and to the west by Honeywell, Inc., a manufacturing facility. There is a residential development to the immediate southwest of Signetics, and extensive residential housing to the east, on the east side of the Pan American Freeway (Interstate 25).

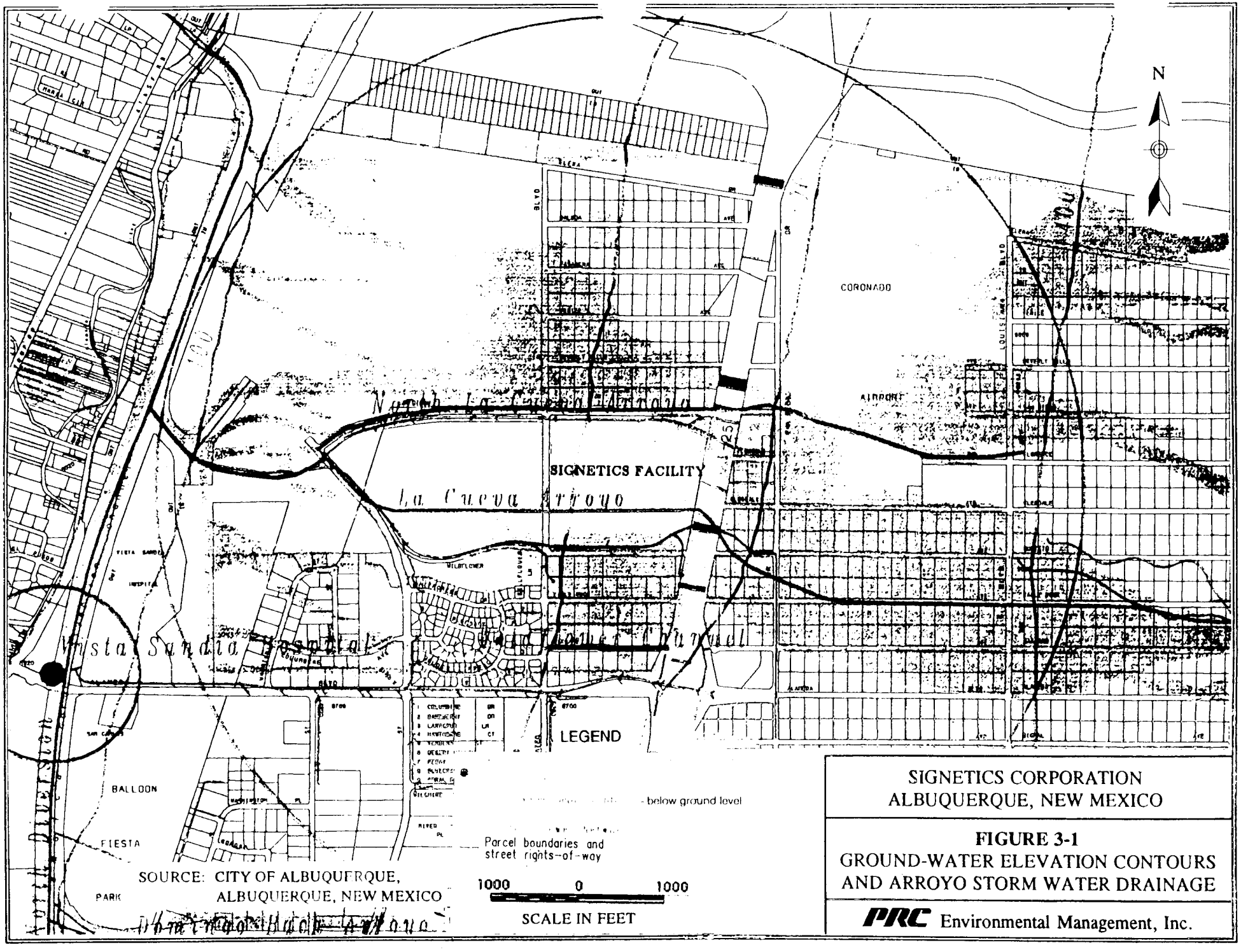
places (Reeder, 1967). The distance between the base of the mountains and the inner valley floor ranges from about 3 miles in the northern part of the area to about 9 miles in the southern part. The valley floor is relatively flat, sloping downstream 6 to 7 feet per mile, and ranging in width from 1 to 4 miles. The inner valley is separated from the east mesa by a bluff which is breached by arroyos from which alluvial fans spread out on the inner valley floor (Reeder, 1967).

A series of cut terraces parallel the Rio Grande on the west, and a broad upland surface, about 600 feet above the river, borders the terraces on the west. In the Albuquerque area, the upland and cut terraces are called the "west mesa." The upland surface slopes generally southeast at about 50 to 100 feet per mile. The Signetics facility is situated on the east mesa near the valley floor at an approximate elevation of 5,200 feet above mean sea level. The facility is situated in the La Cueva Arroyo and is protected from storm water runoff by constructed concrete channels that bypass Signetics on the north and south (Figure 3-1). La Cueva Arroyo drains an area of approximately 6.4 square miles upgradient of the Signetics facility (FEMA, 1983). The channels are designed to contain a 100-year flood and Signetics is, therefore, not in the 100-year flood zone. At this time, the 500-year flood plain has not been established in this area (Anderson, 1992). The concrete channel on the north side has a flow capacity of 5,500 cubic feet per second (ft^3/sec) and the southern channel, a flow capacity of 1,600 ft^3/sec (Signetics, 1980b). Flow from these channels discharges into the Albuquerque Metropolitan Arroyo and Flood Control Administration (AMAFCA) North Diversion Channel, which eventually discharges back into the Rio Grande. Surface water runoff from the facility is directed to the north and south storm water channels.

3.4 SOILS

The soils on which the Signetics facility is constructed are associated with the Embudo series and are described as a gently sloping soil of 0 to 5% on the east mesa, consisting of deep, well drained soils that formed in alluvium derived from decomposed, coarse grained, granite rocks on old alluvial fans (USDA, 1977).

Surface water runoff is medium, and the hazard of water erosion is moderate.



SOURCE: CITY OF ALBUQUERQUE, ALBUQUERQUE, NEW MEXICO

SIGNETICS CORPORATION
ALBUQUERQUE, NEW MEXICO

FIGURE 3-1
GROUND-WATER ELEVATION CONTOURS AND ARROYO STORM WATER DRAINAGE

PRC Environmental Management, Inc.

a depth of 60 inches or more is stratified, pale brown gravelly loamy coarse sand. The soil is moderately alkaline (USDA, 1977).

Permeability is moderate in the upper 20 inches (0.2-0.6 inches per hour) and very rapid below (> 20 inches per hour). Available water capacity is 3 to 4 inches per inch of soil. Effective rooting depth is 60 inches or more (USDA, 1977).

3.5 GEOLOGY

The Albuquerque area lies mostly within a graben which is part of the Rio Grande depression, a connected series of grabens and structural basins having a general north - south alignment and which is bordered on the east and west by upfaulted blocks. The upfaulted blocks to the east form the Sandia and Manzano Mountains and the block to the west forms the highlands of the Rio Puerco and much of the Rio Puerco valley. The Jemez Caldera and the Jemez uplift, north of the Jemez River, are part of the west, upfaulted block that borders the depression (Reeder, 1967).

Fault zones trend along the west base of the Sandia and Manzano Mountains. The bedrock thus rises from the floor of the graben to the west of the mountains in steps. The fault zone bounding the west side of the graben may be similar to that on the east. The graben, or valley, has been partly filled by sand, gravel, silt, clay, and volcanic rocks of Tertiary and Quaternary age. Near the borders of the depression, beds of the Santa Fe group dip toward the axis of the graben, but along the axis the beds are nearly horizontal. Some of the dip of the Santa Fe group is depositional; however, later faulting and movement along old faults in older beds has in places, steepened the dip and caused faulting in the Santa Fe group (Bjorklund, 1961).

Rocks of pre-Tertiary age underlie the Albuquerque area and crop out in the Sandia and Manzano mountains, the Rio Puerco valley, and in the highlands west of the Zia Indian Reservation (Bjorklund, 1961). Rocks of the Tertiary and Quaternary age crop out in most of the valley area. They uncomformably overlie rocks of pre-Tertiary age and generally are composed of unconsolidated to loosely consolidated gravel, sand and silt, and a few beds of basalt and tuff; at places, the sequence is more than 6,000 feet thick. All water wells of large capacity are completed in rocks of Tertiary and Quaternary age (Reeder, 1967).

In the Albuquerque area the rocks of primary interest are the Santa Fe group, alluvial fans, and valley alluvium. The Santa Fe group, of middle (?) Miocene to Pleistocene (?) age, underlies the surficial deposits of the Rio Grande valley and crops out on the east and west mesas. Materials of the Santa Fe group were derived by erosion of the highlands east and west of the Rio Grande depression and by volcanic activity and erosion of the highlands farther north (Reeder, 1967). The Santa Fe group consists of beds of unconsolidated to loosely consolidated sediments and interbedded volcanic rocks. The deposits range from boulders to clay and from well-sorted stream-channel deposits to poorly sorted slopewash deposits. Extrusive volcanic rocks of Tertiary and Quaternary ages, mainly basaltic rocks, are interbedded with the sediments (Reeder, 1967).

A series of coalescing alluvial fans of Recent age were deposited unconformably on the Santa Fe group. They extend westward from the base of the Sandia and Manzano Mountains to the bluffs along the east side of the Rio Grande Valley. The fan deposits consist of sediments ranging from poorly sorted mudflow material to well-sorted stream gravel. The fan deposits range in thickness from 0 to 200 feet, thicken towards the mountains, and are not generally aquifers (Reeder, 1967).

Valley alluvium of Recent age underlies the flood plain of the Rio Grande and its tributaries. This alluvium is similar in appearance and composition to sediments of the underlying Santa Fe group and was derived from them in much of the area. The contact between the alluvium and the underlying Santa Fe group is difficult to distinguish but is generally 80 to 120 feet below the ground surface. Most of the irrigation wells along the Rio Grande tap the alluvium in the main valley (Reeder, 1967).

3.6 GROUND WATER

The valley fill is the principal aquifer in the Albuquerque area and is generally composed of unconsolidated and loosely consolidated gravel, sand, silt, and clay. The valley fill includes two geological units; the Santa Fe group and the alluvium. Both are interconnected hydraulically, and water moves from one formation into the other based on local hydraulic gradient conditions (Bjorklund, 1961).

The ground water in the valley fill generally is under water-table conditions, but locally, artesian conditions may exist owing to a confinement of saturated gravel or sand beds between beds of silt or clay. The water table in the Albuquerque area, in general, is an irregular, sloping surface. The irregularities in the water table are caused by differences in permeability and saturated thickness or by additions or withdrawals of water. The water table slopes generally southwestward from the Sandia and Manzano Mountains at a rate of about 5 to 20 feet to the mile (Bjorklund, 1961).

In the vicinity of the Signetics facility, ground water is encountered at a depth of approximately 190 to 220 feet (Figure 3-1) (Signetics, 1992).

Recharge to the ground-water reservoir, in the Albuquerque area is from precipitation, underflow of ground water from adjacent areas, and seepage from streams, drains, canals, surface reservoirs, and applied irrigation water. The order of importance of each type of recharge depends on local conditions. Much of the recharge comes from streams, particularly the Rio Grande (Reeder, 1967).

4.0 SOLID WASTE MANAGEMENT UNITS

This section discusses the SWMUs at the Signetics Corporation Albuquerque facility and evaluates actual or potential releases from those units. PRC identified eight SWMUs during the PR and VSI. Appendix A is a VSI summary and Appendix B provides photographs of the SWMUs. Unless otherwise referenced, data presented in this section were obtained during the VSI.

4.1 SWMU NO. 1 - SEGREGATED WASTE DRAINS (Photograph No. 1)

Description

The segregated drainage system serves to move most wastes generated in the production areas, Fab 22 and Fab 23, to the Systems Center building (Figures 2-2 and 2-3) for treatment of waste hydrofluoric acid, buffered oxide etch solution, and nitric and sulfuric acid wastewater in the Neutralization Wastewater Treatment System and storage of waste Solvent I in Tank 3 (SWMU No. 2). These drains were designed to be accessible in all parts of the facility, with no hidden piping or

drains, and are suspended from the basement ceiling under the production areas in the Fabrication building or routed to the wastewater area in concrete trenches in the floor of the Systems Center building.

Status

The segregated waste drains are operational and were part of the original construction of the facility in 1982. The drains are not regulated by permit under RCRA.

Waste Type

Each of the drains is consigned to handling an individual waste stream from the process areas. The wastes include:

- spent nitric/sulfuric acid solutions
- waste Solvent I photolithographic cleaning solution
- spent hydrofluoric acid solution
- spent buffered oxide etch (hydrofluoric and ammonium fluoride) solution

Waste Management

Waste streams associated with production activities in Fab 22 and 23 are transported in segregated drain lines to the wastewater treatment area. The spent acids and buffered oxide etch are discharged into the wastewater treatment system for neutralization, and the Solvent I is sent to Tank 3 (SWMU No. 2) for temporary storage. The segregated drains serve as conduits for the transport of these waste streams and no treatment is performed in this drainage system.

Environmental Releases

No environmental releases have been reported from this SWMU.

Remedial Action Taken

No remedial actions have been taken.

Suggested Action

PRC recommends no further investigation at this SWMU.

Reasons

The drainage system is by design, highly visible and easily accessible to plant personnel. Spills from this unit would be immediately evident in the areas where piping is exposed and contained in the concrete trenches in the floor. The areas where piping is exposed are routinely inspected.

4.2 SWMU NO. 2 - TANK 3 (Photograph Nos. 5, 9, and 14)

Description

This 5,000-gallon capacity storage tank is a cylindrical mild steel tank, orientated vertically and containing a flat top and bottom. The tank is 10 feet in diameter and 8 feet 6 inches in height. Wall thickness is 3/16 inches. The tank is equipped with a 3-inch fill line which is attached to a segregated drain pipe from the process areas. The tank is vented to the atmosphere outside of the building and is located below ground, in a concrete vault. The tank is not set on the concrete floor of the vault and the top of the vault is covered by a steel grate (Signetics, 1980b). The vault has a total volume of 9,000 gallons, which is 192 percent of Tank 3's capacity and will contain the release of all of the tank contents and has no drainage system (EPA, 1985). The concrete is coated with chemically resistant resin. A 3-inch hose connection and suction line permits chemical unloading from the tank onto tank trucks (Signetics, 1980b).

Status

This unit is active, is a RCRA regulated unit under Signetics Part B permit, and was part of the original facility construction in 1982. The tank was replaced approximately 2 years ago, along with Tanks 4 and 5.

Waste Type

This SWMU receives and stores a waste stream designated by Signetics as waste Solvent I, a photolithographic cleaning waste with hazardous designations D001, F002, and F003. Primary constituents of the waste include methanol, acetone, ethylene glycol, ethanolamine, diethylene glycol monobutyl ether, and water. Chlorinated solvents, 1,1,1-trichloroethane and freon are also present (Signetics, 1980b).

Waste Management

Tank 3 collects liquid Solvent I waste by gravity feed from the process areas through the segregated drainage system. The level of the tank is monitored daily by measuring with a calibrated measuring pole. This information is recorded daily in the Hazardous Waste Storage Tank Log. The waste is transported to a TSDF when the waste storage volume reaches 4,700 gallons, which is the maximum storage volume allowed under Signetics 1986 hazardous waste storage permit (Signetics, 1980b and NMEID, 1986).

Environmental Releases

No environmental releases have been reported from this SWMU.

Remedial Action Taken

No remedial actions have been taken.

Suggested Action

PRC recommends no further investigation at this SWMU.

Reasons

There have been no reported releases or spills. No visible contamination was observed during the VSI. The walls of the concrete vault appeared to be structurally sound, with no visible evidence of cracks or deterioration. The tank and vault are included in a routine inspection program.

4.3 SWMU NO. 3 - TANK 4 (Photograph Nos. 5, 10, and 12)

Description

Tank 4 is a 5,000-gallon capacity cylindrical storage tank of reinforced fiberglass construction. Orientated vertically and containing a flat top and bottom, the tank is supported by a 5/16 inch steel reinforced PVC extended jacket. The tank is 10 feet in diameter and 8 feet 6 inches in height. The tank has a synthetic corrosion barrier veil and is corrosion resistant to 10% hydrofluoric acid at 150°F or to 30% hydrofluoric acid at 100°F. The tank is equipped with a 3-inch fill line which is attached to a segregated drain pipe from the process areas. There is a 3-inch goose-neck vent with a polypropylene screen attached to the tank, which is in a below ground concrete vault. The tank is not set on the concrete floor of the vault and the top of the vault is covered by a steel grate (Signetics, 1980b). The vault has a total volume of 9,000 gallons, which is 192 percent of Tank 4's capacity and will contain the release of all of the tank contents and has no drainage system (EPA, 1985). The concrete is coated with chemically resistant resin. A 3-inch hose connection and suction line permits chemical unloading from the tank onto tank trucks (Signetics, 1980b).

Status

This unit is currently inactive but is a RCRA regulated unit under Signetics Part B Permit. Originally utilized as a temporary storage unit for waste hydrofluoric acid solution since the start up of the facility in 1982, an agreement between Signetics, and the City of Albuquerque and the State of

New Mexico in 1986, permits Signetics to discharge this waste stream into the Neutralization Wastewater Treatment System (NMEID, 1988a). Tank 4 is maintained on standby for possible future use if a change in regulations or policy should necessitate that Signetics return to its original waste management practices. All tanks in the wastewater treatment area were replaced approximately 2 years ago.

Waste Type

This SWMU was permitted for the storage of waste hydrofluoric acid. This waste stream results from the silica dioxide etching process and consists mainly of a dilute solution (0.1-15%) of hydrofluoric acid at a pH of less than 1. The waste is characterized as hazardous by characteristic of corrosivity and is assigned a D002 waste designation (Signetics, 1980b).

Waste Management

Tank 4 originally collected spent hydrofluoric acid solution by gravity feed from the process areas through the segregated drainage system. The level in the tank was monitored daily by measuring with a calibrated measuring pole. This information was recorded daily in the Hazardous Waste Storage Tank Log. The waste was transported to a TSDF when the waste storage volume reached 4,700 gallons, the maximum storage volume allowed in Signetics hazardous waste storage permit (Signetics, 1980b and NMEID, 1986). Currently, the line carrying the spent hydrofluoric acid is diverted into the Neutralization Wastewater Treatment System prior to reaching Tank 4, but could be restored to this SWMU through the opening of a valve.

Environmental Releases

No environmental releases have been reported from this SWMU.

Remedial Action Taken

No remedial actions have been taken.

Suggested Action

PRC recommends no further investigation at this SWMU.

Reasons

There have been no reported releases or spills. No visible contamination was observed during the VSI. The walls of the concrete vault appeared to be structurally sound, with no visible evidence of cracks or deterioration. The tank and vault are included in a routine inspection program.

4.4 SWMU NO. 4 - TANK 5 (Photograph Nos. 5 and 11)

Description

Tank 5 is a 5,000-gallon capacity cylindrical storage tank of reinforced fiberglass construction . Orientated vertically and containing a flat top and bottom, the tank is supported by a 5/16 inch steel PVC extended jacket. The tank is 10 feet in diameter and 8 feet 6 inches in height. The tank has a synthetic corrosion barrier veil and is corrosion resistant to 10% hydrofluoric acid at 150°F or to 30% hydrofluoric acid at 100°F. The tank is equipped with a 3-inch fill line which is attached to a segregated drain pipe from the process areas. There is a 3-inch goose-neck vent with a polypropylene screen attached to the tank, which is in a below ground concrete vault. The tank is not set on the concrete floor of the vault and the top of the vault is covered by a steel grate (Signetics, 1980b). The vault has a total volume of 9,000 gallons, which is 192 percent of Tank 5's capacity and will contain the release of all of the tank contents and has no drainage system (EPA, 1985). The concrete is coated with chemically resistant resin. A 3-inch hose connection and suction line permits chemical unloading from the tank onto tank trucks (Signetics, 1980b).

Status

This unit is currently inactive but is a RCRA regulated unit under Signetics Part B permit. Originally utilized as a temporary storage unit for waste buffered oxide etch solution since the start up of the facility in 1982, an agreement between Signetics, and the City of Albuquerque and the State of

New Mexico in 1986, permits Signetics to discharge this waste stream into the Neutralization Wastewater Treatment System (NMEID, 1988a). Tank 5 is maintained on standby for possible future use if a change in regulations or policy should necessitate that Signetics return to its original waste management practices. All tanks in the wastewater treatment area were replaced approximately 2 years ago.

Waste Type

This SWMU was permitted for the storage of waste buffered etch solution. This waste stream results from the silica dioxide etching process and consists mainly of a dilute solution of hydrofluoric acid (0.1-15%) and ammonium fluoride (0.1-40%). The buffered oxide etch waste has a low pH and a high concentration of fluoride. The waste is characterized as hazardous by characteristic of corrosivity and is assigned a D002 waste designation (Signetics, 1980b).

Waste Management

Tank 5 originally collected spent buffered oxide etch solution by gravity feed from the process areas through the segregated drainage system. The level in the tank was monitored daily by measuring with a calibrated measuring pole. This information was recorded daily in the Hazardous Waste Storage Tank Log. The waste was transported to a TSDF when the waste storage volume reached 4,700 gallons, the maximum storage volume allowed in Signetics hazardous waste storage permit (Signetics, 1980b and NMEID, 1986). Currently, the line carrying the spent buffered oxide etch is diverted into the Neutralization Wastewater Treatment System prior to reaching Tank 5, but could be restored to this SWMU through the opening of a valve.

Environmental Releases

No environmental releases have been reported from this SWMU.

Remedial Action Taken

No remedial actions have been taken.

Suggested Action

PRC recommends no further investigation at this SWMU.

Reasons

There have been no reported releases or spills. No visible contamination was observed during the VSI. The walls of the concrete vault appeared to be structurally sound, with no visible evidence of cracks or deterioration. The tank and vault are included in a routine inspection program.

4.5 SWMU NO. 5 - FLAMMABLE STORAGE 4 (FS-4) (Photograph Nos. 16 and 17)

Description

Flammable Storage 4 (FS-4) is one of four rooms dedicated to the storage of flammable chemical materials at the Signetics facility (Figure 2-3). FS-1, FS-2, and FS-3 are primarily used to store unused chemical product and ignitable waste is stored in FS-4. This SWMU is constructed of concrete with inside dimensions of 22 by 26 feet and contains 562 ft^2 of floor space. The floor is an 8-inch slab and the walls are 8-inch concrete masonry units with a 1 hour fire rating. The room is also equipped with makeup and exhaust air. The roof has an explosion vent rated at 600 pounds per square inch (psi). The floor has a 4-inch slope to a 4-inch drain in the center of the room. The floor drains to a line that discharges into Tank 3 (SWMU No. 2) (Signetics, 1980b).

Status

This flammable storage room was put into service at the time of plant start up in 1982. This SWMU is operational and is a RCRA regulated unit.

Waste Type

This room is used as a storage area for drummed hazardous waste that Signetics designates as waste Solvent II. This solution is a waste mixture from the process areas of vendor proprietary

formulations of positive photoresists that include cellosolve acetate, glycol esters, and acetone. This waste material is classified as hazardous by ignitability (D001) and as a non-halogenated solvent waste (F003) (Signetics, 1980b).

Waste Management

Flammable wastes stored in FS-4 are placed in 55-gallon DOT 17E metal drums. The drums are stored off the floor on pallets, with four drums per pallet, to elevate them from contact with any possible liquid releases. All drums and pallets are single stacked. The drums are marked with EPA hazardous waste and Department of Transportation (DOT) labels and each drum is assigned a number. The storage room is inspected daily to assure that drums are in good condition and inspection logs are completed and kept on file (Signetics, 1980b).

The waste Solvent II is transferred from the process areas to FS-4 in 5-gallon Nalgene carboys and transferred into drums. These wastes are accompanied by chemical manifests during transit. Each drum is opened approximately 10-20 times to add waste before it is filled. When waste additions are made, a Hazardous Waste Drum Log is updated and maintained in the area of drum storage until the drum is full. These drum logs are maintained in a permanent file (Signetics, 1980b).

Periodic shipments of these drums are made to a TSDF when sufficient drummed inventory is accumulated. The 1986 hazardous waste storage permit limits drummed hazardous waste inventory in FS-4 to 36 drums (NMEID, 1986).

Environmental Release

No environmental releases have been reported from this SWMU.

Remedial Action Taken

No remedial actions have been taken.

Suggested Action

PRC recommends no further investigation at this SWMU.

Reasons

There have been no reported releases or spills. Any releases that might occur in this room would be contained within the confines of this area, or flow through the central floor drain and discharge into Tank 3 (SWMU No. 2). No visible contamination was observed during the VSI.

4.6 SWMU NO. 6 - CHEMICAL STORAGE 2 (CS-2) (Photograph Nos. 2, 3, and 4)

Description

Chemical Storage 2 (CS-2) is one of two rooms dedicated to general chemical storage for inventory used in process activities and general operation of the facility. A portion of CS-2, a southwest corner of the room, has been dedicated to storing drummed arsenic and mercury contaminated waste (Figure 2-3). This area is segregated from other portions of the room used for chemical storage and marked with yellow striped tape. CS-2 has 2,611 ft^2 of floor space, with 172 ft^2 available for hazardous waste storage. The floor and walls are constructed of 8 inch concrete with the roof covered by a 4 inch concrete topping and fiberglass insulation and steel beams. The floor has a 3-inch drain line that runs north into a piping trench and connects to a 6-inch acid waste drain which discharges into the wastewater treatment system. The piping trench is equipped with a sump, air pump, and level controls in case of a release. Since the hazardous waste stored in this room is in a solid form, the likelihood of hazardous waste discharging into the drains is unlikely (Signetics, 1980b).

Status

The two chemical storage rooms, including CS-2, were placed into service at the time of plant start up in 1982. CS-2 is an operational SWMU and is regulated under RCRA.

Waste Type

This room, in addition to storing general chemicals utilized in the day to day operation of the facility, is a temporary storage area for two types of drummed solid hazardous waste; arsenic- and mercury-contaminated materials.

The arsenic-contaminated materials are classified as hazardous waste by characteristics of toxicity and designated as D004 waste. This waste includes all materials that have been contaminated with arsenic from production activities, such as gloves, containers, and rags. While all materials are managed as hazardous wastes, not all would exceed the Toxicity Characteristic Leaching Procedure (TCLP) limits for arsenic (Signetics, 1980b).

The mercury-contaminated materials include mercury vapor lamps, broken mercury thermometers, and contaminated spill containment materials. This material is also characterized as hazardous by toxicity and is designated as a D009 waste (Signetics, 1980b). Since the start up of the Signetics facility, approximately one-half drum of this waste has been accumulated.

Waste Management

The hazardous wastes stored in CS-2 are placed in 55-gallon DOT 17H metal drums. The drums are stored on pallets, with four drums per pallet, to elevate them from contact with any possible liquid releases. All drums and pallets are single stacked. The drums are marked with EPA hazardous waste and DOT labels and each drum is assigned a number. The storage room is inspected daily to assure that drums are in good condition and inspection logs are completed and kept on file (Signetics, 1980b).

The contaminated solid wastes are transferred from the process areas to CS-2 in bags and transferred into drums. These wastes are accompanied by chemical manifests during transit. Each drum is opened approximately 10-20 times to add waste before it is filled. When waste additions are made, a Hazardous Waste Drum Log is updated and maintained in the area of drum storage until the drum is full. These drum logs are maintained in a permanent file (Signetics, 1980b).

Periodic shipments of these drums are made to a TSDF when sufficient drummed inventory is accumulated. The 1986 hazardous waste permit limits drummed hazardous waste inventory in CS-2 to 64 drums (NMEID, 1986).

Environmental Releases

No environmental releases have been reported from this SWMU.

Remedial Action Taken

No remedial actions have been taken.

Suggested Action

PRC recommends no further investigation at this SWMU.

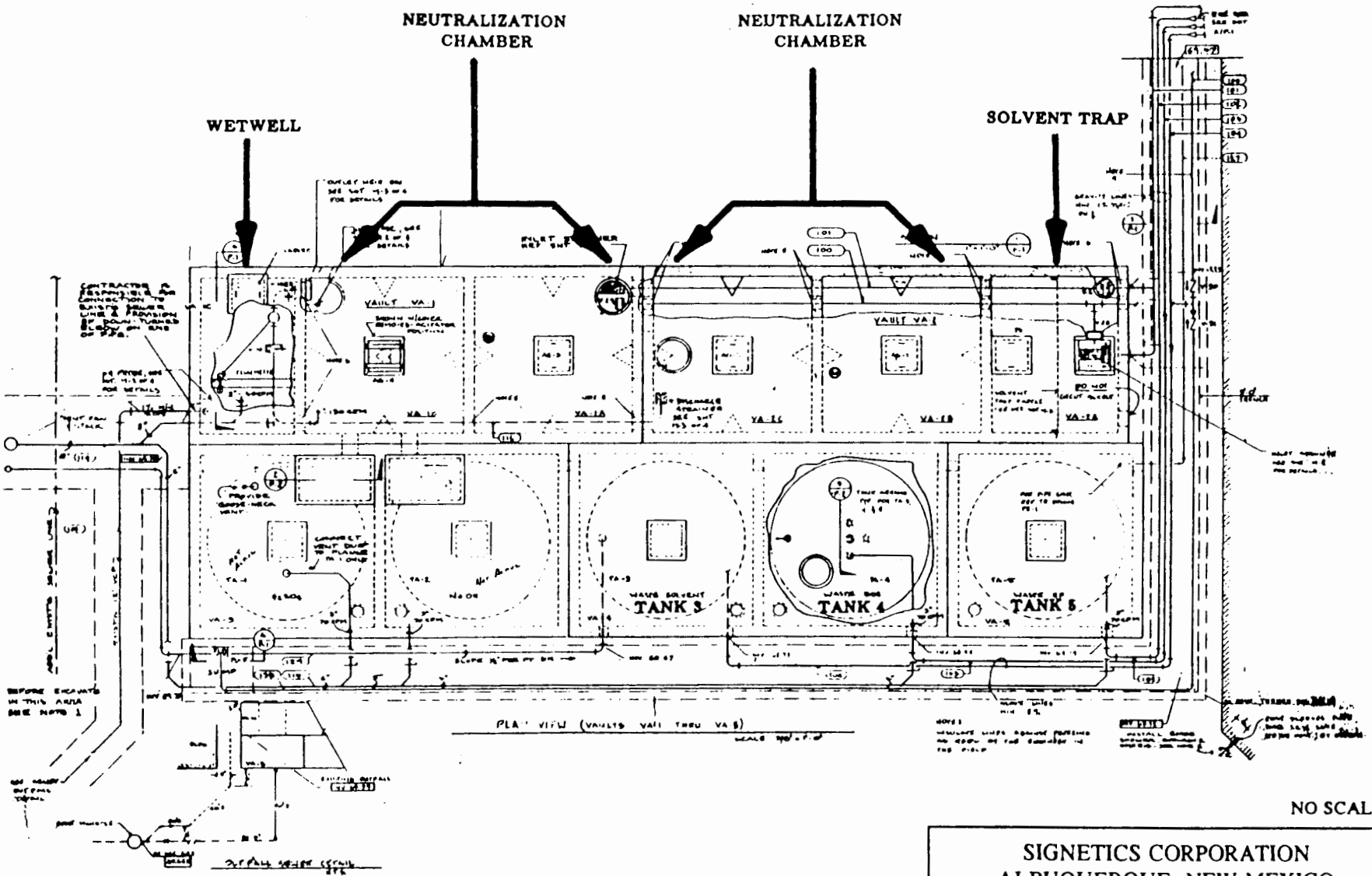
Reasons

There have been no reported releases or spills. Since the hazardous wastes stored in this room are generally solid, and the room is an enclosed structure with no signs of chemical staining or etching of the concrete, containment of any accidental releases should be readily accomplished.

4.7 SWMU NO. 7 - NEUTRALIZATION WASTEWATER TREATMENT SYSTEM (Photograph Nos. 5, 6, and 12)

Description

The wastewater treatment facility is located in the south central portion of the Systems Center building of the Signetics plant (Figure 2-3). This area of the plant includes SWMU Nos. 2, 3, and 4; and the Neutralization Wastewater Treatment System (SWMU No. 7) (Figure 4-1). The Neutralization Wastewater Treatment System consists of a solvent trap (grit chamber) at the influent end of the system, followed by two sets of pH adjustment chambers, each containing two vaults, and



NO SCALE

SIGNETICS CORPORATION
ALBUQUERQUE, NEW MEXICO

FIGURE 4-1
WASTE WATER TREATMENT FACILITY

PRC Environmental Management, Inc.

SOURCE: SIGNETICS, ALBUQUERQUE, NEW MEXICO

a wet well at the outfall or effluent point. The solvent trap, four vaults, and wetwell are configured in series, and each pH adjustment chamber, with its two vaults, can be bypassed to permit maintenance with no interruption of system operations. Two pH probes, one mounted in the last vault before the wetwell, and one in the wetwell provide continuous readings and control signals for pH adjustment to the wastewater. The wetwell also serves as the sampling well for the system (Signetics, 1980b).

The vaults are of concrete construction with vault interiors coated with a protective lining to protect against acid attack. The vaults are accessible through square metal hatches set in the concrete floor of the facility and the pH probes are accessible through circular hatches.

Two 5,000-gallon above ground storage tanks containing sulfuric acid and sodium hydroxide are located in the same area and are utilized for the pH adjustment process in the wastewater treatment system and for regeneration of a demineralization unit in an adjacent area.

The Neutralization Wastewater Treatment System (SWMU No. 7) and SWMU Nos. 2, 3, and 4 are surrounded by a total of 11 acid leak test wells. These dry wells are inspected every 90 days for evidence of wastewater leakage (Figure 2-3). This area was originally open to the elements at the time of the Signetics facility construction in 1980. It was enclosed in 1986 to provide better security and protection to the treatment and storage equipment from the climate (Signetics, 1986).

Status

The Neutralization Wastewater Treatment System was put into service in 1982 at the time of plant start up and is still active. The unit is exempt from RCRA regulation under 40 CFR 264.1 (g) (6) and New Mexico's Hazardous Waste Management Regulations (HWMR) 206.A.4f, but operates under a City of Albuquerque Wastewater Discharge Permit 2023A-3 (Signetics, 1980b and Albuquerque, 1991).

Waste Type

The wastewater treatment system neutralizes industrial wastewaters to a required pH discharge range prior to discharge from the facility into the Albuquerque POTW. The treatment system originally received spent hydrochloric and sulfuric acid solution from wafer cleaning activities in the process areas, cooling tower blowdown, spent sulfuric acid and sodium hydroxide solutions from demineralizer regeneration, and air scrubber fabrication waters. Subsequent to a 1986 agreement with the City of Albuquerque and the State of New Mexico, Signetics was permitted to discharge the spent hydrofluoric acid and buffered oxide etch solutions into the neutralization wastewater treatment system with the other industrial wastewaters (EPA, 1988).

Waste Management

Acidic wastewater is drained by gravity through the segregated drainage system from the process areas or is pumped from a sump in the RO/DI demineralization area into either the solvent trap or first vault of the second neutralization chamber. Sodium hydroxide and occasionally sulfuric acid are used to adjust the wastewater pH to a specified pH discharge range. Chemical feed rates are controlled by pH probes in the second neutralization chamber and the wetwell. The permitted pH range of the wastewater effluent discharged to the City of Albuquerque POTW is 5.0 - 11.0 (Albuquerque, 1991). This treatment process does not provide for the removal of fluorides or heavy metals (Signetics, 1985a).

Environmental Releases

A release that occurred on November 5, 1985 was reported to the NMEID and EPA. The leak was detected in a test well on the north side of the wastewater treatment system and the source of the release was traced to the solvent trap (grit chamber) (Figure 4-1). Collected wastewater from the test well was sent to Signetic's internal laboratory. Analysis of the water indicated a pH of 4.5 but no other analytical data associated with this sample were reported. The release report to the NMEID included analytical data from wastewater samples routinely collected from the wastewater treatment system that showed no significant levels of heavy metals. The release volume could not be

determined, but based on the less than 1/4-inch size of the hole in the vault, the estimated volume was small (Signetics, 1985b).

Remedial Action

Wastewater was pumped from the test well. No other action was requested by regulatory agencies or taken.

Suggested Action

PRC recommends no further investigation at this SWMU.

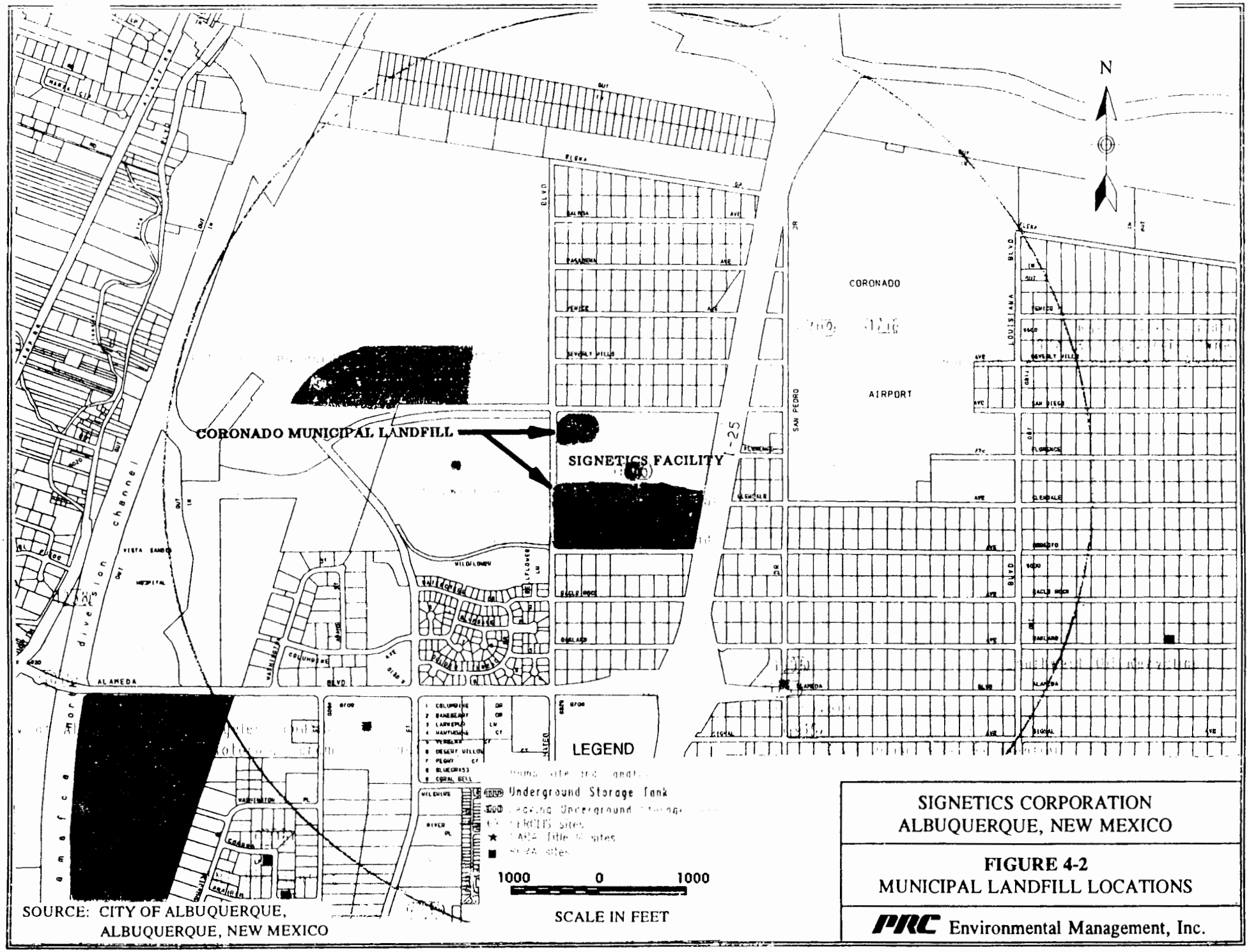
Reason

The wastewater is comprised of acidic wastewaters discharged to the Neutralization Wastewater Treatment System, of which two, the waste hydrofluoric acid and buffered oxide etch, are hazardous by characteristics of corrosivity and contain high concentrations of fluoride. The pH level of the released wastewater sample and lack of hazardous constituents in the reported wastewater analyses suggest a low risk to the environment.

4.8 SWMU NO. 8 - CORONADO MUNICIPAL LANDFILL (Photograph Nos. 18 and 19)

Description

The Signetics Albuquerque facility is situated on a portion of the former Coronado Municipal Landfill site. The landfill was operated by the City of Albuquerque from 1963 to 1965 and received mainly household and commercial trash. Historical evidence suggests that it was a relatively small landfill that was comprised of two sections and occupied an area of approximately 7.5 acres (Figure 4-2). The larger section of the landfill was partially excavated during the construction of the Signetics facility and moved to the Los Angeles Municipal Landfill. The estimated depth of this landfill section was 30 to 40 feet. The smaller section, in the vicinity of the northwest corner of the



SOURCE: CITY OF ALBUQUERQUE, ALBUQUERQUE, NEW MEXICO

SIGNETICS CORPORATION
ALBUQUERQUE, NEW MEXICO

FIGURE 4-2
MUNICIPAL LANDFILL LOCATIONS

PRC Environmental Management, Inc.

Signetics facility, had an estimated depth of 20 to 30 feet (EPA, 1986). The landfill site is vented for methane and subsidence was evident during the VSI. Signetics has installed four monitoring wells at its facility to monitor ground-water conditions (Figure 2-2). Depth to ground water is between 190 to 220 feet and the overlying alluvium is very permeable (Signetics, 1992).

Status

The Coronado landfill was operated from 1963 to 1965 and is inactive. The landfill has EPA identification number NMD980622708 and is not regulated by RCRA or included in the Signetics Part B Permit (Albuquerque, 1992c).

Waste Type

The landfill reportedly received household trash and possibly some commercial refuse. Sampling of an exposed section of fill indicated significant levels of heavy metals, pesticides, and hydrocarbons. Reported substances included lead, zinc, dieldrin, chlordane, naphthalene, and bis(2-ethylhexyl)phthalate (EPA, 1986). Ground-water samples collected by Signetics indicated the presence of low concentrations of volatile organic compounds (VOCs), including tetrachloroethene and 1,1,2 trichloro-1,2,2-trifluoroethane in collected ground-water samples (ENSECO, 1992).

Waste Management

The landfill is uncontained and leaching of any contaminants into the soil is unrestricted (EPA, 1986).

Environmental Release

Exposed landfill material contained significant levels of heavy metals, pesticides, and hydrocarbons. Ground water in the vicinity of the landfill contained low levels of VOCs (EPA, 1986 and ENSECO, 1992).

Remedial Action Taken

An unknown quantity of landfill material was removed from the larger section of the landfill during construction of the Signetics facility and disposed of in the Los Angeles Landfill. No other remedial action has been taken.

Suggested Action

PRC recommends that an RFI be performed to investigate the presence of hazardous constituents in the landfill material and surrounding soil, and the extent of any ground-water contamination.

Reasons

Evidence exists that hazardous materials are present in the landfill. Ground-water sampling indicated the presence of harmful contaminants in the ground water, suggesting that a release from the landfill may have occurred. Potential receptors exist; ground-water in the proximity of the facility may be contaminated (EPA, 1986 and NMSE, 1992).

5.0 AREAS OF CONCERN

PRC identified no areas of concern (AOC) during the VSI.

6.0 HUMAN AND ENVIRONMENTAL TARGETS

This section discusses the potential human and environmental targets of any release of hazardous material into the environment from the SWMUs at the Signetics facility in Albuquerque, New Mexico. Potential pathways include air, soil, subsurface gas, surface water, and ground water.

6.1 AIR

The Signetics facility has a permit with the City of Albuquerque for all its air emissions. Air Quality Permit number 166 was issued to the facility on December 15, 1986 and has since been amended one time in 1987, to raise the levels of permitted VOC and arsenic emissions, and the maximum annual silicon wafer processing volume. The permit requires air quality monitoring of VOCs, arsenic, and acid emissions from the Signetics facility. The air quality permit limits are 1.16 pounds per hour (lbs/hr) (5.015 tons/year) combined VOC stack emissions, 0.00020 lbs/hr (0.0009 tons/year) combined arsenic stack emissions, and a maximum wafer utilization quantity of 1,300,000 per year. Acid emissions have no set limits (Albuquerque, 1992a).

Signetics is required to submit quarterly reports on stack discharges to the City of Albuquerque, Engineering/Air Monitoring Section, Air Pollution Control Division. An April 1990 quarterly report contained combined stack emission measurements of 0.041 lbs/hr (0.184 tons/year) VOCs, 0.00015 lb/hr (0.006 tons/year) arsenic, and 1.418 lb/hr (6.64 tons/year) hydrochloric acid (Albuquerque, 1992a).

Since the 1986 issuance of the original air permit, no notices of violations have been issued in response to submitted quarterly reports or facility inspections. The City has routinely received submitted notifications of stack air scrubber equipment upgrades and modifications from Signetics (Albuquerque, 1992a).

Therefore, based on the information above, the threat posed to the air by Signetics, as a result of plant emissions, is estimated to be low.

6.2 SOIL

The Signetics facility was constructed on a portion of an abandoned and uncontained municipal landfill. The landfill was constructed in 1963 and operated from 1963 to 1965 and received mainly residential and possibly some commercial refuse. Analysis of exposed landfill refuse indicated significant levels of heavy metals, pesticides, and hydrocarbons (EPA, 1986). The detected presence of VOCs in ground-water samples collected by Signetics, and the permeable nature of the

overlying alluvium, indicated that a release of landfill wastes into the underlying soils and ground water may have occurred (ENSECO, 1992).

The Neutralization Wastewater Treatment System had a documented one-time release of wastewater into the surrounding soil in 1985. The wastewater detected in a leak detection test well was removed and the pH measured. The pH measurement combined with analytical data from routinely collected wastewater treatment samples suggest that the released material was not hazardous. No subsequent record of an analysis of released wastewater or investigation of the site was found (Signetics, 1985b).

The presence of the uncontained landfill under the Signetics facility, with an unknown volume of hazardous material, makes the likelihood of a release to soil high. The other SWMUs storing hazardous waste within the Signetics facility have had no reported releases and the containment systems in place make the likelihood of release from these units low.

6.3 SURFACE WATER

Surface water runoff from the Signetics facility is drained to the north and south side of the property where it is discharged to storm water channels constructed to manage runoff from the La Cueva Arroyo. These concrete channels discharge into the AMAFCA North Diversion Channel, approximately 500 feet to the west of the facility (Figure 3-1). This 100-year flood control channel diverts surface water runoff from most of Albuquerque along the east side of the Rio Grande and has discharge points at both the north and south ends of the city. The direction of channel flow is north in the vicinity of Signetics, with the point of discharge into the Rio Grande approximately 3 miles to the northwest. The Rio Grande is the closest surface water body to the facility and is about 3.5 miles west, with a flow direction from north to south. Water use from the Rio Grande River can be generally classified as irrigation, livestock and wildlife watering, some limited warm water fishery, and secondary contact recreation (EPA, 1986). The Rio Grande also serves as a source of ground-water recharge in the Rio Grande Valley (Bjorklund, 1961). Between the AMAFCA North Diversion Channel and the Rio Grande, there is an extensive network of irrigation channels and water ways serving private residences and small farms in the river valley.

There are currently no endangered or threatened species in the vicinity of Signetics. There is, however, one proposed candidate species, the Rio Grande Silvery Minnow, for threatened status, whose habitat includes the Rio Grande in the Albuquerque area. The New Mexico Jumping Mouse, found in riparian habitats, is under consideration as a candidate 2 (C2) level threatened species (Donahue, 1992).

With the possible exception of the abandoned Coronado Municipal Landfill, all hazardous waste generation and storage on the Signetics property, occurs within the confines of the Fabrication and Systems Center buildings (Figure 2-2). The likelihood of hazardous waste release to surface water from these buildings is deemed low. The most likely potential pathway would be the wastewater treatment facility which is routinely monitored and receives only acidic wastewater. The likelihood of release to surface water from the landfill is unknown, but the close proximity of the Rio Grande, approximately 3.5 miles to the west, makes this potential pathway a concern. During the VSI, no visible evidence of landfill material was observed. However, a previous report references collection of exposed landfill material containing hazardous constituents (EPA, 1986).

6.4 SUBSURFACE GAS

The abandoned Coronado Municipal Landfill is the only SWMU of concern regarding the potential release of subsurface gas. There are 35 existing methane vents in the landfill and methane emissions are monitored regularly. Therefore, the potential for release of subsurface gas in the vicinity of the Signetics facility can be described as high. In 1 year of reported monitoring, methane concentrations from 35 vents never exceeded 10% lower explosive limit (LEL) (EPA, 1986).

6.5 GROUND WATER

The Signetics facility is located on valley fill, which is composed mostly of unconsolidated and loosely consolidated gravel, sand, silt, and clay; and includes two geological units, the Santa Fe group and the alluvium (Bjorklund, 1961). The Santa Fe group and alluvium serve as the principal aquifer in the Albuquerque area and are interconnected hydraulically, and water moves from one formation into the other in accordance with the local hydraulic gradient. Ground water in the vicinity of the Signetics facility is reported at depths of 190 to 220 feet (Figure 3-1) (Signetics, 1992). The

high hydraulic conductivity of this unconsolidated alluvium makes the release of any contamination at the facility a potential threat to ground water.

Information on 32 wells that are located within a 3-mile radius of the facility is listed in Table 6-1 (EPA, 1986 and NMSE, 1992). The closest well is located approximately 2,000 feet up gradient of the facility. These wells are utilized for either commercial, irrigation or domestic water consumption. This list of wells may not be current and cannot be considered inclusive of all wells in the vicinity of the facility. Many of the well permits filed in the New Mexico State Engineer Office were incomplete, and it was reported that wells are sometimes completed without a permit being filed. Additionally, the City of Albuquerque has introduced a potable water supply to the area and many of the wells previously used for domestic consumption may be relegated to irrigation of lawns and gardens (EPA, 1986 and NMSE, 1992). Table 6-1 provides a summary of the recorded wells located in the area of the Signetics facility.

Finally, no contamination of ground-water wells has been documented in the communities surrounding the Signetics facility. However, four ground-water monitoring wells installed by Signetics on its property in 1987 (Figure 2-2) and sampled regularly since, have revealed ground-water contamination from low levels of VOCs (EMCON, 1987). The well construction logs for the four monitoring wells; designated MW-1, MW-2, MW-3, and MW-4; are included as Attachment C and a summary of the ground-water contaminants are presented in Table 6-2 (Enseco, 1988 through 1993). The ground-water samples were analyzed for halogenated volatile organics by EPA Methods 601 or 8010 and only the compounds 1,1,2,2-tetrachloroethane, and tetrachloroethene have been detected. Considering the uncontained construction of the landfill, the high permeability of the underlying soils, and general hydraulic interconnection between the main aquifer zones, the alluvium and Santa Fe group, the potential for ground-water contamination is high.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The PA/VSI identified 8 SWMUs and no AOCs at the Signetics facility in Albuquerque, New Mexico. Background information on the facility's location, operations, waste generating processes, history of documented releases, regulatory status, and receptors is presented in Section 2.0. The

TABLE 6-1

Water Wells in a Three Mile Radius of Signetics Corporation Facility

Well Location No.	Owner	Depth (Ft.)	Water Use
11.3.2.223	T. Benson	47	Commercial
11.3.2.140	Southwest Aggregate Co.	102	Commercial
11.3.3.334	Nazareth Sanatorium	245	Commercial
11.3.3.442	J. Crowder	46	Commercial
11.3.9.331	C. Bachechi	100	Irrigation
11.3.9.323	Southern Union Gas	200	Commercial
11.3.10.413	J. Torres	60	Irrigation
11.3.10.432	C. Moore	70	Irrigation
11.3.10.444	Nazareth Sanatorium	160	Irrigation
11.3.10.	M. Caudill	176	Unknown
11.3.10.	M. Montano	80	Unknown
11.3.10.122	G. Garcia	105	Domestic
11.3.11.334	Nazareth Sanatorium	810	Irrigation
11.3.12.444	Sandia Memory Garden	501	Commercial/Irrigation
11.3.12.430	Sandia Memory Garden	550	Exploration
11.3.15.112	E. Christ	65	Irrigation
11.3.15.440	C. Davis	255	Unknown
11.3.15.121	J. Canilli	223	Unknown
11.3.15.	D. Brink	260	Unknown
11.3.15.	C. Smoot	175	Unknown
11.3.15.	Cambro Construction Inc.	220	Unknown
11.3.16.312	Yonemoto Brothers	75	Irrigation
11.3.21.132	Ranchos School	-	Unknown
11.3.22.122	A. Montoya	96	Domestic
11.3.22.220	Wylie Brothers	158	Commercial
11.3.23.112	Public Service Company of NM	303	Commercial
11.3.23.210	American Gypsum	236	Commercial
11.3.24.221	City of Albuquerque (Tracy)	1194	Commercial
	Alameda Well No. 2		
	Walker Well No. 2		
	Walker Well No. 1		
11.3.26.342	A. Simms	302	Irrigation

TABLE 6-2

Signetics Ground-Water Monitoring Well Analytical Results

Sample Date	Parameter	Monitoring Well Numbers				Trip Blank	Reporting Limit (μg/L)
		MW-1 (μg/L)	MW-2 (μg/L)	MW-3 (μg/L)	MW-4 (μg/L)		
September 19 & 20, 1988	1,1,2,2-Tetrachlorethane	30	14	30	—	ND	1.0
	Tetrachloroethene	30	14	30	—	ND	0.5
May 16 & 17, 1989	1,1,2,2-Tetrachloroethane	25	14	—	9.2	—	1.0
	Tetrachloroethene	25	14	—	9.2	—	0.5
September 13 & 14, 1989	Tetrachloroethene	15	9.9	—	6.8	ND	0.5
	Chloroform	ND	ND	---	ND	1.0	0.5
December 6, 1989	1,1,2,2-Tetrachloroethane	17	---	ND	17	---	1.0
	Tetrachloroethene	17	---	ND	17	—	0.5
March 28, 1990	Tetrachloroethene	--- ---	--- 13	--- ---	--- ---	ND ---	0.5 3.3
June 12 & 13, 1990	Tetrachloroethene	20	13	ND	8.1	---	0.5
September 12 & 13, 1990	Tetrachloroethene	17 ---	— 11	ND ---	7.6 ---	ND ---	0.5 1.2
December 5 & 6, 1990	Tetrachloroethene	24	15	ND	11	---	0.5
April 9 & 10, 1991	Tetrachloroethene	11	4.7	ND	5.7	ND	0.5
June 12 & 13, 1991	Tetrachloroethene	14	9.2	ND	6.5	---	0.5
September 11, 1991	Tetrachloroethene	12	11	ND	7.0	---	0.5
December 4 & 17, 1991	Tetrachloroethene	13	9.3	6.2	ND	ND	0.5
March 25 & 26 1992	Tetrachloroethene	13	9.5	ND	4.7	ND	0.5
May 19 & 20, 1992	Tetrachloroethene	9.0	8.7	ND	4.8	ND	0.5
	1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	---	---	4.6	1.0
September 22 & 23, 1992	Tetrachloroethene	11	10	ND	5.5	---	0.5
January 6 & 7, 1993	Tetrachloroethene	6.2	7.1	ND	5.4	ND	0.5

'. = Micrograms per Liter
= Not Detected
.alyses performed by EPA Method Number 601 or 8010

environmental setting of the Albuquerque area is presented in Section 3.0. SWMU-specific information, such as the unit's description, dates of operation, wastes managed, release controls, history of documented releases, and observed condition, are discussed in Section 4.0. AOCs are discussed in Section 5.0. Human and environmental targets as related to potential pathways, are presented in Section 6.0. Following are PRC's conclusions and recommendations for each SWMU. Table 7-1 summarizes the information on all the SWMUs at the Signetics facility and recommended actions.

Eight SWMUs were identified at the Signetics facility as a result of the PR and VSI. Five of these units are active. Of the inactive units, two are permitted units that are maintained for possible future use and one has undergone closure.

With the exception of some minor excursions from the provisions of the wastewater permit granted by the City of Albuquerque, there has been only one reported release from the Signetics facility, which was reported on November 5, 1985. This release from the Neutralization Wastewater Treatment System constituted a release of wastewater with high concentrations of fluorides and a low pH to adjacent soils. All incidences of wastewater treatment plant pH excursions have been promptly reported to the City of Albuquerque's Wastewater Utility Division. The Southside Wastewater Treatment Plant release, which occurred on November 5, 1985, was reported to both state and federal regulators. No citations or notices of violation have been issued to the facility as a consequence of this release.

An RFI has been recommended for SWMU No. 8, the abandoned Coronado Municipal Landfill. This SWMU is an area of potential subsurface contamination due to the unknown nature of disposed wastes, the recorded presence of hazardous constituents, the uncontained nature of the landfill, the high permeability of local soils, and the presence of VOCs in the ground water at the facility.

Table 7-1 summarizes the status, waste type, waste management, releases, migration pathways, and remedial action for all the SWMUs.

Overall, the facility is not judged to pose a significant threat to the environment. With the exception of the abandoned Coronado Municipal Landfill, the waste management practices of Signetics have been exemplory, as indicated by three environmental waste management awards

TABLE 7-1
SWMU Summary

Sheet 1 of 3

Unit	SWMU No. 1	SWMU No. 2	SWMU No. 3
Unit Name	Segregated Drains	Tank 3	tank 4
Description	System of 4- to 6-inch pvc pipes suspended from ceiling of floor under process areas or in accessible concrete trench pipe gallery in floor of System Center.	5,000-gallon cylindrical steel tank of 10 foot by 8.5 foot dimensions in a below grade 11 foot by 11 foot by 13 foot 10 inch concrete vault. The concrete has chemical resistant coating and vaults are covered with steel grating.	5,000-gallon cylindrical reinforced fiberglass tank of 10 foot by 8.5 foot dimensions, in below grade 11 foot by 11 foot by 13 foot 10 inch concrete vault. The concrete has chemical resistant coating and vaults are covered with steel grating.
Operating Status	Active	Active	Inactive
Regulatory Status	Unregulated	Regulated	Regulated
Waste Type	Process area acidic and solvent waste solutions (D001, D002, F002, and F003 wastes).	Waste Solvent I, a mixed photolithographic solvent cleaning waste (D001, F002, and F003).	Spent hydrofluoric acid solution (D002).
Waste Management	Process area wastes are collected in dedicated pipes in a segregated drainage system and transported to the Neutralization Wastewater Treatment System (SWMU No. 7) or Tank 3 (SWMU No. 2).	Process waste is transported to Tank 3 through segregated drainage system from process areas. Waste Solvent I is stored in tank until transported to a TSDF.	Process waste was transported to Tank 4 through the segregated drainage system from process areas. Spent hydrofluoric acid solution originally stored in tank until transported to TSDF. Currently waste hydrofluoric acid bypasses this SWMU and is treated in SWMU No. 7, the wastewater treatment system, prior to discharge to the POTW.
Release History	No reported releases	No reported releases	No reported releases
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	N/A	N/A	N/A
Release Potential	Low	Low	Low
Potential Pathway	None	None	None
Reason for Release Potential Rating	No reported releases or spills. No visible contamination during VSI. Piping is visible, easily accessible, and potential releases contained within Fabrication and Systems Center buildings.	No reported releases or spills. No visible contamination during VSI and concrete vault appeared to have good structural integrity. No drains or sumps in vault area, completely contained.	No reported releases or spills. No visible contamination during VSI and concrete vault appeared to have good structural integrity. No drains or sumps in vault area, completely contained. Unit is inactive.
Need for RFI	No	No	No

TABLE 7-1
SWMU Summary

Sheet 2 of 3

Unit	SWMU No. 4	SWMU No. 5	SWMU No. 6
Unit Name	Tank 5	Flammable Storage 4 (FS-4)	Chemical Storage 2 (CS-2)
Description	5,000-gallon cylindrical reinforced fiberglass tank of 10 foot by 8.5 foot dimensions, in below grade 11 foot by 11 foot by 13 foot 10 inch concrete vault. The concrete has chemical resistant coating and vaults are covered with steel grating.	One of four rooms dedicated to storage of flammable materials. FS-4 is used for hazardous flammable waste storage. FS-4 is a concrete room, with floor dimensions of 22 by 26 feet and 8 inch thick walls and flooring. The floor is sloped to a central drain that discharges into Tank 3. The concrete roof has an explosion vent and the room is vented.	One of two rooms dedicated to general chemical storage of process and facility chemicals. CS-2 has a portion of its floor space specifically dedicated to drummed toxic hazardous waste storage. CS-2 has 2,611 ft^2 of floor space of which the southwest corner, containing 172 ft^2 has been dedicated to the storage of drummed toxic waste. The room is constructed of concrete floors, walls, and roof. The floor has a drainage system connected to the wastewater treatment system.
Operating Status	Inactive	Active	Active
Regulatory Status	Regulated	Regulated	Regulated
Waste Type	Spent buffered oxide etch solution (hydrofluoric acid and ammonium fluoride) (D002 waste).	Waste Solvent II, a mixed solution of proprietary vendor formulations of photoresist (D001 and F003 waste).	Materials contaminated with arsenic from process activities (D004 waste) and materials contaminated with mercury (D009 waste).
Waste Management	Process waste was transported to Tank 5 through the segregated drainage system from process areas. Spent buffered oxide etch solution originally stored in tank until transported to TSDF. Currently, spent buffered oxide etch bypasses this SWMU and is treated in SWMU No. 7, the wastewater treatment system, prior to discharge to the POTW.	Process area generated waste is transported daily to FS-4 in 5-gallon carboys and transferred to 55-gallon steel drums. Drums are stored off of floor on wooden pallets. Drums are periodically transported by permitted transporter to TSDF.	Arsenic and mercury contaminated materials are transported in sealed bags to CS-2 and placed in separate 55-gallon steel drums. Drums are stored by waste type, off the floor, on wooden pallets. Periodic shipments by permitted transporters are made to TSDFs.
Release History	No reported releases	No reported releases	No reported releases
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	N/A	N/A	N/A
Release Potential	Low	Low	Low
Potential Pathway	None	None	None
Reason for Release Potential Rating	No reported releases or spills. No visible contamination during VSI and concrete vault appeared to have good structural integrity. No drains or sumps in vault area, completely contained. Unit is inactive.	No visible contamination during VSI. Unit is well contained with no easily accessible pathways for potential release, except from fire.	No visible contamination during VSI. Unit is well contained with only potential pathway through drains system to wastewater treatment system, to POTW, and to Rio Grande. Stored hazardous waste is in solid form and release through this pathway is unlikely.
Need for RFI	No	No	No

TABLE 7-1
SWMU Summary

Sheet 3 of 3

Unit	SWMU No. 7	SWMU No. 8
Unit Name	Neutralization Wastewater Treatment System	Coronado Municipal Landfill
Description	A wastewater treatment system with six below ground concrete vaults configured in series. Vaults are covered by concrete slabs and accessible through metal hatches. The concrete is coated with corrosion resistant material. The neutralization system has an influent grit chamber, two neutralization chambers of two vaults each, and one outfall vault. Both neutralization chambers are typically utilized, but can operate alone during maintenance cycles. The treatment area is surrounded by a grid of 11 acid leak test wells.	Abandoned uncontained municipal landfill located on portions of Signetics facility. Landfill has two sections of approximately 7.5 acres of area and has a reported depth of 20 to 40 feet. There are 35 methane vents and four ground-water monitoring wells in the area.
Operating Status	Active	Inactive
Regulatory Status	Unregulated	Unregulated
Waste Type	Spent acidic wastewater solutions including nitric/sulfuric acid, spent hydrofluoric acid (D002), and spent buffered oxide etch (D002). Additional wastewaters include demineralizer regeneration wastewater, cooling tower blowdown, and process scrubber wastewater.	Household and commercial refuse
Waste Management	Acid wastewaters from the process areas are transported through the segregated drainage system and discharged into the wastewater neutralization system. The pH of the wastewater is adjusted to meet a permit required pH range prior to combination with general facility wastewater and discharge to the POTW.	Received residential and commercial refuse in an uncontained landfill from 1962 to 1965.
Release History	One reported release of acidic wastewater in 1985 from a small leak in grit chamber. Occasional short pH excursions in neutralization process.	Collected fill from the landfill contained heavy metals, pesticides, and hydrocarbons. Ground-water samples from Signetics facility contain low levels of VOCs. Landfill is currently vented for methane.
Release Pathway	Soil and surface water	Soil, surface water, ground water, and subsurface gas.
Remedial Action Taken	None. Recovered leaking wastewater from test well. Plant pH excursions are short term and are corrected to normal operating conditions.	A portion of landfill material was relocated to the Los Angeles Municipal Landfill during facility construction. Methane vents have been installed.
Release Potential	Low	High
Potential Pathway	Surface water	Soil, surface water, ground water, and subsurface gas.
Reason for Release Potential Rating	Combined acidic wastewater is generally nonhazardous. Vault leak was an anomaly. Wastewater constituents of concern are typically low pH and high concentrations of fluoride.	Contents of the landfill are unknown. Hazardous constituents have been detected in collected fill material and ground-water samples.
Need for RFI	No	Yes

received from the EPA in 1988, 1989, and 1991. The generation and storage of all hazardous wastes associated with IC manufacturing are contained within the facility's Fabrication and Systems Center buildings. The plant has instituted an aggressive waste recycling and minimization program. Quarterly wastewater discharge and air quality reports to the City of Albuquerque indicate that the facility is not releasing excessive levels of hazardous constituents to the POTW and atmosphere.

The contribution of the abandoned Coronado Municipal Landfill to soil and ground-water contamination represents a potential threat to the environment and neighboring communities. The population within a 1 mile radius, downgradient from the facility is relatively low, but increases in the river valley near the Rio Grande. No ground-water contamination has been documented downgradient of the landfill but the unknown domestic ground-water use in the area, combined with the high permeability of the subsurface sediments, make this potential release a concern.

REFERENCES

Sheet 1 of 2

Albuquerque, 1991. City of Albuquerque (Albuquerque) Wastewater Discharge Permit Number: 2023A-3. Public Utility Division, Industrial Pretreatment Section, August 1

Albuquerque, 1992a. City of Albuquerque Air Quality Permit 166 File. Engineering/Air Monitoring Section, Air Pollution Division, Notes taken by Frank Robinson of PRC Environmental Management Inc., October 5

Albuquerque, 1992b. City of Albuquerque Wastewater Discharge Permit 2023A-3 File. Public Utility Division, Industrial Pretreatment Section, October 2

Albuquerque, 1992c. City of Albuquerque Site Environmental Audit (SEA) Database - Signetics Corporation. Environmental Health Department, September 18

Anderholm, S., 1988. Ground-Water Geochemistry of the Albuquerque - Belen Basin, Central New Mexico. U.S. Geological Survey, Water-Resources Investigation Report 86-4094

Anderson, C., 1992. Albuquerque Metropolitan Arroyo and Flood Control Administration (AMAFCA), Albuquerque, New Mexico. Personal communication with Frank Robinson, PRC Environmental Management, Inc., October 14

Bjorklund, L. and B. Maxwell, 1961. Availability of Ground Water in the Albuquerque Area, Bernalillo and Sandoval Counties, New Mexico. New Mexico State Engineer Technical Report 21.

Donahue, M., 1992. United States Fish and Wildlife Services, Ecological Services Field Office, Albuquerque, New Mexico. Personal communication with Frank Robinson, PRC Environmental Management, Inc., October 14

Emcon, 1987. Baseline Ground-water Investigation, Signetics Corporation, Albuquerque, New Mexico. Emcon Associates, Project 377-16.01, June

Enseco 1988 through 1993. Enseco Rocky Mountain Analytical Laboratory results prepared for Signetics

Environmental Protection Agency (EPA), 1983a. Letter from Craig Campbell to W. Dana, Signetics Corporation, March 17

EPA, 1983b. Settlement Agreement and Final Order. United States Environmental Protection Agency Region VI, June 29

EPA, 1985. Preliminary Assessment Facility Checklist. September 2

EPA, 1986. Potential Hazardous Waste Site, Site Inspection Report. September

EPA, 1988. Compliance Evaluation Inspection (CEI) Report. August 30

Federal Emergency Management Agency (FEMA), 1983. Flood Insurance Study, City of Albuquerque, New Mexico, Bernalillo County. FEMA, Community Number 350002, Final, September 15

REFERENCES

Sheet 2 of 2

GEMS, 1992. Geographical Exposure Modelling System (GEMS) Database. July 22

New Mexico Environment Division (NMED), 1991. Signetics Inspection Report. January 10

New Mexico Environmental Improvement Division (NMEID), 1986. Letter from unnamed author to Gary Mavrakis, Signetics Corporation, April 1

NMEID, 1988a. Inspection Report. August 30

NMEID, 1988b. Letter from Kirkland Jones to Gary Mavrakis, Signetics, September 1

New Mexico State Engineer's Office (NMSE), 1992. Ground-water well permit file. October 1 and 2

Reeder, H., L. Bjorklund, and G. Dinwiddie, 1967. Quantitative Analysis of Water Resources in the Albuquerque Area, New Mexico. NMSE, Technical Report 33

Signetics, 1980a. RCRA Part A Permit Application, August 14

Signetics, 1980b. RCRA Part B Permit Application, August 14

Signetics, 1985a. Letter from Gary Mavrakis to Jamie Wright, EPA, May 14

Signetics, 1985b. Letter from Gary Mavrakis to Maxine Goad, NMEID, November 18

Signetics, 1986. Letter from Gary Mavrakis to Denise Fort, NMED, April 14

Signetics, 1988. Letter from Gary Mavrakis to Kelly Crossman, NMEID, August 16

Signetics, 1990. 1989 Hazardous Waste Report. State of New Mexico Health and Environment Department, No date

Signetics, 1991. 1991 Hazardous Waste Report, Off-Site Identification. U.S. Environmental Protection Agency, No Date

Signetics, 1992. Letter from Gary Mavrakis to Frank Robinson, PRC Environmental Management, Inc. (PRC), September 28

United States Department of Agriculture (USDA), 1977. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico. Soil Conservation Service, Forest Service, and United States Department of Interior (USDI) in cooperation with New Mexico Agriculture Experiment Station, No Date

Williams, J., 1986. New Mexico in Maps. University of New Mexico Press, Albuquerque, Second Edition, No Date

ATTACHMENT A

VISUAL SITE INSPECTION SUMMARY

VISUAL SITE INSPECTION SUMMARY

Signetics Corporation
9201 Pan American Freeway, N.E.
Albuquerque, New Mexico 87113

Date:	August 24, 1992
Facility Representatives:	Gary Mavrakis, Material/Environmental Compliance Manager, Signetics Corporation
Inspection Team:	Frank Robinson, PRC Environmental Management, Inc. Cynthia McNulty, PRC Environmental Management, Inc. Joan Middleton, PRC Environmental Management, Inc.
Photographer:	Cynthia McNulty
Weather Conditions:	Overcast and cloudy, wind direction was due north, temperature was 62°F

Summary of Activities:

An introductory meeting, lasting approximately 1 1/2 hours, was held with Gary Mavrakis at 8:20 AM on August 24, 1992. During the meeting, the purpose of the RFA and site visit was reviewed by Frank Robinson, the PRC site inspection team leader. Discussion was also held on the on going activities of a parallel EPA investigation being performed by Fluor Daniels. The meeting then focused on the history of the facility, regulatory permit requirements, the processes, and operations of the facility. Also discussed were the wastes generated and various waste management practices at the facility. A review of the planned site inspection itinerary was made with Gary Mavrakis at the conclusion of the meeting.

The visual site inspection (VSI) began at 9:50 AM from the reception area at the entrance to the Signetics Fabrication building. The first area inspected was the facility's Compliance and Product Testing Laboratories where wastewater samples are tested for compliance and incoming photolithographic chemicals are tested for quality. Drains were inspected, and chemical handling and storage practices reviewed.

We then proceeded south to the process areas within the Fabrication building where the blank silicon wafers are processed into semiconductor integrated circuits (IC). At 10:00 AM we were shown the first process area, Fab 22, a "Class 100" clean room that we were able to view from an adjacent corridor. Proceeding down the corridor we were able to view the newest process area, Fab 23, a "Class 10" clean room. We were able to view the automated manufacturing equipment and operators in clean room attire. Areas of construction were evident in the building, where a new production area is being built.

From the process area, we proceeded west to the basement of the Fabrication building at approximately 10:15 AM and were shown the segregated drainage pipes that transport the bulk of the process area wastes to the storage areas. We were able to see that the pipes were designed to allow easy inspection and observation of any releases.

From the Fabrication building we proceeded west to the Systems Center building to inspect the waste storage areas and wastewater treatment system. The Chemical Storage 2 (CS-2) toxic hazardous waste storage room was our next stop on the inspection tour at 10:20 AM. The drum storage practices were noted. The next area was the wastewater treatment area that includes the wastewater neutralization system and the three waste storage tanks in below ground concrete vaults. We inspected the vaults from the top of the tanks with a flashlight. At 11:00 AM the inspection moved to the Flammable Storage 4 (FS-4) ignitable hazardous waste storage area. Drum storage and waste management practices were reviewed. From the FS-4 area, we returned to the chemical storage area at 11:15 AM and inspected Chemical Storage 1 (CS-1); the other chemical storage room adjacent to CS-2.

At 11:20 AM we left the Systems Center building from the southwest side of the building and inspected the facility loading areas and the approximate site of the abandoned Coronado Municipal Landfill. Areas of subsidence were evident and notice made of methane vents and ground-water monitoring wells installed by Signetics.

We returned to the office of Gary Mavrakis at 11:40 AM and held a debriefing meeting. Gary indicated that he never received the letter requesting a site visit or the requested additional site information. Frank Robinson will address this with a follow up letter. The inspection team left the facility at 12:20 AM.

ATTACHMENT B

VISUAL SITE INSPECTION PHOTOGRAPHS

PHOTOGRAPH NO. 1

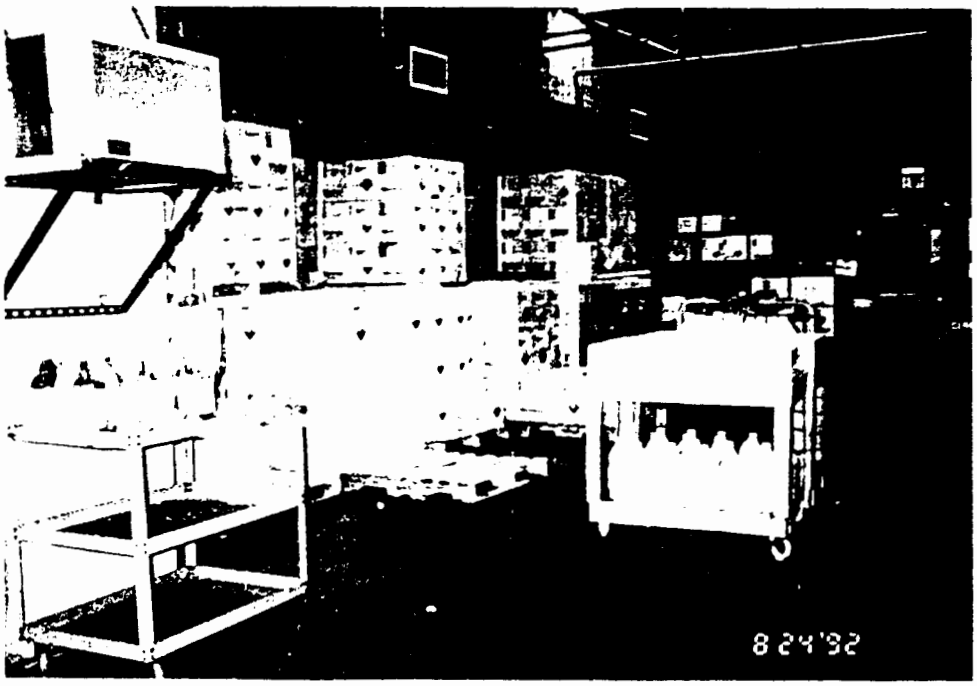
Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: East

Picture Description: SWMU No. 1 - Segregated drain pipes used to transport waste streams from process areas. Piping is transitioning from ceiling to concrete trenches in System Center.

PHOTOGRAPH NO. 2

Date: 8 24 92 Picture Taken by: C. McNulty Direction Facing: East
Picture Description: SWMU No. 6 - Chemical Storage 2 (CS-2): drummed chemicals used at Signetics stored on wood pallets. Toxic hazardous wastes are stored in a separate area to the left.

PHOTOGRAPH NO. 3



Date: 8 24 92 Picture Taken by: C. McNulty Direction Facing: West
Picture Description: SWMU No. 6 - CS-2: chemical products used at Signetics stored on wood pallets and cold storage room for photoresist material.

PHOTOGRAPH NO. 4

Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: Southwest
Picture Description: SWMU No. 6 - CS-2: drummed toxic solid waste stored on wooden pallets in dedicated waste storage area.

PHOTOGRAPH NO. 5

Date: 8 24 92 Picture Taken by: C. McNulty Direction Facing: Northeast
Picture Description: SWMU Nos. 2, 3, 4 and 7 - Wastewater treatment system is left of the metal grates. Grated and solid covers are over vaults for Tanks 3, 4, and 5, and two empty vaults.

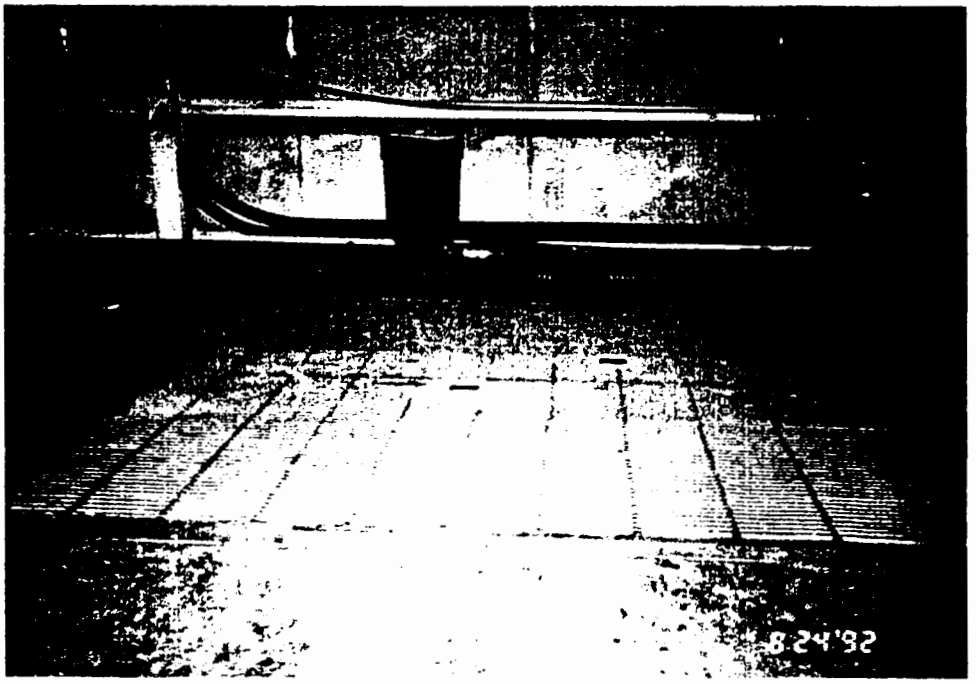
PHOTOGRAPH NO. 6

Date: 8 24 92 . Picture Taken by: C. McNulty Direction Facing: East
Picture Description: SWMU No. 7 - Influent point of wastewater treatment system at top center. The metal hatches give access to neutralization chambers. The circular hatch accesses pH probe.

PHOTOGRAPH NO. 7

Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: South
Picture Description: A grate cover to one of two empty concrete vaults west of Tank 3. The empty vault was previously used for bulk storage of sulfuric acid. Salvage drums are empty.

PHOTOGRAPH NO. 8

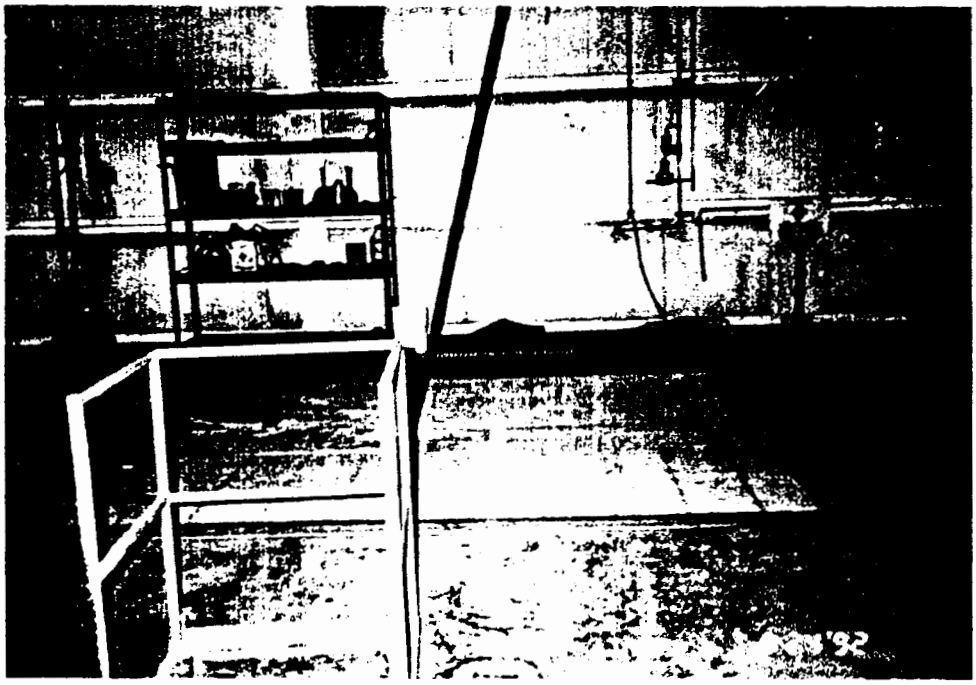


Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: South
Picture Description: A grate cover to one of two empty concrete vaults west of Tank 3. The empty vault was previously used for bulk storage of caustic. Concrete pipe trench in background.

PHOTOGRAPH NO. 9

Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: South
Picture Description: SWMU No. 2 - Metal cover over concrete vault holding Tank 3. Note vent and metered stick used for tank gauging. Concrete pipe trench in background.

PHOTOGRAPH NO. 10

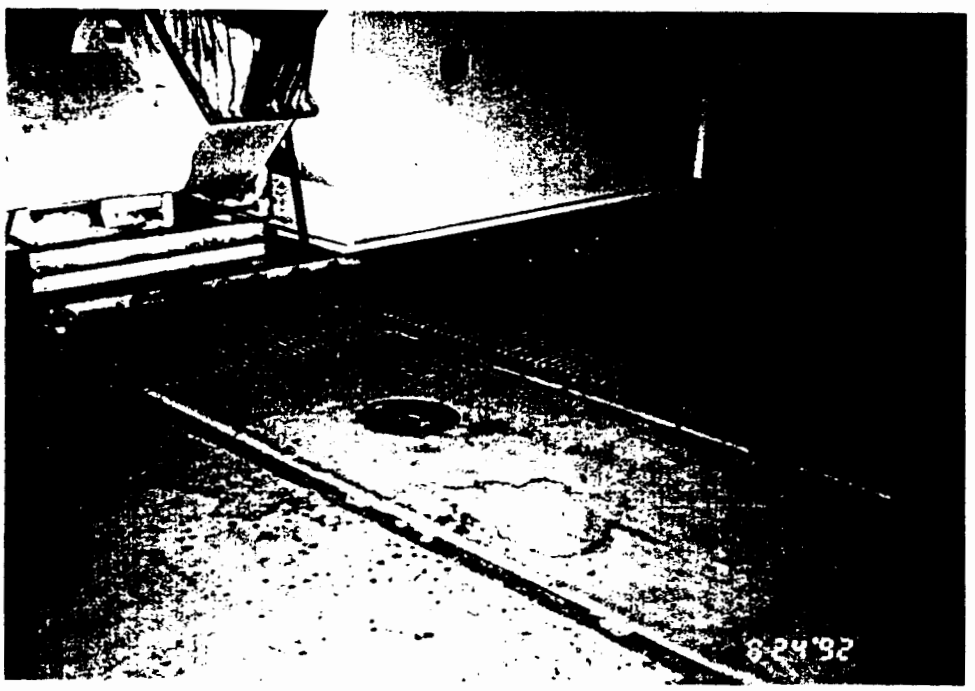


Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: South
Picture Description: SWMU No. 3 - Metal grate cover over concrete vault holding Tank 4. Note metered stick used for tank gauging in center of picture.

PHOTOGRAPH NO. 11

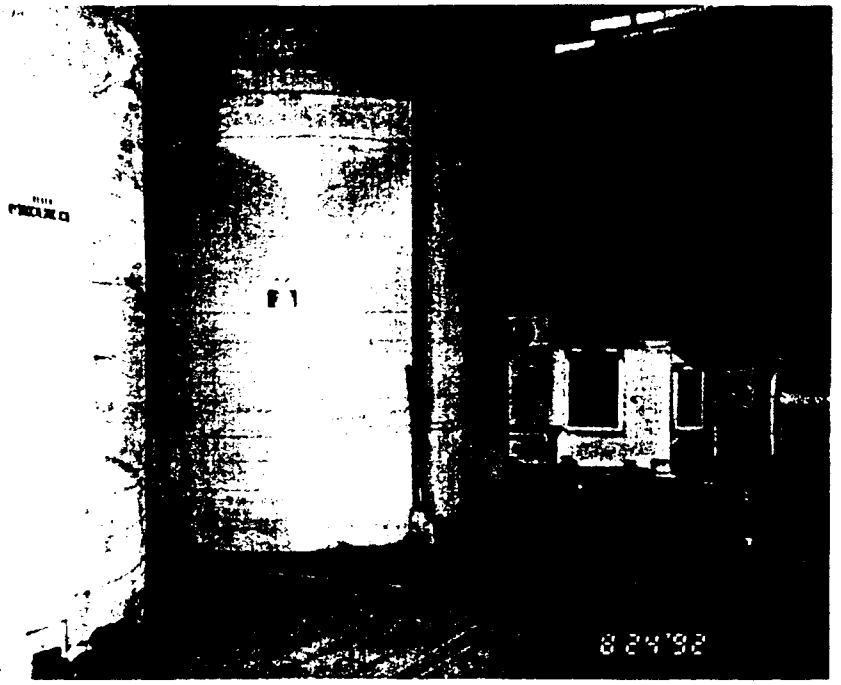
Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: Southeast
Picture Description: SWMU No. 4 - Metal grate cover over concrete vault holding Tank 5. Note concrete pipe trench for segregated drainage system around periphery of area.

PHOTOGRAPH NO. 12



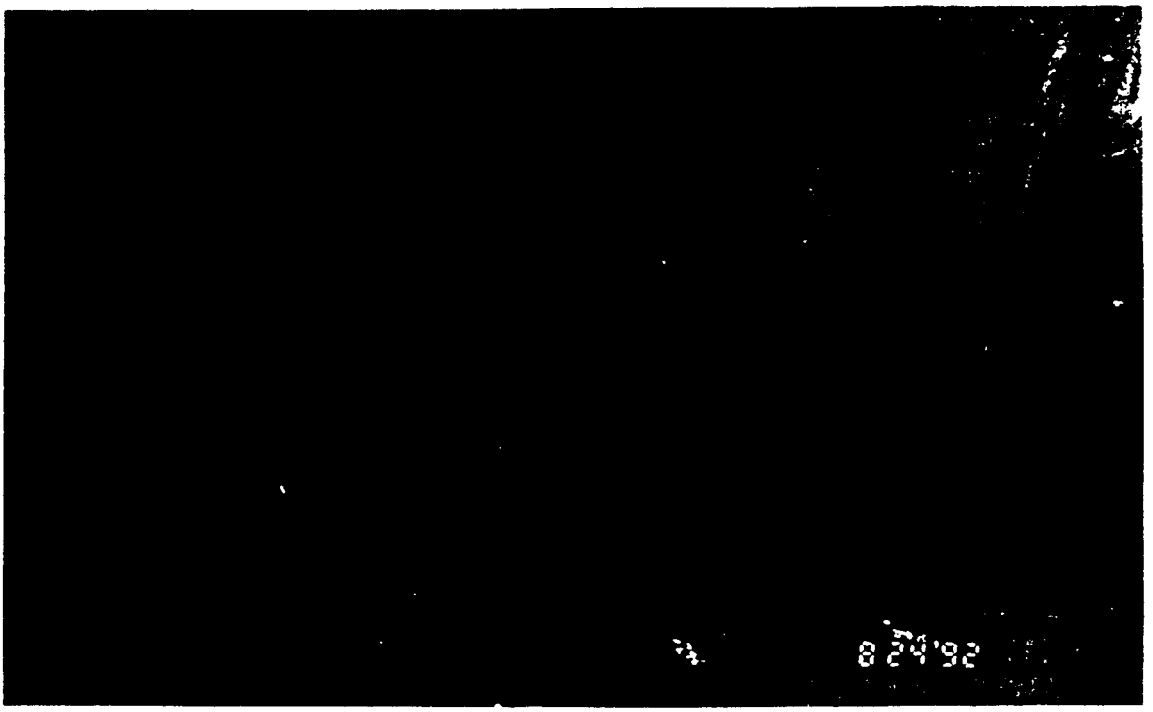
Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: Northeast
Picture Description: SWMU No. 7 - Steel cover over one of 11 acid leak test wells surrounding the wastewater treatment system and Tanks 3, 4, and 5. Note floor drain to wastewater plant.

PHOTOGRAPH NO. 13



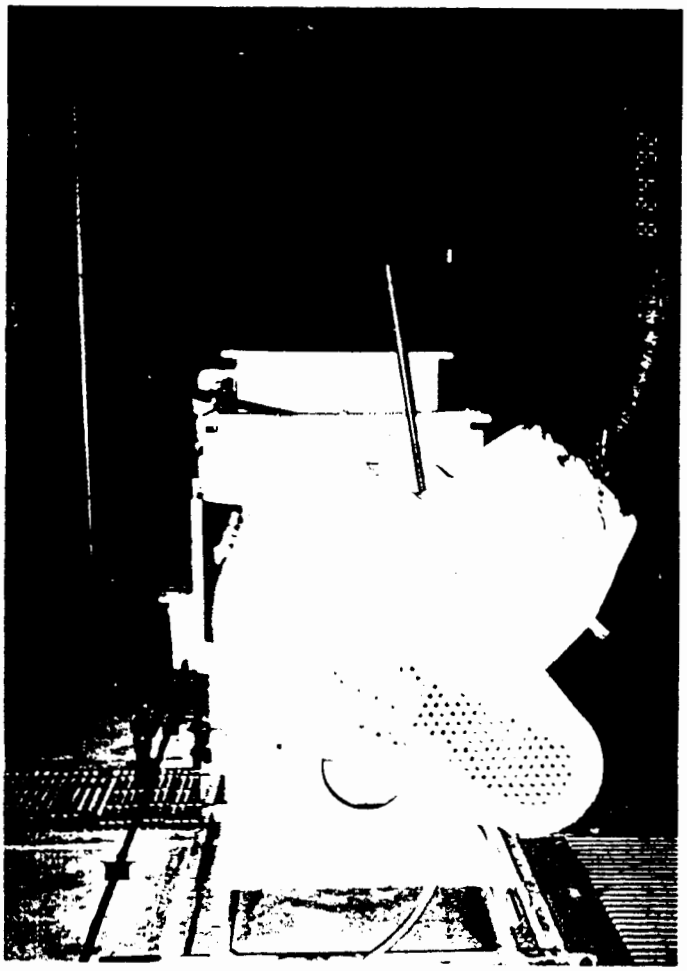
Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: Northeast
Picture Description: Bulk hydrochloric acid, sulfuric acid, and caustic storage tanks in wastewater treatment area. The white air scrubber is in background.

PHOTOGRAPH NO. 14



Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: East
Picture Description: SWMU No. 4 - East wall of concrete vault with top of steel Tank 3 in foreground. No evidence of spills or cracks in walls. The vault is inspected daily.

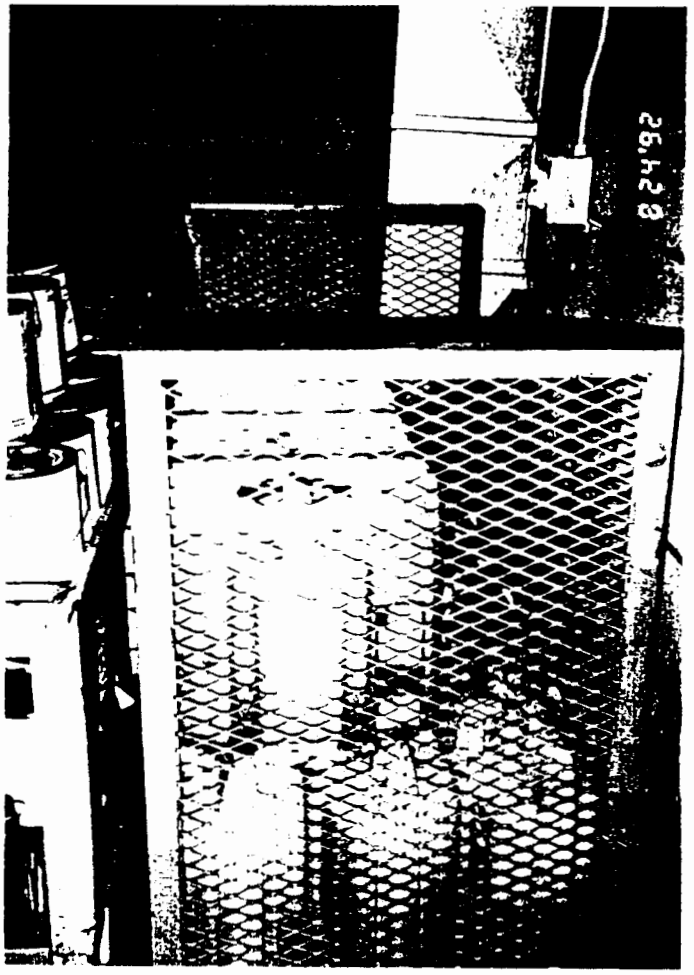
PHOTOGRAPH NO. 15



Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: North

Picture Description: This is an air scrubber unit in the wastewater treatment area used to remove hydrochloric acid and caustic fumes.

PHOTOGRAPH NO. 16

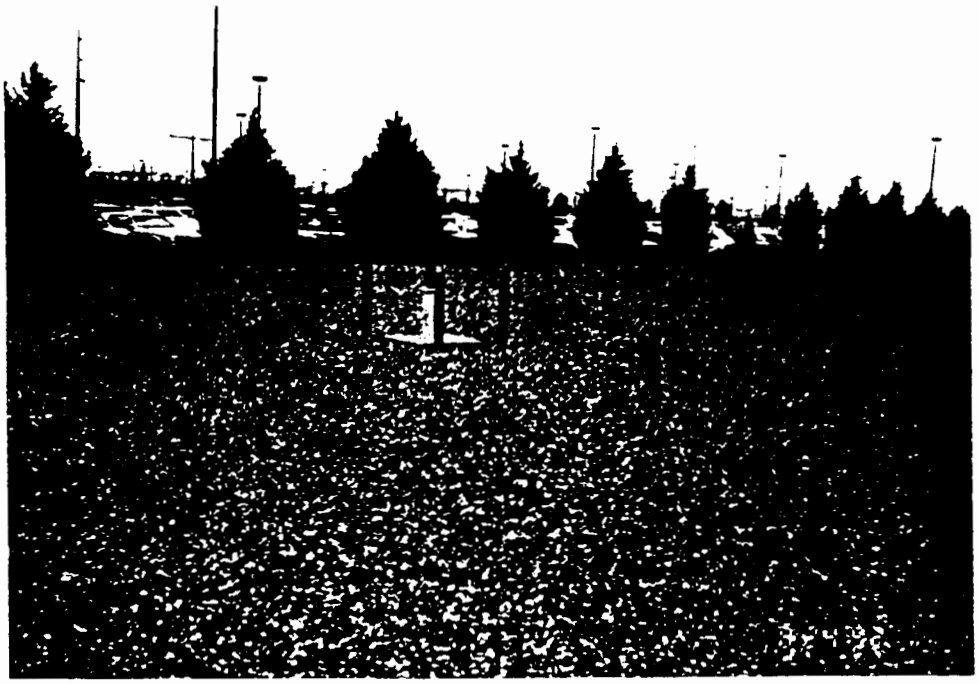


Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: West
Picture Description: SWMU No. 5 - Flammable Storage 4 (FS-4): waste Solvent II storage room with 5-gallon Nalgene carboy containers in a cart prior to transfer of contents to 55-gallon drums.

PHOTOGRAPH NO. 17

Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: South
Picture Description: SWMU No. 5 - FS-4: drummed Solvent II waste stored on wooden pallets. Note the spill/leak containment containers under the pallets.

PHOTOGRAPH NO. 18



Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: Northwest
Picture Description: SWMU No. 8 - Ground-water monitoring well located in vicinity of abandoned Coronado Municipal Landfill on Signetics facility.

PHOTOGRAPH NO. 19

Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: West
Picture Description: SWMU No. 8 - Approximate site of Coronado Municipal Landfill on Signetics facility. Two methane vents in foreground and ground subsidence evident in area.

PHOTOGRAPH NO. 20

Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: East
Picture Description: Municipal trash bin and nonchemical loading dock on west side of Signetics Fabrication building.

PHOTOGRAPH NO. 21

Date: 8/24/92 Picture Taken by: C. McNulty Direction Facing: North
Picture Description: Chemical receiving/loading dock on south side of Signetics Systems Center building. No materials are permitted to be stored on the dock.

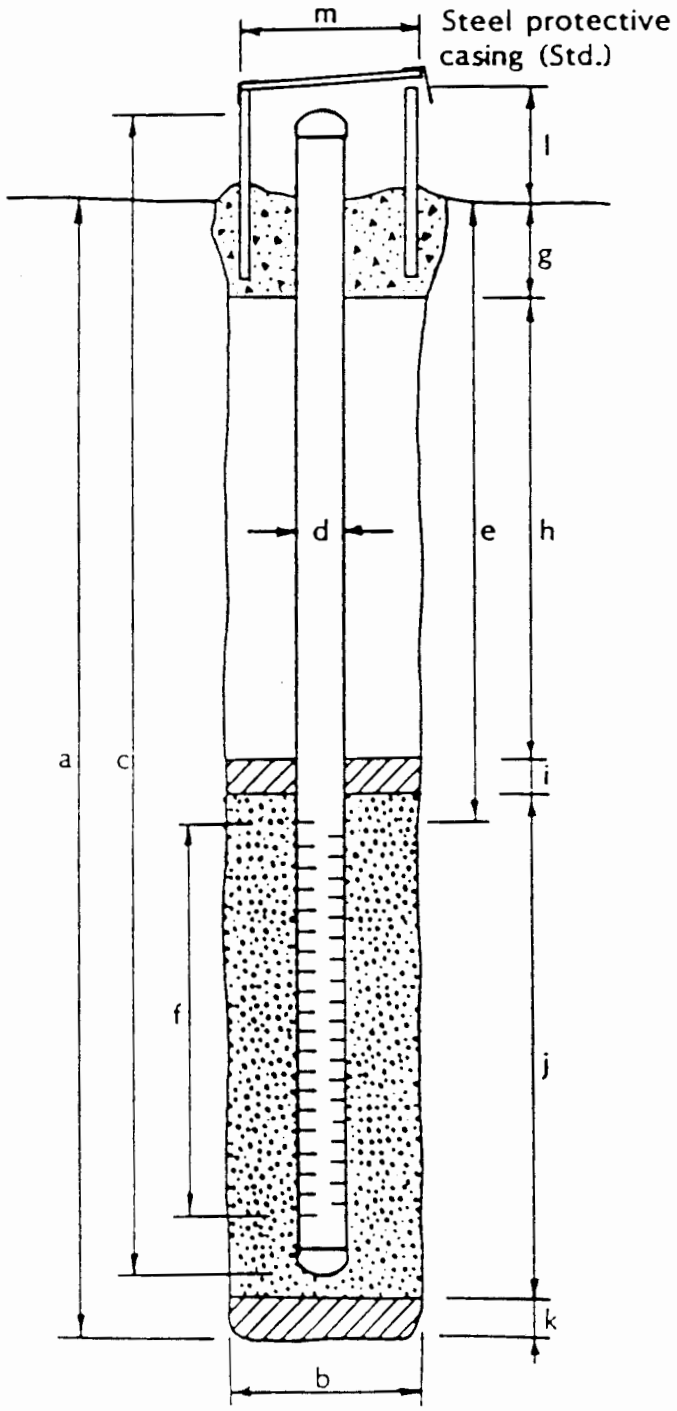
ATTACHMENT C

SIGNETICS MONITORING WELL CONSTRUCTION LOGS

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

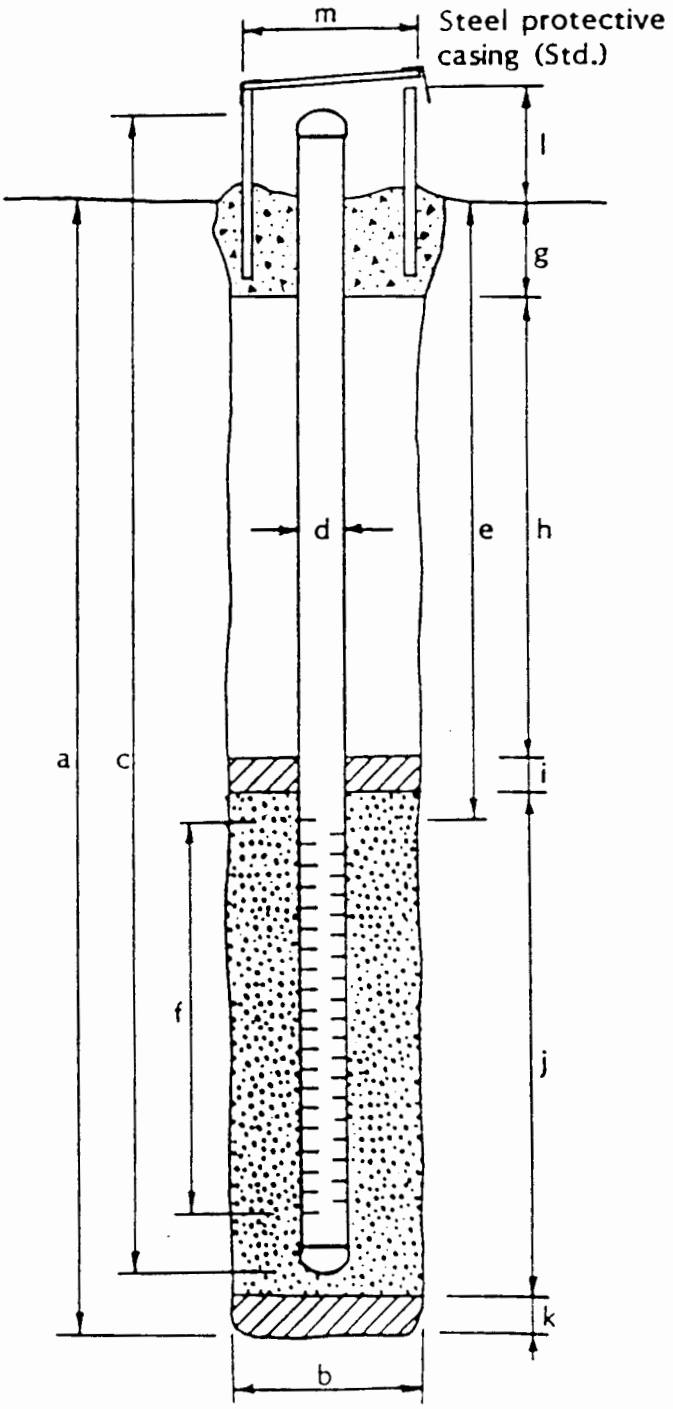
c. Casing length 230 ft.
Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 199.5 ft.
f. Perforated length 30 ft.
Perforated interval from 199.5 to 229.5 ft.
Perforation type Machine Slotted
Perforation size 0.02 inch
g. Surface seal 3 ft.
Seal material Cement w/ 3% Bentonite
h. 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

Exhibit A-10

CORRECTIVE ACTION STABILIZATION QUESTIONNAIRE

Completed by: Rich Mayer
Date: 12/29/92

Background Facility Information

Facility Name: Signetics house - name has been changed to Phillips
EPA Identification No.: NMD000101782
Location (City, State): Albuquerque - NM
Facility Priority Rank: 472.00

1. Is this checklist being completed for one solid waste management unit (SWMU), several SWMUs, or the entire facility? Explain.
   1 Landfill

Status of Corrective Action Activities at the Facility

2. What is the current status of HSWA corrective action activities at the facility?

   ( ) No corrective action activities initiated
   (✓) RCRA Facility Assessment (RFA) or equivalent completed
   ( ) RCRA Facility Investigation (RFI) completed
   ( ) Corrective Measures Study (CMS) completed
   ( ) Corrective Measures Implementation (CMI) begun or completed
   ( ) Interim Measures begun or completed

3. If corrective action activities have been initiated, are they being carried out under a permit or an enforcement order?

   ( ) Operating permit
   ( ) Post-closure permit
   ( ) Enforcement order

4. Have interim measures, if required or completed [see Question 2], been successful in preventing the further spread of contamination at the facility?

   ( ) Yes
   ( ) No
   ( ) Uncertain; still underway

CONTINUE TO QUESTION 5 <u>ONLY</u> IF THE FOLLOWING CONDITIONS ARE MET:

Note: Not applicable in this situation

- *The facility ranks "High" on the National Corrective Action Prioritization System; <u>AND</u>*
- *Interim Measures have not been initiated, or if initiated, have not been successful in preventing the further spread of contamination at the facility.*

Facility Releases and Exposure Concerns

5. To what media have contaminant releases from the facility occurred or been suspected of occurring?

   (✓) Ground water
   ( ) Surface water
   ( ) Air
   ( ) Soils

6. Are contaminant releases migrating off-site?

( ) Yes; Indicate media, concentrations, and level of certainty.

Don't know, wells contaminated and on site

( ) No
( ) Uncertain

7a. Are humans currently being exposed to contaminants released from the facility?

( ) Yes
( ) No
(✓) Uncertain

7b. Is there a potential for human exposure to the contaminants released from the facility over the next five to 10 years?

(✓) Yes
( ) No
( ) Uncertain

8a. Are environmental receptors currently being exposed to contaminants released from the facility?

( ) Yes
(✓) No
( ) Uncertain

8b. Is there a potential that environmental receptors could be exposed to the contaminants released from the facility over the next five to 10 years?

( ) Yes
( ) No
(✓) Uncertain

Anticipated Final Corrective Measures

9. If already identified or planned, would final corrective measures be able to be implemented in time to adequately address any existing or short-term threat to human health and the environment?

( ) Yes
( ) No
(✓) Uncertain

Additional explanatory notes:

10. Could a stabilization initiative at this facility reduce the present or near-term (e.g., less than two years) risks to human health and the environment?

( ) Yes
( ) No
( ) Uncertain

Additional explanatory notes:

Groundwater pumping could keep the plume from growing offsite

11. If a stabilization activity were not begun, would the threat to human health and the environment significantly increase before final corrective measures could be implemented?

( ) Yes
( ) No
(✓) Uncertain

Additional explanatory notes:

Conclusion

9. Is this facility an appropriate candidate for stabilization activities?

(✓) Yes
( ) No, not feasible
( ) No, not required

Explain final decision, using additional sheets if necessary.

Down gradient wells monitoring the landfill have detected Tetrachloroethane. Most recent data, May 19, 1992, show the three downgradient wells with 9, 8.7, and 4.8 ppb tetrachloroethane. The MCL is 5.0 ppb. Two monitoring wells are on site. The EPA doesn't mention anything about the construction of these wells, screen length. Therefore EPA doesn't know the vertical and horizontal extent of contamination from the landfill.

Exhibit A-11

PHILIPS

Philips Semiconductors

Law Department
Philips Semiconductors
a North American Philips Company

811 E. Arques Avenue
P.O. Box 3409
Sunnyvale, CA 94088-3409
(408) 991-2000

April 16, 1993

Mr. Rich Mayer
Ms. Nancy Morlock
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, TX 75202-2733

Re: **Old Coronado Landfill**
Philips Semiconductors Site, Albuquerque

Dear Rich and Nancy:

Thank you for our meeting on April 6. Gary Mavrakis and I appreciate the opportunity to discuss the draft Part B permit, particularly the conditions concerning the landfill, since they will have such an impact on our current operations. At the end of our meeting you requested a synopsis of the points presented which I have summarized below.

As I indicated during our meeting, Section D, Special Conditions, subparagraphs "a-d", are the focus of our concern. Subsection "a" seeks the location of "all water supply wells within a three mile radius of the facility." Enclosed is a copy of the well map we reviewed at our meeting and corresponding well descriptions. We are attempting to determine if the city has a more recent map and will provide you with a copy if available. Subsections "c" and "d" are requests for copies of "installation logs" and "historical analytical data" for the groundwater monitoring wells at the Philips' facility. Copies of both were presented to you during our April 5 meeting (Emcon Associates report, 1987). The condition of gravest concern is Subsection "b", regarding the installation of "additional groundwater monitoring wells... to completely define the horizontal and vertical extent of the contaminated plum." For the reasons set forth more fully below, Philips believes the proposed modification to Philips' current permit is unwarranted based on the trace concentrations detected in the groundwater and clear indication of an offsite source.

As explained, the area in question was utilized by the City of Albuquerque for a residential landfill for approximately eighteen (18) months during the 1963-1965 time period. During this period the City did not own the property, rather entered into a lease agreement with private owners to use the property to fill two arroyos with household refuse. The site, referred to as the Old Coronado Landfill, was established for the convenience of north end residents, such that household trash could be deposited. Other sites located near the City Center were available for commercial refuse. Unfortunately, accurate records of the Landfill's location is not available. However, the 1986 EPA Preliminary Report indicates that one landfill transects east to west the length of the southern portion of the Philips property. The other is located on the adjacent property directly north of the Philips site. (*See*, attached EPA map.)

Philips purchased the property in 1980, but did not know, or have reason to know of the existence of any landfill. Further, Philips never operated, disposed or contributed to the landfill. The presence of the landfill was not known until routine preconstruction borings were done in May of 1980. Subsequent inquiries of the City confirmed the existence of the landfill. Followup investigations revealed landfill to a depth of approximately 20-25', groundwater depth of 190'-225' and soil type indicated low permeability and saturation. The landfill was comprised mainly of household refuse material (i.e., grass clippings, bottles, newspapers, tires, etc.).

In 1987 Philips independently installed four groundwater monitoring wells at the depth of 247' to 260' (screened at 199'-239'). (*See*, Emcon Associates report, 1987.) Trace concentrations of 1,1,2,2 Tetrachloroethane was initially detected, but have not been detected since 1989. Negligible amounts of Tetrachloroethene (PCE) have continued to be detected, but at consistently decreasing levels. Recent tests indicate only 5.4 ppb to 7.1 ppb of PCE.

In addition, four soil samples were taken and analyzed when the groundwater monitoring wells were installed. The soil borings penetrated the landfill as well as the underlying native soil. Attached is a copy of Emcon's soil analysis. As the analyses indicates, leachate migration has not occurred from the landfill underlying Philips' property as evidenced by the absence of VOCs or pesticides detected in the underlying soil.

The proposed condition, Subsection "b", requires the complete horizontal and lateral definition of the plume. Philips believes such a requirement is not warranted for several reasons. First, the maximum contamination level (MCL) for PCE is 5 ppb. New Mexico's water quality standard is 20 ppb. Only trace amounts of PCE (5.4 to 7.1 ppb) are being detected in the monitoring wells. Accordingly, Philips' position is

that such low levels do not warrant any further action. Rather, Philips recommends that current monitoring continue with either submission of quarterly reports or notification in the event of any significant detection increase.

Second, Philips has never used either 1,1,1,2 Tetrachloroethane or PCE at the facility. Hence, the trace levels cannot be attributed to the Philips operation. Furthermore, Philips believes the source of the PCE originates from an offsite location. In our recent meeting, we reviewed the report prepared by environmental consultant, Emcon Associates, regarding the well installation and groundwater analysis. As part of their analysis, Emcon stated that the chemical PCE was not patented until after the 1965 closure of the Old Coronado Landfill. Moreover, PCE was not in industrial usage until at least a decade later. Hence, the trace PCE concentrates originated from a source other than the Old Coronado Landfill underlying the Philips site. Emcon recommended evaluating several potential offsite sources of PCE near the Philips facility.

Third, according to the 1986 EPA Preliminary Report map, the majority of the northern Coronado landfill is underlying property other than the Philips site. To require Philips to define a plume originating from an offsite source is an unduly burdensome task and inconsistent with the RCRA mandate. Further, the cost associated with the installation of a groundwater monitoring well of this nature runs in the amount of $40,000 per well. It is inequitable to require Philips to bear such a cost.

During our meeting you asked us to identify any adjacent landfills and provide information concerning the adjacent municipal airport. There are several known landfills in close proximity to the Philips site. The Los Angeles landfill is located southwest, approximately one-half mile from Philips. The Los Angeles site was operated by the City of Albuquerque from 1978 to 1983 and was a depository for commercial and domestic refuse. According to the Albuquerque Water Quality Department low levels of PCE have been detected at the Los Angeles landfill. The Department further indicated PCE has not been detected in any of the City drinking water pumping stations. A second landfill, located on the Nazareth Sanitarium property, is located one-half mile due west of the Philips site. We have no information concerning this particular landfill other than the landfill is no longer in operation. With regard to the municipal airport located directly across Interstate 25 from the Philips' facility, it is our understanding that the UST investigation is being handled by the state of New Mexico.

For the reasons identified above, Philips submits the modification of the Part B Permit to include special condition "b" is not warranted. Specifically, only negligible concentrations of PCE are being detected in the groundwater. Soil analyses indicated

an absence of leachate migration. Moreover, nondetection of VOCs in the underlying soil at a time when trace PCE concentrations have been detected demonstrates the existence of an offsite source. Furthermore, a CERCLA investigation is currently being conducted of the Albuquerque landfills, which will address the areas' landfills and responsible parties. Accordingly, in order to assess/monitor the plume Philips proposes submission of the current quarterly groundwater monitoring reports and immediate notification in the event of a significant detection increase.

If you have any questions after review of the enclosed material, please feel free to contact me.

Sincerely,

James N. Casey
Counsel

JNC:cb

cc: Gary Mavrakis

NO.	DISCRIPTION & ADDRESS		MAP LOCATION
1.	Volcano Cliffs 6641 81st St NW	Well # 1, Res.	E-9
2.	Volcano Cliffs 5301 81st St NW	Well #2	E-9
3.	West Mesa 8803 Cloudcroft Rd. NW	Well #2	K-9
4.	West Mesa 119 94th St NW	Res. & P.S. & Well #1	K-9
5.	West Mesa 8700 Avalon NW Avalon Rd. East of 90th St. NW	Well #3	K-9
6.	Don 11414 Central Ave. SW	Reservoir & Well #1	L-8
7.	Franciscan 12000 Cavitt St. SW	Reservoir	M-8
8.	Don 1002 Cerrillos Rd. SW	Pump Station	M-8
9.	Leavitt 1320 86th St SW	Well #1 & Res.	M-9
10.	Leavitt Directly South of Well #1 8500 Benavidez SE	Well #2	M-9
11.	West Mesa 7721 Sarracino Pl. NW East of 79th St NW	Well #4	K-10
12.	Atrisco 5029 Ute Dr. NW	Well #13	K-11
13.	Duranes 2603 Don Fernando Rd. NW	Well #2	G-12
14.	Duranes 2106 Gabaldon Rd. NW	Well #7	H-12
15.	Duranes 1917 Cherry Lane NW	Res. P.S.	H-12

NO.	DISCRIPTION & ADDRESS		MAP LOCATION
16.	Duranes 2805 Socorro St. NW	Well #3	H-12
17.	Duranes 3240 Duranes Rd. NW	Well #4	H-12
18.	Duranes 3298 Spur Court NW	Well #5	J-12
19.	Atrisco 324 46th Street NW	Well #9	J-12
20.	Tingley 701 Tingley Dr. SW	Well #1	J-12
21.	Atrisco 1519 Osage Rd. SW	Well #11	K-12
22.	Atrisco 3226 Gonzales Rd. SW	Well #1 P.S & Res.	K-12
23.	Atrisco 1802 Eucariz Ave. SW	Well #7	K-12
24.	Atrisco Pump Station, 669 Atrisco Rd. SW	Well #5, Res.	L-12
25.	Atrisco 2302 Hooper Rd. SW	Well #8	L-12
26.	Griegos 4117 Dietz Court NW	Well #1, P.S., & Reservoir	F-13
27.	Griegos 4812 Guadalupe Trail NW	Well #5	F-13
28.	Griegos 2322 Teodora Rd NW	Well #3	F-13
29.	Griegos 1954 San Lorenzo Rd NW	Well #2	F-13
30.	Duranes 2009 Indian School Rd NW	Well #1	H-13
31.	Duranes 1917 Cherry Lane NW	Res. & Pump Station	H-12
32.			

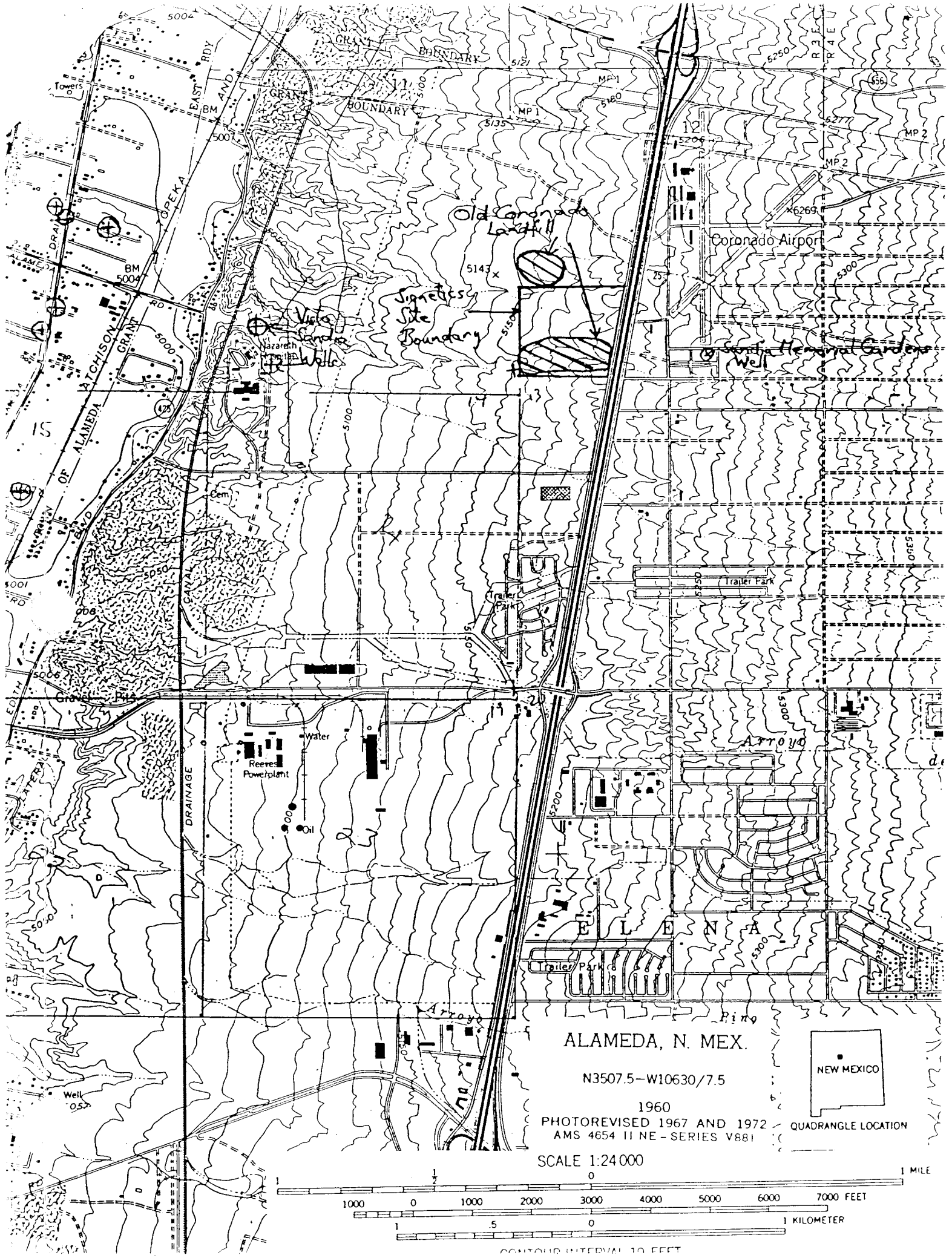
NO.	DISCRIPTION & ADDRESS		MAP LOCATION
33.	Griegos 1105 Montano Rd. NW	Well #4	F-14
34.	Candelaria 100 Candelaria Rd. NW	Well #24	L-12
35.	San Jose 2303 Commercial Ave. SE	Well #8	L-14
36.	San Jose 717 Gibson Rd. SE	Well #7	L-14
37.	San Jose 500 San Jose SE	Well #1 Res. & P.S.	M-14
38.	San Jose 2930 Arno St. SE	Well #3	M-14
39.	San Jose 408 Woodward Rd. SE	Well #10	M-14
40.	Candelaria 215 Candelaria Rd NE	Well #21 Res. & P.S	G-15
41.	Candelaria 3822 Commercial St. NE	Well #22	G-15
42.	Candelaria 3715 Edith Blvd. NE	Well #23	H-15
43.	Santa Barbara 1520 Menaul Blvd. NE	Pump Station	H-15
44.	Yale 1220 Hazeldine Ave. SE (Roosevelt Park)	Well #4	K-15
45.	Yale 417 Buena Vista SE The Parking Lot (TVI)	Well #1	K-15
46.	Yale 1925 Kathryn SE	Well #3	L-15
47.	Vol Andia 3514 Amherst Pl. NE	Well #3	G-16

NO.	DISCRIPTION & ADDRESS		MAP LOCATION
48.	Santa Barbara 3301 Claremont Ave. NE	Well #1 & Res.	H-16
49.	Burton Park 1200 Wellesley Dr. SE	Reservoir	L-16
50.	Yale 2207 Central Ave. NE	P.S. & Res.	K-16
51.	Burton 517 Hermosa Dr NE	Well #2	K-17
52.	Vol Andia 4651 McLeod Rd NE	Well #6	F-17
53.	Vol Andia 4608 Jefferson St. NE	Well #1, P.S. & Res.	F-17
54.	Vol Andia 4810 Carlisle Blvd NE	Well #5	F-17
55.	Charles Wells 5101 Cutler Ave. NE	Pump Station	H-17
56.	Burton 213 Morningside Dr. SE	Well #3	K-17
57.	Leyendecker 6901 Montgomery Blvd NE	Well #1, P.S., & Res.	F-18
58.	Vol Andia 4545 San Mateo Blvd. NE	Well #4	G-18
59.	Vol Andia Well 5212 Ponderosa Ave. NE	Well #2	G-18
60.	Charles Wells 6215 Phoenix Ave. NE	Well #3	H-18
61.	Thomas 8729 Avenida La Prestina	Well #4	F-19
62.	Charles Wells 7805 McKnight Ave. NE	Well #4	J-19
63.	Ridgecrest 324 Grove NE	Well #4	K-19
64.	Ridgecrest 415 Virginia SE	Well #3	L-19

NO.	DISCRIPTION & ADDRESS		MAP LCOATION
65.	Charles Wells 2421 Mesilla Ave. NE	Res. Well #1	H-19
66.	Tracie Los Angeles & Louisiana NE	Well #1	D-19
67.	Ponderosa 9301 Spain NE	Well #3	F-20
68.			
69.	Thomas 8924 Montgomery Blvd. NE	Well #2	F-20
70.	Ridgecrest 2417 Eubank Blvd. NE	Res. #1	H-20
71.	Charles Wells 6514 Indian School Rd NE	Well #2	H-20
72.	Love 920 Wyoming Blvd. NE	Well #4	K-20
73.	Love 807 Easterday Dr. NE	Well #3	K-20
74.	Eubank 10322 Lomas Blvd. NE	Pump Station	K-20
75.	Love 1815 Parsifal NE	Well #7	H-20
76.	Love 10319 Copper Ave. NE	Well #2	K-20
77.	Ridgecrest 600 Altez St. SE	Res. #2 Well #1	L-20
78.	Ponderosa 4620 Eubank NE	Well #2	F-21
79.	Ponderosa 10608 Montgomery Blvd. NE	P.S. Res. & Well #1	L-20
80.	Love 10601 Hannett NE	Well #6	J-21
81.	Lomas 11427 Princess Jeanne NE	Well #4	J-21

NO.	DISCRIPTION & ADDRESS		MAP LOCATION
82.	Love 10611 Lomas Blvd. NE	Well #1 & Res.	J-21
83.	Lomas 300' West of Juan Tabo on Cochiti, Southside	Well #8	L-21
84.	Gutierrez 11523 Montgomery Blvd. NE	Res. & P.S.	F-22
85.	Kiva 12407 Montgomery Blvd. NE	Res. & P.S.	F-22
86.	Lomas 1118 Algondones NE	Well #3	J-22
87.	Lomas 700 Juan Tabo NE	Well #2	K-22
88.	Lomas 12503 Cloudview Ave. NE	Well #1	K-22
89.	Lomas 13200 Skyview Dr. NE	Res & P.S.	K-22
90.	Simms 5035 Glenwood Hills Dr. NE	Reservoir	F-23
91.	Glenwood 12929 Blackstone Rd. NE	Res. & P.S.	F-23
92.	Supper Rock 14529 Mel Smith Rd. NE	Res. & P.S.	K-23
93.	Linda Vista 14009 Mel Smith Rd NE	Res. & P.S.	K-23
94.	Sandia Manor 15000 Block Indian School Rd. NE	Reservoir, P.S.	K-23
95.	Four Hills 911 Four Hills Rd. SE	Pump Station	M-23
96.	Four Hills in 4-Hills Golf-course	Pump Station, Res.	M-23
97.	Miles Road 3108 University Blvd. SE University & Railroad Spur SE	Res. & Well & P.S.	M-15

NO.	DISCRIPTION & ADDRESS		MAP LOCATION
98.	Atrisco 1725 Five Points Rd. SW	Well #6	M-12
99.	Valley Gardens 4629 Sorrel Lane SW	Well "A" & P.S & Res.	Q-11
100.	Thomas 8505 Montgomery Blvd. NE	Well #1, P.S. & Res.	F-20
101.	Leyendecker 3617 Louisiana Blvd NE	Well #2	G-18
102.	Leyendecker 4509 Louisiana Blvd NE	Well #4	F-18
103.	Leyendecker 4509 San Pedro Dr. NE	Well #3	F-18
104.	Canada 13416 Cedarbrook Ave. NE	Pump Station	F-24
105.	Duranes 2416 Los Anayas Rd. NW	Well #6	H-12
106.	Escondido 900 Block Hideaway Lane SE	Res.	M-24
107.	Alameda Los Angeles	Res., Well	C, D-19
108.	Valley Gardens 2400 Gun Club Rd. SW	Well "B"	Q-11


Old Coronado Landfill
Signetics Site Boundary
Vista Sandia
Nazareth Cemetery
Coronado Airport
Sandia Memorial Gardens
Well
Trailer Park
Gravel Pits
Reered Powerplant
Water
Oil
Arroyo
E L E N A
Pino
Well
ALAMEDA, N. MEX.
N3507.5—W10630/7.5
1960
PHOTOREVISED 1967 AND 1972
AMS 4654 II NE - SERIES V881
NEW MEXICO
QUADRANGLE LOCATION
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 10 FEET

RESULTS

GEOLOGY

The results from the subsurface investigation are presented in geologic cross-section A-A shown on Figure 4. As shown in the geologic cross-section, the site is underlain by 70 to 100 feet of Quaternary alluvium, 75 to 110 feet of sands and gravels of the Pleistocene Edith Formation, and over 100 feet of clays, silts, and clayey gravels of the older Quaternary Buff Formation. Specific descriptions of each of these units are presented in the logs presented in Appendix A. A brief summary is provided below.

Quaternary Alluvium

The Quaternary alluvium ranges in thickness from 70 to 100 feet and is composed of material ranging from fine sandy silt to gravel. The fine sandy silt is interpreted to represent overbank deposits of braided stream sediments. Interbedded coarse arkosic sands derived from the nearby Sandia Mountains probably represent aggradations of braided stream channel sediments deposited during flash-flood events. Portions of the Quaternary alluvium may be interbedded with thin beds of the Menaul Formation, a coarse-grained gravelly unit deposited by the ancestral Rio Grande River (ERCO, 1981).

Edith Formation

The Edith Formation consists of an upper coarse-grained unit and a lower fine-grained unit (see Figure 4). The coarse-grained unit is composed of clean, medium- to coarse-grained sands and gravels deposited by the ancestral Rio Grande River. Samples obtained during drilling were non-indurated and appeared to be highly permeable. The fine-grained unit observed in Wells MW-2 and MW-3 is composed of clean, moist sand and clayey to silty sand. The unit appears to consist of floodplain deposits. The Edith Formation is commonly 70 to

110 feet thick beneath the site, except in Well MW-1, where it may be over 180 feet thick.

Upper Buff Formation

The Upper Buff Formation is a very fine-grained unit composed of clay, silty sand, and sand. In contrast to the overlying Edith Formation, the Upper Buff Formation is moderately well indurated and appears less permeable due to the presence of interstitial clays. With the exception of Well MW-1, all wells are screened within the Upper Buff Formation. It is first encountered at a depth of approximately 150 to 200 feet.

HYDROGEOLOGY

Surface-water flow is routed around the site by concrete-lined diversion channels of the Albuquerque Metropolitan Arroyo and Flood Control Administration (SNMEID, 1986). Accordingly, little ground-water recharge is inferred to occur. Minor infiltration may occur from precipitation, runoff, and the on-site sprinkler irrigation system. Ground water lies at depths ranging from approximately 190 to 240 feet beneath the site. The ground-water flow direction in June 1987 was nearly due east, with a hydraulic gradient of 0.0045 foot per foot (see Figure 5). The saturated zone occurs primarily within the Upper Buff Formation.

Under undisturbed conditions of mountain front recharge, ground water would be expected to flow from the west and south, towards the Rio Grande River and to the downgradient (southern) end of the Albuquerque-Belen Basin. However, the ground-water table on site is approximately 20 feet lower than the surface-water elevation of the Rio Grande River, and ground-water flow beneath the site is to the east. This ground-water gradient reversal in the site vicinity is most likely due to the influence of a large cone of depression surrounding the City of Albuquerque pumping center located approximately 1.5 to

3 miles southeast to east-southeast of the site. The most recent records available from the City of Albuquerque (personal communication, Tamara Morgan) indicate that this series of pumping wells withdrew 1,583 acre-feet of water within the first 6 months of 1987. The combined effect of ground-water withdrawal from the southeast and a sustained source of recharge from the Rio Grande River to the west has resulted as east-directed ground-water flow beneath the site.

CHEMISTRY

Soil and ground-water samples were submitted for analyses of parameters listed above. Certified Analytical Reports are presented in Appendix C and summarized in Tables 3 and 4.

Soils Analyses

Previous soils analyses detected concentrations of pesticides and semivolatile compounds in site soils (SNMEID, 1986).

Soil samples were collected from Borings EB-1, EB-2, MW-3, and MW-4. The intent of the soil sampling was to assess the impact of potential leachate migration from the residual trash fill into the underlying substrate. Borings 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 at 5-foot intervals and submitted for analysis. Samples were collected from similar depths in Borings MW-3 and MW-4, which were located outside of the extent of landfill activities. These samples were collected in order to characterize background conditions.

Results of the soils analyses are summarized in Table 3. Soil pH values indicate that fill and native soils are alkaline, with pH values ranging from 7.8 to 9.7. Soil moisture content ranges from 0.9 to 18 percent by weight. With the exception of the sample collected

from 35 feet in background Boring MW-3, all pH and soil moisture values are consistent with values observed in alkaline soils of semiarid to arid conditions. With the exception of methylene chloride, volatile organic compounds and pesticides were not detected in any of the soils analysis. Methylene chloride is used by the contract laboratory as a laboratory reagent for EPA Methods 624 and 8240.

Table 3

SUMMARY OF ANALYTICAL DATA - SOILS

	Sample Depth (feet)											
	Boring EB-1				Boring EB-2		Boring MW-3			Boring MW-4		
	20	20 (DUP)	27.5	35	35	40	25	30	35	25	30	35
pH	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 (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 compounds (EPA Method 8240)	ND[1]	ND			ND[1]		ND[1]			ND[1]		
Pesticides (EPA Method 8080)	ND	ND			ND		---			---		

1. Methylene chloride detected (laboratory reagent)

WESTERN TECHNOLOGIES INC.

3737 East Broadway Road
P.O. Box 21387
Phoenix, Arizona 85036
(602) 437-3737

LABORATORY REPORT

EMCON

Client: Emcon Associates
1921 Kingwood Avenue
San Jose, CA 95131
Attn: Keoni Murphy

Sample No. 8706438-6445
Job/Invoice No. 3247W022
Date of Report 6/17/87
Reviewed By Fred J. Kent

Project 377-16.01-Signetics

Location Signetic Plant

Material Soil — Sampled By C. French — Date 5/22-26/87

Source -- — Submitted By C. French — Date 5/26/87

Procedure As noted — Authorized By Murphy — Date 5/13/87

RESULTS

Four samples were received for analysis of volatile organic contaminants. Each sample was dispersed into methanol and analyzed using purge and trap gas chromatography/mass spectrometry. The results of this analysis are attached.

GAS CHROMATOGRAPHY/MASS SPECTROMETRY
ORGANIC ANALYSIS DATA SHEET
VOLATILE COMPOUNDS

Sample Number: 8706438
Sample Identification: #2 MW-3-25

CAS NUMBER	COMPOUND	CONCENTRATION mg/kg
71-43-2	Benzene	<1.
75-27-4	Bromodichloromethane	<1.
75-25-2	Bromoform	<1.
74-83-9	Bromomethane	<1.
56-23-5	Carbon tetrachloride	<1.
108-90-7	Chlorobenzene	<1.
75-00-3	Chloroethane	<1.
110-75-8	2-Chloroethylvinyl ether	<1.
67-66-3	Chloroform	<1.
74-87-3	Chloromethane	<1.
'24-48-1	Dibromochloromethane	<1.
-50-1	1,2-Dichlorobenzene	<1.
41-73-1	1,3-Dichlorobenzene	<1.
106-46-7	1,4-Dichlorobenzene	<1.
75-34-3	1,1-Dichloroethane	<1.
107-06-2	1,2-Dichloroethane	<1.
75-35-4	1,1-Dichloroethene	<1.
156-60-5	trans-1,2-Dichloroethene	<1.
78-87-5	1,2-Dichloropropane	<1.
10061-01-5	cis-1,3-Dichloropropene	<1.
10061-02-6	trans-1,3-Dichloropropene	<1.
100-41-4	Ethyl benzene	<1.
75-09-2	Methylene chloride	<10.
79-34-5	1,1,2,2-Tetrachloroethane	<1.
127-18-4	Tetrachloroethene	<1.
108-88-3	Toluene	<1.
71-55-6	1,1,1-Trichloroethane	<1.
79-00-5	1,1,2-Trichloroethane	<1.
79-01-6	Trichloroethene	<1.
75-69-4	Trichlorofluoromethane	<1.
75-01-4	Vinyl Chloride	<1.

GAS CHROMATOGRAPHY/MASS SPECTROMETRY
ORGANIC ANALYSIS DATA SHEET
VOLATILE COMPOUNDS

Sample Number: 8706441
Sample Identification: #2 MW-4-25

CAS NUMBER	COMPOUND	CONCENTRATION mg/kg
71-43-2	Benzene	<1.
75-27-4	Bromodichloromethane	<1.
75-25-2	Bromoform	<1.
74-83-9	Bromomethane	<1.
56-23-5	Carbon tetrachloride	<1.
108-90-7	Chlorobenzene	<1.
75-00-3	Chloroethane	<1.
110-75-8	2-Chloroethylvinyl ether	<1.
67-66-3	Chloroform	<1.
74-87-3	Chloromethane	<1.
124-48-1	Dibromochloromethane	<1.
95-50-1	1,2-Dichlorobenzene	<1.
541-73-1	1,3-Dichlorobenzene	<1.
106-46-7	1,4-Dichlorobenzene	<1.
75-34-3	1,1-Dichloroethane	<1.
107-06-2	1,2-Dichloroethane	<1.
75-35-4	1,1-Dichloroethene	<1.
156-60-5	trans-1,2-Dichloroethene	<1.
78-87-5	1,2-Dichloropropane	<1.
10061-01-5	cis-1,3-Dichloropropene	<1.
10061-02-6	trans-1,3-Dichloropropene	<1.
100-41-4	Ethyl benzene	<1.
75-09-2	Methylene chloride	20.
79-34-5	1,1,2,2-Tetrachloroethane	<1.
127-18-4	Tetrachloroethene	<1.
108-88-3	Toluene	<1.
71-55-6	1,1,1-Trichloroethane	<1.
79-00-5	1,1,2-Trichloroethane	<1.
79-01-6	Trichloroethene	<1.
75-69-4	Trichlorofluoromethane	<1.
75-01-4	Vinyl Chloride	<1.

GAS CHROMATOGRAPHY/MASS SPECTROMETRY
ORGANIC ANALYSIS DATA SHEET
VOLATILE COMPOUNDS

Sample Number: 8706444
Sample Identification: EB-1-TR

CAS NUMBER	COMPOUND	CONCENTRATION mg/kg
71-43-2	Benzene	<1.
75-27-4	Bromodichloromethane	<1.
75-25-2	Bromoform	<1.
74-83-9	Bromomethane	<1.
56-23-5	Carbon tetrachloride	<1.
108-90-7	Chlorobenzene	<1.
75-00-3	Chloroethane	<1.
110-75-8	2-Chloroethylvinyl ether	<1.
67-66-3	Chloroform	<1.
74-87-3	Chloromethane	<1.
124-48-1	Dibromochloromethane	<1.
95-50-1	1,2-Dichlorobenzene	<1.
541-73-1	1,3-Dichlorobenzene	<1.
106-46-7	1,4-Dichlorobenzene	<1.
75-34-3	1,1-Dichloroethane	<1.
107-06-2	1,2-Dichloroethane	<1.
75-35-4	1,1-Dichloroethene	<1.
156-60-5	trans-1,2-Dichloroethene	<1.
78-87-5	1,2-Dichloropropane	<1.
10061-01-5	cis-1,3-Dichloropropene	<1.
10061-02-6	trans-1,3-Dichloropropene	<1.
100-41-4	Ethyl benzene	<1.
75-09-2	Methylene chloride	22.
79-34-5	1,1,2,2-Tetrachloroethane	<1.
127-18-4	Tetrachloroethene	<1.
108-88-3	Toluene	<1.
71-55-6	1,1,1-Trichloroethane	<1.
79-00-5	1,1,2-Trichloroethane	<1.
79-01-6	Trichloroethene	<1.
75-69-4	Trichlorofluoromethane	<1.
75-01-4	Vinyl Chloride	<1.

GAS CHROMATOGRAPHY/MASS SPECTROMETRY
ORGANIC ANALYSIS DATA SHEET
VOLATILE COMPOUNDS

Sample Number: 8706445
Sample Identification: EB-2-TR

CAS NUMBER	COMPOUND	CONCENTRATION mg/kg
71-43-2	Benzene	<1.
75-27-4	Bromodichloromethane	<1.
75-25-2	Bromoform	<1.
74-83-9	Bromomethane	<1.
56-23-5	Carbon tetrachloride	<1.
108-90-7	Chlorobenzene	<1.
75-00-3	Chloroethane	<1.
110-75-8	2-Chloroethylvinyl ether	<1.
67-66-3	Chloroform	<1.
74-87-3	Chloromethane	<1.
124-48-1	Dibromochloromethane	<1.
95-50-1	1,2-Dichlorobenzene	<1.
541-73-1	1,3-Dichlorobenzene	<1.
106-46-7	1,4-Dichlorobenzene	<1.
75-34-3	1,1-Dichloroethane	<1.
107-06-2	1,2-Dichloroethane	<1.
75-35-4	1,1-Dichloroethene	<1.
156-60-5	trans-1,2-Dichloroethene	<1.
78-87-5	1,2-Dichloropropane	<1.
10061-01-5	cis-1,3-Dichloropropene	<1.
10061-02-6	trans-1,3-Dichloropropene	<1.
100-41-4	Ethyl benzene	<1.
75-09-2	Methylene chloride	54.
79-34-5	1,1,2,2-Tetrachloroethane	<1.
127-18-4	Tetrachloroethene	<1.
108-88-3	Toluene	<1.
71-55-6	1,1,1-Trichloroethane	<1.
79-00-5	1,1,2-Trichloroethane	<1.
79-01-6	Trichloroethene	<1.
75-69-4	Trichlorofluoromethane	<1.
75-01-4	Vinyl Chloride	<1.

Copies to: Client (1)

WESTERN TECHNOLOGIES INC.

3737 East Broadway Road
P.O. Box 21387
Phoenix, Arizona 85036
(602) 437-3737

LABORATORY REPORT

Client: Emcon Associates
1921 Kingwood Avenue
San Jose, CA 95131
Attn: Keoni Murphy

Sample No. 8706274-6277
Job/Invoice No. 3247W021
Date of Report 6/22/87
Reviewed By Fred J. Kent

Project: 377-16.01-Signetics

Location: Signetics Plant - Albuquerque, New Mexico

Material: Soil — Sampled By: C. French — Date: 5/19/87

Source: -- — Submitted By: C. French — Date: 5/22/87

Procedure: As noted — Authorized By: K. Murphy — Date: 5/13/87

RESULTS

Two samples were received for analysis of volatile contaminants and chlorinated pesticides. Each sample was dispersed into methanol and analyzed for volatile organic contaminants using gas chromatography/mass spectrometry. Additionally, each sample was extracted into acetone:hexane (1:1) and analyzed for pesticides residues using gas-chromatography with an electron capture detector. The results of these analyses are attached.

GAS CHROMATOGRAPHY/MASS SPECTROMETRY
ORGANIC ANALYSIS DATA SHEET
VOLATILE COMPOUNDS

Sample Number: 8706274
Sample Identification: EB-1 #2

CAS NUMBER	COMPOUND	CONCENTRATION mg/kg
107-02-8	Acrolein	<1.
107-13-1	Acrylonitrile	<1.
71-43-2	Benzene	<1.
75-27-4	Bromodichloromethane	<1.
75-25-2	Bromoform	<1.
74-83-9	Bromomethane	<1.
56-23-5	Carbon tetrachloride	<1.
108-90-7	Chlorobenzene	<1.
75-00-3	Chloroethane	<1.
110-75-8	2-Chloroethylvinyl ether	<1.
67-66-3	Chloroform	<1.
74-87-3	Chloromethane	<1.
124-48-1	Dibromochloromethane	<1.
95-50-1	1,2-Dichlorobenzene	<1.
541-73-1	1,3-Dichlorobenzene	<1.
106-46-7	1,4-Dichlorobenzene	<1.
75-34-3	1,1-Dichloroethane	<1.
107-06-2	1,2-Dichloroethane	<1.
75-35-4	1,1-Dichloroethene	<1.
156-60-5	trans-1,2-Dichloroethene	<1.
78-87-5	1,2-Dichloropropane	<1.
10061-01-5	cis-1,3-Dichloropropene	<1.
10061-02-6	trans-1,3-Dichloropropene	<1.
100-41-4	Ethyl benzene	<1.
75-09-2	Methylene chloride	18.
79-34-5	1,1,2,2-Tetrachloroethane	<1.
127-18-4	Tetrachloroethene	<1.
108-88-3	Toluene	<1.
71-55-6	1,1,1-Trichloroethane	<1.
79-00-5	1,1,2-Trichloroethane	<1.
79-01-6	Trichloroethene	<1.
75-69-4	Trichlorofluoromethane	<1.
75-01-4	Vinyl Chloride	<1.

GAS CHROMATOGRAPHY/MASS SPECTROMETRY
ORGANIC ANALYSIS DATA SHEET
VOLATILE COMPOUNDS

Sample Number: 8706277
Sample Identification: EB-2 #1

CAS NUMBER	COMPOUND	CONCENTRATION mg/kg
107-02-8	Acrolein	<1.
107-13-1	Acrylonitrile	<1.
71-43-2	Benzene	<1.
75-27-4	Bromodichloromethane	<1.
75-25-2	Bromoform	<1.
74-83-9	Bromomethane	<1.
56-23-5	Carbon tetrachloride	<1.
108-90-7	Chlorobenzene	<1.
75-00-3	Chloroethane	<1.
110-75-8	2-Chloroethylvinyl ether	<1.
67-66-3	Chloroform	<1.
[illegible]-87-3	Chloromethane	<1.
24-48-1	Dibromochloromethane	<1.
95-50-1	1,2-Dichlorobenzene	<1.
541-73-1	1,3-Dichlorobenzene	<1.
106-46-7	1,4-Dichlorobenzene	<1.
75-34-3	1,1-Dichloroethane	<1.
107-06-2	1,2-Dichloroethane	<1.
75-35-4	1,1-Dichloroethene	<1.
156-60-5	trans-1,2-Dichloroethene	<1.
78-87-5	1,2-Dichloropropane	<1.
10061-01-5	cis-1,3-Dichloropropene	<1.
10061-02-6	trans-1,3-Dichloropropene	<1.
100-41-4	Ethyl benzene	<1.
75-09-2	Methylene chloride	18.
79-34-5	1,1,2,2-Tetrachloroethane	<1.
127-18-4	Tetrachloroethene	<1.
108-88-3	Toluene	<1.
71-55-6	1,1,1-Trichloroethane	<1.
79-00-5	1,1,2-Trichloroethane	<1.
79-01-6	Trichloroethene	<1.
75-69-4	Trichlorofluoromethane	<1.
75-01-4	Vinyl Chloride	<1.

GAS CHROMATOGRAPHY
ORGANIC ANALYSIS DATA SHEET
PESTICIDE COMPOUNDS

Sample Number: 8706274
Sample Identification: EB-1 #2

COMPOUND	CONCENTRATION mg/kg
Aldrin	<0.02
α - BHC	<0.02
γ - BHC	<0.02
β - BHC	<0.02
δ - BHC (Lindane)	<0.02
Chlordane	<0.02
4,4' - DDD	<0.02
4,4' - DDE	<0.02
4,4' - DDT	<0.02
Dieldrin	<0.02
Endosulfan I	<0.02
Endosulfan II	<0.02
Endosulfan sulfate	<0.02
Endrin	<0.02
Endrin aldehyde	<0.02
Heptachlor	<0.02
Heptachlor epoxide	<0.02
Methoxychlor	<0.02
Toxaphene	<0.02
PCB - 1016	<0.02
PCB - 1221	<0.02
PCB - 1232	<0.02
PCB - 1242	<0.02
PCB - 1248	<0.02
PCB - 1254	<0.02
PCB - 1260	<0.02

GAS CHROMATOGRAPHY
ORGANIC ANALYSIS DATA SHEET
PESTICIDE COMPOUNDS

Sample Number: 8706277
Sample Identification: EB-2 #1

COMPOUND	CONCENTRATION mg/kg
Aldrin	<0.02
α - BHC	<0.02
γ - BHC	<0.02
β - BHC	<0.02
δ - BHC (Lindane)	<0.02
Chlordane	<0.02
4,4' - DDD	<0.02
4,4' - DDE	<0.02
4,4' - DDT	<0.02
Dieldrin	<0.02
Endosulfan I	<0.02
Endosulfan II	<0.02
Endosulfan sulfate	<0.02
Endrin	<0.02
Endrin aldehyde	<0.02
Heptachlor	<0.02
Heptachlor epoxide	<0.02
Methoxychlor	<0.02
Toxaphene	<0.02
PCB - 1016	<0.02
PCB - 1221	<0.02
PCB - 1232	<0.02
PCB - 1242	<0.02
PCB - 1248	<0.02
PCB - 1254	<0.02
PCB - 1260	<0.02

om

WESTERN TECHNOLOGIES INC.

3737 East Broadway Road
P.O. Box 21387
Phoenix, Arizona 85036
(602) 437-3737

LABORATORY REPORT

Client: Emcon Associates
1921 Kingwood Avenue
San Jose, CA 95131
Attn: Keoni Murphy

Sample No. 8706273-6278
Job/Invoice No. 3247W021
Date of Report 6/22/87
Reviewed By Anita Gai

Project 377-16.01-Signetics

Location Signetics Plant - Albuquerque, New Mexico

Material Soil — Sampled By C. French — Date 5/19/87

Source -- — Submitted By C. French — Date 5/22/87

Procedure -- — Authorized By K. Murphy — Date 5/13/87

RESULTS

ample Number	Client Identification	pH, S.U. (1:1 Extract)	Water Content %
8706273	EB-1 No. 1	9.5	5.2
8706275	EB-1 No. 3	9.7	1.3
8706276	EB-1 No. 4	9.8	1.9
8706277	EB-2 No. 1	7.8	3.8
8706278	EB-2 No. 2	8.4	4.0

om

EMCON ASSOCIATES • CHEMICAL LABORATORIES

Analysis • Consultation • Research • Environmental Studies

State Approved Water Laboratory

EMCON

CERTIFIED ANALYTICAL REPORT

Report to:

Project Number: 377-16.0

Signetics Corp.
811 E. Arques Ave.
Sunnyvale, Ca 94088-3409

Location: ALBUQUERQUE NM

Sample Type: SOIL

Sample Designation:	EB1-N02
Field Date:	06/01/87
Laboratory Number:	E87-0527
Moisture (percent)	2.7%
pH	9.38

Reported by: Leon A Murphy Date: June 18, 1987

1921 RINGWOOD AVENUE, SAN JOSE, CALIFORNIA 95131 TELEPHONE (408) 275-1444

These results were obtained by following standard laboratory procedures; the liability of the corporation shall not exceed the amount paid for the ...

Date: 17 JUN 87
Project Number: 377-16.01

Signetics Corp.
811 E. Arques Ave.
Sunnyvale, Ca 94088-3409

Location: ALBUQUERQUE NM

METHODS OF ANALYSIS

Sample Type: SOIL

PARAMETER	METHOD
pH	9042

Exhibit A-12

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
SUPERFUND SITE STRATEGY RECOMMENDATION - REGION 06

Site Name: Coronado Landfill CERCLIS ID#: NMD980622708

Alias Site Names: Signetics, Inc. (NMD000709782)

Address: 9201 Pan American Freeway NE (northwest of Alameda Avenue)

City/County or Parish/State/Zip Code: Albuquerque/Bernalillo/New Mexico/unknown

Report Type, Date, and Author: Site Inspection/April 26, 1993/Fluor Daniel, Inc.

RECOMMENDATION

(X) 1. Site Evaluation Accomplished (SEA) ( ) 2. Further Investigation Needed Under Superfund

( ) PA ( ) HRS Priority: ( ) High
( ) SI ( ) RA (X) Low
( ) ESI ( ) RI/FS
(X) Other: Evaluation of Prescore
To be performed by: EPA

(X) 3. Action Deferred to:
(X) RCRA ( ) NRC

'FY AUTHORITY:

( ) Removal	( ) RCRA	( ) TSCA	( ) CAA	( ) SMCRA
( ) Remedial	( ) State	( ) NPDES	( ) NRC	( ) Resource Trustee:
( ) CERCLA Enforcement	( ) Federal Facility	( ) UIC	( ) SPCC	( ) Other:

SEND REPORT COPIES TO: (X) 6E-E (X) 6W-SP (X) ATSDR (X) State Agency ( ) Other

DISCUSSION: The Coronado Landfill (the "site") encompasses approximately 60 acres and includes an inactive landfill and active microchip manufacturing facility known as Signetics Inc. (NMD000709782). Both the landfill and active facility are currently regulated under the Resource Conservation and Recovery Act and are not CERCLA eligible at this time.

APPROVALS:

Report Reviewed by: Kim T. Hill Signature: Kim T. Hill Date: Jun/21/93

Disposition Recommended by: Eddie A. Sierra Signature: Eddie A. Sierra Date: 6/21/93
(Section Chief)

Disposition Approved by: Betty Williamson Signature: Betty Williamson Date: 6/23/93
(Branch Chief)

5/4/93 K. Dill

FLUOR DANIEL ARCS TEAM

Members: Fluor Daniel, Inc.
I.T. Corporation
PEI Associates, Inc.
Life Systems, Inc.

Program Office:
12790 Merit Drive
Suite 200, LB 169
Dallas, TX 75251
Tel (214) 450-4100
Fax (214) 450-4101

April 26, 1993

FDI/ARCS # 1940

U.S. Environmental Protection Agency
Attn: Ms. Stacey Bennett
Work Assignment Manager
1445 Ross Avenue
Suite 1000
Dallas, Texas 75202

CONTRACT NO.
REVISED SITE INSPECTION REPORT
CORONADO LANDFILL SITE
NMD980622708
WA #25-6JZZ

Dear Ms. Bennett,

Transmitted with this letter is the referenced Revised Site Inspection Report. This report is a revision of the Part A report for the subject site, submitted on September 29, 1992. Results of the field sampling are presented in this report. Since this site will be turned over to RCRA for investigation, a Pre-score was not prepared. This report is submitted as a revision, rather than an addendum, so that the entire report could be presented in one document.

Should you have any questions, please contact myself or Jonathan Stewart at (214) 450-4100.

Sincerely,

Jean Kemmgl

Bill Park
for ARCS Project Scientist

Jonathan Stewart

Jonathan Stewart
ARCS Project Manager

BP/JS:kh

Enclosure

REVISED SITE INSPECTION REPORT
FOR
CORONADO LANDFILL SITE
NMD980622708
WA # 25-6JZZ

EPA Project Manager	Date
Project Manager	4/29/93 Date
Team Leader for Bill Park	04/29/93 Date

REVISED SITE INSPECTION REPORT FOR
CORONADO LANDFILL SITE NMD980622708
WA # 25-6JZZ
TABLE OF CONTENTS

ITEM	DESCRIPTION	PAGE
1.0	**INTRODUCTION**	1
1.1	Site Inspection Objectives	1
1.2	Site Description/History	1
1.3	Site-Specific Objectives	3
2.0	**DATA REVIEW AND DATA COLLECTION**	4
2.1	Source Waste Characterization	4
2.2	Ground Water Migration Pathway	5
2.3	Surface Water Migration Pathway	6
2.4	Soil Exposure Pathway	7
2.5	Air Migration Pathway	8
3.0	**SITE INSPECTION RESULTS**	8
4.0	**SUMMARY**	12

TABLES

1 Sampling Locations and Rationale

2 Sample Summary Table

3 Summary of Organic, Pestcide/PCB, and Metals/Cyanide Results, Ground Water Samples

4 Summary of Inorganic Analyte Results, Surface Soil Samples

5 Summary of Organic Compound Results, Surface Soil Samples

FIGURES

1 Site Location Map

2 Site Sketch

3 Sample Location Map

4 Four Mile Radius Map

PHOTOGRAPHS

Site Photographs

ATTACHMENTS

1 Data Validation Package

REFERENCES

REVISED SITE INSPECTION REPORT
FOR
CORONADO LANDFILL SITE
NMD980622708
WA # 25-6JZZ

1.0 INTRODUCTION

The Fluor Daniel ARCS Team has been tasked by the U.S. Environmental Protection Agency (EPA) to perform a Site Inspection (SI) at the Coronado Landfill (NMD980622708), located in Albuquerque, Bernalillo County, New Mexico. This site is listed twice in CERCLIS, the second listing is as Signetics (NMD000709782). Signetics is also listed as a RCRA generator. At the direction of the EPA Region VI, the investigation of this site was continued. Fluor Daniel is a participant in the Region VI Alternative Remedial Contracting Strategy (ARCS) Program under contract number 68-W9-0013.

1.1 Site Inspection Objectives

The SI is the second stage of site assessment under Superfund. The SI expands upon the data collected during the Preliminary Assessment (PA) and identifies data gaps. Information obtained during the SI supports the management decision of whether the site proceeds to the Expanded Site Inspection (ESI) or receives the classification of Site Evaluation Accomplished (SEA) under the Superfund Amendments and Reauthorization Act (SARA).

1.2 Site Description/History

The Coronado Landfill is located at 9201 Pan American Freeway N.E., northwest of the intersection of Pan American Freeway and Alameda Ave. Site coordinates are latitude 35°11'23'' North, longitude 106°34'55'' West (1). The site is approximately 60 acres in size (Figure 1 and 2). The landfill operated from 1963 to 1964 or 1965. A Notification

of Hazardous Waste was submitted by the City of Albuquerque to the EPA in 1981. The notification speculated that the landfill contained at least 9 percent hazardous wastes from industrial sources (2). In 1978 or 1979, the city sold the property to Signetics Inc., a subsidiary of North American Philips Company, for construction of a building to manufacture microchips. Construction on the site started in 1980. Signetics was not aware that they had purchased land that was formerly a landfill. During a geotechnical investigation in 1980, exploratory borings discovered fill material and methane gas being produced. A portion of the landfilled material near the center of the property was excavated prior to construction of the building. The excavated material was taken to the City of Albuquerque, Los Angeles Landfill. In 1983, drainage ditches were excavated along the north and south side of the property. During the construction of the northern drainage ditch, landfilled material was exposed near the northwest corner of the property. Mr.Gary Mavrakis, Environmental Compliance Manager for Signetics, explained that the New Mexico Department of Environmental Quality collected soil samples from the area of the exposed landfilled material. However, the state files have not been made available for review to date.

Four monitoring wells are located on the property. Each well has a dedicated bladder pump installed. The wells were installed by Signetics and have been sampled quarterly for the past three years. Results of analysis are sent to the New Mexico Department of Environmental Quality. Organic and inorganic contaminants have been detected in the monitoring wells. Depth to ground water at the site is approximately 250 feet.

Thirty-five methane gas vents have been installed on the property by Signetics. The vents are primarily located along the south and southwestern side of the building. The vents are monitored monthly. Methane gas has been detected as high as 500,000 parts per million (ppm).

The location of the fill material is believed to be in two former arroyos that crossed the property from east to west. One arroyo was located near the northern property line. The second, larger arroyo was located near the south/central part of the property. These arroyos are no longer visible on the site.

Land subsidence has occurred on the property in several locations. This is most noticeable near the chain link fence on the south side of the receiving area and locations along the roads south and southwest of the building.

Signetics constructed a 500,000 square foot building in approximately the center of the property. The building is not believed to be constructed on top of fill material. The receiving dock is located in a former fill area. However, the fill material was removed and taken to the Los Angeles landfill prior to construction. An estimated 77,436 cubic yards of fill (trash) was removed from the site prior to construction (12).

1.3 Site Specific Objectives

The primary objectives of this SI are to determine if contamination is present on the site (source characterization) and evaluate its migration potential. Sampling during the SI was limited to ground water samples and surface soil samples in an effort to characterize potential contamination on site.

2.0 DATA REVIEW AND DATA COLLECTION

Limited file information was available for review on this site. The state files have been requested but have not been received. Sampling performed during this SI focused on characterizing on-site contamination, if any. The primary pathway of concern appears to be the ground water pathway. Table 1 lists the sample locations and the rationale for collecting each sample. Figure 3 shows the sample locations. All field activities were conducted in accordance with the following documents:

- "Final Project Work Plan - Revision 1 for the site Inspection Project, EPA Region VI, Volume I", June 9, 1992, Flour Daniel.

- "Original Project Field Sampling Quality Assurance Project Plan for the Site Investigation, Region VI, EPA", July 5, 1992, Fluor Daniel.

- "CLP Users Guide", EPA Region VI, not dated.

- "Original Health and Safety Plan, Site Inspections", June 8, 1992, Fluor Daniel.

2.1 Source Waste Characterization

Signetics performs quarterly ground water sampling of its four monitoring wells on site. The samples are analyzed for total Kjeldahl Nitrogen and Halogenated Volatile Organic compounds. Tetrachlorethene has been detected in the ground water samples in several of the quarterly sampling events. Signetics also performs monthly monitoring of the 35 methane gas vents on the property. Methane has been detected as high as 500,000 ppm (3). There are indications that the state performed soil sampling on the site, however the data are incomplete and not useable.

Numerous borings were placed on site during the geophysical investigation. Cross sections from these borings indicate that the fill is as deep as 30 feet below the ground surface and the cover material ranges from 0 to 10 feet (4). The total volume of waste material is not known, but is estimated to be quite large. The type of wastes received by this landfill is unknown. The City of Albuquerque, in its Notification of Hazardous Waste submitted to the EPA in 1981, speculated that the landfill contained 9% hazardous wastes from industrial sources. This figure was based on EPA publication 600/2-79-135 "Quantification of Municipal Disposal Methods for Industrially Generated Hazardous Wastes" (2). The soil samples collected on site may not be adequate to characterize source contamination given the depth of fill.

2.2 Ground Water Pathway

The site is located in the eastern most portion of the Basin and Range Province of the United States. The geologic setting is characterized by a thick alluvial sediment package within a north-south trending fault basin. This sedimentary basin is bisected by the Rio Grande. Sediments deposited by the Rio Grande are loosely consolidated and are extremely porous and permeable. Ground water recharge into the shallow unconfined aquifer are via the Rio Grande and local precipitation within the basin boundaries (i.e., mountain ranges) (10, 11).

The stratigraphy at the site consists of terrace deposits consisting of medium to fine grain sand. This is underlain by a thick sequence of river sediments that grades from fine grain sand to gravel and boulders (10, 11). Ground water within this area is 150 to 250 feet deep. The mean annual precipitation for the Albuquerque area is approximately 8 inches. Aquifer recharge at the Coronado Landfill site is

solely dependent upon the amount of local precipitation. The City of Albuquerque does not have a designated well head protection area (7).

Ground water is the only source of drinking water within the City of Albuquerque. The nearest municipal well (Coronado well #1) is located approximately 1 mile southeast from the site (5).

Four monitoring wells are located on site. Quarterly ground water samples are collected. Tetrachlorethene has been detected numerous times in the ground water collected from these wells.

Five ground water samples were collected during this investigation. One sample was collected from each of the wells on site and a duplicate sample was collected from well number 4. The matrix spike/ matrix spike duplicate (ms/msd) was originally scheduled to be sampled from well number 1, however this well has historically been a poor producing well so the ms/msd was moved to well number 2.
The Coronado Number 1 municipal well was sampled during another SI during the same week as this investigation. The data from this well will be used to document background ground water conditions.

2.3 Surface Water Migration Pathway

Drainage on the site enters drainage ditches on the north and south side of the property. The 100 year flood plain is confined to the drainage ditches on the property (6). The southern drainage ditch is concrete lined, except for approximately 450 feet near the southeast corner of the property which consists of rip-rap (i.e., large rocks held in place with wire mesh). The northern drainage ditch is concrete lined the entire length of the property. The

concrete portions of the ditches did not contain any sediment at the time of the site reconnaissance (3). The ditches drain to the west into the North Diversion Channel which is located approximately one mile from the site. The North Diversion Channel flows to the north for approximately 11/2 miles before entering the Rio Grande (1, 6). Surface water in the Albuquerque area is not used for public drinking supply, however it is used for irrigation.

Since 1974, the average flow rate of the Rio Grande has been 1408 cubic feet per second (8). The Rio Grande is utilized for recreational fishing, however the state of New Mexico does not maintain fishery production records (9).

Since the drainage ditches on site are concrete lined, no sediment samples were collected during this investigation.

2.4 Soil Exposure Pathway

Due to the limited information on the site, it is not clear if any contaminants on site are available to the soil exposure pathway. The original geophysical survey performed in 1980 indicated that in some locations the fill was at the surface (Ref. 4). However, with the improvements to the property since 1980, which includes: removal of over 70,000 cubic yards of fill; construction of the building, roads and parking lots; and construction of two concrete drainage ditches, it is not clear if any of the fill is available to the soil exposure pathway.

There are approximately 1000 employees at the Signetics facility. Land immediately north of the site is undeveloped. Interstate Highway 25 and its access roads bound the property on the east. The property is bound on the south by an one story office building. West of the property is a large Honeywell manufacturing building. No schools or day

care facilities were identified within the target distance limit. The site is not fenced, is accessible from adjacent roads, and is located near an urban/commercial area (3).

Four surface soil samples were collected in order to evaluate this pathway. Sample 06 was collected south of the receiving area in an area where notable subsidence is occurring. This sample was collected approximately 8 inches below the surface. Sample 07 and duplicate sample 08 were collected near the northwest corner of the site in the area where fill was discovered during the construction of the drainage ditch. The sample was collected from an area adjacent to the parking lot. Small amounts of debris including cigarette butts, plastic and wire were observed in this area. A background soil sample was collected from vacant land approximately 150 feet from the northwest corner of the site.

2.5 Air Exposure Pathway

Due to the limited information available, it is unclear if potential contamination is available to the air exposure pathway. The soil samples 06,07,and 08 may help evaluate this pathway. Vegetation on portions of the site is limited and winds could cause contamination to be blown off site.

3.0 SITE INSPECTION RESULTS

Analytical Results Chronology

Signetics has conducted quarterly ground water sampling for the past three years. The ground water is analyzed for total Kjeldahl Nitrogen and Halogenated Volatile Organics. Tetrachlorethene has been detected in the ground water samples in several of the quarterly sampling events. Signetics also performs monthly monitoring of the 35 methane gas vents on the property. Methane has been detected as high as 500,000 ppm (3). There are indications in the EPA

files that the state collected soil and waste samples from an area of exposed waste, but the files are incomplete and the data unusable.

Fluor Daniel conducted a sampling event on September 22 and 23, 1992. The Coronado Well #1, the background ground water sample, was collected on September 25, 1992. The focus of the sampling effort was to determine if contamination is present on the site and evaluate its migration potential. Sampling during this effort was limited to ground water samples and surface soil samples. Samples collected during the field work were shipped to Datachem Laboratories which is a participant in the Contract Laboratory Program (CLP). Analytical results were received from the CLP in Fluor Daniel's Dallas office on January 19, 1992. The data validation package transmittal from International Technologies Corporation was received on March 2, 1993.

Quality Control Procedures

During the sample collection, Fluor Daniel followed the previously approved sampling and quality assurance project plans for sampling, packaging and shipping samples to the CLP. The analytical packages were evaluated with respect to data completeness and contractual compliance by the Houston EPA Environmental Services Division Surveillance Branch. The data were then validated by International Technology Corporation to assess the quality assurance/quality control procedures utilized by the laboratory. Data validation was in accordance with current EPA guidelines and regional instructions. The data validation package is included as Attachment A.

The validation process involves scrutinizing various aspects of the analytical procedures to fully assess data quality and useability. Procedures subject to review during the

validation process include 1) laboratory holding time, 2) laboratory equipment calibrations, 3) blanks, 4) interference checks, 5) ICP serial dilutions, 6) duplicates, 7) matrix spike and spike duplicate recoveries, 8) field duplicates, 9) sample verification, 10) compound quatitation, 11) reported detection limits, and 12) system performance. Based on the review of the data, the reviewer may assign data qualifiers to show quality of data.

Summary Tables

The sample location map is presented as Figure 3. The Sample Summary Table, Table 2, summarizes sample numbers, relative depths, matrices and locations. The Sample Results Summary Tables summarize station location, concentrations, standard CLP qualifiers and comments relating results to background concentrations.

Discussion of Results

A total of 10 samples were collected and analyzed for TCL organics and TAL metals. Six ground water samples were collected including a trip blank and a field duplicate. Coronado Well #1, a municipal well, was sampled during another SI the same week as this sampling event. Data from this well will be used for background comparisons. Four surface soil samples collected at depths of 0 to 8 inches. Three samples were collected on-site and one sample was collected off-site for background comparison. Analytical results have been compared to the Background Benchmark Concentration (BBC), which is three times background concentration.

Ground Water Samples

Selenium (20.2 J ug/l, MW-02) and zinc (28.9 ug/l, MW-03) were detected in the ground water at concentrations greater

than the BBC. No other analytes were detected in the ground water samples above the BBC.

The only volatile organic compound detected at the site, in the ground water, was tetrachloroethene. This is a common solvent to many industries such as, dry cleaners, garages, and also microchip producers. This compound is very mobile and does not readily bond to the soils in this area. It was detected at a range of 11 ug/L in MW-02 to 14 ug/L in MW-01.

Of the semivolatile organic compounds analyzed, only bis(2-ethylhexyl)Phthalate was detected above BBC. Since this compound was not detected in the background or in any of the blank data, it is possible that it comes from the site. This compound is usually a common lab contaminant and is also used in the plastics industry as a plasticizer in the manufacture of plastic bags. No pesticides/PCBs were detected in the ground water samples. A summary of the ground water analysis is presented in Table 3.

Surface Soil Samples

Analytes found in the surface soil samples above the BBC include: chromium (20.9 mg/kg, SS07), lead (72.4 mg/kg, SS07 and 62.5 mg/kg, SS-08), mercury (0.09 B mg/kg, SS07 and SS08). A summary of the analyte results is presented in Table 4.

The organic data consists of volatile, semivolatile and pesticide/PCB analysis of soils. The analysis reveals that there is no significant organic contamination in the background samples. No volatile organic compounds were detected in any of the soil samples. Upon examining the semivolatile data, there was no contamination identified in the background soil sample. Contamination in the other samples is limited to dibenzofuran and high levels of

polyaromatic hydrocarbons. Dibenzofuran was detected in soil samples SS-07 and SS-08 at 2200 ug/Kg and 1500 ug/Kg, respectively. The polyaromatic hydrocarbons detected in the soil samples are acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluroanthene, benzo(k)fluroanthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, benzo(g,h,i,)perylene. In the initial analysis, the instrument range was exceeded and required that the samples be diluted in order that an estimate of the contaminant concentration could be determined. These results are presented in Table 5 and includes both initial and diluted sample results. Of these compounds, benzo(a)pyrene is the most toxic and was found in SS-07 and SS-08 at 88000 ug/Kg and 58000 ug/Kg, respectively. These compounds are common to the wood preserving industry and can also be found in waste oils as well. These compounds were not detected in the background sample.

Pesticides were detected in each of the soil samples. Heptachlor and dieldrin were originally not detected in samples SS07 and duplicate sample SS08. However, upon dilution of the samples, both these pesticides were detected. Other pesticides detected in the soil samples above the BBC include aldrin, heptachlor epoxide, and endrine ketone. Table 5 presents a summary of the results of the organic analysis of the soil samples.

4.0 SUMMARY

The Coronado Landfill site is approximately 60 acres in size and operated from 1963 to 1964 or 1965. A Notification of Hazardous Waste was submitted by the City of Albuquerque to the EPA in 1981. The notification speculated that 9 percent of the landfill contained hazardous wastes from industrial

sources. Signetics purchased the property from the city in 1978 or 1979 and constructed a 500,000 square foot building. The building is not believed to be constructed on top of landfilled material. Prior to construction, an estimated 77,436 square feet of landfill waste was removed from the area where the receiving dock is currently located. The waste was taken to the Los Angeles landfill.

The location of the fill material is believed to be in two former arroyos that crossed the property from east to west. One arroyo was located near the northern property line. The second, larger arroyo, was located near the south/ central part of the property. Neither of these arroyos is currently visible on the site.

Signetics has installed four monitoring wells and 35 methane gas vents on the property. The monitoring wells have been sampled quarterly for the last three years. Results from ground water monitoring are sent to the state.

Fluor Daniel conducted a sampling event on September 22 and 23, 1993. A total of ten samples were collected, six ground water and four soil samples. Tetrachloroethene and bis(2-ethylhexyl)Phthalate were the two organic compounds detected above the BBC in the ground water samples. Analytes detected above the BBC in the ground water were selenium and zinc. Numerous polyaromatic hydrocarbons were detected above the BBC in the soil samples. Analytes detected above the BBC included chromium, lead, and mercury. Based on the sampling results the primary pathways of concern appear to be the ground water pathway and the soil exposure pathway.

REFERENCES

1. U.S.G.S 7.5 minute Topographic Map, Alameda, New Mexico Quadrangle, 1960 photorevised 1967 and 1972.

2. City of Albuquerque, Refuse Division, EPA Notification of Hazardous Waste, June 10, 1981.

3. Bill Park and Debra Kading, Fluor Daniel, Site Visit, August 4, 1992.

4. Fox Consulting Engineers and Geologists, Geotechnical Investigation Proposed Manufacturing Facility For Signetics, Inc., North Albuquerque Acres, Albuquerque, New Mexico, June 5,1980.

5. Metcalf and Eddy,Inc., City of Albuquerque New Mexico Water System Diagram, June, 1987.

6. Flood Plain/Land Use Map, Exhibit B-1 RCRA part B Permit, Signetics Corporation, August 12, 1983.

7. Jill Wheatherspoon, Public Works Department, City of Albuquerque, New Mexico. Personal Communication with Bill Agee, January 25, 1993.

8. Pat Boreland, Information Specialist. U.S.G.S., Personal Communication with Jonathan Stewart, September 8, 1992.

9. Michael Hatch, Fisheries Biologist, New Mexico Fish and Game, Personal Communication With Jonathan Stewart, September 9, 1992.

10. C.A. Kaehler, 1990, Lithology of Basin-Fill Deposits in the Albuquerque-Belen Basin, New Mexico; U.S. Geological Survey, Water-Resources Investigation Report 89-4162, 14P.

11. D.W. Wilkins, 1986, Geohydrology of the Southwest Aquifer-Systems Analysis, Part of Colorado, New Mexico and Texas; U.S.G.S. Water-Resources Investigation Report 84-4224.

12. Energy Resources Company, Detailed Evaluation of the Waste Fill, Albuquerque, New Mexico, September 3, 1993.

TABLES

TABLE 1
SAMPLING LOCATIONS AND RATIONALE

SAMPLE NUMBER	SAMPLE LOCATION AND RATIONALE
1	Ground water sample collected from Signetics well number 1. **RATIONALE:** The rationale for this sample was to document a potential observed release to ground water.
2	Ground water sample collected from Signetics well number 2. A matrix spike duplicate was also collected from this well. **RATIONALE:** The rationale for this sample was to document a potential observed release to ground water.
3	Ground water sample collected from Signetics well number 3. **RATIONALE:** The rationale for this sample was to document a potential observed release to ground water.
4	Ground water sample collected from Signetics well number 4. **RATIONALE:** The rationale for this sample was to document a potential observed release to ground water.
5	This was a duplicate of sample number 04.
6	Soil sample collected from the south side of the receiving area, from an area where subsidence is occurring. This sample was collected within the first foot of the surface. **RATIONALE:** The rationale for this sample was to document potential surface contamination on site. This sample also served as the matrix spike duplicate.

TABLE 1 (CONT.)
SAMPLING LOCATIONS AND RATIONALE

SAMPLE NUMBER	SAMPLE LOCATION AND RATIONALE
7	Soil sample collected from the northwest corner of the site. The sample was collected within the first foot of the surface. This sample was collected from an area of suspected waste disposal. **RATIONALE:** The rationale for this sample was to document potential surface contamination on site.
8	This was a duplicate of sample number 7.
9	Soil sample collected from the vacant land north of the property. This sample served as a soil background.
10	Trip blank, water.

NOTE: **Coronado well Number 1 is a municipal well, and is located approximately one mile southeast of the site. This well was sampled the week of September 21, 1992 as part of the site inspection for Sacramento Landfill (NMD980864227). Results of this sample were used to document background conditions at the Coronado Landfill.**

TABLE 2
SAMPLE SUMMARY TABLE
Albuquerque Coronado Landfill
Sampling Event September 22–23, 1992

Station Location	CLP Number Organic/Inorganic	Depth or Sample Medium	Matrix	Landfill Location	Comments
MW–02	MFW402/FX901	Groundwater	Liquid	Northwest	Contamination
MW–01	MFW403/FX902	Groundwater	Liquid	West Central	Contamination
TB–10	MFW404/FX903	Water	Liquid	Blank	Trip Blank
SS–09	MFW405/FX904	Near Surface	Soil	North of site	Surface Contam.
SS–06	MFW406/FX905	Near Surface	Soil	South Central	Surface Contam.
MW–04	MFW407/FX906	Groundwater	Liquid	South Central	Contamination
MW–05	MFW408/FX907	Groundwater	Liquid	South Central	Duplicate of MW04
SS_07	MFW409/FX908	Near Surface	Soil	Northwest Corner	Surface Contam.
SS–08	MFW410/FX909	Near Surface	Soil	Northwest Corner	Duplicate of SS07
MW–03	MFW411/FX910	Groundwater	Liquid	Northeast	Contamination

TABLE 3
SUMMARY OF ORGANIC, PESTICIDE/PCB AND METALS/CYANIDE RESULTS, GROUND WATER SAMPLES
Albuquerque Coronado Landfill
Sampling Event: September 22–23, 1992

Station Location:	Coronado Well #1 **		Coronado Well #1		MW–02		MW–01		MW–04		MW–05		MW–03	
Comments:	Background		Benchmark Concentration		Monitoring Well 02		Monitoring Well 01		Monitoring Well 04		Duplicate MW–04		Monitoring Well 03	
Analyte Qualifier	(ug/l)	Q	(ug/l)	Q	(ug/l)	Q	(ug/l)	Q	(ug/kg)	Q	(ug/l)	Q	(ug/l)	Q
VOA														
Tetrachloroethene	2	U	2		11	*	14	*	7	J*	8	J*	10	U
Acid/Base Neutral														
bis(2–Ethylhexyl) Phthalate	4	U	4		4	J*	11	*	18	*	14	*	13	*
Pesticide None Detected														
Metals/Cyanide														
Arsenic	23.4		70		1.8	B	1.1	U	2.0	B	2.0	B	0.3	J
Lead	5.6		17		1.1	U	1.1	U	1.1	U	1.1	U	2.2	B
Selenium	2.9	U	2.9		20.2	J*	1.1	R	1.1	R	1.1	R	1.1	R
Zinc	20	U	20		10.6	B	10.0	U	10.0	U	10.0	U	28.9	*

B – Anlyte was detected above the instrument detection limit but below the contract required detection limit.
J – The associated value is an estimated quantity.
U – The material was analyzed for but was not detected above the level of the assciated value.
R – Data for analyte is unusable.
UJ – The material was analyzed for but was not detected. The assoceated value is an estimate annd may be inaccurate or imprecise.
* – analyte is greater than three times background concentration or greater than quantitation limit.
** – This drinking water well was sampled during another SI that occured during the same week and is being used for background comparison.

TABLE 4
SUMMARY OF INORGANIC ANALYTE RESULTS, SURFACE SOIL SAMPLES
Albuquerque Coronado Landfill
Sampling Event: September 22–23, 1992

Station Location	Compound or Element	Concentration (mg/kg)	Qualifier	CLP Sample Number	Comments
SURFACE SOIL BACKGROUND SAMPLE (Depth: 0–10 inches)					
SS09	Aluminum	9350		MFW405	Background
SS09	Arsenic	2.7		MFW405	Background
SS09	Chromium	6.2		MFW405	Background
SS09	Iron	12800		MFW405	Background
SS09	Lead	10.1		MFW405	Background
SS09	Nickel	9.6		MFW405	Background
SS09	Mercury	0.05	U	MFW405	Background
SS09	Vanadium	22.2		MFW405	Background
SS09	Zinc	52.4	J	MFW405	Background
BACKGROUND BENCHMARK CONCENTRATIONS					
SS09	Aluminum	28050		MFW405	3 X Background
SS09	Arsenic	8.1		MFW405	3 X Background
SS09	Chromium	18.6		MFW405	3 X Background
SS09	Iron	38400		MFW405	3 X Background
SS09	Lead	30.3		MFW405	3 X Background
SS09	Nickel	28.8		MFW405	3 X Background
SS09	Mercury	0.05		MFW405	Quantitation Limit
SS09	Vanadium	66.6		MFW405	3 X Background
SS09	Zinc	157.2		MFW405	3 X Background
SURFACE SOIL SOURCE SAMPLES (Depth: 0–6 inches)					
SS06	Aluminum	4290		MFW406	Surface Soils
SS06	Arsenic	1.3	B	MFW406	Surface Soils
SS06	Chromium	3.4		MFW406	Surface Soils
SS06	Iron	6320		MFW406	Surface Soils
SS06	Lead	8.9		MFW406	Surface Soils
SS06	Nickel	6.1	U	MFW406	Surface Soils
SS06	Mercury	0.05	U	MFW406	Surface Soils
SS06	Vanadium	9.3	B	MFW406	Surface Soils
SS06	Zinc	35.8	J	MFW406	Surface Soils
SS07	Aluminum	4310		MFW407	Surface Soils
SS07	Arsenic	2.3		MFW407	Surface Soils
SS07	Chromium	20.9 *		MFW407	Surface Soils
SS07	Iron	7920		MFW407	Surface Soils
SS07	Lead	72.4 *		MFW407	Surface Soils
SS07	Nickel	7.5	B	MFW407	Surface Soils
SS07	Mercury	0.09 *	B	MFW407	Surface Soils
SS07	Vanadium	14.1		MFW407	Surface Soils
SS07	Zinc	114	J	MFW407	Surface Soils
SS08	Aluminum	4150		MFW408	Duplicate of SS07
SS08	Arsenic	1.9	B	MFW408	Duplicate of SS07
SS08	Chromium	9.3		MFW408	Duplicate of SS07
SS08	Iron	7850		MFW408	Duplicate of SS07
SS08	Lead	62.5 *		MFW408	Duplicate of SS07
SS08	Nickel	8.7		MFW408	Duplicate of SS07
SS08	Mercury	0.09 *	B	MFW408	Duplicate of SS07
SS08	Vanadium	12.0		MFW408	Duplicate of SS07
SS08	Zinc	101	J	MFW408	Duplicate of SS07

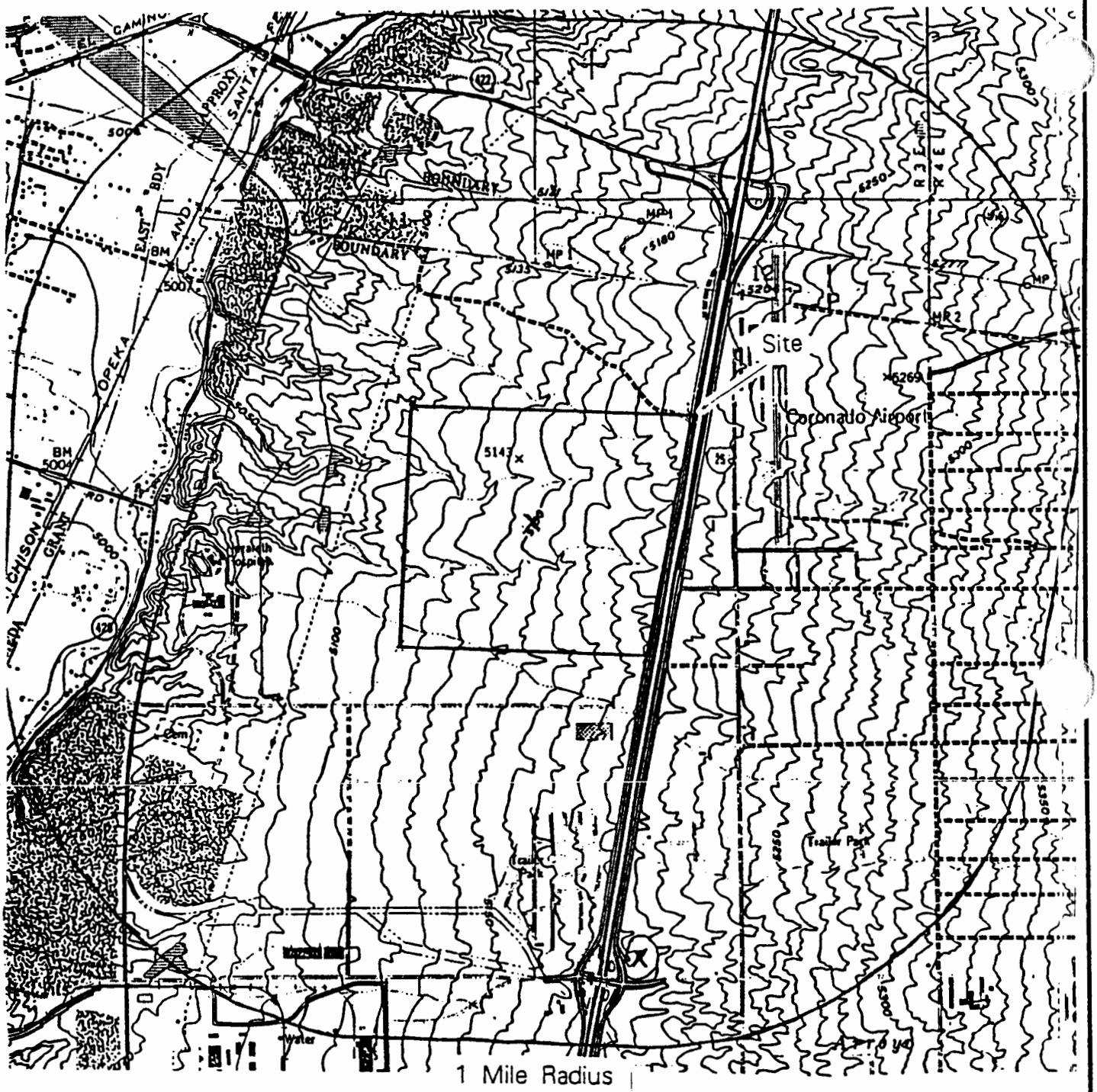
B – Analyte was detected above the Instrument Detection Limit but below the Contract Required Detection Limit.
J – The associated value is an estimated quantity.
U – The material was analyzed for but was not detected above the level of the assciated value.
UJ – The material was analyzed for but was not detected. The assciated value is an estimate and may be inaccurate.
* – Analyte is greater than three times background concentration or greater than quantitation limit.

TABLE 5
SUMMARY OF ORGANIC COMPOUND RESULTS, SURFACE SOIL SAMPLES
Albuquerque Coronado Landfill
September 22-23, 1993

Station Location:	SS09		SS09		SS06		SS07		SS07		SS08		SS08	
CLP Sample Number:	FX904		FX904		FX905		FX908		FX908D		FX909		FX909D	
Comments:	Background		Benchmark Concentration		Surface Soils		Surface Soils		Surface Soils		Duplicate SS07		Duplicate SS07	
Analyte Qualifier	(ug/kg)	Q	(ug/kg)	Q	(ug/kg)	Q	(ug/kg)	Q	(ug/kg)	Q	(ug/kg)	Q	(ug/kg)	Q
VOC														
None Detected														
Acid/Base Neutral														
2-Methylphenol	350	U	350	U	350	U	350	U	35000	U	69	J	17000	U
4-Methylphenol	350	U	350	U	350	U	130	J	35000	U	94	J	17000	U
2,4-Dimethylphenol	350	U	350	U	350	U	40	J	35000	U	350	U	17000	U
Naphthalene	350	U	350	U	350	U	470	*	35000	U	430	*	17000	U
2-Methylnaphthalene	350	U	350	U	350	U	240	J	35000	U	180	J	17000	U
Acenaphthylene	350	U	350	U	350	U	2000	*	35000	U	1600	*	17000	U
Acenaphthene	350	U	350	U	350	U	3000	E*	2800	DJ*	1900	*	17000	U
Dibenzofuran	350	U	350	U	350	U	2200	*	370	U	360	U	370	U
Fluorene	350	U	350	U	350	U	4900	E*	370	U	360	U	370	U
Phenanthrene	350	U	350	U	120	J	56000	E*	370	U	360	U	370	U
Anthracene	350	U	350	U	350	U	7700	E*	370	U	360	U	370	U
Carbazole	350	U	350	U	23	J	29000	E*	370	U	360	U	370	U
Di-n-Butylphthalate	350	U	350	U	350	U	350	U	370	U	360	U	79	J
Fluoranthene	350	U	350	U	260	J	84000	E*	370	U	360	U	370	U
Pyrene	350	U	350	U	220	J	130000	E*	170000	D*	82000	E*	100000	D*
Benzo(a)Anthracene	350	U	350	U	92	J	410	U	370	U	360	U	370	U
Chrysene	350	U	350	U	170	J	410	U	370	U	360	U	370	U
Benzo(b)Fluoranthene	350	U	350	U	210	J	75000	EJ*	110000	D*	6000	EJ*	6200	D*
Benzo(k)Fluoranthene	350	U	350	U	220	J	350	UJ*	65000	DJ*	350	UJ	75000	DJ*
Benzo(a)pyrene	350	U	350	U	83	J	30000	EJ*	88000	D*	17000	EJ*	58000	D*
Indeno(1,2,3-cd) Pyrene	350	U	350	U	130	J	32000	EJ*	55000	D*	18000	EJ*	35000	D*
Dibenzo(a,h) Anthracene	350	U	350	U	350	U	13000	EJ*	28000	DJ*	5500	EJ*	18000	D*
Benzo(g,h,i) Perylene	350	U	350	U	120	J	32000	EJ*	55000	D*	14000	EJ*	33000	D*
Pesticide														
Heptachlor	1.8	U	1.8	U	1.8	U	1.8	U	150	DJP*	1.8	U	150	DJP*
Aldrin	1.8	U	1.8	U	1.8	U	15	JP*	180	U	14	JP*	180	U
Hepachlor Epoxide	1.8	U	1.8	U	3.3	JP*	8.5	JP*	180	U	8.3	JP*	180	U
Dieldrin	21	X	21	X	3.0	JP	3.5	UJ	310	DPJ*	3.5	UJ	62	DPJ*
Endrine Ketone	3.5	U	3.5	U	3.5	U	3.5	UJ	280	DJP*	3.5	UJ	190	DPJ*
alpha-Chlordane	2.5	P	7.5	P	6.2		5.9	JP	180	U	5.5	JP	180	U
gamma-Chlordane	2.4	P	7.2	P	5.2		1.8	U	180	U	1.8	U	180	U

J - The associated value is an estimated quantity.
U - The material was analyzed for but was not detected above the level of the assciated value.
P - Greater than 25% difference between two GC columns for the detected concentration.
X - Results are considered suspect because retention time windows fall within the range belonging to Aroclors.
E - Exceeds instrument range.
D - Diluted Sample result.
* - Compuond was greater than three times background concentration or greater than quantitation limit.

FIGURES



NOTE: Topographic Map, Almeda Quadrangle, 1960. Photorevised 1967 and 1972

SCALE 1:24000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 400 500 600 7000 FEET

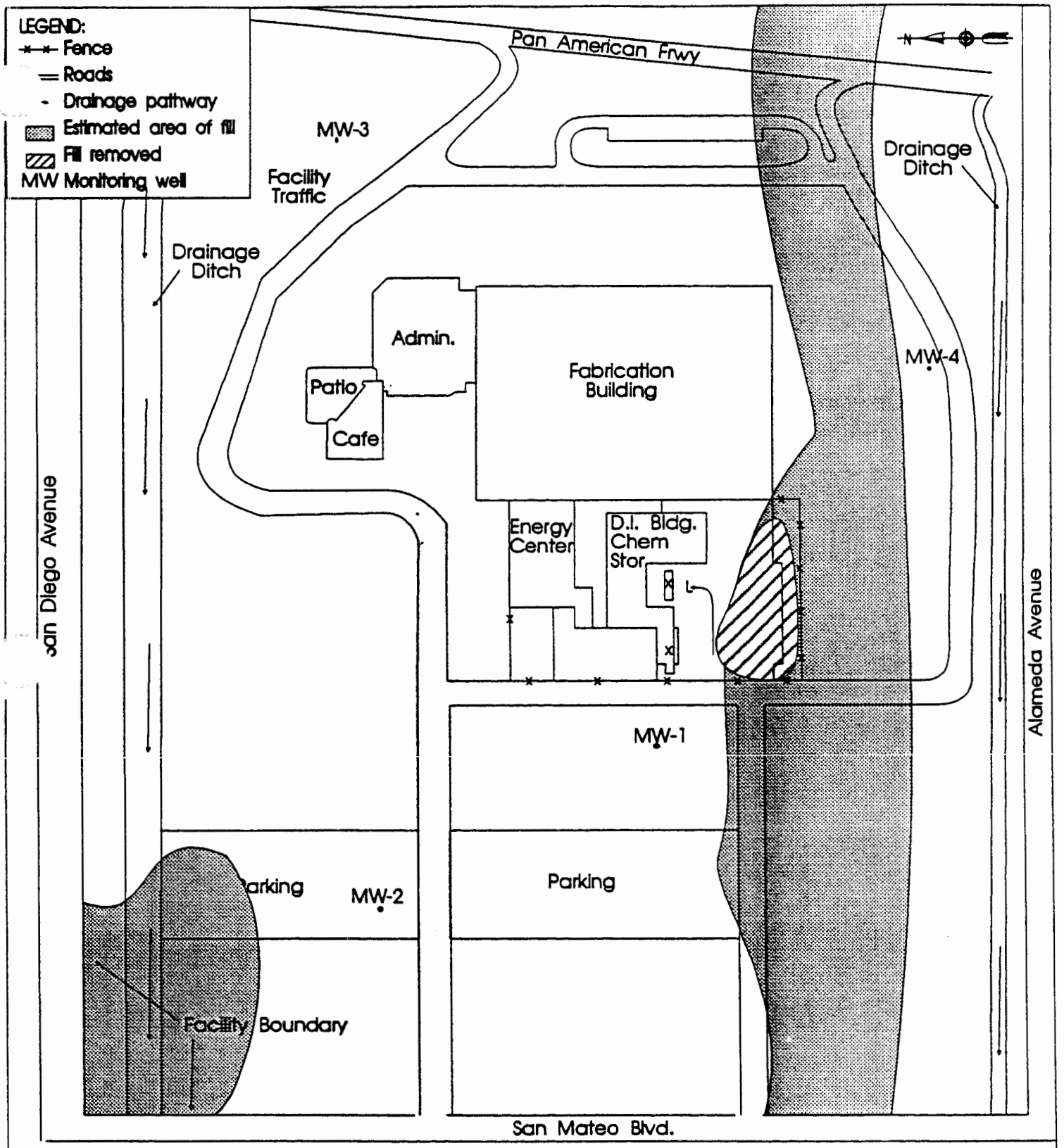
1 .5 0 1 KILOMETER

Quadrangle Location

FLUOR DANIEL

Figure 1

Location Map
Coronado Lf
Albuquerque, New Mexico



NOTE: Signatic Corp. RCRA Part B Permit

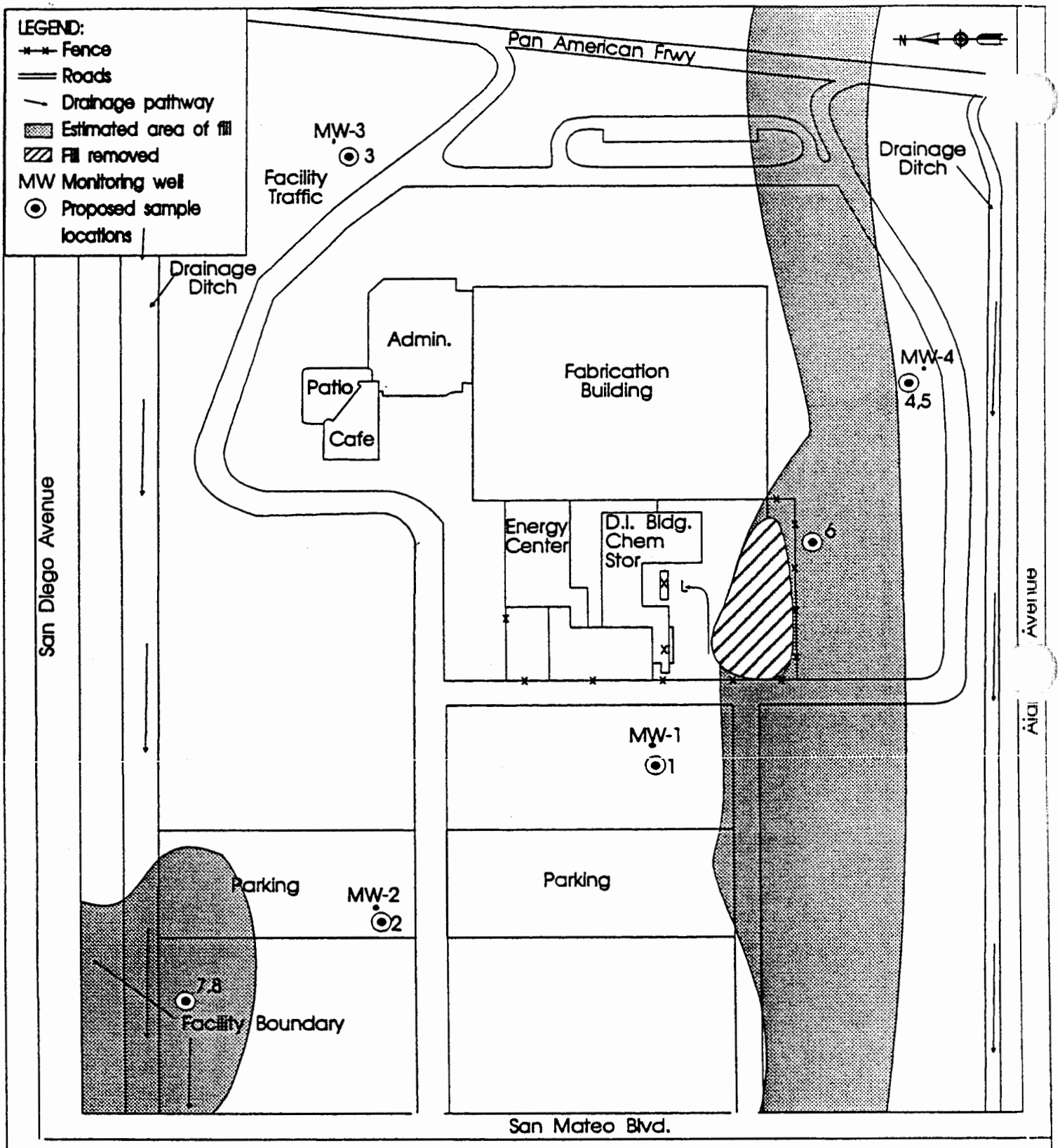
NOT TO SCALE

SITE SKETCH
CORONADO LF
ALBUQUERQUE, NEW MEXICO

FLUOR DANIEL

FIGURE 2

FIGURE 2



NOTE: Signatic Corp. RCRA Part B Permit

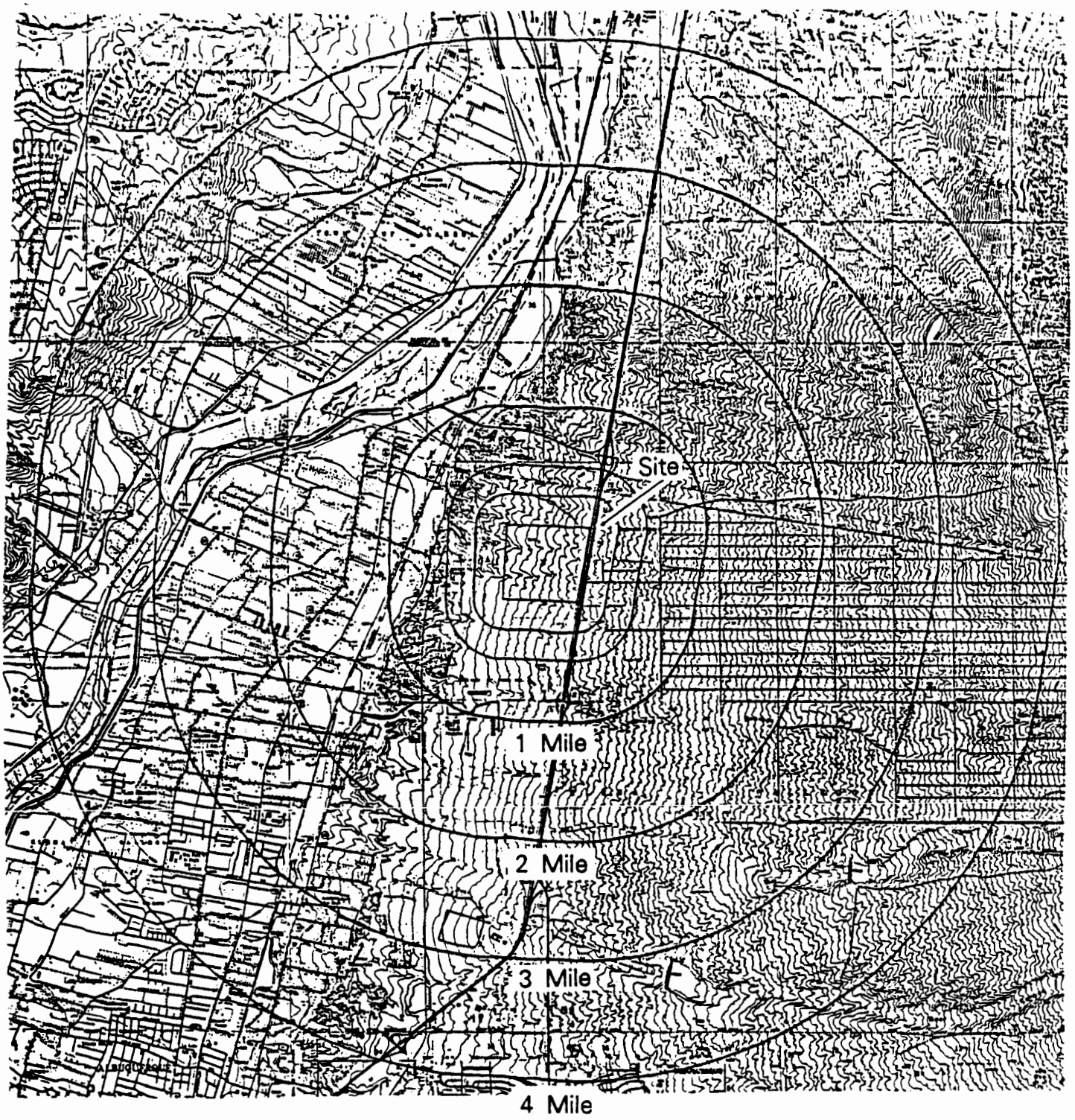
NOT TO SCALE

SAMPLE LOCATIONS
CORONADO LF
ALBUQUERQUE, NEW MEXICO

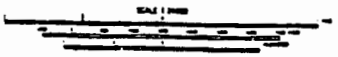
FLUOR DANIEL

FIGURE 3

FIGURE 3



NOTE: Topographic Map, Almeda Quadrangle, 1960. Photorevised 1967 and 1972; Los Griegos Quadrangle 1960. Photorevised 1967, 1972; Loma Machete Quadrangle 1954. Photorevised 1972; and Bernalillo Quadrangle 1954. Photorevised 1972.



Quadrangle Location

FLUOR DANIEL

Four Mile Radius
Coronado Lf
Albuquerque, New Mexico

Figure 4

PHOTOGRAPHS

Photo No.

1

Site Name:
Coronado Landfill

CERCLIS # NMD980622708 Photographer/Witness WRP Bill Park/Keith Westberry KW

Location: Date 09/23/93 Time 9:45 Direction East

Albuquerque, N.M. Description SS–06, Collected south of receiving area.

ject #: 06635316

Photo No.

2

ge 1 Photographer/Witness WRP Bill Park/Keith Westberry KW

2 Date 09/23/92 Time 10:35 Direction

Description Well MW–04, pneumatic pump being used to purge well.

Photo No.

3

Site Name:	Coronado Landfill
CERCLIS #:	NMD980622708
Location:	Albuquerque, N.M.
Project #:	06635316

Photographer/Witness		Bill Park/Keith Westberry (WCP / KW)			
Date:	09/23/92	Time	11:30 AM	Direction	East
Description	Sample SS–07 and duplicate sample SS–08 collected from northwest corner of site.				

ATTACHMENTS

DATA QUALITY ASSURANCE REVIEW

Site Name:	Albuquerque Coronado Landfill	JTS 423251
Site Code:	NMD980622708	
Case Number:	18782	

Laboratory: DATAChem Laboratories, Inc. -- Salt Lake City, Utah

Soil Samples: FX904, FX905, FX908, and FX909

Water Samples: FX901, FX902, FX903, FX906, FX907, and FX910

The data package consisted of four soil samples and six water samples analyzed for volatile organics, semivolatile organics, and pesticides/PCBs. Resubmitted data was used where applicable, but the resubmissions were not placed within the data package.

VOA Fraction

1. Analytical Parameters: The samples were analyzed using low concentration protocols.

2. Holding Times: All samples were analyzed within holding time limits.

3. Instrument Tunings: All volatile organic GC/MS tuning and mass calibrations were within control limits.

4. Initial Calibrations: Initial calibration results were within quality control limits.

5. Continuing Calibrations: The percent difference for bromoform exceeded the quality control limits, but no data qualification was required.

6. Internal Standards: Internal standard areas and retention times were within quality control limits.

7. Surrogates: All surrogate recoveries were within quality control limits.

8. Method Blanks: No compounds were detected in the method blanks.

9. Matrix Spike Recoveries: Matrix spike recoveries met quality control requirements.

10. Duplicates: The soil samples did not have any positive paired analytes in the duplicate sample. Tetrachloroethane in the water samples had a relative percent difference of 13.3 percent. No data qualification was required.

11. Target Compound Identification and Quantification: All TCL compounds reported by the laboratory appeared to be correctly identified. All unknown Tentatively Identified Compounds (TICs) were qualified as estimated. All identified TICs were qualified based on presumptive evidence of the compound's presence (NJ).

ABN Fraction

1. Analytical Protocol: The samples were analyzed using low concentration protocols. Samples FX908 and FX909 were reanalyzed at 100X dilution and 50X dilution, respectively.

2. Holding Times: All samples were extracted and analyzed within holding time limits.

3. Instrument Tunings: All semivolatile organic GC/MS tuning and mass calibrations were within control limits.

4. Initial Calibrations: Initial calibrations were performed three times. 3,3'-dichlorobenzidine failed minimum relative response factor (RRF) requirements on the second and third calibrations. Results for this compound in samples FX903, FX904, FX905, FX906, FX908, FX908DL, FX909, and FX909DL were qualified as unusable (R).

   Results for the following compounds in the listed samples were qualified as estimated (UJ) because of percent relative standard deviations greater than quality control limits:

   Hexachlorocyclopentadiene: FX901, FX902, FX907, FX910
   3,3'-Dichlorobenzidine: FX901, FX902, FX907, FX910
   2,2'-oxybis(1-Chloropropane): FX903, FX905, FX906, FX908, FX908DL, FX909, FX909DL
   4-Chloroaniline: FX903, FX904, FX905, FX906, FX908, FX908DL, FX909, FX909DL
   2-Nitroaniline: FX903, FX905, FX906, FX908, FX908DL, FX909, FX909DL
   2,4-Dinitrophenol: FX903, FX905, FX906, FX908, FX908DL, FX909, FX909DL

4-Nitrophenol: FX903, FX905, FX906, FX908, FX908DL, FX909, FX909DL
4,6-Dinitro-2-methylphenol: FX903, FX905, FX906, FX908, FX908DL, FX909, FX909DL
Di-n-ocytl phthalate: FX903, FX905, FX906, FX908, FX908DL, FX909, FX909DL
3-Nitroaniline: FX904
4-Nitroaniline: FX904
N-nitrosodiphenylamine: FX904.

5. Continuing Calibrations: 3,3'-Dichlorobenzidine and 4-chloroaniline failed minimum RRF requirements on 10-23-92. Results for the two compounds in sample FX904 were qualified as unusable (R).

Several compounds did not satisfy the criteria for percent difference; however, these compounds were not detected, and no data qualification was required. Results for the following compounds in the listed samples were qualified as estimated (J and UJ) because of percent differences outside of quality control limits:

4-Nitroaniline: FX908DL, FX909DL
4-Chloroaniline: FX903, FX906, FX908, FX909
N-nitrosodiphenylamine: FX903, FX906, FX908, FX909
Fluoranthene: FX908DL, FX909DL
Benzo(k)fluoranthene: FX908DL, FX909DL.

6. Internal Standards: Internal standard areas and/or retention times were not within quality control limits for the following samples and standards:

FX908 - IS5 and IS6 (chrysene-d12 and perylene-d12)
FX909 - IS5 and IS6 (chrysene-d12 and perylene-d12)
FX905MS - IS6 (perylene-d12)

For samples FX908 and FX909, all compounds quantitated with these two internal standards were qualified as estimated (J and UJ) unless the results were previously qualified as unusable.

7. Surrogates: Several ABN samples had surrogate recoveries outside of quality control limits, but data qualification was not required.

8. Method Blanks: The results for di-n-butylphthalate in samples FX904 and FX905 were changed to the CRQL and qualified as not detected (U) because the compound was present in the associated blank.

9. Matrix Spike/Matrix Spike Duplicate Recoveries: One matrix spike duplicate recovery exceeded quality control limits for the water samples. Three matrix spike recoveries, one matrix spike duplicate recovery, and two relative percent differences exceeded quality control limits for the soil samples. No data qualification was required.

10. Duplicates: Original and duplicate results were consistent. No data qualification was required.

11. Target Compound Identification and Quantification: All TCL compounds reported by the laboratory appeared to be correctly identified. All unknown TICs were qualified as estimated (J). All identified TICs were qualified based on presumptive evidence of the compound's presence (NJ).

Pesticide/PCB Fraction

1. Analytical Parameters: All samples were analyzed using low concentration protocols. Samples FX908 and FX909 were reanalyzed at 100X dilution because of matrix interferences. Samples FX904 and FX904MS/MSD were reanalyzed because the original sample analysis did not meet contractual requirements.

2. Holding Times: Criteria for sample extraction and analysis were satisfied.

3. Instrument Performance: All instrument performance criteria were met except for the coelution of 4,4'-DDD and endosulfan II on column DB-1701. No data qualification was required.

4. Calibrations: All calibrations met quality control requirements.

5. Blanks: Methoxychlor was detected in both blanks. Results for this compound in sample FX904RE were changed to the CRQL and qualified as not detected (U).

6. Surrogates: Recoveries of DCB from both columns were high in samples FX908 and FX909. DCB recoveries in the corresponding diluted samples were high for one column and diluted out for the other column. No data qualification was required.

7. Matrix Spike/Matrix Spike Duplicate Recoveries: All quality control guidelines were met except for the relative percent difference criteria for dieldrin in sample FX904RE. This result was qualified as estimated (J).

8. Duplicates: Original and duplicate results were consistent. No data qualification was required.

9. Target Compound Identification and Quantification: Because of matrix interference in samples FX908 and FX909, results for delta-BHC, gamma-BHC, dieldrin, 4,4'-DDE, endrin, endosulfan II, 4,4'-DDT, methoxychlor, endrin ketone, toxaphene, Aroclor 1254, and Aroclor 1260 were qualified as estimated in these two samples. All results with greater than 25 percent difference between the two columns for detected concentraions were qualified as estimated (JP).

Reviewer: Bennett Howell by LWG

QA Review: Wendy W. Gram

CHEMICAL DA JMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/liter (ug/l)
Compiled by: IT Corp.

			Traffic Report Number and Station Location											
Traffic Number:			FX901		FX902		FX903		FX906		FX907		FX910	
Matrix:			Water		Water		Water		Water		Water		Water	
Percent Moisture:			MW-02		MW-01		TB-10		MW-04		MW-05		MW-03	
Location and/or Sample Description:														
	CAS No.	Class	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q
Chloromethane	74-87-3	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Bromomethane	74-83-9	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Vinyl chloride	75-01-4	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Chloroethane	75-00-3	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Methylene chloride	75-09-2	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Acetone	67-64-1	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Carbon Disulfide	75-15-0	VOA	10	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene	75-35-4	VOA	10	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethane	75-34-3	VOA	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethene (total)	540-59-0	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Chloroform	67-66-3	VOA	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane	107-06-2	VOA	10	U	10	U	10	U	10	U	10	U	10	U
2-Butanone	78-93-3	VOA	10	U	10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane	71-55-6	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Carbon Tetrachloride	56-23-5	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Bromodichloromethane	75-27-4	VOA	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane	78-87-5	VOA	10	U	10	U	10	U	10	U	10	U	10	U
cis-1,3-Dichloropropene	10061-01-5	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Trichloroethene	79-01-6	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Dibromochloromethane	124-48-1	VOA	10	U	10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane	79-00-5	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	71-43-2	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Trans-1,3-dichloropropene	10061-02-6	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Bromoform	75-25-2	VOA	10	U	10	U	10	U	10	U	10	U	10	U
4-Methyl-2-Pentanone	108-10-1	VOA	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	591-78-6	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene	127-18-4	VOA	11		14		10	U	7	J	8	J	10	U
1,1,2,2-Tetrachloroethane	79-34-5	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Toluene	108-88-3	VOA	10	U	10	U	3	J	10	U	10	U	10	U
Chlorobenzene	108-90-7	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Ethylbenzene	100-41-4	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Styrene	100-42-5	VOA	10	U	10	U	10	U	10	U	10	U	10	U
Xylene (total)	1330-20-7	VOA	10	U	10	U	10	U	10	U	10	U	10	U

J - Data for analyte is estimated.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
VOA - Volatile Organic Analysis.

CHEMICAL DATA SUMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/kilogram (ug/kg)
Compiled by: IT Corp.

	Traffic Report Number and Station Location							
Traffic Number:	FX904		FX905		FX908		FX909	
Matrix:	Soil		Soil		Soil		Soil	
Percent Moisture:	5		6		5		5	
Location and/or Sample Description:	SS-09		SS-06		SS-07		SS-08	
	CAS No.	**Class**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**
Chloromethane	74-87-3	VOA	11	U	11	U	11	U	11	U
Bromomethane	74-83-9	VOA	11	U	11	U	11	U	11	U
Vinyl chloride	75-01-4	VOA	11	U	11	U	11	U	11	U
Chloroethane	75-00-3	VOA	11	U	11	U	11	U	11	U
Methylene chloride	75-09-2	VOA	11	U	11	U	11	U	11	U
Acetone	67-64-1	VOA	11	U	11	U	11	U	11	U
Carbon Disulfide	75-15-0	VOA	11	U	11	U	11	U	11	U
1,1-Dichloroethene	75-35-4	VOA	11	U	11	U	11	U	11	U
1,1-Dichloroethane	75-34-3	VOA	11	U	11	U	11	U	11	U
1,2-Dichloroethene (total)	540-59-0	VOA	11	U	11	U	11	U	11	U
Chloroform	67-66-3	VOA	11	U	11	U	11	U	11	U
1,2-Dichloroethane	107-06-2	VOA	11	U	11	U	11	U	11	U
2-Butanone	78-93-3	VOA	11	U	11	U	11	U	11	U
1,1,1-Trichloroethane	71-55-6	VOA	11	U	11	U	11	U	11	U
Carbon Tetrachloride	56-23-5	VOA	11	U	11	U	11	U	11	U
Bromodichloromethane	75-27-4	VOA	11	U	11	U	11	U	11	U
1,2-Dichloropropane	78-87-5	VOA	11	U	11	U	11	U	11	U
cis-1,3-Dichloropropene	10061-01-5	VOA	11	U	11	U	11	U	11	U
Trichloroethene	79-01-6	VOA	11	U	11	U	11	U	11	U
Dibromochloromethane	124-48-1	VOA	11	U	11	U	11	U	11	U
1,1,2-Trichloroethane	79-00-5	VOA	11	U	11	U	11	U	11	U
Benzene	71-43-2	VOA	11	U	11	U	11	U	11	U
Trans-1,3-dichloropropene	10061-02-6	VOA	11	U	11	U	11	U	11	U
Bromoform	75-25-2	VOA	11	U	11	U	11	U	11	U
4-Methyl-2-Pentanone	108-10-1	VOA	11	U	11	U	11	U	11	U
2-Hexanone	591-78-6	VOA	11	U	11	U	11	U	11	U
Tetrachloroethene	127-18-4	VOA	11	U	14	U	11	U	11	U
1,1,2,2-Tetrachloroethane	79-34-5	VOA	11	U	11	U	11	U	11	U
Toluene	108-88-3	VOA	11	U	11	U	11	J	11	U
Chlorobenzene	108-90-7	VOA	11	U	11	U	11	U	11	U
Ethylbenzene	100-41-4	VOA	11	U	11	U	11	U	11	U
Styrene	100-42-5	VOA	11	U	11	U	11	U	11	U
Xylene (total)	1330-20-7	VOA	11	U	11	U	11	U	11	U

J - Data for analyte is estimated.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
VOA - Volatile Organic Analysis.

CHEMICAL DA[illegible]UMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/liter (ug/l)
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			FX901		FX902		FX903		FX906		FX907		FX910					
Matrix:			Water		Water		Water		Water		Water		Water					
Percent Moisture:			NA		NA		NA		NA		NA		NA					
Location and/or Sample Description:			MW-02		MW-01		TB-10		MW-04		MW-05		MW-03					
Compound Name	**CAS No.**	**Class**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**				
Phenol	108-95-2	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
bis(2-Chloroethyl) Ether	111-44-4	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2-Chlorophenol	95-57-8	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
1,3-Dichlorobenzene	541-73-1	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
1,4-Dichlorobenzene	106-46-7	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichlorobenzene	95-50-1	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2-Methylphenol	95-48-7	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2,2'-oxybis(1-Chloropropane)	108-60-1	ABN	10	U	10	U	10	UJ	10	UJ	10	U	10	U				
4-Methylphenol	106-44-5	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
N-Nitroso-Di-n-propylamine	621-64-7	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
Hexachloroethane	67-72-1	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
Nitrobenzene	98-95-3	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
Isophorone	78-59-1	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2-Nitrophenol	88-75-5	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2,4-Dimethylphenol	105-67-9	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
bis(2-Chloroethoxy)Methane	111-91-1	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2,4-Dichlorophenol	120-83-2	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
1,2,4-Trichlorobenzene	120-82-1	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
Naphthalene	91-20-3	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
4-Chloroaniline	106-47-8	ABN	10	U	10	U	10	UJ	10	UJ	10	U	10	U				
Hexachlorobutadiene	87-68-3	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
4-Chloro-3-Methylphenol	59-50-7	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2-Methylnaphthalene	91-57-6	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
Hexachlorocyclopentadiene	77-47-4	ABN	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ				
2,4,6-Trichlorophenol	88-06-2	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2,4,5-Trichlorophenol	95-95-4	ABN	25	U	25	U	25	U	25	U	25	U	25	U				
2-Chloronaphthalene	91-58-7	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2-Nitroaniline	88-74-4	ABN	25	U	25	U	25	UJ	25	UJ	25	UJ	25	U				
Dimethyl Phthalate	131-11-3	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
Acenaphthylene	208-96-8	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
2,6-Dinitrotoluene	606-20-2	ABN	10	U	10	U	10	U	10	U	10	U	10	U				
3-Nitroaniline	99-09-2	ABN	25	U	25	U	25	U	25	U	25	U	25	U				
Acenaphthene	83-32-9	ABN	10	U	10	U	10	U	10	U	10	U	10	U				

ABN - Acid/Base/Neutral
J - Data for analyte is estimated.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DATA SUMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/liter (ug/l)
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			FX901		FX902		FX903		FX906		FX907		FX910	
Matrix:			Water		Water		Water		Water		Water		Water	
Percent Moisture:			NA		NA		NA		NA		NA		NA	
Location and/or Sample Description:			MW-02		MW-01		TB-10		MW-04		MW-05		MW-03	
Compound Name	**CAS No.**	**Class**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**
2,4-Dinitrophenol	51-28-5	ABN	25	U	25	U	25	UJ	25	UJ	25	U	25	U
4-Nitrophenol	100-02-7	ABN	25	U	25	U	25	UJ	25	UJ	25	U	25	U
Dibenzofuran	132-64-9	ABN	10	U	10	U	10	U	10	U	10	U	10	U
2,4-Dinitrotoluene	121-14-2	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Diethylphthalate	84-66-2	ABN	10	U	10	U	10	U	10	U	10	U	10	U
4-Chlorophenyl-phenylether	7005-72-3	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Fluorene	86-73-7	ABN	10	U	10	U	10	U	10	U	10	U	10	U
4-Nitroaniline	100-01-6	ABN	25	U	25	U	25	U	25	U	25	U	25	U
4,6-Dinitro-2-methylphenol	534-52-1	ABN	25	U	25	U	25	UJ	25	UJ	25	U	25	U
N-Nitrosodiphenylamine	86-30-6	ABN	10	U	10	U	10	UJ	10	UJ	10	U	10	U
4-Bromophenyl-phenylether	101-55-3	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Hexachlorobenzene	118-74-1	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Pentachlorophenol	87-86-5	ABN	25	U	25	U	25	U	25	U	25	U	25	U
Phenanthrene	85-01-8	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Anthracene	120-12-7	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Carbazole	86-74-8	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Di-n-Butylphthalate	84-74-2	ABN	10	U	10	U	0.6	J	10	U	10	U	10	U
Fluoranthene	206-44-0	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Pyrene	129-00-0	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Butylbenzylphthalate	85-68-7	ABN	10	U	10	U	10	U	10	U	10	U	10	U
3,3'-Dichlorobenzidine	91-94-1	ABN	10	UJ	10	UJ	10	R	10	R	10	UJ	10	UJ
Benzo(a)Anthracene	56-55-3	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Chrysene	218-01-9	ABN	10	U	10	U	10	U	10	U	10	U	10	U
bis(2-Ethylhexyl) Phthalate	117-81-7	ABN	4	J	11		10	U	18		14		13	
Di-n-Octyl Phthalate	117-84-0	ABN	10	U	10	U	10	UJ	10	UJ	10	U	10	U
Benzo(b) Fluoranthene	208-99-2	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Benzo(k)Fluoranthene	207-08-9	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Bennzo(a)pyrene	50-32-8	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Indeno(1,2,3-cd) Pyrene	193-39-5	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Dibenzo(a,h) Anthracene	53-70-3	ABN	10	U	10	U	10	U	10	U	10	U	10	U
Benzo(g,h,i) Perylene	191-24-2	ABN	10	U	10	U	10	U	10	U	10	U	10	U

ABN - Acid/Base/Neutral
J - Data for analyte is estimated.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DA.. ,MMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/kilograms (ug/kg)
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			FX904		FX905		FX908		FX908DL		FX909		FX909DL	
Matrix:			Soil		Soil		Soil		Soil		Soil		Soil	
Percent Moisture:			5		6		5		5		5		5	
Location and/or Sample Description:			SS-09		SS-06		SS-07		SS-07		SS-08		SS-08	
Compound Name	**CAS No.**	**Class**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**
Phenol	108-95-2	ABN	350	U	350	U	170	J	35000	U	350	U	17000	U
bis(2-Chloroethyl) Ether	111-44-4	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
2-Chlorophenol	95-57-8	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
1,3-Dichlorobenzene	541-73-1	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
1,4-Dichlorobenzene	106-46-7	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
1,2-Dichlorobenzene	95-50-1	ABN	350	U	350	U	350	U	35000	U	330	J	17000	U
2-Methylphenol	95-48-7	ABN	350	U	350	U	350	U	35000	U	69	J	17000	U
2,2'-oxybis(1-Chloropropane)	108-60-1	ABN	350	U	350	UJ	350	UJ	35000	UJ	350	UJ	17000	UJ
4-Methylphenol	106-44-5	ABN	350	U	350	U	130	J	35000	U	94	J	17000	U
N-Nitroso-Di-n-propylamine	621-64-7	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Hexachloroethane	67-72-1	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Nitrobenzene	98-95-3	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Isophorone	78-59-1	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
2-Nitrophenol	88-75-5	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
2,4-Dimethylphenol	105-67-9	ABN	350	U	350	U	40	J	35000	U	350	U	17000	U
bis(2-Chloroethoxy)Methane	111-91-1	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
2,4-Dichlorophenol	120-83-2	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
1,2,4-Trichlorobenzene	120-82-1	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Naphthalene	91-20-3	ABN	350	U	350	U	470		35000	U	430		17000	U
4-Chloroaniline	106-47-8	ABN	350	R	350	UJ	350	UJ	35000	UJ	350	UJ	17000	UJ
Hexachlorobutadiene	87-68-3	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
4-Chloro-3-Methylphenol	59-50-7	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
2-Methylnaphthalene	91-57-6	ABN	350	U	350	U	240	J	35000	U	180	J	17000	U
Hexachlorocyclopentadiene	77-47-4	ABN	350	UJ	350	UJ	350	UJ	35000	U	350	UJ	17000	U
2,4,6-Trichlorophenol	88-06-2	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
2,4,5-Trichlorophenol	95-95-4	ABN	840	U	850	U	840	U	84000	U	840	U	42000	U
2-Chloronaphthalene	91-58-7	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
2-Nitroaniline	88-74-4	ABN	840	U	850	UJ	840	UJ	84000	UJ	840	UJ	42000	UJ
Dimethyl Phthalate	131-11-3	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Acenaphthylene	208-96-8	ABN	350	U	350	U	2000		35000	U	1600		17000	U
2,6-Dinitrotoluene	606-20-2	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
3-Nitroaniline	99-09-2	ABN	840	UJ	850	U	840	U	84000	U	840	U	42000	U
Acenaphthene	83-32-9	ABN	350	U	350	U	3000	E	2800	DJ	1900		17000	U

ABN - Acid/Base/Neutral
D - Diluted sample result.
J - Data for analyte is estimated.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DATA SUMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/kilograms (ug/kg)
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			FX904		FX905		FX908		FX908DL		FX909		FX909DL	
Matrix:			Soil		Soil		Soil		Soil		Soil		Soil	
Percent Moisture:			5		6		5		5		5		5	
Location and/or Sample Description:			SS-09		SS-06		SS-07		SS-07		SS-08		SS-08	
Compound Name	**CAS No.**	**Class**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**	**Concentration**	**Q**
2,4-Dinitrophenol	51-28-5	ABN	840	U	850	UJ	840	UJ	84000	UJ	840	UJ	42000	UJ
4-Nitrophenol	100-02-7	ABN	840	U	850	UJ	840	UJ	84000	UJ	840	UJ	42000	UJ
Dibenzofuran	132-64-9	ABN	350	U	350	U	2200		35000	U	1500		17000	U
2,4-Dinitrotoluene	121-14-2	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Diethylphthalate	84-66-2	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
4-Chlorophenyl-phenylether	7005-72-3	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Fluorene	86-73-7	ABN	350	U	350	U	4900	E	4800	DJ	3500	E	3100	DJ
4-Nitroaniline	100-01-6	ABN	840	UJ	850	U	840	U	84000	UJ	840	U	42000	UJ
4,6-Dinitro-2-methylphenol	534-52-1	ABN	840	U	850	UJ	840	UJ	84000	UJ	840	UJ	42000	UJ
N-Nitrosodiphenylamine	86-30-6	ABN	350	UJ	350	U	350	UJ	35000	U	350	UJ	17000	U
4-Bromophenyl-phenylether	101-55-3	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Hexachlorobenzene	118-74-1	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Pentachlorophenol	87-86-5	ABN	840	U	850	U	840	U	84000	U	840	U	42000	U
Phenanthrene	85-01-8	ABN	350	U	120	J	56000	E	110000	D	39000	E	69000	D
Anthracene	120-12-7	ABN	350	U	350	U	7700	E	14000	DJ	5900	E	9900	DJ
Carbazole	86-74-8	ABN	350	U	23	J	29000	E	27000	DJ	29000	E	18000	D
Di-n-Butylphthalate	84-74-2	ABN	350	U	350	U	350	U	35000	U	350	U	17000	U
Fluoranthene	206-44-0	ABN	350	U	260	J	84000	E	180000	DJ	64000	E	120000	DJ
Pyrene	129-00-0	ABN	350	U	220	J	130000	E	170000	D	82000	E	100000	D
Butylbenzylphthalate	85-68-7	ABN	350	U	350	U	350	UJ	35000	U	350	UJ	17000	U
3,3'-Dichlorobenzidine	91-94-1	ABN	350	R	350	R	350	R	35000	R	350	R	17000	R
Benzo(a)Anthracene	56-55-3	ABN	350	U	92	J	99000	EJ	90000	D	68000	EJ	57000	D
Chrysene	218-01-9	ABN	350	U	170	J	28000	EJ	120000	D	23000	EJ	77000	D
bis(2-Ethylhexyl) Phthalate	117-81-7	ABN	350	U	43	J	350	UJ	35000	U	350	UJ	17000	U
Di-n-Octyl Phthalate	117-84-0	ABN	350	U	350	UJ	350	UJ	35000	UJ	350	UJ	17000	UJ
Benzo(b) Fluoranthene	208-99-2	ABN	350	U	210	J	75000	EJ	110000	D	60000	EJ	62000	D
Benzo(k)Fluoranthene	207-08-9	ABN	350	U	220	J	350	UJ	65000	DJ	350	UJ	75000	DJ
Bennzo(a)pyrene	50-32-8	ABN	350	U	83	J	30000	EJ	88000	D	17000	EJ	58000	D
Indeno(1,2,3-cd) Pyrene	193-39-5	ABN	350	U	130	J	32000	EJ	55000	D	18000	EJ	35000	D
Dibenzo(a,h) Anthracene	53-70-3	ABN	350	U	350	U	13000	EJ	28000	DJ	5500	EJ	18000	D
Benzo(g,h,i) Perylene	191-24-2	ABN	350	U	120	J	32000	EJ	55000	D	14000	EJ	33000	D

ABN - Acid/Base/Neutral
D - Diluted sample result.
E - Exceeds instrument range.
J - Data for analyte is estimated.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DA[illegible]MMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/kilograms (ug/kg) for soil samples and micrograms/liter (ug/L) for water sample
Compiled by: IT Corp.

	Traffic Report Number and Station Location						
Traffic Number:	FX903	FX904	FX905	FX908	FX908DL	FX909	FX909DL
Matrix:	Water	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture:	NA	5	6	5	5	5	5
Location and/or Sample Description:	TB-10	SS-09	SS-06	SS-07	SS-07	SS-08	SS-08

Compound Name	CAS No./RT	Class	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q
METHANE, TRICHLOROFLUORO-	75-69-4	VOA/TIC							3	NJ						
ALDOL CONDENSATION PRODUCT	8.77	ABN/TIC					160	AJ								
ALDOL CONDENSATION PRODUCT	8.94	ABN/TIC					3400	ABJ								
ALDOL CONDENSATION PRODUCT	9.37	ABN/TIC			100	AJ										
ALDOL CONDENSATION PRODUCT	9.54	ABN/TIC			220	ABJ										
ALDOL CONDENSATION PRODUCT	9.62	ABN/TIC					520	ABJ								
ALDOL CONDENSATION PRODUCT	9.84	ABN/TIC					360	ABJ								
ALDOL CONDENSATION PRODUCT	10.20	ABN/TIC			340	ABJ										
ALDOL CONDENSATION PRODUCT	10.44	ABN/TIC			210	ABJ										
ALDOL CONDENSATION PRODUCT	10.54	ABN/TIC					510	ABJ								
ALDOL CONDENSATION PRODUCT	10.94	ABN/TIC					470	ABJ								
ALDOL CONDENSATION PRODUCT	11.14	ABN/TIC			320	ABJ										
ALDOL CONDENSATION PRODUCT	11.50	ABN/TIC			250	ABJ										
ALDOL CONDENSATION PRODUCT	11.79	ABN/TIC					210	AJ								
ALKANE @ C27	30.27	ABN/TIC					73	J								
ALKANE @ C29	35.19	ABN/TIC			83	J										
ALKANE @ C30	34.64	ABN/TIC					310	J								
MIXED PNAs	29.74	ABN/TIC									15000	J			9800	J
MIXED PNAs	30.11	ABN/TIC							5500	J						
MIXED PNAs	30.26	ABN/TIC							13000	J						
OXYGENATED PNA	31.77	ABN/TIC							5400	J						
OXYGENATED PNA, MW=208	25.04	ABN/TIC							27000	J			22000	J		
OXYGENATED PNA, MW=208	24.52	ABN/TIC													21000	J
OXYGENATED PNA, MW=208	26.41	ABN/TIC									12000	J				
OXYGENATED PNA, MW=218	24.52	ABN/TIC									36000	J				
OXYGENATED PNA, MW=218	26.72	ABN/TIC											4400	J		
OXYGENATED PNA, MW=230	28.27	ABN/TIC													12000	J
OXYGENATED PNA, MW=230	28.79	ABN/TIC									27000	J			18000	J
OXYGENATED PNA, MW=230	29.49	ABN/TIC											12000	J		
OXYGENATED PNA, MW=258	30.34	ABN/TIC									16000	J			9000	J
PNA	30.17	ABN/TIC											5300	J		
PNA	30.32	ABN/TIC											8900	J		
PNA	33.37	ABN/TIC											3600	J		
PNA, MW-216	27.12	ABN/TIC											13000	J		
PNA, MW-216	27.42	ABN/TIC											21000	J		
PNA, MW-216	27.57	ABN/TIC											13000	J		
PNA, MW-216	27.71	ABN/TIC											10000	J		
PNA, MW-226	29.16	ABN/TIC											10000	J		
PNA, MW=190	24.04	ABN/TIC									28000	J				
PNA, MW=190	24.32	ABN/TIC							23000	J						
PNA, MW=190	24.34	ABN/TIC											16000	J		
PNA, MW=192	23.80	ABN/TIC									14000	J				
PNA, MW=192	23.99	ABN/TIC							12000	J						

CHEMICAL DATA SUMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/kilograms (ug/kg) for soil samples and micrograms/liter (ug/L) for water sample
Compiled by: IT Corp.

	Traffic Report Number and Station Location						
Traffic Number:	FX903	FX904	FX905	FX908	FX908DL	FX909	FX909DL
Matrix:	Water	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture:	NA	5	6	5	5	5	5
Location and/or Sample Description:	TB-10	SS-09	SS-06	SS-07	SS-07	SS-08	SS-08

Compound Name	CAS No./RT	Class	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q
PNA, MW=192	24.00	ABN/TIC											8700	J		
PNA, MW=192	24.07	ABN/TIC							8500	J						
PNA, MW=204	24.70	ABN/TIC							12000	J						
PNA, MW=204	24.74	ABN/TIC											8100	J		
PNA, MW=216	26.67	ABN/TIC									19000	J			11000	J
PNA, MW=216	26.96	ABN/TIC									42000	J			25000	J
PNA, MW=216	27.09	ABN/TIC							14000	J						
PNA, MW=216	27.11	ABN/TIC													16000	J
PNA, MW=216	27.12	ABN/TIC									25000	J				
PNA, MW=216	27.22	ABN/TIC													13000	J
PNA, MW=216	27.24	ABN/TIC									20000	J				
PNA, MW=216	27.41	ABN/TIC							26000	J						
PNA, MW=216	27.52	ABN/TIC							16000	J						
PNA, MW=216	27.67	ABN/TIC							14000	J						
PNA, MW=217	29.62	ABN/TIC													6200	J
PNA, MW=217	29.86	ABN/TIC											7600	J		
PNA, MW=218	27.07	ABN/TIC											13000	J		
PNA, MW=226	28.69	ABN/TIC									18000	J			25000	J
PNA, MW=226	29.11	ABN/TIC							16000	J						
PNA, MW=228	28.99	ABN/TIC							16000	J						
PNA, MW=228	29.04	ABN/TIC											13000	J		
PNA, MW=228	29.47	ABN/TIC									16000	J			10000	J
PNA, MW=228	30.01	ABN/TIC							7800	J						
PNA, MW=228	30.07	ABN/TIC											6600	J		
PNA, MW=230	28.27	ABN/TIC									21000	J				
PNA, MW=234	28.77	ABN/TIC													10000	J
PNA, MW=234	28.96	ABN/TIC							15000	J						
PNA, MW=234	29.16	ABN/TIC							3800	J						
PNA, MW=240	30.57	ABN/TIC									22000	J				
PNA, MW=240	31.16	ABN/TIC							12000	J						
PNA, MW=242	30.19	ABN/TIC									20000	J				
PNA, MW=242	30.19	ABN/TIC													12000	J
PNA, MW=242	30.31	ABN/TIC													8300	J
PNA, MW=250	32.54	ABN/TIC													10000	J
PNA, MW=252	32.52	ABN/TIC									20000	J				
PNA, MW=252	33.14	ABN/TIC					150	J			85000	J			54000	J
PNA, MW=252	33.61	ABN/TIC									26000	J				
PNA, MW=252	33.62	ABN/TIC													15000	J
PNA, MW=252	34.64	ABN/TIC							12000	J						
PNA, MW=254	31.24	ABN/TIC							2400	J						
PNA, MW=254	31.29	ABN/TIC											9400	J		
PNA, MW=254	31.71	ABN/TIC													8300	J
SULFUR CONT[illegible]G PNA, MW=23	28.54	ABN/TIC													18000	J

CHEMICAL DA[illegible]MMARY

Site Name and Co[illegible] Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/kilograms (ug/kg) for soil samples and micrograms/liter (ug/L) for water sample
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			FX903				FX904				FX905				FX908				FX908DL				FX909				FX909DL		
Matrix:			Water				Soil				Soil				Soil				Soil				Soil				Soil		
Percent Moisture:			NA				5				6				5				5				5				5		
Location and/or Sample Description:			TB-10				SS-09				SS-06				SS-07				SS-07				SS-08				SS-08		
Compound Name	CAS No./RT	Class	Concentration	Q			Concentration	Q			Concentration	Q			Concentration	Q			Concentration	Q			Concentration	Q			Concentration	Q	
SULFUR CONTAINING PNA, MW=23	28.56	ABN/TIC																	27000	J									
SULFUR CONTAINING PNA, MW=23	28.99	ABN/TIC																					11000	J					
UNKNOWN OXYHODROCARBON	7.98	ABN/TIC									170	J																	
UNKNOWN OXYHODROCARBON	8.22	ABN/TIC									110	J																	
UNKNOWN OXYHYDROCARBON	8.47	ABN/TIC	3	J																									
UNKNOWN OXYHYDROCARBON	8.62	ABN/TIC					83	J																					
UNKNOWN SULFUR CONTAINING CO	9.45	ABN/TIC					140	J																					
UNKNOWN SULFUR CONTAINING CO	8.94	ABN/TIC									570	J																	

ABN - Acid/Base/Neutral
J - Data for analyte is estimated.
NJ - Presumptive evidence of compound presence.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DATA SUMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD 980622708)
Case Number: 18782
Concentrations in micrograms/liter (ug/L)
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			FX901		FX902		FX903		FX906		FX907		FY910	
Matrix:			Water		Water		Water		Water		Water		Water	
Percent Moisture:			NA		NA		NA		NA		NA		NA	
Location and/or Sample Description:			MW-02		MW-01		TB-10		MW-04		MW-05		MW-03	
Compound Name	**CAS No.**	**Class**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**
alpha-BHC	319-84-6	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
beta-BHC	319-85-7	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
delta-BHC	319-86-8	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
gamma-BHC	58-89-9	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Heptachlor	76-44-8	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Aldrin	309-00-2	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Heptachlor epoxide	1024-57-3	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Endosulfan I	959-98-8	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Dieldrin	60-57-1	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
4,4'-DDE	72-55-9	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Endrin	72-20-8	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Endosulfan II	33213-65-9	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
4,4'-DDD	72-54-8	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Endosulfan sulfate	1031-07-8	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
4,4'-DDT	50-29-3	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Methoxychlor	72-43-5	PES	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Endrin ketone	53494-70-5	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Endrin aldehyde	7421-93-4	PES	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
alpha-Chlordane	5103-71-9	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
gamma-Chlordane	5103-74-2	PES	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Toxaphene	8001-35-2	PES	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Aroclor-1016	12674-11-2	PES	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1221	11104-28-2	PES	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Aroclor-1232	11141-16-5	PES	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1242	53469-21-9	PES	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1248	12672-29-6	PES	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1254	11097-69-1	PES	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1260	11096-82-5	PES	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U

J - Data for analyte is estimated.
P - Greater than 25% difference between two GC columns for detected concentrations.
PES - Pesticide/PCB
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DA UMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD 980622708)
Case Number: 18782
Concentrations in micrograms/kilogram (ug/kg)
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			FX904				FX904RE				FX905				FX908				FX908DL				FX909				FX909DL			
Matrix:			Soil				Soil				Soil				Soil				Soil				Soil				Soil			
Percent Moisture:			5				5				6				5				5				5				5			
Location and/or Sample Description:			SS-09				SS-09				SS-06				SS-07				SS-07				SS-08				SS-08			
Compound Name	**CAS No.**	**Class**	**Concentration**	**C**			**Concentration**	**C**			**Concentration**	**C**			**Concentration**	**C**			**Concentration**	**C**			**Concentration**	**C**			**Concentration**	**C**		
alpha-BHC	319-84-6	PES	1.8	U			1.8	U			1.8	U			1.8	U			180	U			1.8	U			180	U		
beta-BHC	319-85-7	PES	1.8	U			1.8	U			1.8	U			1.8	U			180	U			1.8	U			180	U		
delta-BHC	319-86-8	PES	1.8	U			1.8	U			1.8	U			1.8	UJ			180	U			1.8	UJ			180	U		
gamma-BHC	58-89-9	PES	1.8	U			1.8	U			1.8	U			1.8	UJ			180	U			1.8	UJ			180	U		
Heptachlor	76-44-8	PES	1.8	U			1.8	U			1.8	U			1.8	U			150	DJP			1.8	U			150	DJP		
Aldrin	309-00-2	PES	1.8	U			1.8	U			1.8	U			15	JP			180	U			14	JP			180	U		
Heptachlor epoxide	1024-57-3	PES	1.8	U			1.8	U			3.3	JP			8.5	JP			180	U			8.3	JP			180	U		
Endosulfan I	959-98-8	PES	1.8	U			1.8	U			1.8	U			1.8	U			180	U			1.8	U			180	U		
Dieldrin	60-57-1	PES	21	X			21	JX			3.0	JP			3.5	UJ			310	DJP			3.5	UJ			62	DJP		
4,4'-DDE	72-55-9	PES	1.6	JX			1.7	JX			3.5	U			3.5	UJ			350	U			3.5	UJ			350	U		
Endrin	72-20-8	PES	2.1	JX			2.1	JX			3.5	U			3.5	UJ			350	U			3.5	UJ			350	U		
Endosulfan II	33213-65-9	PES	3.5	U			3.5	U			3.5	U			3.5	UJ			350	U			3.5	UJ			350	U		
4,4'-DDD	72-54-8	PES	1.4	JXP			1.3	JXP			3.5	U			3.5	U			350	U			3.5	U			350	U		
Endosulfan sulfate	1031-07-8	PES	3.5	U			3.5	U			3.5	U			3.5	U			350	U			3.5	U			350	U		
4,4'-DDT	50-29-3	PES	7.0	XP			7.1	XP			1.8	J			3.5	UJ			350	U			3.5	UJ			350	U		
Methoxychlor	72-43-5	PES	18	U			18	U			18	U			18	UJ			1800	U			18	UJ			1800	U		
Endrin ketone	53494-70-5	PES	3.5	U			3.5	U			3.5	U			3.5	UJ			280	DJP			3.5	UJ			190	DJP		
Endrin aldehyde	7421-93-4	PES	3.5	U			3.5	U			3.5	U			3.5	U			350	U			3.5	U			350	U		
alpha-Chlordane	5103-71-9	PES	2.5	XP			2.6	XP			6.2				5.9	JP			180	U			5.5	JP			180	U		
gamma-Chlordane	5103-74-2	PES	2.4	XP			2.3	XP			5.2				1.8	U			180	U			1.8	U			180	U		
Toxaphene	8001-35-2	PES	180	U			180	U			180	U			180	UJ			18000	U			180	UJ			18000	U		
Aroclor-1016	12674-11-2	PES	35	U			35	U			35	U			35	U			3500	U			35	U			3500	U		
Aroclor-1221	11104-28-2	PES	71	U			71	U			71	U			71	U			7100	U			71	U			7100	U		
Aroclor-1232	11141-16-5	PES	35	U			35	U			35	U			35	U			3500	U			35	U			3500	U		
Aroclor-1242	53469-21-9	PES	35	U			35	U			35	U			35	U			3500	U			35	U			3500	U		
Aroclor-1248	12672-29-6	PES	35	U			35	U			35	U			35	U			3500	U			35	U			3500	U		
Aroclor-1254	11097-69-1	PES	26	JP			26	JP			35	U			35	UJ			3500	U			35	UJ			3500	U		
Aroclor-1260	11096-82-5	PES	35	U			35	U			35	U			35	UJ			3500	U			35	UJ			3500	U		

D - Diluted sample result.
J - Data for analyte is estimated.
P - Greater than 25% difference between two GC columns for detected concentrations.
PES - Pesticide/PCB
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
X - Results are considered suspect because retention time windows fall within the range of peaks belonging to Aroclors.

DATA QUALITY ASSURANCE REVIEW

Site Name:	Albuquerque Coronado Landfill	JTS 423251
Site Code:	NMD980622708	
Case Number:	18782	

Laboratory: Data Chem Laboratories, Inc. -- Salt Lake City, Utah

Water Samples: MFW402, MFW403, MFW404, MFW407, MFW408, and MFW411

Soil Samples: MFW405, MFW406, MFW409, and MFW410

The data package consisted of six water samples and four soil samples analyzed for TCL metals and cyanide:

1. Analytical Parameters: All samples were analyzed using low concentration protocols.

2. Holding Times: All sample preparation and analysis were conducted within holding time limits.

3. Calibration Verifications: All initial calibration verification results were within control limits. All continuing calibration verifications were conducted at the proper frequency, and the results were within control limits.

4. Blanks: The concentration of copper, mercury, and selenium in the soil calibration blanks were above the instrument detection limit (IDL) but less than the contract required detection limits (CRDL). The copper results for samples MF405, MFW406, MFW409, and MFW410 were qualified as undetected (U). The concentration of copper and sodium in the soil preparation blank were above the IDL but less than the CRDL. The concentrations of iron and sodium in the water preparation blank were above the IDL but less than the CRDL.

5. Matrix Spike Recoveries: The selenium results in the soil samples were qualified as unusable (R) due to a 27.1 percent pre-digestion matrix spike recovery. The antimony and thallium results in the soil samples were qualified as estimated (UJ) due to pre-digestion matrix spike recoveries of 44.1 percent and 72.3 percent, respectively. The

The selenium result for water sample MFW402 was qualified as estimated (J) due to a minus 115.9 percent pre-digestion matrix spike recovery. The selenium results in samples MFW403, MFW404, MFW407, MFW408, and MFW411 were qualified as unusable (R) due to a minus 115.9 percent pre-digestion matrix spike recovery. The thallium results in the water samples were qualified as estimated (UJ) due to 68.9 percent pre-digestion matrix spike recovery.

6. Duplicates: The zinc results in the soil samples were qualified as estimated (J) due to a 112.8 percent relative percent difference for duplicate results. The 200.4 mg/kg difference between duplicate barium results exceeded the technical limit of 84.2 mg/kg (twice the CRDL). The barium results in the soil samples were qualified as estimated.

7. Laboratory Control Samples: All silver results for water samples were qualified as unusable (R) due to a 30.4 percent recovery for the laboratory control sample.

8. ICP Interference Check Sample: ICP interference check samples were analyzed at the specified frequency, and the results were within control limits.

9. ICP Serial Dilution: The zinc results in the soil samples were qualified as estimated (J) due to a 13.0 percent serial dilution difference. The iron results in the water samples were qualified as estimated (J) due to a 460.4 percent serial dilution difference.

10. Furnace AA: The arsenic result for MFW411 was qualified as estimated (J) due to a 116.5 percent FAA analytical spike recovery. The FAA analytical spike recoveries for selenium in MFW403, MFW406, MFW407, MFW408, MFW409, MFW410, and MFW411 ranged from 48.9 percent to 80.5 percent. All thallium results were qualified as estimated (UJ) due to FAA analytical spike recoveries ranging from 62.2 percent to 118.5 percent. The selenium result for MFW402 was qualified as estimated (J) because the FAA analytical spike recoveries were below 40 percent, two times even when diluted. The percent relative standard deviation for selenium in MFW405 had duplicate injections above 20 percent for both the initial run and the rerun. The FAA analytical spike recoveries were 16.4 percent and 71.1 percent, respectively.

11. Sample Result Verification: Form DC-2 was incorrectly numbered. The data package stopped at page 406. Form DC-2 had been numbered to page 457.

12. Overall Assessment of Data: The data package was provisional for the following reasons:

A. Blank concentrations were above the instrument detection limits.

B. Laboratory control sample results were not within control limits.

C. Differences between duplicate results exceeded quality control limits.

D. Matrix spike recoveries were outside of quality control limits.

E. Soil field duplicate results for chromium had a relative percent difference between the duplicate sample of 76.8 percent.

F. Serial dilution results exceeded quality control limits.

G. Percent relative standard deviations for duplicate FAA injections were above 20 percent.

H. FAA analytical spike recoveries exceeded the quality control limits 10 of 40 determinations.

I. FAA analytical spike recoveries were below 40 percent for both the diluted and undiluted samples.

J. Form DC-2 was incorrectly numbered.

Reviewer: Bennett Howell QA Review: Wendy W. Gram

CHEMICAL DATA .MARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in micrograms/liter (ug/L)
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			MFW402		MFW403		MFW404		MFW407		MFW408		MFW411	
Matrix:			Water		Water		Water		Water		Water		Water	
Percent Solids:			0.0		0.0		0.0		0.0		0.0		0.0	
Location and/or Sample Description:			MW-02		MW-01		TB-10		MW-04		MW-05		MW-03	
Compound Name	**CAS No.**	**Class**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**
Aluminum	7429-90-5	INO	46.7	U	70.5	B	46.7	U	46.7	U	46.7	U	581	
Antimony	7440-36-0	INO	66.7	U	66.7	U	66.7	U	66.7	U	66.7	U	66.7	U
Arsenic	7440-38-2	INO	1.8	B	1.1	U	1.1	U	2.0	B	2.0	B	3.1	J
Barium	7440-39-3	INO	110	B	226		6.7	U	124	B	130	B	65.7	B
Beryllium	7440-41-7	INO	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
Cadmium	7440-43-9	INO	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U
Calcium	7440-70-2	INO	117000		74700		31.1	U	122000		129000		53500	
Chromium	7440-47-3	INO	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Cobalt	7440-48-4	INO	12.2	U	12.2	U	12.2	U	12.2	U	12.2	U	12.2	U
Copper	7440-50-8	INO	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U
Iron	7439-89-6	INO	11.7	J	18.4	J	11.1	UJ	11.1	UJ	11.1	UJ	411	J
Lead	7439-92-1	INO	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	2.2	B
Magnesium	7439-95-4	INO	16500		9950		71.1	U	17900		18900		11200	
Manganese	7439-96-5	INO	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	8.6	B
Mercury	7439-97-6	INO	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Nickel	7440-02-0	INO	32.2	U	32.2	U	32.2	U	32.2	U	32.2	U	32.2	U
Potassium	7440-09-7	INO	3980	B	6990		1140	U	4500	B	4650	B	3340	B
Selenium	7782-49-2	INO	20.2	J	1.1	R	1.1	R	1.1	R	1.1	R	1.1	R
Silver	7440-22-4	INO	4.4	R	4.4	R	4.4	R	4.4	R	4.4	R	4.4	R
Sodium	7440-23-5	INO	30100		32400		686	B	41500		43500		24200	
Thallium	7440-28-0	INO	2.2	UJ	2.2	UJ	2.2	UJ	2.2	UJ	2.2	UJ	2.2	UJ
Vanadium	7440-62-2	INO	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U
Zinc	7440-66-6	INO	10.6	B	10.0	U	10.0	U	10.0	U	10.0	U	28.9	
Cyanide		INO	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

INO - Inorganic
B - Analyte was detected above the IDL but below the CRDL.
J - The associated value is an estimated quantity.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DATA SUMMARY

Site Name and Code: Albuquerque Coronado Landfill (NMD980622708)
Case Number: 18782
Concentrations in milligrams/kilogram (mg/kg)
Compiled by: IT Corp.

Traffic Report Number and Station Location

Traffic Number:			MFW405		MFW406		MFW409		MFW410	
Matrix:			Soil		Soil		Soil		Soil	
Percent Solids:			95.7		94.9		94.0		93.5	
Location and/or Sample Description:			SS-09		SS-06		SS-07		SS-08	
Compound Name	**CAS No.**	**Class**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**	**Concentration**	**C**
Aluminum	7429-90-5	INO	9350		4290		4310		4150	
Antimony	7440-36-0	INO	12.5	UJ	12.6	UJ	12.8	UJ	12.8	UJ
Arsenic	7440-38-2	INO	2.7		1.3	B	2.3		1.9	B
Barium	7440-39-3	INO	138	J	64.5	J	119	J	122	J
Beryllium	7440-41-7	INO	0.51	B	0.42	U	0.43	U	0.43	U
Cadmium	7440-43-9	INO	1.0	U	1.1	U	1.1	U	1.1	U
Calcium	7440-70-2	INO	25600		13000		10900		10400	
Chromium	7440-47-3	INO	6.2		3.4		20.9		9.3	
Cobalt	7440-48-4	INO	5.1	B	2.5	B	3.7	B	2.9	B
Copper	7440-50-8	INO	12.8	U	7.3	U	18.0	U	21.7	U
Iron	7439-89-6	INO	12800		6320		7920		7850	
Lead	7439-92-1	INO	10.1		8.9		72.4		62.5	
Magnesium	7439-95-4	INO	4410		2150		1960		1970	
Manganese	7439-96-5	INO	321	J	185	J	201	J	193	J
Mercury	7439-97-6	INO	0.05	U	0.05	U	0.09	B	0.09	B
Nickel	7440-02-0	INO	9.6		6.1	U	7.5	B	8.7	
Potassium	7440-09-7	INO	2080		1260		1260		1270	
Selenium	7782-49-2	INO	2.1	R	2.1	R	0.21	R	0.21	R
Silver	7440-22-4	INO	0.84	U	0.84	U	0.85	U	0.86	U
Sodium	7440-23-5	INO	257	B	105	B	261	B	261	B
Thallium	7440-28-0	INO	0.42	UJ	0.42	UJ	0.43	UJ	0.43	UJ
Vanadium	7440-62-2	INO	22.2		9.3	B	14.1		12.0	
Zinc	7440-66-6	INO	52.4	J	35.8	J	114	J	101	J
Cyanide		INO	0.52	U	0.53	U	0.53	U	0.53	U

INO - Inorganic
B - Possible laboratory contaminant.
J - The associated value is an estimated quantity.
R - Data for analyte is unusable.
U - The material was analyzed for but was not detected above the level of the associated value.
UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

Exhibit A-13

PHILIPS

VIA FEDERAL EXPRESS

July 21, 1994

a Philips Electronics North America Company

811 E. Arques Avenue
P.O. Box 3409
Sunnyvale, CA 94088-3409
Telephone 408 991-2000

Ms. Nancy Reinhart Morlock
Environmental Engineer
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, TX 75202-2733

Re: ***Philips Semiconductors, Albuquerque, New Mexico***

Dear Ms. Morlock:

Thank you for our meeting on June 23. Jim Cochran and I appreciate the opportunity to discuss the proposed expansion and the upcoming renewal of the Part B Permit.

During our meeting you requested that Philips provide the current groundwater monitoring results for the Philips-Albuquerque site. Enclosed please find copies of the quarterly Enseco reports for 1993 and Quarter 1 for 1994. With regard to the location of the City of Albuquerque's well/pumping station, I have enclosed a partial copy of the City's well map. According to the map, the nearest well is 1.5 miles (approximately) southeast of the Philips property.

With regard to the proposed expansion, Philips is only in the preliminary decision-making stage. If the expansion project does go forward, Philips will take the necessary steps to notify and obtain excavation permits from the city/local agencies.

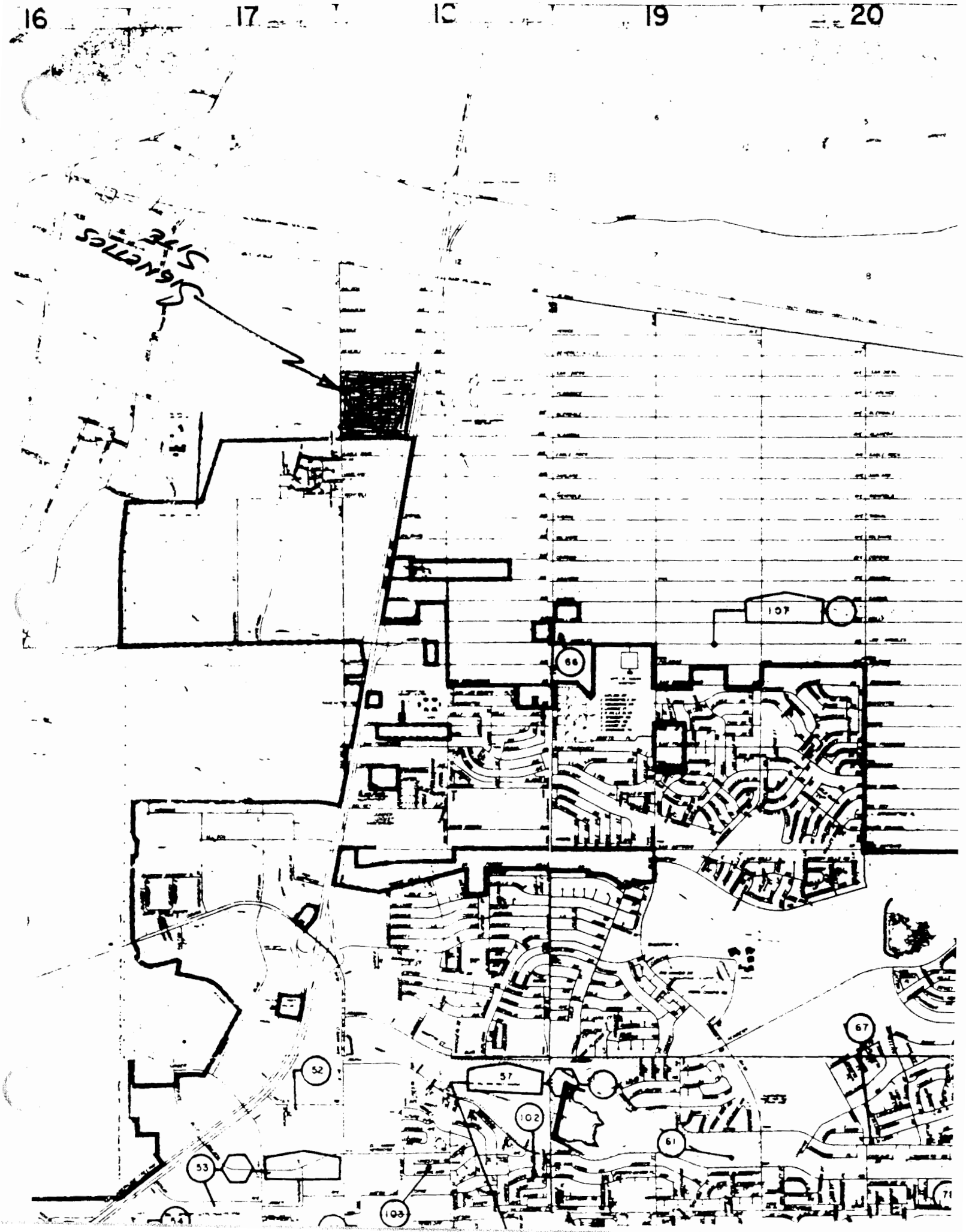
If you have any questions concerning the enclosed material, please don't hesitate to contact me at your earliest convenience.

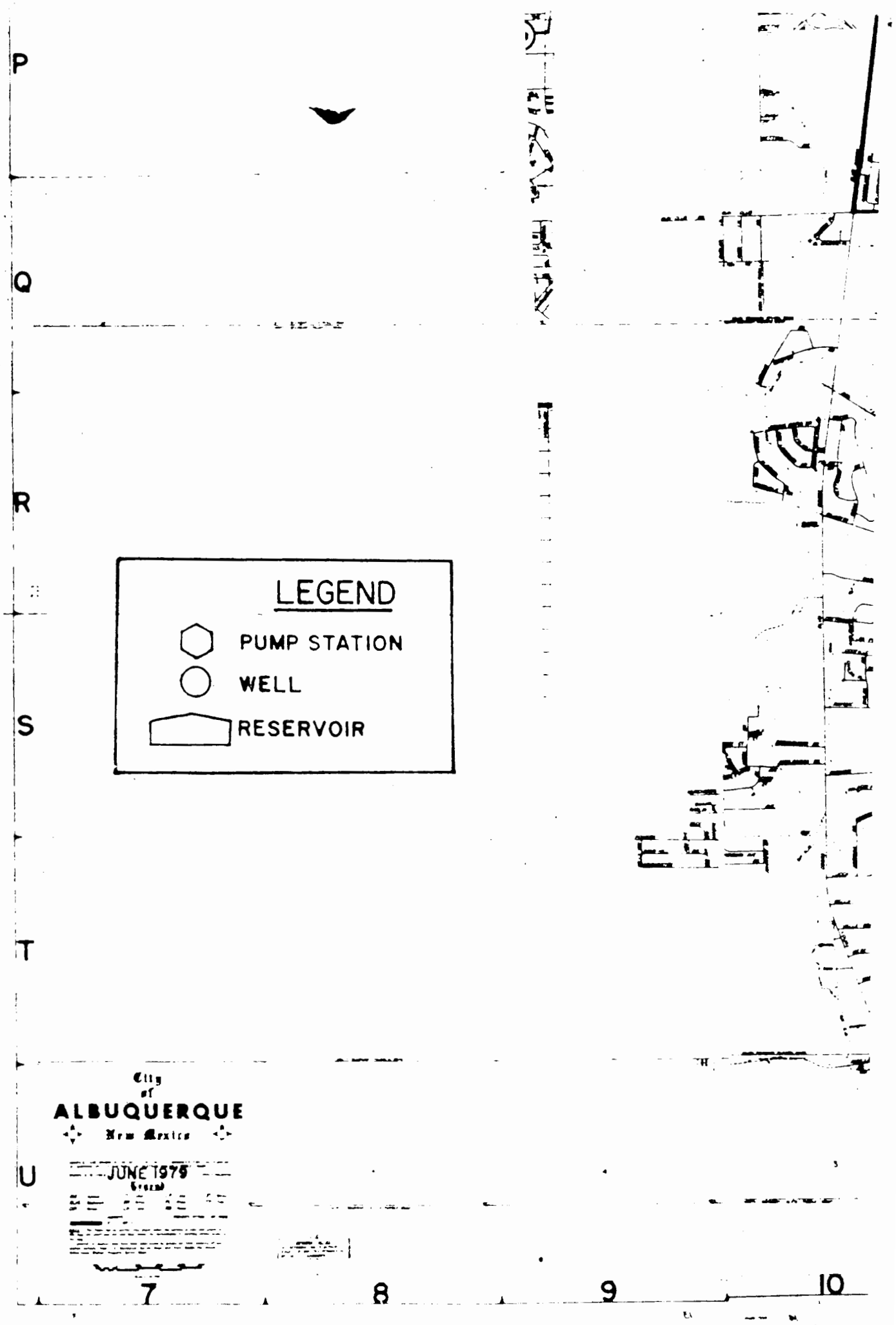
Sincerely yours,

James N. Casey
Counsel

JNC:cb
Enclosures

cc: Jim Cochran


16
17
18
19
20
Generator Site
107
66
57
102
61
67
52
53
103


P
Q
R
S
T
U
LEGEND
PUMP STATION
WELL
RESERVOIR
City of
ALBUQUERQUE
New Mexico
JUNE 1975
7
8
9
10

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
028444-0001-SA	Groundwater Well #1	AQUEOUS	30 MAR 93	13:30	01 APR 93
028444-0002-SA	Groundwater Well #2	AQUEOUS	30 MAR 93	11:05	01 APR 93
028444-0003-SA	Well #3	AQUEOUS	31 MAR 93	14:10	01 APR 93
028444-0004-SA	Well #4	AQUEOUS	31 MAR 93	11:45	01 APR 93
028444-0005-SA	Trip Blank	AQUEOUS	31 MAR 93		01 APR 93

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 028444	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Groundwater Well #1
Lab ID: 028444-0001-SA
Matrix: AQUEOUS Sampled: 30 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	8.3	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Groundwater Well #2
Lab ID: 028444-0002-SA
Matrix: AQUEOUS Sampled: 30 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	7.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	107	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #3
Lab ID: 028444-0003-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #4
Lab ID: 028444-0004-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.7	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip Blank
Lab ID: 028444-0005-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	103	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Groundwater Well #1
Lab ID: 028444-0001-SA
Matrix: AQUEOUS Sampled: 30 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	08 APR 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	05 APR 93

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Will Pratt

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Groundwater Well #2
Lab ID: 028444-0002-SA
Matrix: AQUEOUS Sampled: 30 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	08 APR 93
Total Organic Carbon	1.7	mg/L	0.50	9060	NA	05 APR 93

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Will Pratt

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Well #3
Lab ID: 028444-0003-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	08 APR 93
Total Organic Carbon	0.78	mg/L	0.50	9060	NA	05 APR 93

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Will Pratt

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Well #4
Lab ID: 028444-0004-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	08 APR 93
Total Organic Carbon	1.9	mg/L	0.50	9060	NA	05 APR 93

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Will Pratt

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
028444-0001-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J
028444-0002-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J
028444-0003-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J
028444-0004-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J
028444-0005-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Limi
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 09 APR 93-6J								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	5.40	5.25	5.32	107	68-122	2.8	1
Chloroform	5.00	5.18	5.16	5.17	103	71-145	0.4	1
Bromodichloromethane	10.0	9.00	9.14	9.07	91	62-118	1.5	1
Trichloroethene	5.00	4.28	4.44	4.36	87	70-129	3.7	1
Chlorobenzene	5.00	4.90	5.07	4.98	100	62-115	3.4	1

Calculations are performed before rounding to avoid round-off errors in calculated results.

Enseco
A Corning Company

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 09 APR 93-6J QC Run: 09 APR 93-6J				
Concentration Units: ug/L				
Bromochloromethane	5.00	5.46	109	50-144

Calculations are performed before rounding to avoid round-off errors in calculated results

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 09 APR 93-6J QC Run: 09 APR 93-6J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 09 APR 93-6J QC Run: 09 APR 93-6J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 09 APR 93-6J QC Run: 09 APR 93-6J

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
:t Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
028444-0001-SA	AQUEOUS	TKN-A	07 APR 93-6A	07 APR 93-6A
028444-0001-SA	AQUEOUS	TOC-A	05 APR 93-6A	-
028444-0002-SA	AQUEOUS	TKN-A	07 APR 93-6A	07 APR 93-6A
028444-0002-SA	AQUEOUS	TOC-A	05 APR 93-6A	-
028444-0003-SA	AQUEOUS	TKN-A	07 APR 93-6A	07 APR 93-6A
028444-0003-SA	AQUEOUS	TOC-A	05 APR 93-6A	-
028444-0004-SA	AQUEOUS	TKN-A	07 APR 93-6A	07 APR 93-6A
028444-0004-SA	AQUEOUS	TOC-A	05 APR 93-6A	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisi (RPD) DCS	Precisi (RPD) Lim
Category: TKN-A Matrix: AQUEOUS QC Lot: 07 APR 93-6A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	5.00	4.55	4.83	4.69	94	78-122	6.0	2
Category: TOC-A Matrix: AQUEOUS QC Lot: 05 APR 93-6A Concentration Units: mg/L								
Total Organic Carbon	25.0	24.8	24.8	24.8	99	91-109	0.0	1

Calculations are performed before rounding to avoid round-off errors in calculated results

Enseco
A Corning Company

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 07 APR 93-6A QC Run: 07 APR 93-6A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
029880-0001-SA	WELL 1	AQUEOUS	29 JUN 93		02 JUL 93
029880-0002-SA	WELL 2	AQUEOUS	29 JUN 93	10:40	02 JUL 93
029880-0003-SA	WELL 3	AQUEOUS	30 JUN 93	11:20	02 JUL 93
029880-0004-SA	WELL 4	AQUEOUS	30 JUN 93	09:00	02 JUL 93
029880-0005-TB	TRIP BLANK	AQUEOUS	02 JUL 93		02 JUL 93

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL 1
Lab ID: 029880-0001-SA
Matrix: AQUEOUS Sampled: 29 JUN 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	12	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	103	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Ensecc
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL 2
Lab ID: 029880-0002-SA
Matrix: AQUEOUS Sampled: 29 JUN 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	4.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	82	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL 3
Lab ID: 029880-0003-SA
Matrix: AQUEOUS Sampled: 30 JUN 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Ensecc
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL 4
Lab ID: 029880-0004-SA
Matrix: AQUEOUS Sampled: 30 JUN 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	3.6	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	104	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: TRIP BLANK
Lab ID: 029880-0005-TB
Matrix: AQUEOUS Sampled: 02 JUL 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	106	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL 1
Lab ID: 029880-0001-SA
Matrix: AQUEOUS
Authorized: 02 JUL 93

Sampled: 29 JUN 93
Prepared: See Below

Received: 02 JUL 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JUL 93
Total Organic Carbon	0.73	mg/L	0.50	9060	NA	14 JUL 93

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL 2
Lab ID: 029880-0002-SA
Matrix: AQUEOUS
Authorized: 02 JUL 93

Sampled: 29 JUN 93
Prepared: See Below

Received: 02 JUL 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JUL 93
Total Organic Carbon	0.92	mg/L	0.50	9060	NA	14 JUL 93

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL 3
Lab ID: 029880-0003-SA
Matrix: AQUEOUS
Authorized: 02 JUL 93

Sampled: 30 JUN 93
Prepared: See Below

Received: 02 JUL 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JUL 93
Total Organic Carbon	0.51	mg/L	0.50	9060	NA	14 JUL 93

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL 4
Lab ID: 029880-0004-SA
Matrix: AQUEOUS
Authorized: 02 JUL 93

Sampled: 30 JUN 93
Prepared: See Below

Received: 02 JUL 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	0.61	mg/L	0.50	351.2	NA	15 JUL 93
Total Organic Carbon	0.99	mg/L	0.50	9060	NA	14 JUL 93

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Blake Besser

IV. QUALITY CONTROL REPORT

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data;

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix;

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench; and

4) provide a standard set of reportables that assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix that is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029880-0001-SA	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F
029880-0002-SA	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F
029880-0003-SA	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F
029880-0004-SA	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F
029880-0005-TB	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precisio (RPD) DCS	Limi
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 14 JUL 93-F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.60	4.74	4.67	93	68-122	3.0	1
Chloroform	5.00	5.01	5.24	5.12	103	71-145	4.5	1
Bromodichloromethane	10.0	9.61	9.91	9.76	98	62-118	3.1	1
Trichloroethene	5.00	4.81	4.92	4.86	97	70-129	2.3	1
Chlorobenzene	5.00	4.60	4.66	4.63	93	62-115	1.3	1

Calculations are performed before rounding to avoid round-off errors in calculated results.

Enseco
A Corning Company

NGLE CONTROL SAMPLE REPORT
rganics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 14 JUL 93-F QC Run: 14 JUL 93-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	5.66	113	50-144

Calculations are performed before rounding to avoid round-off errors in calculated results.

Enseco
A Corning Company

THOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 14 JUL 93-F QC Run: 14 JUL 93-F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 14 JUL 93-F QC Run: 14 JUL 93-F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 14 JUL 93-F QC Run: 14 JUL 93-F

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco
A Corning Company

LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029880-0001-SA	AQUEOUS	TKN-A	12 JUL 93-6A	12 JUL 93-6A
029880-0001-SA	AQUEOUS	TOC-A	14 JUL 93-1A	-
029880-0002-SA	AQUEOUS	TKN-A	12 JUL 93-6A	12 JUL 93-6A
029880-0002-SA	AQUEOUS	TOC-A	14 JUL 93-1A	-
029880-0003-SA	AQUEOUS	TKN-A	12 JUL 93-6A	12 JUL 93-6A
029880-0003-SA	AQUEOUS	TOC-A	14 JUL 93-1A	-
029880-0004-SA	AQUEOUS	TKN-A	12 JUL 93-6A	12 JUL 93-6A
029880-0004-SA	AQUEOUS	TOC-A	14 JUL 93-1A	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 12 JUL 93-6A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.77	5.39	5.61	5.50	115	78-122	4.0	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 14 JUL 93-1A Concentration Units: mg/L								
Total Organic Carbon	25.0	24.0	24.6	24.3	97	91-109	2.5	20

Calculations are performed before rounding to avoid round-off errors in calculated res

Enseco
A Corning Company

THOD BLANK REPORT
.t Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 12 JUL 93-6A QC Run: 12 JUL 93-6A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
031610-0001-SA	GROUND WATER SAMPLES WELL#1	AQUEOUS	08 OCT 93	14:20	09 OCT 93
031610-0002-SA	GROUND WATER SAMPLES WELL#2	AQUEOUS	08 OCT 93	14:20	09 OCT 93
031610-0003-SA	GROUND WATER SAMPLES WELL#3	AQUEOUS	08 OCT 93	14:20	09 OCT 93
031610-0004-SA	GROUND WATER SAMPLES WELL#4	AQUEOUS	08 OCT 93	14:20	09 OCT 93
031610-0005-TB	TRIP BLANK	AQUEOUS	08 OCT 93		09 OCT 93

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 031610	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#1
Lab ID: 031610-0001-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	13	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	102	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Coming Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#2
Lab ID: 031610-0002-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.9	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	116	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#3
Lab ID: 031610-0003-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#4
Lab ID: 031610-0004-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.4	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	107	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: TRIP BLANK
Lab ID: 031610-0005-TB
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	116	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#1
Lab ID: 031610-0001-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	19 OCT 93
Total Organic Carbon	0.84	mg/L	0.50	9060	NA	21 OCT 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Steve Shurgot

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#2
Lab ID: 031610-0002-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	19 OCT 93
Total Organic Carbon	ND	mg/L	0.50	9060	NA	21 OCT 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Steve Shurgot

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#3
Lab ID: 031610-0003-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	19 OCT 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	21 OCT 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Steve Shurgot

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#4
Lab ID: 031610-0004-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	19 OCT 93
Total Organic Carbon	ND	mg/L	0.50	9060	NA	21 OCT 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Steve Shurgot

Quality Control Report

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of Duplicate Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Enseco
A Corning Company

LOT ASSIGNMENT REPORT
ganics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
031610-0001-SA	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F
031610-0002-SA	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F
031610-0003-SA	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F
031610-0004-SA	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F
031610-0005-TB	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 11 OCT 93-1F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.31	4.36	4.34	87	68-122	1.2	13
Chloroform	5.00	4.69	4.89	4.79	96	71-145	4.2	13
Bromodichloromethane	10.0	8.07	8.45	8.26	83	62-118	4.6	15
Trichloroethene	5.00	4.51	4.82	4.66	93	70-129	6.6	14
Chlorobenzene	5.00	4.43	4.81	4.62	92	62-115	8.2	19

Calculations are performed before rounding to avoid round-off errors in calculated results.

Enseco
A Corning Company

"ETHOD BLANK REPORT
ganics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 OCT 93-1F QC Run: 11 OCT 93-1F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
'ans-1,3-Dichloropropene	ND	ug/L	1.0
ichloroethene	ND	ug/L	0.50
ɔibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 OCT 93-1F QC Run: 11 OCT 93-1F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 11 OCT 93-1F QC Run: 11 OCT 93-1F

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco
A Corning Company

LOT ASSIGNMENT REPORT
Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
031610-0001-SA	AQUEOUS	TKN-A	18 OCT 93-1M	18 OCT 93-1M
031610-0001-SA	AQUEOUS	TOC-A	21 OCT 93-1A	-
031610-0002-SA	AQUEOUS	TKN-A	18 OCT 93-1M	18 OCT 93-1M
031610-0002-SA	AQUEOUS	TOC-A	21 OCT 93-1A	-
031610-0003-SA	AQUEOUS	TKN-A	18 OCT 93-1M	18 OCT 93-1M
031610-0003-SA	AQUEOUS	TOC-A	21 OCT 93-1A	-
031610-0004-SA	AQUEOUS	TKN-A	18 OCT 93-1M	18 OCT 93-1M
031610-0004-SA	AQUEOUS	TOC-A	21 OCT 93-1A	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 18 OCT 93-1M Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.77	5.21	5.14	5.18	108	78-122	1.4	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 21 OCT 93-1A Concentration Units: mg/L								
Total Organic Carbon	25.0	25.1	24.9	25.0	100	91-109	0.7	20

Calculations are performed before rounding to avoid round-off errors in calculated resu

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 18 OCT 93-1M QC Run: 18 OCT 93-1M			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
032131-0001-SA	GROUND WATER SAMPLES WELL #1	AQUEOUS	05 NOV 93	13:00	06 NOV 93
032131-0002-SA	GROUND WATER SAMPLES WELL #2	AQUEOUS	05 NOV 93	13:00	06 NOV 93
032131-0003-SA	GROUND WATER SAMPLES WELL #3	AQUEOUS	05 NOV 93	13:00	06 NOV 93
032131-0004-SA	GROUND WATER SAMPLES WELL #4	AQUEOUS	05 NOV 93	13:00	06 NOV 93
032131-0005-TB	TRIP BLANK	AQUEOUS	05 NOV 93	13:00	06 NOV 93

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 032131	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #1
Lab ID: 032131-0001-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 11 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	10	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	86	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #2
Lab ID: 032131-0002-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 12 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	8.7	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	81	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #3
Lab ID: 032131-0003-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 12 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	74	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #4
Lab ID: 032131-0004-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 12 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.6	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	77	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: TRIP BLANK
Lab ID: 032131-0005-TB
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 12 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	80	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #1
Lab ID: 032131-0001-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	12 NOV 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	11 NOV 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Lavon Trujillo

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #2
Lab ID: 032131-0002-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	12 NOV 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	11 NOV 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Lavon Trujillo

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #3
Lab ID: 032131-0003-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	12 NOV 93
Total Organic Carbon	1.3	mg/L	0.50	9060	NA	11 NOV 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Lavon Trujillo

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #4
Lab ID: 032131-0004-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	12 NOV 93
Total Organic Carbon	3.8	mg/L	0.50	9060	NA	11 NOV 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Lavon Trujillo

Quality Control Report

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of Duplicate Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly Basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
032131-0001-SA	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F
032131-0002-SA	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F
032131-0003-SA	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F
032131-0004-SA	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F
032131-0005-TB	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 11 NOV 93-4F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.82	4.78	4.80	96	68-122	0.8	13
Chloroform	5.00	4.92	4.93	4.92	99	71-145	0.2	13
Bromodichloromethane	10.0	8.96	8.84	8.90	89	62-118	1.3	15
Trichloroethene	5.00	5.45	5.44	5.44	109	70-129	0.2	14
Chlorobenzene	5.00	4.85	4.67	4.76	95	62-115	3.8	19

Calculations are performed before rounding to avoid round-off errors in calculated results.

Enseco
A Corning Company

NGLE CONTROL SAMPLE REPORT
rganics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 11 NOV 93-4F QC Run: 11 NOV 93-4F				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.65	93	50-144

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 NOV 93-4F QC Run: 11 NOV 93-4F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 NOV 93-4F QC Run: 11 NOV 93-4F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

THOD BLANK REPORT
rganics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 11 NOV 93-4F QC Run: 11 NOV 93-4F

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
trachloroethene	ND	ug/L	0.50
orobenzene	ND	ug/L	2.0

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
032131-0001-SA	AQUEOUS	TKN-A	09 NOV 93-1M	09 NOV 93-1M
032131-0001-SA	AQUEOUS	TOC-A	11 NOV 93-1T	-
032131-0002-SA	AQUEOUS	TKN-A	09 NOV 93-1M	09 NOV 93-1M
032131-0002-SA	AQUEOUS	TOC-A	11 NOV 93-1T	-
032131-0003-SA	AQUEOUS	TKN-A	09 NOV 93-1M	09 NOV 93-1M
032131-0003-SA	AQUEOUS	TOC-A	11 NOV 93-1T	-
032131-0004-SA	AQUEOUS	TKN-A	09 NOV 93-1M	09 NOV 93-1M
032131-0004-SA	AQUEOUS	TOC-A	11 NOV 93-1T	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
t Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 09 NOV 93-1M Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.77	5.07	5.06	5.06	106	78-122	0.2	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 11 NOV 93-1T Concentration Units: mg/L								
Total Organic Carbon	25.0	25.7	26.0	25.9	103	91-109	1.0	20

^alculations are performed before rounding to avoid round-off errors in calculated results.

Enseco
A Corning Company

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 09 NOV 93-1M QC Run: 09 NOV 93-1M			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Enseco

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
034371-0001-SA	Ground Water Well 3	AQUEOUS	18 MAR 94	07:40	19 MAR 94
034371-0002-SA	Ground Water Well 4	AQUEOUS	17 MAR 94	07:35	19 MAR 94
034371-0003-SA	Ground Water Well 1	AQUEOUS	16 MAR 94	07:50	19 MAR 94
034371-0004-SA	Ground Water Well 2	AQUEOUS	14 MAR 94	13:10	19 MAR 94
034371-0005-SA	Trip Blank	AQUEOUS			19 MAR 94

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 034371	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 3
Lab ID: 034371-0001-SA
Matrix: AQUEOUS Sampled: 18 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 4
Lab ID: 034371-0002-SA
Matrix: AQUEOUS Sampled: 17 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.4	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	95	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 1
Lab ID: 034371-0003-SA
Matrix: AQUEOUS Sampled: 16 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.8	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	82	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 2
Lab ID: 034371-0004-SA
Matrix: AQUEOUS Sampled: 14 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	86	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip Blank
Lab ID: 034371-0005-SA
Matrix: AQUEOUS Sampled: Unknown Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	90	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 3
Lab ID: 034371-0001-SA
Matrix: AQUEOUS Sampled: 18 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	ND	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 4
Lab ID: 034371-0002-SA
Matrix: AQUEOUS Sampled: 17 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.2	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 1
Lab ID: 034371-0003-SA
Matrix: AQUEOUS Sampled: 16 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.2	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 2
Lab ID: 034371-0004-SA
Matrix: AQUEOUS Sampled: 14 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.3	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

"THOD BLANK REPORT
ganics by Chromatography

Test: 601-A
Matrix: AQUEOUS
QC Lot: 28 MAR 94-1F QC Run: 28 MAR 94-1F

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
ans-1,3-Dichloropropene	ND	ug/L	1.0
ichloroethene	ND	ug/L	0.50
ibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A
Matrix: AQUEOUS
QC Lot: 28 MAR 94-1F QC Run: 28 MAR 94-1F

Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 28 MAR 94-1F QC Run: 28 MAR 94-1F

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco

LOT ASSIGNMENT REPORT
Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
034371-0001-SA	AQUEOUS	TKN-A	23 MAR 94-9L	23 MAR 94-9L
034371-0001-SA	AQUEOUS	TOC-A	23 MAR 94-1A	-
034371-0002-SA	AQUEOUS	TKN-A	23 MAR 94-9L	23 MAR 94-9L
034371-0002-SA	AQUEOUS	TOC-A	23 MAR 94-1A	-
034371-0003-SA	AQUEOUS	TKN-A	23 MAR 94-9L	23 MAR 94-9L
034371-0003-SA	AQUEOUS	TOC-A	23 MAR 94-1A	-
034371-0004-SA	AQUEOUS	TKN-A	23 MAR 94-9L	23 MAR 94-9L
034371-0004-SA	AQUEOUS	TOC-A	23 MAR 94-1A	-

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 23 MAR 94-9L Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	7.92	9.00	9.07	9.04	114	78-122	0.8	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 23 MAR 94-1A Concentration Units: mg/L								
Total Organic Carbon	25.0	24.4	24.5	24.4	98	90-111	0.4	10

Calculations are performed before rounding to avoid round-off errors in calculated resu

HOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 23 MAR 94-9L QC Run: 23 MAR 94-9L			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Exhibit A-14

AUG 0 8 1994

Mr. James Cochran, Manager
Environmental, Health and Safety
Philips Semiconductors
9201 Pan American Freeway, N.E.
Albuquerque, NM 87113

Dear Mr. Cochran:

As a follow-up to my telephone message this morning, I am requesting that you or your staff provide a summary of all historical groundwater level data for the four monitoring wells located at the Philips Semiconductors facility in Albuquerque. This information is needed to verify the direction of groundwater flow in the vicinity of your facility.

Please feel free to contact me at (214) 665-6650 if you have any questions about this request or need additional information.

Sincerely yours,

Nancy R. Morlock
Environmental Engineer
RCRA Permits Branch

NMORLOCK:6H-PN:X6650:08/9/94:J:\USER\SHARE\6H-PN\PHILIPS.GW

Exhibit A-15

PHILIPS

PHILIPS

Philips Semiconductors

a Philips Electronics North America Company

Law Department

811 E. Arques Avenue
P.O. Box 3409
Sunnyvale, CA 94088-3409
Telephone 408/991-2000

VIA FACSIMILE (214) 665-6460

August 16, 1994

Ms. Nancy Reinhart Morlock
Environmental Engineer
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Philips Semiconductors, Albuquerque, New Mexico:
Monitoring Well of Water Dept

Dear Nancy:

I apologize for the delay in providing you with the enclosed information, however, the data was not readily available. Enclosed please find a summary of the monitoring well water depth for the four wells at the Albuquerque site. I have also enclosed a summary of the corresponding well elevations. If you have any questions or require additional information, please contact me at your earliest convenience.

Sincerely,

James N. Casey
Counsel

JNC:cb
Enclosures

cc: Jim Cochran

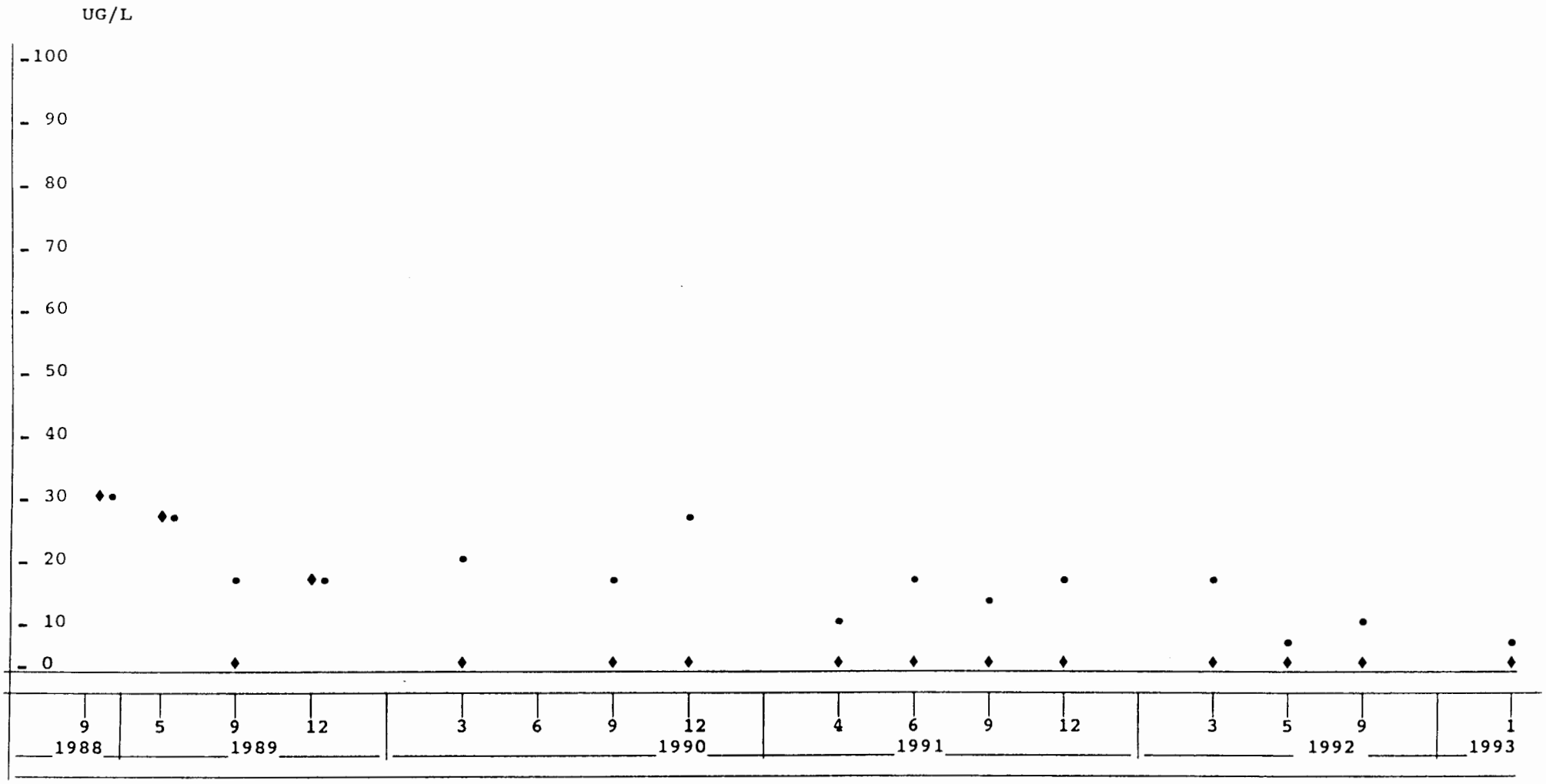
Monitoring Well Water Depth (ft)

DATE	WELL 1	WELL 2	WELL 3	WELL 4
Q3-1988	202.8	190.6	224.5	218.2
Q2-1989	203.1	191.2	224.8	218.5
Q3-1989	203	192	225	219
Q4-1989	202	192	225	219
Q3-1990	203	192	226	220
Q4-1990	203	192	226	220
Q2-1991	204.5	192.6	227	220
Q3-1991	209	193	220	220
Q4-1991	204	193	227	221
Q1-1992	206	193	228	221
Q2-1992	205	193	228	221
Q3-1992	206	194	228	221
Q4-1992	205	194	228	221
Q1 1993	205	194	229	222
Q2-1993	207	194	229	222
Q3-1993	207	194	229	222
Q4-1993	207	194	230	222
Q1-1994	207	194	230	222
Q2-1994	207.66	194.92	230.33	222.92

WELL ELEVATION DATA

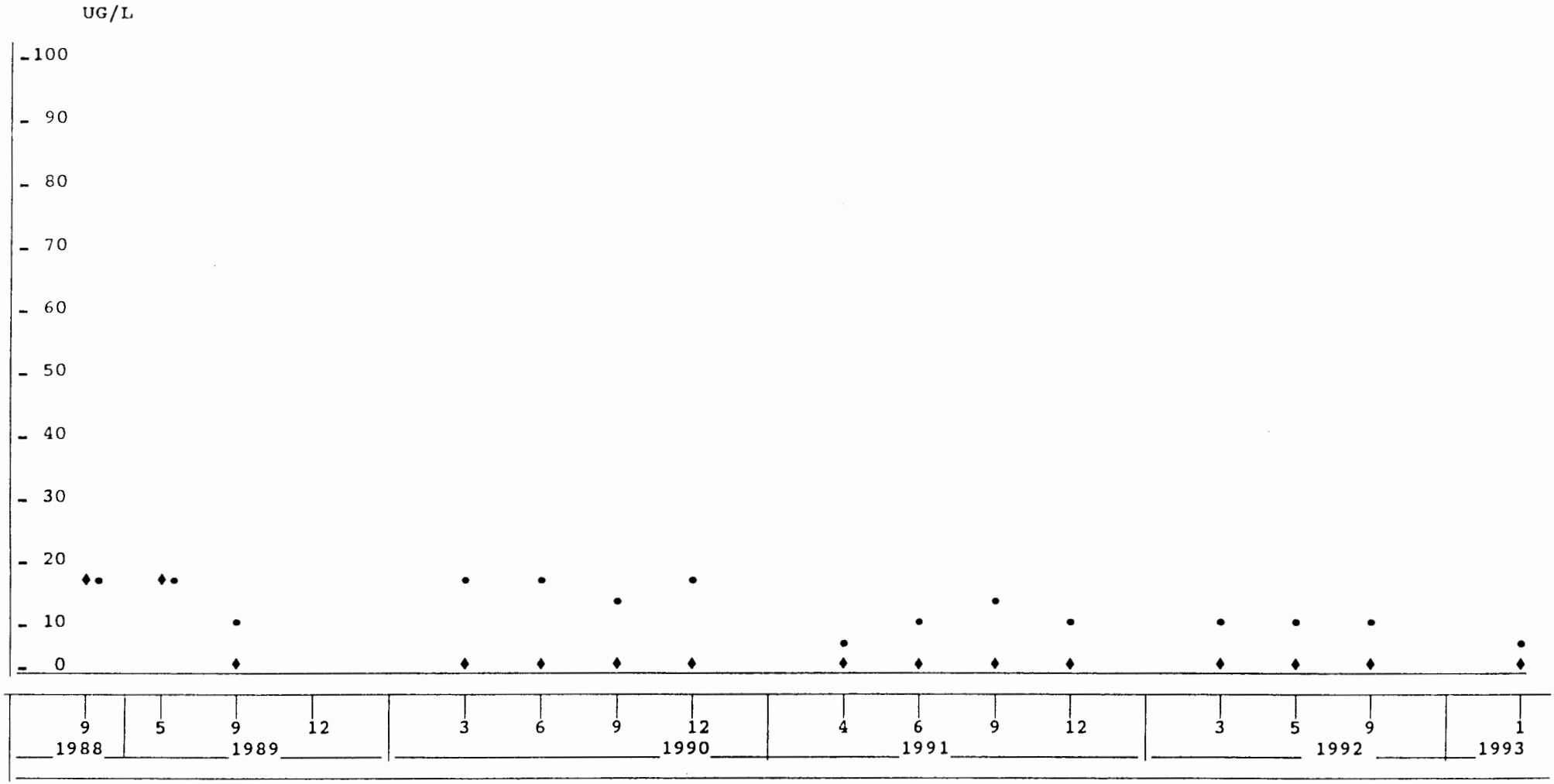
Well	Ground-Surface Elevation	Top of Casing Elevation	Ground-Water Elevation 7-20-94
1	5168.17	5168.70	4961.04
2	5158.15	5159.36	4964.44
3	5185.48	5186.43	4956.10
4	5182.46	5182.94	4960.02

MONITORING WELL #1



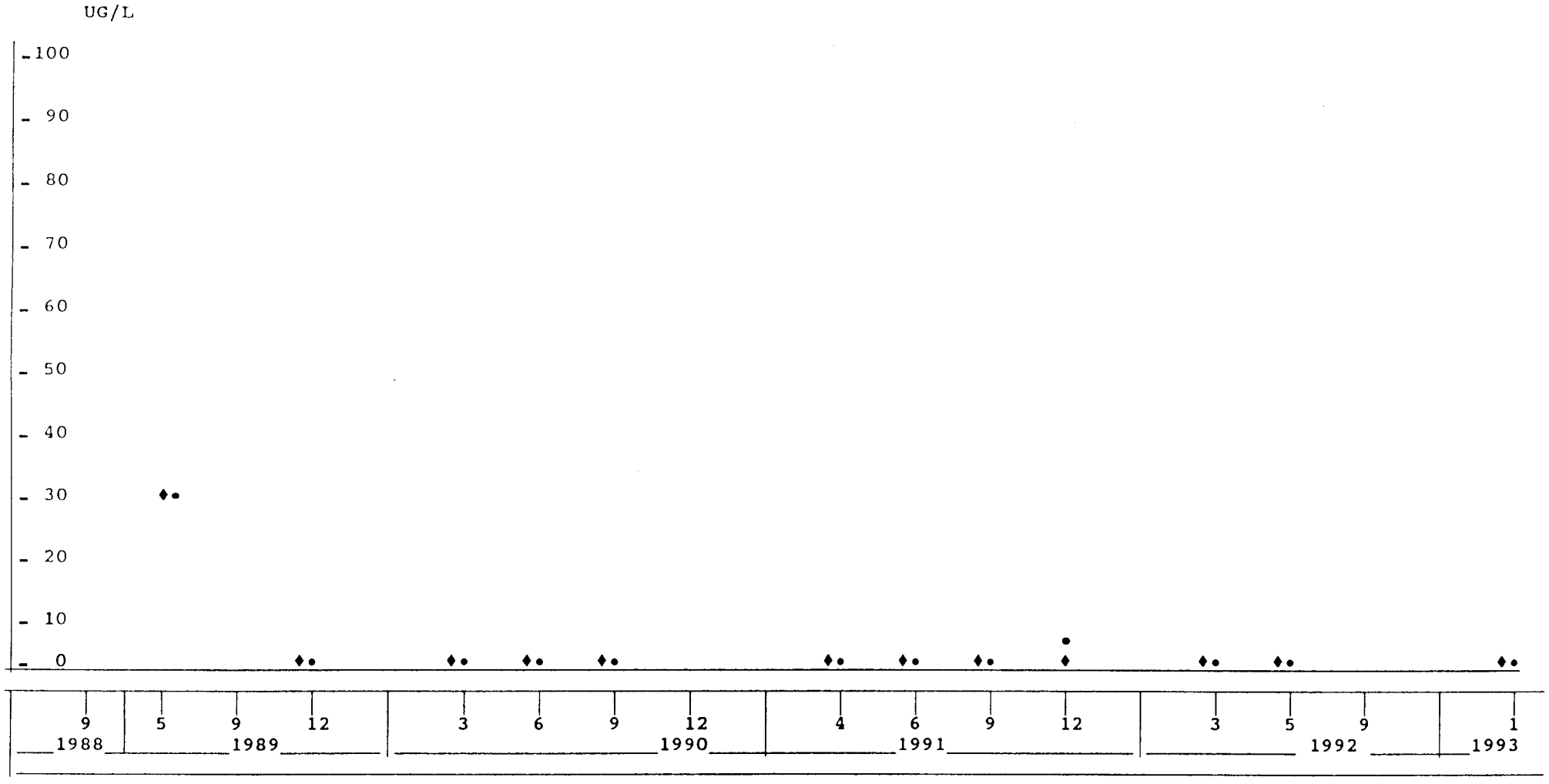
LEGEND: ♦ **1.1.2.2--TETRACHLOROETHENE**
● **TETRACHLORETHENE**

MONITORING WELL #2



LEGEND: ♦ **1.1.2.2–TETRACHLOROETHENE**
● **TETRACHLORETHENE**

MONITORING WELL #3

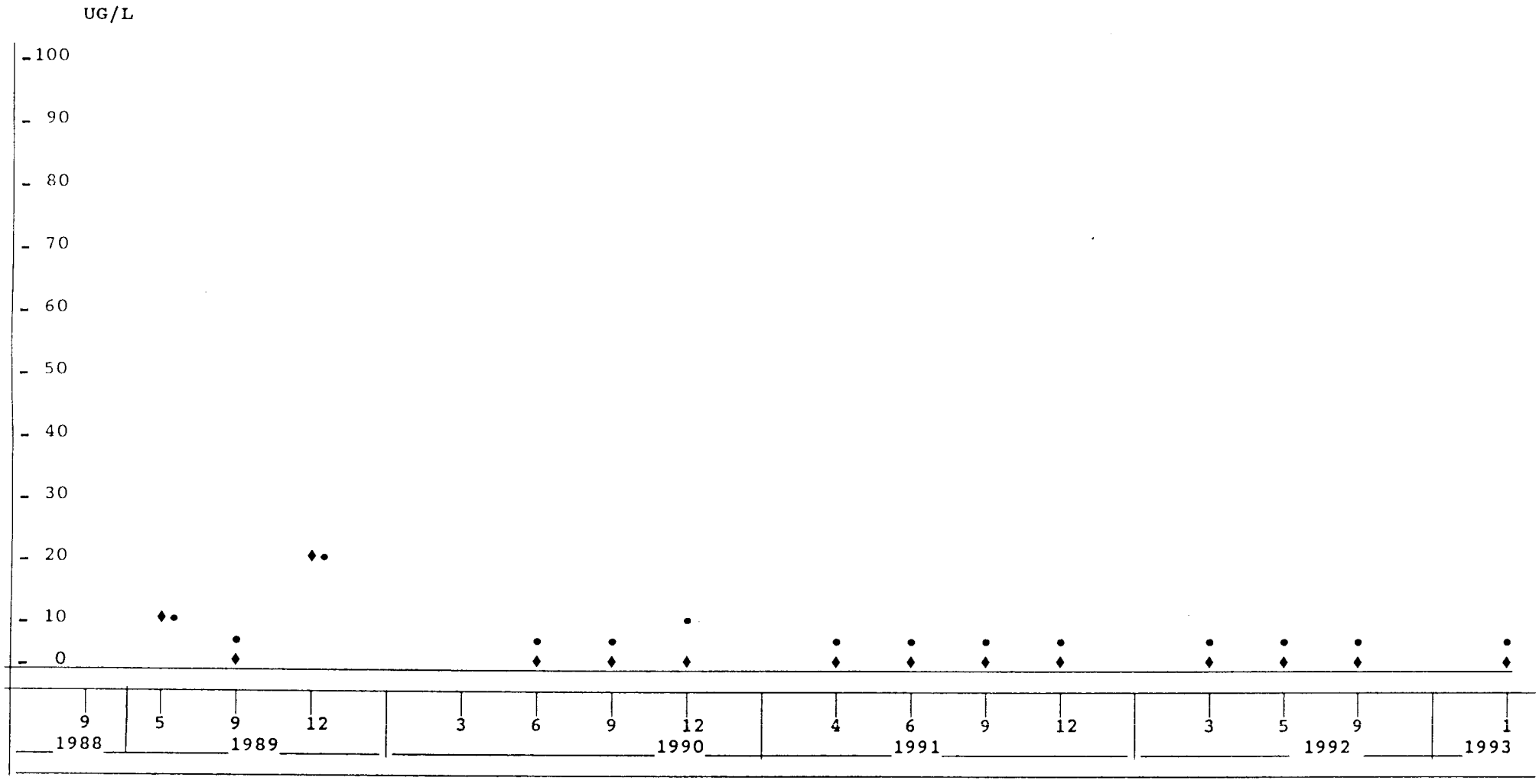


LEGEND:

♦ **1.1.2.2--TETRACHLOROETHENE**

● **TETRACHLORETHENE**

MONITORING WELL #4



LEGEND:

♦ **1.1.2.2–TETRACHLOROETHENE**

● **TETRACHLORETHENE**

Exhibit A-17

Summary of Anlaytical Data
Philips/Signetics Corporation
NMD000709782

Sample Date	Monitoring Well No.	1,1,2,2-Tetrachloro-ethane (ppb)	Tetrachloro-ethene (ppb)	Method
9/19/88	1	30	30	601
	2	14	14	
	3	30	30	
	4	ND	ND	
5/16/89	1	25	25	601
	2	14	14	
	4	9.2	9.2	
9/13/89	1	15	ND	601
	2	9.9	ND	
	3	6.8	ND	
	4	ND	ND	
12/06/89	1	17	17	601
	2	?	?	
	3	ND	ND	
	4	17	17	
03/28/90	2	13	ND	8010
06/12/90	1	ND	20	8010
	2	ND	13	
	3	ND	ND	
	4	ND	8.1	
09/12/90	1	ND	17	8010
	2	ND	11	
	3	ND	ND	
	4	ND	7.6	
12/05/90	1	ND	24	8010
	2	ND	15	
	3	ND	ND	
	4	ND	11	
12/04/91	1	ND	13	8010
	2	ND	9.3	
	3	ND	6.2	
	4	ND	ND	
04/09/91	1	ND	11	8010
	2	ND	4.7	
	3	ND	ND	
	4	ND	5.7	

Summary of Anlaytical Data
Philips/Signetics Corporation
NMD000709782

Sample Date	Monitoring Well No.	1,1,2,2-Tetrachloro-ethane (ppb)	Tetrachloro-ethene (ppb)	Method
06/12/91	1	ND	14	8010
	2	ND	9.2	
	3	ND	ND	
	4	ND	6.5	
09/11/91	1	ND	12	8010
	2	ND	11	
	3	ND	ND	
	4	ND	7.0	
03/25/92	1	ND	13	8010
	2	ND	9.5	
	3	ND	ND	
	4	ND	4.7	
05/19/92	1	ND	9.0	8010
	2	ND	8.7	
	3	ND	ND	
	4	ND	4.8	
09/22/92	1	ND	11	8010
	2	ND	10	
	3	ND	ND	
	4	ND	5.5	
01/06/93	1	ND	6.2	8010
	2	ND	7.1	
	3	ND	ND	
	4	ND	5.4	
03/30/93	1	ND	8.3	8010
	2	ND	7.2	
	3	ND	ND	
	4	ND	5.7	
06/29/93	1	ND	12	8010
	2	ND	4.0	
	3	ND	ND	
	4	ND	3.6	

Summary of Anlaytical Data
Philips/Signetics Corporation
NMD000709782

Sample Date	Monitoring Well No.	1,1,2,2-Tetrachloro-ethane (ppb)	Tetrachloro-ethene (ppb)	Method
10/08/93	1	ND	13	8010
	2	ND	9.9	
	3	ND	ND	
	4	ND	6.4	
11/05/93	1	ND	10	8010
	2	ND	8.7	
	3	ND	ND	
	4	ND	5.6	
03/16/94	1	ND	9.8	8010
	2	ND	9.0	
	3	ND	ND	
	4	ND	5.4	

Exhibit A-18

APR 2 4 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. James Cochran, Manager
Environmental, Health and Safety
Philips Semiconductors
9201 Pan American Freeway NE
Albuquerque, NM 87113

Dear Mr. Cochran:

You are hereby notified that the Environmental Protection Agency (EPA) has initiated modification procedures with respect to the permit issued pursuant to the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA), to Philips Semiconductors (Philips), EPA ID Number NMD000709782, 9201 Pa American Freeway NE, Albuquerque, New Mexico.

The cause for modification is the review of new information that was not available at the time of permit issuance, as per 40 CFR 270.41(a)(2) which states that:

> The Director has received information. Permits may be modified during their terms for this cause only if the information was not available at the time of permit issuance...and would have justified the application of different permit conditions at the time of issuance.

More specifically, the EPA has reviewed new information concerning the Philips facility, including the results of the RCRA Facility Assessment (RFA) completed in October 1992 and recent groundwater monitoring information. The RFA identified the abandoned Coronado Municipal Landfill, located on Philip's property, as a solid waste management unit (SWMU) that required additional investigation and remediation.

As a result of this information not being available at the time of permit issuance, the current permit condition B.4 states that "The permittee has determined that the facility contains no solid waste management units other than the RCRA regulated units identified in B.1." This portion of the permit is therefore being modified to include a compliance schedule for the investigation of the Coronado Municipal Landfill SWMU.

You are also notified that Philips is obligated under 40 CFR 270.10 to submit an application for permit reissuance at least 180 days prior to the current permit expiration date of April 1, 1996. EPA requests that Philips submit written notification within 270 days of permit expiration as to their intent to renew the permit.

Please contact Nancy Morlock of my staff at (214) 665-6650 if you have ny questions or require additional information.

Sincerely yours,

William K. Honker, P.E., Chief
RCRA Permits Branch

cc: Mr. Benito Garcia, Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
525 Camino De Los Marquez
P.O. Box 26110
Santa Fe, NM 87502

Mr. James N. Casey, Counsel
Philips Semiconductors
811 E Arques Avenue
P.O. Box 3409
Sunnyvale, Ca. 94088-3409

NMORLOCK:6H-PN:5-6650:04/12/95:J:6H-PN:or:A disk:PHILIPS.MOD

6H-PN	6H-P	6C-M
Neleigh	Mixon	Jones

Exhibit A-19

The United States Environmental Protection Agency
Public Notice of Draft Permit Modification

The United States Environmental Protection Agency (EPA) Region 6 proposes to modify Philips Semiconductors, Inc., (EPA Identification Number NMD000709782) (formerly known as Signetics Company) hazardous waste management permit issued April 1986, for the temporary storage of hazardous waste. The facility is located at 9201 Pan American Freeway, N.E., Albuquerque, New Mexico.

Since the time of permit issuance in April 1986, EPA has received ground water sampling data which indicates the presence of contamination. The proposed permit modification will require the investigation, and possible remediation, of this contamination.

The modified permit contains conditions for the investigation of a newly-identified solid waste management unit (SWMU) called the Coronado Municipal Landfill. The Philips Semiconductors facility is situated on a portion of the former Coronado Municipal Landfill site. The landfill was operated from approximately 1963 to 1965 and received mainly household and commercial refuse. Ground water data indicates the presence of volatile organic compounds. The proposed permit modification will require an investigation of the presence of hazardous constituents in the landfill material and surrounding soil, and an investigation of the nature and extent of any ground water contamination. Pending the results of the investigations, cleanup activities may also be required.

The proposed permit modification is based on the administrative records of EPA Region 6. The administrative record consists of the original and revised permits; the *Site Inspection Report* prepared for EPA Region 6 by Fluor Daniel, Inc., dated April 26, 1993; the *RCRA Facility Assessment Report* prepared for EPA Region 6 by PRC Environmental Management, Inc., dated October 26, 1992; the *Baseline Ground-Water Investigation* prepared for Signetics Corporation by EMCON Associates dated June 1987; the analytical data submitted to EPA Region 6 by Philips Semiconductors; and miscellaneous correspondence, notes, and surveys.

EPA's administrative record relative to this proposed permit modification is on file at EPA Region 6, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202, and may be viewed upon request.

Persons wishing to comment on EPA's proposed permit modification should submit their comments in writing to:

Nancy R. Morlock (6H-PN)
U.S. EPA, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-6650

EPA's comment and public hearing procedures may be found at 40 CFR 124.10 and 124.12 (48 Federal Register 14262, April 1, 1983, as amended at 49 Federal Register 38051, September 26, 1984). The comment period during which written comments may be submitted on EPA's proposed permit modification extends for forty-five (45) days from the date of this notice. During the comment period, any interested person may request a public hearing by filing a written request. The request must include a synopsis of the issues to be discussed at the hearing. A hearing will be held if EPA finds a significant degree of public interest in the Philips Semiconductors, Inc., proposed permit modification. Notice of the public hearing will be given at least thirty (30) days before the hearing.

EPA will notify each person who has submitted written comments or who has requested notice of final decision. Any person may request an Evidentiary Hearing on EPA's final decision. However, the request must be submitted within thirty (30) days of the date of final variance decision and be in accordance with the requirements of 40 CFR 124.74. The final decision will become effective thirty (30) days after the service of notice of the decision unless a later date is specified or review is requested under regulation 40 CFR 124.19. If no comments request a change in the proposed permit modification, the decision to modify the permit will become effective immediately upon issuance.

A copy of the revised permit may be reviewed at:

Technical Vocational Institute Library
525 Buena Vista Drive SE
Albuquerque, NM 87106
(505) 224-3285

New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
525 Camino De Los Marquez
Santa Fe, NM 87502
(505) 827-4308

Persons wishing to be placed on the facility mail list should fill out the form below and send to Vickey Finch, US EPA, 1445 Ross Avenue, (6H-PA) Dallas, TX 75202-2733.

I would like to be placed on the MAILING LIST of:
Philips Semiconductors, Inc., NM, EPA ID. No. NMD000709782

NAME _____

ADDRESS _____

CITY, STATE _____
ZIP CODE

TELEPHONE A/CODE _____ PHONE _____
NUMBER

The United States Environmental Protection Agency
Draft Permit Modification
Philips Semiconductors
Fact Sheet

In 1978 or 1979, Philips Semiconductors, then known as the Signetics Company (Signetics), purchased a piece of property located at 9201 Pan American Freeway, N.E., Albuquerque, New Mexico, for construction of a facility to manufacture microchips. During a geotechnical investigation in 1980, Signetics discovered an abandoned landfill on their property. Portions of the landfill were removed prior to construction of the facility.

In 1986, the United States Environmental Protection Agency (EPA) issued a Hazardous Waste Management Permit (permit) to Signetics. The 10-year permit allowed for the temporary storage of hazardous waste at their facility. No environmental investigation or cleanup requirements were included in the permit at the time of issuance because it was believed that the landfill had been completely removed.

In 1987, Signetics completed their own baseline ground water investigation. Exploratory borings and monitoring wells were completed as part of this investigation. Volatile organic compounds were detected in these ground water monitoring wells. Quarterly ground water monitoring has continued to reveal volatile organic compounds which often exceed federal ground water standards.

In 1992, the EPA completed a Resource, Conservation and Recovery Act (RCRA) Facility Assessment at Signetics, which is now known as Philips Semiconductors, Inc. (Philips). The assessment concluded that further investigation is needed at the former landfill area, sometimes referred to as the "Coronado Municipal Landfill." The assessment results were corroborated by the results of an independent site inspection completed by EPA's Superfund Branch in April 1993.

EPA therefore proposes to modify the Hazardous Waste Management Permit issued to Philips Semiconductors, Inc. to reflect the new information discussed above. The modified permit contains conditions for the investigation of the newly-identified solid waste management unit (SWMU) called the Coronado Municipal Landfill. The proposed permit modification will require an investigation of the presence of hazardous constituents in the landfill material and surrounding soil, and an investigation of the nature and extent of any ground water contamination. Specifically, Section B.4 of the permit will be revised to require the completion of a RCRA Facility Investigation at the Coronado Municipal Landfill. Pending the results of the investigations, cleanup activities may also be required.

The proposed permit modification is based on the administrative records of EPA Region 6. The administrative record

consists of the original and revised permits; the April 26, 1993 *Site Inspection Report* prepared for EPA Region 6 by Fluor Daniel, Inc.; the October 26, 1992 *RCRA Facility Assessment Report* prepared for EPA Region 6 by PRC Environmental Management, Inc.; the June 1987 *Baseline Ground-Water Investigation* prepared for Signetics Corporation by EMCON Associates; the analytical data submitted to EPA Region 6 by Philips Semiconductors; and miscellaneous correspondence, notes, and surveys.

The EPA's administrative record relative to this proposed permit modification is on file at the library of EPA Region 6, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202, and may be viewed and copied (at a charge of $0.20 per page) at any time between 8:30 am and 4:00 pm, Monday through Friday, except holidays. The administrative record is also on file at the New Mexico Environment Department, Hazardous and Radioactive Materials Bureau, 525 Camino De Los Marquez, Santa Fe, New Mexico, 87502, and may be viewed at any time between 8:00 am and 4:00 pm, Monday through Friday, except holidays.

Persons wishing to comment on EPA's proposed permit modification should submit their comments in writing to:

Nancy R. Morlock (6H-PN)
U.S. EPA, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

EPA's comment and public hearing procedures may be found at 40 CFR 124.10 and 124.12 (48 Federal Register 14262, April 1, 1983, as amended at 49 Federal Register 38051, September 26, 1984). The comment period during which written comments on EPA's proposed permit modification may be submitted extends forty-five (45) days from the date of this notice. During the comment period, any interested person may request a public hearing by filing a written request. The request must include a synopsis of the issues to be discussed at the hearing. A hearing will be held if EPA finds a significant degree of public interest in the proposed permit modification. Notice of the public hearing will be given at least thirty (30) days before the hearing.

EPA will notify each person who has submitted written comments or who has requested notice of final decision. Any person may request an Evidentiary Hearing on EPA's final decision. However, the request must be submitted within thirty (30) days of the date of final variance decision and be in accordance with the requirements of 40 CFR 124.74. The final decision will become effective thirty (30) days after the service of notice of the decision unless a later date is specified or review is requested under regulation 40 CFR 124.19. If no comments request a change in the proposed permit modification, the decision to modify the permit will become effective immediately upon issuance.

A copy of the revised permit may be reviewed at:

Technical Vocational Institute Library
Circulation Desk
525 Buena Vista Drive SE
Albuquerque, NM 87106
(505) 224-3000

New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
525 Camino De Los Marquez
Santa Fe, New Mexico 87502
(505) 827-4308

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
HAZARDOUS WASTE MANAGEMENT Permit

PERMITTEE: Philips Semiconductors, Inc. (formerly known as Signetics Company)

LOCATION: 9201 Pan American Freeway, N.E.
Albuquerque, New Mexico 87113

ID NUMBER: NMD000709782

PERMIT NUMBER: NMD000709782-1

EFFECTIVE DATE: April 1, 1986

EXPIRATION DATE: April 1, 1996

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6901, et seq.) and the Hazardous and Solid Waste Amendments of 1984 (HSWA), a permit is issued to Philips Semiconductors, Inc. (hereafter called the Permittee), formerly known as Signetics Company, to operate a hazardous waste storage facility at the location stated above.

The Permittee must comply with all the terms and conditions of this Permit. This Permit consists of the conditions contained herein (including the attachments). Applicable provisions are those which are in effect on the date of issuance of this Permit (see 40 CFR 270.32(c)).

This Permit is based in part on the provisions of Sections 206, 212, and 224 of HSWA which modified Sections 3004 and 3005 of RCRA. These require corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage, or disposal facility seeking a Permit, regardless of the time at which the waste was placed in such unit and provide the authority to review and modify the Permit at any time. This Permit is also based on the assumption that all information contained in the Permit application is accurate and that the facility will be operated as specified in the Permit application. The Permit application consists of information submitted on August 9, 1984 (and revised February 4, 1985).

Any inaccuracies found in the information may be grounds for the termination or modification of this Permit (see 40 CFR 270.41, 270.42, and 270.43) and potential enforcement action.

Issued this _____ day of _____

by _____
Allyn M. Davis, Director
Hazardous Waste Management Division

A. STANDARD

A.1 Effect of Permit.

The Permittee is allowed to store hazardous waste in accordance with the conditions of this Permit. Any treatment, storage, or disposal of any hazardous waste not authorized in this Permit is prohibited. Any hazardous waste treatment, storage, or disposal process not authorized in this Permit is prohibited. Compliance with this Permit will be considered compliance, for purposes of enforcement, with Subtitle C of the Resource Conservation and Recovery Act (RCRA). A full RCRA Permit consists of this Permit which addresses the provisions of the Hazardous and Solid Waste Amendments of 1984 (HSWA) and the State of New Mexico Permit which addresses the portion of the RCRA program for which the State is authorized. Issuance of this Permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this Permit does not constitute a defense to any action brought under Section 7003 of RCRA (42 U.S.C. 6973), Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq., commonly known as CERCLA), or any other law governing protection of public health or the environment.

A.2 Permit Actions.

This Permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 270.41, 270.42, 270.43, and HSWA Section 212. The filing of a request for a Permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay the applicability or enforceability of any Permit condition. Review of any application for Permit renewal shall consider improvements in the state of control and measurement technology as well as changes in the applicable regulations.

A.3 Duration of Permit.

This Permit is effective for a period of ten (10) years unless terminated, revoked, or reissued.

A.4 Severability.

The provisions of this Permit are severable. If any provision of this Permit is held invalid, the remainder of this Permit shall not be affected thereby. If the application of any provision of this Permit is held invalid, the application of

such provision to other circumstances shall not be affected thereby.

A.5 Duty to Comply.

The Permittee shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized by an emergency Permit. Any Permit noncompliance constitutes a violation of RCRA and is grounds for enforcement action, Permit termination, revocation and reissuance, modification, or for denial of a Permit renewal application.

A.6 Duty to Reapply.

If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee must submit a new application for a Permit at least one hundred eighty (180) days before this Permit expires.

A.7 Permit Expiration.

This Permit and all conditions herein will remain in effect beyond the Permit's expiration date if the Permittee has complied with condition A.6 and through no fault of the Permittee, the Regional Administrator has not issued a new Permit as set forth in 40 CFR 124.15.

A.8 Need To Halt Or Reduce Activity Not A Defense.

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.

A.9 Duty to Mitigate.

In the event of noncompliance with this Permit, the Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

A.10 Proper Operation and Maintenance.

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, adequate spare parts inventory, and adequate

laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of a back-up or auxiliary facility or similar systems only when necessary to achieve compliance with the conditions of this Permit.

A.11 Duty to Provide Information.

The Permittee shall furnish to the Regional Administrator, within a reasonable time, any relevant information which the Regional Administrator may request to determine whether cause exists for modifying , revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this Permit.

A.12 Inspection and Entry.

The Permittee shall allow the Regional Administrator, or any authorized representative, upon the presentation of credentials and other documents as may be required by law to:

(a) Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

(d) Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by RCRA, any substances or parameters at any location.

A.13 Retention of Records.

The Permittee shall maintain records to show compliance with this Permit for three (3) years after this Permit is terminated or reissued. This time period is automatically extended during the course of any unresolved enforcement action. This time period may be extended at the request of the Regional Administrator at any time.

A.14 Notices of Planned Physical Facility Changes.

The Permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Physical alterations or additions shall include all hazardous and solid waste activities and underground tanks. Construction of new units may not begin until a permit or permit modification has been issued.

A.15 Anticipated Noncompliance.

The Permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

A.16 Transfer of Permits.

This Permit may be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to 40 CFR 270.41(b)(2) or 270.42(d). Before transferring ownership or operation of the facility, the Permittee shall notify the new owner or operator in writing of the requirements of 40 CFR 264 and 40 CFR 270.

A.17 Twenty-Four Hour Reporting of Hazardous Noncompliance.

The Permittee shall report to the Regional Administrator any noncompliance which may endanger human health or the environment. Any information shall be provided orally within twenty-four (24) hours from the time the Permittee becomes aware of the circumstances. The following shall be included as information which must be reported orally within twenty-four (24) hours:

(a) Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

(b) Any information if a release or discharge of hazardous waste, or of a fire or explosion from the facility, which could threaten the environment or human health outside the facility. The description of the occurrences and its cause shall include:

(i) Name, address, and telephone number of the owner or operator;
(ii) Name, address, and telephone number of the facility;
(iii) Date, time, and type of incident;
(iv) Name and quantity of material(s) involved;
(v) The extent of injuries, if any;

(vi) An assessment of actual or potential hazard to the environment and human health outside the facility, where this is applicable; and

(vii) Estimated quantity and disposition of recovered material that resulted from the incident.

A.18 Follow-up Written Report of Hazardous Noncompliance.

A written submission shall also be provided within five (5) days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance (including exact dates and times), and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Permittee need not comply with the five day written notice requirements if the Regional Administrator waives that requirement and the Permittee submits a written report within fifteen (15) days of the time the Permittee becomes aware of the circumstances.

A.19 Other Noncompliance.

At the time monitoring reports are submitted, the Permittee shall report all other instances of noncompliance not otherwise required to be reported. The reports shall contain the information listed in condition A.17.

A.20 Other Information.

Where the Permittee becomes aware that he or she failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, the Permittee shall promptly submit such facts or information. The term, "permit application", includes the information submitted on solid waste management units.

A.21 Signatory Requirement.

All reports or other information requested by the Regional Administrator shall be signed and certified according to 40 CFR 270.11.

B. SPECIFIC

B.1 Permitted Process Units.

The process units include container storage area number four (4) which holds a maximum of 36 fifty-five (55) gallon containers, container storage area number two (2) which holds a maximum of 64 fifty-five (55) gallon containers, and three (3) 5,000 gallon tanks.

B.2 Waste Minimization.

The Permittee shall certify annually by October 1 for the previous year ending August 31, that the Permittee:

(a) Has a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the Permittee's facility's operation to the degree determined to be economically practicable; and

(b) that the proposed method of treatment, storage, or disposal is that practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment.

The certification is to be included in the operating record.

B.3 Dust Suppression.

The Permittee shall comply with 40 CFR 266.23(b).

B.4 Solid Waste Management Units.

The following SWMU requires a RCRA Facility Investigation (RFI), as detailed in Section C and Section F of this Permit:

SWMU #8 Coronado Municipal Landfill

If the Permittee becomes aware of any additional solid waste management unit, the Permittee must:

(a) Immediately notify the Regional Administrator in accordance with condition A.20; and

(b) submit within forty-five (45) days of becoming aware of a solid waste management unit, preliminary assessment information for the solid waste management unit to determine if there has been or is currently a release from the unit. The Permittee is to contact the Regional Administrator for guidance regarding the required information to be submitted. Based upon this

information, the Regional Administrator will modify this Permit as necessary.

B.5 Definitions.

For purposes of these special conditions pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA, the following definitions shall apply:

"Administrative Authority" means the New Mexico Environment Department (NMED), or his/her designee, or, in the case of HSWA provisions for which the State is not authorized, the United States Environmental Protection Agency (EPA). The mailing addresses for the EPA and the NMED are as follows:

U.S. EPA, Region 6
Hazardous Waste Management Division
RCRA Permits Branch
1445 Ross Avenue
Dallas, Texas 75202-2733

New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
525 Camino De Los Marquez
P.O. Box 26110
Santa Fe, New Mexico 86502

"CMS" means Corrective Measures Study.

"EPA" means the United States Environmental Protection Agency.

"Facility" means all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

"HSWA" means the 1984 Hazardous and Solid Waste Amendments to RCRA.

"Hazardous constituent" means any constituent identified in Appendix VIII of 40 CFR Part 261, or any constituent identified in Appendix IX of 40 CFR Part 264.

"Hazardous waste" means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The term hazardous waste includes hazardous constituent.

"NMED" means the New Mexico Environment Department.

"Permit" means the conditions embodied in these special conditions pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA.

"Permittee" means Philips Semiconductors (formerly Signetics Company), 9201 Pan American Freeway, N.E., Albuquerque, New Mexico 87113, EPA I.D. Number NMD000709782.

"RCRA" means the Resource Conservation and Recovery Act of 1980 as amended by HSWA in 1984.

"RCRA Permit" means the full permit, with RCRA and HSWA portions.

"RFA" means RCRA Facility Assessment.

"RFI" means RCRA Facility Investigation.

"Release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

"Solid Waste Management Unit" (SWMU) means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

If, subsequent to the issuance of this Permit, regulations are promulgated which redefine any of the above terms, the Administrative Authority may, at its discretion, apply the new definition to this Permit.

C. SPECIAL CONDITIONS

Within sixty (60) days of the effective date of this Permit modification, the Permittee shall submit an RFI Workplan in accordance with Section F and Section N of this Permit. In addition to the RFI Workplan requirement, the Permittee shall complete the following items:

C.1 Quarterly Sampling of Existing Ground Water Monitoring Wells

(a) Within thirty (30) days of the effective date of this permit modification, the Permittee shall sample ground

water monitoring wells MW-1, MW-2, MW-3, and MW-4. These wells shall be sampled for *Appendix VIII* constituents, as codified in 40 CFR Part 261. The sampling and analysis program for these wells shall follow/be equivalent to the requirements of the RCRA Ground-Water Technical Enforcement Guidance Document, dated September 1986. All sampling results shall be reported to the Administrative Authorities as specified in Section B.5.

(b) All existing ground water monitoring wells shall be analyzed on a quarterly basis. Target compounds may be proposed only after adequate data exists to verify that indicator compounds are reliable surrogates for all contaminants of concern. All quarterly sampling results shall be reported to the Administrative Authorities as specified in Section B.5.

C.2 Installation of Additional Ground Water Monitoring Wells

The RFI Workplan, described further in Section F and Section N, shall include information on the proposed design, number, and placement of additional ground water monitoring wells. Wells used to detect DNAPLs (dense non-aqueous phase liquids) shall be screened at the bottom of the aquifer of concern. Well screen length should not exceed 15 feet. Longer screens may be used only with adequate justification from the facility and approval from the Administrative Authorities. See the March, 1991 "Handbook of Suggested Practices for the Design and Installation of Ground Water Monitoring Wells" (EPA/600/4-89/034) for specific information on monitoring well design and installation.

C.3 Identification of Water Supply Wells and Submittal of Area Map(s)

(a) Within sixty (60) days of the effective date of this permit modification, the Permittee shall locate all water supply wells within a one mile radius of the facility.

(b) Within sixty (60) calendar days of the effective date of this permit modification, the Permittee shall submit information characterizing/describing the slope of the water table or potentiometric surface underlying their facility. The characterization/description shall be based upon current ground water level information, as collected by the Permittee.

(c) Map(s) depicting the information required under Section C.3 (a) and (b) shall be consistent with the requirements set forth in 40 CFR 270.14. This information shall be submitted to the Administrative Authorities specified in Section B.5.

D. REPORTING REQUIREMENTS

D.1 Quarterly Progress Reports

The Permittee shall submit signed quarterly progress reports of all activities (i.e., well installation, RFI, CMS) conducted pursuant to the provisions of this Permit beginning no later than ninety (90) calendar days from the effective date of this Permit modification. These reports shall contain:

(a) A description of the work completed and an estimate of the percentage of work completed;

(b) Summaries of all findings, including summaries of laboratory data;

(c) Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;

(d) Projected work for the next reporting period;

(e) Summaries of contacts pertaining to corrective action or environmental matters with representatives of the local community, public interest groups or State government during the reporting period;

(f) Changes in key project personnel during the reporting period; and

(g) Summaries of all changes made in implementation during the reporting period.

D.2 Other Reports

Copies of other reports (e.g., inspection reports), drilling logs and laboratory data shall be made available to the Administrative Authority upon request.

D.3 Status Review

In addition to the written reports, at the request of the Administrative Authority, the Permittee shall provide status review through semi-annual briefings with the Administrative Authority.

E. INTERIM MEASURES

E.1 Requirement to Conduct Interim Measures

If during the course of any activity initiated under this Permit, the Administrative Authority determines that a release or potential release of hazardous constituents from a SWMU poses a threat to human health and the environment, the Administrative Authority may require interim measures. The Administrative Authority shall determine the specific measure(s) or require the Permittee to propose a measure(s). The interim measure(s) may include a permit modification, a schedule for implementation, and a written plan. The Administrative Authority shall notify the Permittee in writing of the requirement to perform interim measures. The Administrative Authority shall modify this Permit to incorporate interim measures into the Permit.

E.2 Determination of Need for Interim Measures

The following factors will be considered by the Administrative Authority in determining the need for interim measures:

(a) Time required to develop and implement a final remedy;

(b) Actual and potential exposure to human and environmental receptors;

(c) Actual and potential contamination of drinking water supplies and sensitive ecosystems;

(d) The potential for further degradation of the medium in the absence of interim measures;

(e) Presence of hazardous wastes in containers that may pose a threat of release;

(f) Presence and concentration of hazardous waste including hazardous constituents in soil that have the potential to migrate to ground water or surface water;

(g) Weather conditions that may affect the current levels of contamination;

(h) Risks of fire, explosion, or accident; and

(i) Other situations that may pose threats to human health and the environment.

F. RFI Workplan

F.1 General Requirements

The RFI Workplan, as specified in this section and in Section C and Section N, shall be submitted to the Administrative Authority within sixty (60) days of the effective date of this

Permit modification. The RFI Workplan must address releases of hazardous waste or hazardous constituents to all media for the SWMU listed in Section B.4. The SWMU number is from the RFA Report, prepared by PRC Environmental Management, Inc., dated October 26, 1992.

(a) The Workplan shall describe the objectives of the investigation and the overall technical and analytical approach to completing all actions necessary to characterize the direction, rate, movement, and concentration of releases of hazardous waste or hazardous constituents from specific units or groups of units, and their actual or potential receptors. The RFI Workplan shall detail all proposed activities and procedures to be conducted at the facility, the schedule for implementing and completing such investigations, the qualifications of personnel performing or directing the investigations, including contractor personnel, and the overall management of the RFI. The Scope of Work for a RCRA Facility Investigation (RFI) is in Section N.

(b) The RFI Workplan shall describe sampling, data collection quality assurance, and data management procedures, including formats for documenting and tracking data and other results of investigations, and health and safety procedures.

(c) Development of the RFI Workplan and reporting of data shall be consistent with the following EPA guidance documents or the equivalent thereof:

(i) RCRA Facility Investigation Guidance Document (EPA 530/5W-89-031);

(ii) RCRA Groundwater Monitoring Technical Enforcement Guidance Document (OSWER 9950.1) September 1986; and

(iii) Test Methods for Evaluating Solid Waste (SW 846, 2nd ed.) 1982.

F.2 <u>Approval, Disapproval, or Modification of RFI Workplan by Administrative Authority</u>

After the Permittee submits the Workplan, the Administrative Authority will either approve, disapprove, or modify the Workplan in writing.

If the Administrative Authority approves the Workplan, the Permittee shall implement the plan within two weeks (14 days) of receipt of approval, according to the schedule contained in

the plan. All approved Workplans become incorporated into this Permit.

In the event of disapproval (in whole or in part) of the Workplan, the Administrative Authority shall specify deficiencies in writing. The Permittee shall modify the plan to correct these within the time frame specified in the notification of disapproval by the Administrative Authority. The modified Workplan shall be submitted in writing to the Administrative Authority for review. Should the Permittee take exception to all or part of the disapproval, the Permittee shall submit a written statement of the grounds for the exception within 10 days of receipt of the disapproval.

F.3 RFI Workplans for New SWMUs and New Releases

The Administrative Authority shall review for approval as part of the RFI Workplan or as a new Workplan any plans developed to address further investigations of newly-identified SWMUs, or to address new releases from previously-identified SWMUs.

G. RFI IMPLEMENTATION

Upon receipt of written approval from the Administrative Authority for the RFI Workplan, the Permittee shall implement the RFI according to the schedules and in accordance with the approved RFI Workplan and the following:

(a) The Permittee shall notify EPA and the NMED at least 10 days prior to any sampling, testing, or monitoring activity required by this Permit to give Agency personnel the opportunity to observe investigation procedures and/or split samples.

(b) Deviations from the approved RFI Workplan which are necessary during implementation of the investigations must be approved by the Administrative Authority and fully documented and described in the progress reports and in the RFI Final Report.

H. RFI FINAL REPORT AND SUMMARY

(a) Within sixty (60) calendar days after the completion of the RFI, or as specified by the Administrative Authority in the RFI Workplan approval, the Permittee shall submit an RFI Final Report and Summary. The RFI Final Report shall describe the procedures, methods, and results of all investigations as described in Section N. This includes SWMUs and their releases, the type and extent of contamination at the facility, sources and migration pathways, and actual or potential receptors. The RFI Final Report shall present all information gathered under

the approved RFI Workplan. The RFI Final Report must contain adequate information to support further corrective action decisions at the facility. The Summary shall summarize the RFI Final Report.

(b) After the Permittee submits the RFI Final Report and Summary, the Administrative Authority shall either approve or disapprove them in writing.

If the Administrative Authority approves the RFI Final Report and Summary, the Permittee shall mail the approved Summary to all individuals on the facility mailing list established pursuant to 40 CFR 124.10(c)(1)(ix), within fifteen (15) calendar days of receipt of approval.

If the Administrative Authority determines the RFI Final Report and Summary do not fully meet the objectives stated in Section N.5, the Administrative Authority may disapprove the RFI Final Report and Summary. If the Administrative Authority disapproves the Report, the Administrative Authority shall notify the Permittee in writing of the Report's deficiencies and specify a due date for submittal of a revised Final Report and Summary. Once approved, the Summary shall be mailed to all individuals on the facility mailing list as specified above.

I. DETERMINATION OF NO FURTHER ACTION

(a) Based on the results of the RFI and other relevant information, the Permittee may submit an application to the Administrative Authority for a Class III permit modification under 40 CFR 270.42(c) to terminate the RFI/CMS process for a specific unit. This permit modification application must contain information demonstrating that there are no releases of hazardous waste including hazardous constituents from a particular SWMU at the facility that pose threats to human health and/or the environment, as well as additional information required in 40 CFR 270.42(c).

If, based upon review of the Permittee's request for a permit modification, the results of the RFI, and other information, including comments received during the sixty (60) day public comment period required for Class III permit modifications, the Administrative Authority determines that releases or suspected releases which were investigated either are non-existent or do not pose a threat to human health and/or the environment, the Administrative Authority will grant the requested modification.

(b) If necessary to protect human health or the environment, a determination of no further action shall not preclude the Administrative Authority from requiring continued or periodic monitoring of air, soil, ground water, or surface water, when site-specific circumstances indicate that releases of hazardous waste or hazardous constituents are likely to occur.

(c) A determination of no further action shall not preclude the Administrative Authority from requiring further investigations, studies, or remediation at a later date, if new information or subsequent analysis indicates a release or likelihood of a release from a SWMU at the facility that is likely to pose a threat to human health or the environment. In such a case, the Administrative Authority shall initiate a modification to the Permit.

J. CMS PLAN

(a) If the Administrative Authority has reason to believe that a SWMU has released concentrations of hazardous constituents, or if the Administrative Authority determines that contaminants present a threat to human health or the environment given site-specific exposure conditions, the Administrative Authority may require a CMS and shall notify the Permittee in writing. The notification may also specify remedial alternatives to be evaluated by the Permittee during the CMS.

(b) The Permittee shall submit a CMS Plan to the Administrative Authority within forty five (45) calendar days from notification of the requirement to conduct a CMS. The Scope of Work for a CMS Plan is found in Section O.

The CMS Plan shall provide the following information:

(i) A description of the general approach to the investigation, and potential remedies;

(ii) A definition of the overall objectives of the study;

(iii) Specific plans for evaluating remedies to ensure compliance with remedy standards;

(iv) Schedules for conducting the study; and

(v) The proposed format for the presentation of information.

(c) After the Permittee submits the CMS Plan, the Administrative Authority will either approve, disapprove, or modify the plan in writing.

If the Administrative Authority approves the CMS Plan, the Permittee shall implement the plan per Section K.

In the event of disapproval (in whole or in part) of the CMS Plan, the Administrative Authority shall specify deficiencies in writing. The Permittee shall modify the plan to correct these within the time frame specified in the notice of deficiency. The modified CMS Plan shall be submitted in writing to the Administrative Authority for review. Should the Permittee take exception to all or part of the disapproval, the Permittee shall submit a written statement of the grounds for the exception within 10 days of receipt of the disapproval.

K. CMS IMPLEMENTATION

No later than fourteen (14) calendar days after the Permittee has received written approval from the Administrative Authority for the CMS Plan, the Permittee shall implement the Corrective Measures Study according to the schedules specified and in accordance with the approved CMS Plan. All approved plans become incorporated into this Permit.

L. CMS FINAL REPORT AND SUMMARY

(a) Within sixty (60) calendar days after the completion of the CMS, the Permittee shall submit a CMS Final Report and Summary. The Summary shall summarize the Final Report. The CMS Final Report shall discuss the results of investigations of each remedy studied and of any bench-scale or pilot tests conducted. It must include an evaluation of each remedial alternative. The CMS Final Report shall present all information gathered during the CMS, and must contain adequate information to support the remedy selection process. In the CMS Final Report, the Permittee shall propose a corrective action program that shall:

(i) attain compliance with corrective action objectives for hazardous constituents in each medium, as established in Section O.3;

(ii) control sources of releases;

(iii) meet acceptable waste management requirements; and

(iv) protect human health and the environment.

(b) After the Permittee submits the CMS Final Report and Summary, the Administrative Authority will either approve or disapprove them in writing.

If the Administrative Authority approves the CMS Final Report and Summary, the Permittee shall mail the approved Summary to all individuals on the facility mailing list established pursuant to 40 CFR 124.10(c)(1)(ix), within fifteen (15) calendar days of receipt of approval.

If the Administrative Authority determines the CMS Final Report and Summary do not fully meet the objectives stated in Section O, the Administrative Authority may disapprove the CMS Final Report and Summary. If the Administrative Authority disapproves the Report, the Administrative Authority shall notify the Permittee in writing of the Report's deficiencies and specify a due date for submittal of a revised Final Report and Summary. Once approved, the Summary shall be mailed to all individuals on the facility mailing list as specified above.

(c) Based on preliminary results and the CMS Final Report, the Administrative Authority may require the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

M. CORRECTIVE MEASURE (REMEDY) SELECTION AND IMPLEMENTATION

Within fifteen (15) calendar days from receipt of approval of CMS Final Report and Summary, the Permittee shall submit a Permit Modification request according to Section A.2 for corrective measure (remedy) selection, based on the approved CMS Final Report. The resultant modified permit will include schedules for remedy implementation.

N. RFI SCOPE OF WORK

N.1 Purpose

The purpose of the RFI is to determine the nature and extent of releases of hazardous wastes or hazardous constituents from solid waste management units. The required information shall include each item specified under Tasks I-III. The Permittee shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RFI.

If the Permittee believes that certain requirements of the Scope of Work are not applicable, the specific requirements shall be identified and a detailed rationale for inapplicability shall be provided.

N.2 Scope

The RFI consists of three tasks:

Task I: RFI Workplan

a. Introduction
b. Environmental Setting
c. Source Characterization
d. Contamination Characterization
e. Potential Receptor Identification
f. Data Collection Quality Assurance Plan
g. Data Management Plan
h. Health and Safety Plan
i. Community Relations Plan
j. Project Management Plan

Task II: RCRA Facility Investigation

Task III: RFI Final Report and Summary

N.3 Task I: RFI Workplan

The Permittee shall prepare a RFI Workplan as specified in Sections C and F and the following. The RFI Workplan shall provide for and address the following information needs:

(a) Introduction

(i) Facility Description

The introduction shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. Information from existing reports and studies is acceptable, as long as the source of this information is documented, pertinent, and reflective of current conditions. This section shall include:

(1) Map(s) depicting the information specified below. All maps shall be consistent with requirements set forth in 40 CFR 270.14 and shall be of sufficient detail and accuracy to locate all current and future work performed at the site.

a. general geographic location;

b. property lines, with the owners of all adjacent property clearly

indicated, and all land previously owned and/or used by the Permittee around the facility;

c. topography, waterways, wetlands, floodplains, water features, and drainage patterns;

d. all tanks, buildings, utilities, paved areas, rights-of-way, and other features;

e. all solid waste management units;

f. all known past solid or hazardous waste treatment, storage and disposal areas or units regardless of whether they were active on November 19, 1980;

g. surrounding land uses (residential, commercial, agricultural, recreational); and

h. the location of all production and ground water monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations included (these elevations may be included as an attachment).

(2) A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility.

(3) A summary of approximate dates or periods of past waste releases, identification of the materials released, the amount released, the location released, and a description of the response actions conducted (local, state, or Federal response units, or private parties), including any inspection reports or technical reports generated as a result of the response.

(4) A reference to all environmental, geologic, and hydrogeologic studies performed by all parties, at or near the facility, with a short summary of the

purpose, scope, and significant findings thereof.

(5) A reference to all environmental permits, applied for and/or received, the purpose thereof, and a short summary of requirements.

(ii) Nature and Extent of Contamination

(1) The Introduction shall summarize all possible source areas of contamination. This, at a minimum, should include all SWMUs. For each area, the Permittee shall identify the following:

a. location of unit/area on a facility map;

b. quantities of solid, hazardous,and radiochemical wastes;

c. quantities of radiochemical and hazardous constituents, to the extent known; and

d. identification of areas where additional information is necessary.

(2) The Permittee shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

a. available monitoring data and qualitative information on locations and levels of contamination at the facility;

b. all potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

c. the potential impact(s) on human health or the environment, including demography, ground water and surface water use, and land use.

(iii) Implementation of Interim Measures

The Permittee shall document and report on all interim measures which were or are being undertaken at the facility, including under state or Federal compliance orders, other than those specified in the Permit. This shall include:

(1) Objectives of the interim measures: how the measure is mitigating a potential threat to human health or the environment and/or is consistent with and integrated into requirements for a long term solution;

(2) Schedules for design, construction and monitoring; and

(3) Schedule for progress reports.

(b) Environmental Setting

The Workplan shall provide for collection of information to supplement and verify existing information on the environmental setting at the facility. The Workplan shall provide for characterization of the following:

(i) Hydrogeology

The Workplan shall describe in detail a program to evaluate hydrogeologic conditions at the facility. This program shall provide for least the following information needs:

(1) A description of the regional, local, facility-wide, and SWMU-specific geologic and hydrogeologic characteristics affecting ground water flow beneath the facility.

(2) An analysis of any topographic features including surface water bodies that might influence the ground water flow system.

(3) A representative and accurate classification and description of the hydrogeologic units which may be part of migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units) based on field data, tests (e.g., gamma and neutron logging of existing and new

wells, piezometers and borings), and cores.

(4) The extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of migration pathways based on field studies and cores, structural geology, and hydrogeologic cross sections, including:

a. unconsolidated sand and gravel deposits;

b. zones of fracturing or channeling in consolidated or unconsolidated deposits; and

c. zones of high permeability or low permeability that might direct and restrict the flow of contaminants.

(5) A description of representative water level or fluid pressure based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source. Information needs include: potentiometric surface maps; hydrologic cross sections showing vertical gradients; vertical and horizontal components of flow; temporal changes in hydraulic gradients; and flow nets.

(6) A description of man-made influences that may affect site hydrogeology such as active and inactive local water-supply and production wells, pipelines, french drains, and ditches.

(ii) Soils

The Permittee shall describe in detail a program designed to characterize soil and rock units above the water table. Such characterization shall include, but is not limited to, the following information: surface soil distribution; soil profile, including ASTM and USCS classifications of soils; transects of soil stratigraphy; saturated hydraulic conductivity; porosity; cation exchange capacity (CEC); soil pH; particle

size distribution; depth to water table; moisture content; effect of stratification on unsaturated flow; infiltration; evapotranspiration; residual concentration of contaminants in soil; total natural organic carbon content; and mineral and metal content.

(c) Source Characterization

The Permittee shall describe in detail a program designed to completely characterize the wastes and the areas where wastes have been placed, including: type, quantity, physical form, composition, disposition (containment and nature of wastes), and the facility characteristics affecting releases (e.g., facility security, engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

(i) Unit/disposal area characteristics, including but not limited to: location of unit/disposal area; type of unit/disposal area; design features; operating practices (past and present); period of operation; age of unit/disposal area; general physical conditions; and method used to close the unit/disposal area.

(ii) Waste characteristics, including but not limited to: type of waste placed in unit (hazardous classification, quantity, chemical composition); physical and chemical characteristics (physical form, physical description, temperature, Ph, general chemical class, molecular weight, density, boiling point, viscosity, solubility in water, solubility in solvents, cohesiveness, vapor pressure); and migration and dispersal characteristics of the waste (sorption coefficients, biodegradability, photodegradation rates, hydrolysis rates, chemical transformations).

(d) Contamination Characteristics

The Permittee shall describe in detail a program to collect analytical data on ground water, soils, surface water, sediment, and subsurface gas contamination when necessary to characterize contamination from a SWMU. The data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data

required shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individual(s) performing the sampling and analysis. Each medium (ground water, surface water and sediments, soil, air, and gas) must be investigated. If the Permittee believes certain media could not be affected by a release from a specific unit, a detailed justification for not investigating those media must be provided. The Permittee shall address the following types of contamination at the facility:

(i) Ground Water Contamination

The Workplan shall describe in detail a program of ground water investigation to characterize any plumes of contamination at the facility. The program shall at a minimum provide for the following information needs:

(1) a description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;

(2) the horizontal and vertical direction of contamination movement;

(3) the velocity of contaminant movement;

(4) the horizontal and vertical concentrations of any 40 CFR 264 Appendix IX constituents;

(5) an evaluation of factors influencing the plume movement; and

(6) an extrapolation of future contaminant movement.

(ii) Soil Contamination

The Permittee shall describe in detail a program to characterize contamination of soil and rock units above the water table in the vicinity of the contaminant release. The program shall provide for the following information needs:

(1) a description of the vertical and horizontal extent of contamination;

(2) a description of contaminant and soil chemical properties within the contaminant source area. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, natural total organic carbon content, and other factors that might affect contaminant migration and transformation.

(3) plume migration and transformation; specific contaminant concentrations; the velocity and direction of contaminant movement; and an extrapolation to future contaminant movement.

(iii) Surface Water and Sediment Contamination

The Permittee shall describe in detail a program to characterize contamination in surface water bodies and sediment resulting from contaminant releases at the facility. The investigation shall at minimum include the following:

(1) a description of the surface water body including location, elevation, flow, velocity, depth, width, seasonal fluctuations, flooding tendencies, drainage patterns, and evapotranspiration rates.

(2) a description of sediment characteristics including depositional area, thickness, mineralogy, grain size, density, ion exchange capacity, and total natural organic carbon content.

(3) maps for all areas included in surface water and sediment investigations which meet requirements in 40 CFR 270.14 and which are sufficiently detailed and accurate to depict all the information required.

(4) a description of the horizontal and vertical extent of any immiscible or dissolved plumes originating from the facility, and the extent of contamination in the underlying sediments;

(5) the horizontal and vertical direction and velocity of contaminant movement;

(6) an evaluation of the physical, biological, chemical, and radiochemical factors influencing contaminant movement;

(7) an extrapolation to future contaminant movement;

(8) a description of the chemistry of the contaminated surface waters and sediments. This includes Ph, temperature, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total organic carbon, and specific contaminant concentrations.

(iv) Air Contamination

The Permittee shall describe in detail a program to characterize particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information: a description of the horizontal and vertical direction and velocity of contaminant movement; the rate and amount of the release; and the chemical, radiochemical, and physical composition of the contaminants released, including horizontal and vertical concentration profiles.

(v) Subsurface Gas

The Permittee shall describe in detail a program to characterize the nature, rate and extent of releases of reactive gases from the units. Such a program shall include, but is not limited to: provisions for monitoring subsurface gases released from the unit, and an assessment of the potential for threat to human health and/or the environment.

(e) Potential Receptors

The Permittee shall describe in detail a program to collect data to describe human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical

and radiochemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be required. The following characteristics shall be identified:

(i) Local uses and possible future uses of ground water, including:

(1) type of use (i.e., potable, domestic, agricultural, residential, industrial, municipal).

(2) location of all ground water wells, names of owners or tenants at those locations, USGS/DODT well designations, and current use of those wells within a 1 mile radius of facility.

(ii) Local uses and possible future uses of surface waters within a 1.5 mile radius of the facility, including domestic and municipal, recreational, agricultural, industrial, and environmental.

(iii) Human use of or access to the facility and adjacent lands, including but not limited to recreation, hunting, residential, commercial, and industrial.

(iv) A demographic profile of people who use or have access to the facility and adjacent land, including, but not limited to age, gender, and sensitive subgroups.

(v) A description of the local ecology, including biota in surface water bodies on, adjacent to, or affected by the facility, and a description of any endangered or threatened species near the facility.

(f) Data Collection Quality Assurance Plan

The Permittee shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed at the facility during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are

technically sound, statistically valid, and properly documented.

(i) The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

(1) description of the intended uses for the data, and the necessary level of precision and accuracy for those intended uses;

(2) description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data; and

(3) schedule and information to be provided in quality assurance reports, including at least:

a. periodic assessment of measurement data accuracy, precision, and completeness;

b. results of performance audits;

c. results of systems audits; and

d. significant quality assurance problems and resolutions.

(ii) The Sampling and Field Measurements Section of the Data Collection Quality Assurance Plan shall at least discuss:

(1) selecting appropriate sampling and field measurements locations, depths, etc.;

(2) providing a statistically sufficient number of sampling and field measurement sites;

(3) determining conditions under which sampling or field measurements shall be conducted;

(4) determining which parameters are to be measured and where;

(5) selecting the frequency of sampling and length of sampling period;

(6) selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

(7) delineating procedures designed to prevent contamination of sampling or field measurements equipment and cross contamination between sampling points;

(8) documenting field sampling operations and procedures;

(9) selecting appropriate sample containers;

(10) preserving samples;

(11) controlling chain-of-custody; and

(12) disposing of all contaminated materials generated by activities in a manner compliant with all state and Federal regulations.

(ii) The Sample Analysis shall include:

(1) chain-of-custody procedures;

(2) sample storage procedures and holding times;

(3) sample preparation methods;

(4) analytical procedures;

(5) calibration procedures and frequency;

(6) data reduction, validation and reporting; and

(7) frequency of internal quality control checks and laboratory performance audits.

(g) Data Management Plan

The Permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures (data record), project file requirements, and project-related progress reporting procedures and documents.

(i) The data record shall include at least the following for all sample and field measurements: unique measurement code; measurement location; measurement type; laboratory ID number; property or component analyzed; and results of analysis.

(ii) The Data Management Plan shall provide the format to be used to present the data and conclusions of the investigation, etc.

(iii) The following shall be presented in tables: raw data; data sorted by significant features such as location, media, constituent; data reduction for statistical analysis; and summary data.

(iv) The following shall be presented in graphical formats (e.g., bar graphs, line graphs, plan maps, isopleth plots, cross-sections, three-dimensional displays, etc.): sampling location and grid; levels of contamination at each sampling location; geographical extent of contamination; and changes in concentration relative to source, time, depth, and other parameters.

(h) Health and Safety Plan

(i) The Permittee shall prepare a facility Health and Safety Plan, which shall include:

(1) a description of the facility including availability of resources such as roads, water supply, electricity and telephone service;

(2) a description of the known hazards and evaluation of the risks associated with each activity conducted, including but not limited to on and off-site exposure to contaminants during implementation of interim measures;

(3) a list of key personnel and alternatives responsible for site safety, response operations, and for protection of public health;

(4) a delineation of the work area;

(5) a description of levels of protection to be worn by personnel in the work area;

(6) procedures established to control site access;

(7) decontamination procedures for personnel and equipment;

(8) site emergency procedures;

(9) emergency medical care procedures for injuries and toxicological problems;

(10) requirements for an environmental field monitoring program;

(11) routine and special training requirements for responders; and

(12) procedures for protecting workers from weather-related problems.

(ii) The Facility Health and Safety Plan shall be consistent with:

(1) NIOSH Occupation Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

(2) EPA Order 1440.1 - Respiratory Protection;

(3) EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

(4) approved Facility Contingency Plan;

(5) EPA Operating Safety Guide (1984);

(6) OSHA regulations, particularly 29 CFR 1910 and 1926;

(7) State and local regulations; and

(8) other EPA guidance as provided.

(i) Community Relations Plan

The Permittee shall prepare a plan for dissemination of information to the public regarding investigation activities and results.

(j) Project Management Plan

The Permittee shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and key project personnel. The project management plan will also include a description of qualifications of key project personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RFI.

N.4 Task II: RCRA Facility Investigation

The facility investigation activities shall follow the approved RFI Workplan. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map. During the RFI, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility specific situation.

The Permittee shall conduct investigations of SWMUs previously identified with known or suspected releases of contamination to characterize the facility (Environmental Setting), define the source (Source Characterization), define the degree and extent of contamination (Contamination Characterization), and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to develop and evaluate corrective measures alternatives during the Corrective Measures Study, when necessary.

N.5 Task III: RFI Final Report and Summary

The Permittee shall analyze all facility investigation data collected during the RFI process and prepare a detailed report on the type and extent of contamination at the facility including sources and migration pathways. All information generated during the investigation shall be presented and analyzed. All evidence and procedures used for making any determinations (e.g., velocity of ground water, extent of contamination) shall be fully documented. The report shall describe extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area. The report shall contain the results of all tests, calculations,

inspections, record searches, and observations. It shall contain soil and ground water contamination profiles, statistical comparisons, and the results of all sampling events conducted as part of the investigation. It shall display results in tables, graphs, maps, and cross sections as discussed in the Data Management Plan.

The Permittee shall identify all relevant and applicable standards for the protection of human health or the environment (e.g., National Ambient Air Quality Standards, Federally-approved State water quality standards, ground water protection standards, etc.)

Data shall be evaluated to ensure it is sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, to evaluate the potential threat to human health or the environment, and to support a CMS, if required. The report shall present all data in an Appendix.

(a) General RFI Reporting Requirements

(i) Two hard copies and one IBM compatible disk copy of all reports and data shall be submitted by the Permittee to the Administrative Authority as specified in Section B.5.

(ii) The RFI Workplan shall be submitted by the Permittee to the Administrative Authority as described in Section B.5.

(iii) The RFI Final Report and Summary shall be submitted by the Permittee to the Administrative Authority as described in Section B.5.

(iv) Within 90 days of the effective date of this Permit modification, the Permittee shall provide the Administrative Authority with signed, quarterly progress reports as specified in Section D.

O. CMS SCOPE OF WORK

O.1 Purpose

The purpose of the CMS is to develop and evaluate corrective measures alternatives and to recommend the corrective measure or measures to be taken. The required information shall include each item specified under CMS Tasks IV-VI. The

Permittee will furnish the personnel, materials, and services necessary to prepare the CMS, except as otherwise specified.

If the Permittee believes that certain requirements of the Scope of Work are not applicable, the specific *requirements shall be identified and the rationale for inapplicability shall be provided.

0.2 Scope

The Corrective Measure Study consists of three tasks:

Task IV: CMS Plan

a. Description of Current Situation
b. Establishment of Corrective Action Objectives
c. Description of Approach to CMS
d. Schedule for CMS

Task V: Corrective Measures Study

a. Identification of Corrective Measures Alternatives(s)
b. Screening of Corrective Measures Alternatives(s)
c. Development of Corrective Measures Alternative(s)
d. Evaluation of Corrective Measures Alternative(s)
e. Selection of Corrective Measures Alternative(s)

Task VI: CMS Final Report and Summary

0.3 Task IV: CMS Plan

(a) Description of Current Conditions

The Permittee shall briefly describe current conditions at the facility to update information provided in the RFI Final Report and Summary. This shall include previous and/or ongoing remedial activity or interim measures.

(i) Establishment of Corrective Action Objectives

The Permittee shall propose to the Administrative Authority for review and approval, facility specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RFI, EPA guidance, and the requirements of any applicable Federal statutes and regulations.

(ii) Description of Approach to CMS

The Permittee shall describe the general approach to the corrective measures study. The approach shall include identification, development, screening, and evaluation of the corrective measures alternatives, as discussed in detail in Section J. The Permittee shall describe specific plans for laboratory and bench-scale studies, or field studies, if needed. Specific plans for evaluating remedy effectiveness shall also be developed. The approach shall specify formats to be used for data presentation, including raw data, maps, charts, graphs, engineering schematics, construction design, etc.

(iii) Schedule

The Permittee shall develop a schedule for implementing the corrective measures study, and a schedule for submitting quarterly progress reports on the study implementation.

O.4 Task V: Corrective Measures Study

The CMS consists of five parts: identification, screening, development, evaluation, and selection of the corrective measures alternative(s).

(a) Identification of Preliminary Corrective Measures Alternative(s)

Based on the results of the RFI and the CMS Plan objectives, the Permittee shall identify all possible alternatives for removal, containment, treatment and/or other remediation of the contamination.

(i) Screening of Preliminary Corrective Measures Alternatives

The Permittee shall screen the identified preliminary corrective measures alternatives to eliminate those that may not prove feasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective action objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technological limitations.

Site, waste, and technological characteristics which are used to screen inapplicable technologies are described in more detail below:

(1) Site Characteristics
Site data should be reviewed to identify conditions which may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

(2) Waste Characteristics
Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by waste characteristics should be eliminated from consideration.

(3) Technological Limitations
The level of technology development, performance record, and operation and maintenance problems shall be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process.

(ii) Development of Corrective Measures Alternatives

The Permittee shall develop corrective measures alternatives based on corrective measures objectives, and identification and screening of preliminary alternatives. The Permittee shall rely on engineering practice to determine which of the previously identified and screened technologies appear most suitable for the site. Technologies can be combined to form the overall corrective measures alternatives. The alternatives developed should represent a workable number of options that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Permittee shall document the reasons for excluding technologies.

When a new technology is proposed or similar waste streams have not routinely been treated or disposed of using the technology, the Permittee shall conduct laboratory and/or bench-scale studies to

determine the applicability to facility conditions. The Permittee shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

(1) The Permittee shall develop a testing plan identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

(2) Upon completion of testing, the Permittee shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

(3) The Permittee shall prepare a report summarizing the testing program and its results, both positive and negative.

(iii) Evaluation of Corrective Measures Alternative(s)

The Permittee shall evaluate each corrective measures alternative developed in Section J. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Permittee shall also develop cost estimates for each corrective measure.

(1) Technical, Environmental, Human Health, and Institutional Concerns

The Permittee shall provide a description of each corrective measures alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Permittee shall evaluate each alternative in the four following areas:

(2) Technical

The Permittee shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

The Permittee shall evaluate performance based on the effectiveness and useful life of the corrective measure:

a. Effectiveness shall be evaluated in terms of the ability to perform intended functions such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies.

b. Useful life is defined as the length of time the level of effectiveness can be maintained. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

c. The Permittee shall provide information on the reliability of each corrective measure including operation and maintenance requirements and demonstrated reliability:

    1. Operation and maintenance requirements include the frequency and complexity of operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered.

    2. Demonstrated and expected reliability is a way of measuring

risk and effect of failure. The Permittee should evaluate whether technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

d. The Permittee shall describe the implementability of each corrective measure including relative ease of installation (constructibility) and total time required to achieve a given level of response:

1. Constructibility is determined by conditions both internal and external to facility conditions and includes such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of facility (i.e., remote location vs. congested urban area). The Permittee shall evaluate what measures can be taken to facilitate construction under site specific conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities.

2. Time has two components to be addressed: the time it takes to implement a corrective measure and the time it takes to see beneficial results. Beneficial results are defined as the reduction of contaminants to acceptable levels as established in the corrective measures objectives.

e. The Permittee shall evaluate each corrective measures alternative with

regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider include fire, explosion, and exposure to hazardous substances.

(3) Environmental

The Permittee shall perform an Environmental Assessment for each alternative. The assessment shall focus on facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include at a minimum, an evaluation of the short- and long-term beneficial and adverse effects of the response alternative, evaluation of any adverse effects on environmentally sensitive areas, and an analysis of measures to mitigate adverse impacts.

(4) Human Health

The Permittee shall assess each alternative in terms of the extent to which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or regulations acceptable to the Administrative Authority.

(5) Institutional

The Permittee shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, State, and Local environmental and public health standards, regulations, guidance, advisories,

ordinances, or community relations on the design, operation, and timing of each alternative shall be considered.

a. Cost Estimate

The Permittee shall develop an estimate of the cost of each corrective measures alternative and for each phase or segment of the alternative. The cost estimate shall include capital, and operation and maintenance costs.

b. Capital costs consist of direct and indirect costs.

Direct capital costs include:

1. Construction costs: Cost of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measures alternative;

2. Equipment costs: Costs of treatment, containment, disposal and/or servicing of equipment used to implement the action;

3. Land and site development costs: Expenses associated with purchase of land and development of existing property; and

4. Building and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.

Indirect capital costs include:

1. Engineering expenses: Costs of administration, design, construction, supervision, drafting, and testing of corrective measures alternatives;

2. Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses

and permits for installation and operation;

3. Start-up and shakedown costs: Costs incurred during corrective measure start-up; and

4. Contingency allowances: Funds to cover costs resulting from unforeseen circumstances such as adverse weather conditions, strikes, and inadequate facility characterization.

c. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Permittee shall consider the following operation and maintenance cost components:

1. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operation;

2. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

3. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

4. Purchased services: Sampling costs, laboratory fees, and professional fees which can be predicted;

5. Disposal and treatment: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operation;

6. Administrative costs: Costs associated with administration of corrective measures operation and

d. Safety. Corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

(2) Human Health

The corrective measure or measures must comply with existing EPA criteria, standards, or regulations for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

(3) Environmental

The corrective measure or measures imposing the least adverse impact or greatest improvement on the environment over the shortest period of time will be preferred.

0.5 Task VI: CMS Final Report and Summary

The Permittee shall prepare a CMS Final Report and Summary presenting the results of the CMS and recommending a corrective action program. The Report shall at a minimum include:

(a) A summary of all the corrective measures alternatives originally identified, and the screening rationale employed. The results of development of each alternative shall be described, and the evaluation of those developed shall be presented in detail. The report will describe the rationale for selection of a corrective measures alternative, including performance expectations, preliminary design criteria and rationale, general operation and maintenance requirements, and long-term monitoring requirements. The report shall include summary tables which allow the alternative or alternatives to be easily understood. Trade-offs among health risks, environmental effects, and other pertinent factors shall be highlighted.

(b) A proposed corrective action program that will attain compliance with concentration level objectives, control sources of releases, meet acceptable waste management requirements, and protect human health and the environment.

(c) Design and implementation precautions, including special technical problems, additional engineering data required, permits and regulatory requirements, access, easements, and right-of-way, health and safety requirements, and community relations activities.

(d) Cost estimates and schedules including capital cost estimate, operation and maintenance cost estimate, and project schedule (design, construction, operation).

(e) A schedule for corrective measure (remedy) implementation.

O.6 General CMS Reporting Requirements

(a) Two hard copies and one IBM compatible disk copy of all reports shall be submitted by the Permittee to the Administrative Authority as specified in Section B.5.

(b) The CMS Plan shall be submitted by the Permittee to the Administrative Authority as described in Section J.

(c) The CMS Final Report and Summary shall be submitted by the Permittee to the Administrative Authority as described in Section L.

(d) Within 90 days of the date the Permittee is notified to begin a CMS, the Permittee shall provide the Administrative Authority with signed, quarterly progress reports as specified in Section D.

Table 1: RFI/CMS SUBMISSION SUMMARY

Below is a summary of the planned reporting requirements pursuant to this Permit:

Actions	Due Date (examples)
Progress reports on all activities	Quarterly; no later than ninety (90) calendar days after effective date of this Permit modification
RFI Workplan	Sixty (60) calendar days after the effective date of the Permit modification
Revised RFI Workplan	As determined by Administrative Authority, usually within thirty (30) calendar days of receipt of notice of deficiency
RFI Report and Summary	Sixty (60) calendar days after completion of RFI
Revised RFI Report and Summary	As determined by Administrative Authority, usually within thirty (30) calendar days of receipt of notice of deficiency
Notification of newly-identified SWMUs	Thirty (30) calendar days after discovery
Notification of newly-discovered releases	Fifteen (15) calendar days after discovery
Interim Measures Plan	As determined by Administrative Authority
Revised Interim Measure Plan	As determined by Administrative Authority
CMS Plan	Forty-five (45) calendar days after notification of requirement to perform CMS

Revised CMS Plan	As determined by Administrative Authority, usually within thirty (30) calendar days of receipt of notice of deficiency
CMS Final Report and Summary	Sixty (60) calendar days after completion of CMS
Revised CMS Final Report	As determined by Administrative Authority, usually thirty (30) calendar days after receipt of notice of deficiency
Demonstration of Financial Assurance at Facility	One hundred and twenty (120) calendar days after permit modification to implement corrective measures

Table 2: SWMUs REQUIRING AN RFI

Below is a list of the SWMU(s) requiring an RFI.

SWMU #	SWMU Name
8	Coronado Municipal Landfill

Exhibit B-1

ATTACHMENT D

THE MERCK INDEX

AN ENCYCLOPEDIA OF
CHEMICALS, DRUGS, AND BIOLOGICALS

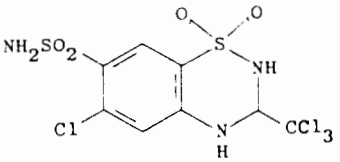
TENTH EDITION

Martha Windholz, *Editor*
Susan Budavari, *Co-Editor*
Rosemary F. Blumetti, *Associate Editor*
Elizabeth S. Otterbein, *Assistant Editor*

Published by
MERCK & CO., INC.
RAHWAY, N.J., U.S.A.

1983

trichloromethyl-2H-1,2,4-benzothiadiazine-7-sulfonamide 1,1-dioxide; 6-chloro-3,4-dihydro-7-sulfamoyl-3-trichloromethyl-2*H*-1,2,4-benzothiadiazine 1,1-dioxide; 3-trichloromethylhydrochlorothiazide; teclothiazide; PS 207; K 33; Depleil. $C_8H_7Cl_4N_3O_4S_2$; mol wt 415.13. C 23.15%, H 1.70%, Cl 34.17%, N 10.12%, O 15.42%, S 15.45%. Prepn: Close *et al., J. Am. Chem. Soc.* **82,** 1132 (1960); Novello *et al., J. Org. Chem.* **25,** 970 (1960).



Crystals, mp 300-303° (Close); mp 287° (Novello).
THERAP CAT: Diuretic.

9016. Tetrachloroethane. *1,1,2,2-Tetrachloroethane; sym*-tetrachloroethane; acetylene tetrachloride; Cellon; Bonoform. $C_2H_2Cl_4$; mol wt 167.86. C 14.31%, H 1.20%, Cl 84.49%. $Cl_2CHCHCl_2$. Manuf by catalytic addition of chlorine to acetylene: Peters, Neumann, *Angew. Chem.* **45,** 261 (1932); by chlorination of ethylene: Pye, **U.S.** pat. **2,752,402** (1956 to Dow); by catalytic chlorination of ethane: Joseph, **U.S.** pat. **2,752,401** (1956 to Dow); by chlorination of 1,2-dichloroethane: Conrad, **U.S.** pat. **2,725,412** (1955 to Ethyl Corp.); Fox, **U.S.** pat. **2,846,484** (1958 to Monsanto). Toxicity: E. Browning, *Toxicity and Metabolism of Industrial Solvents* (Elsevier, New York, 1965) pp 220-229.

Nonflammable, heavy, mobile liquid. Sweetish, suffocating, chloroform-like odor. d_4^{25} 1.58658. mp −44°. bp_{760} 146.5°. n_D^{20} 1.49419. Very sparingly sol in water. At 25° one gram dissolves in 350 ml H_2O. Misc with methanol, ethanol, benzene, ether, petr ether, carbon tetrachloride, chloroform, carbon disulfide, dimethylformamide, oils. Has the highest solvent power of the chlorinated hydrocarbons. LD_{50} orally in rats: 0.20 ml/kg, H. F. Smyth *et al., Am. Ind. Hyg. Assoc. J.* **30,** 470 (1969).

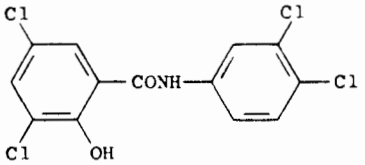
USE: Nonflammable solvent for fats, oils, waxes, resins, cellulose acetate, rubber, copal, phosphorus, sulfur. As solvent in certain types of Friedel-Crafts reactions or phthalic anhydride condensations. In the manuf of paint, varnish, and rust removers. In soil sterilization and weed killer and insecticide formulations. In the determination of theobromine in cacao. As immersion fluid in crystallography. In the biological laboratory to produce pathological changes in gastrointestinal tract, liver, and kidneys. Intermediate in the manuf of trichloroethylene and other chlorinated hydrocarbons having two carbon atoms. *Caution:* Powerful narcotic; liver poison. For symptoms *see* Carbon Tetrachloride.

9017. Tetrachloroethylene. Perchloroethylene; ethylene tetrachloride; tetrachlorethylene; Nema; Tetracap; Tetropil; Perclene; Ankilostin; Didakene. C_2Cl_4; mol wt 165.85. C 14.48%, Cl 85.52%. $Cl_2C{=}CCl_2$. Prepd by Faraday in 1821. Manuf by catalytic oxidation of 1,1,2,2-tetrachloroethane: Ellsworth, Vancamp, **U.S.** pat. **2,951,103** (1960 to Columbia-Southern Chem.); Feathers, Rogerson, **U.S.** pat. **3,040,109** (1962 to Pittsburgh Plate Glass); by catalytic chlorination of acetylene: Thermet, Parvi, **U.S.** pat. **2,938,-931** (1960 to Société d'électrochimie, d'électrométallurgie et des aciéries électriques d'Ugine). Review of mfg processes: Faith, Keyes & Clark's *Industrial Chemicals,* F. A. Lowenheim, M. K. Moran, Eds. (Wiley-Interscience, New York, 4th ed., 1975) pp 604-611.

Colorless, nonflammable liq; ethereal odor; d_4^{15} 1.6311; d_4^{20} 1.6230. bp 121°. Solidif about −22°. n_D^{20} 1.5055: Mumford, Phillips, *J. Chem. Soc.* **1950,** 75. Sol in about 10,000 vol

THERAP CAT (VET): Anthelmintic.

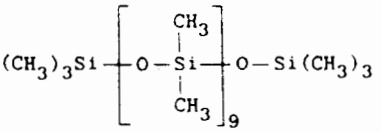
9018. 3,3′,4′,5-Tetrachlorosalicylanilide. *3,5-Dichloro-N-(3,4-dichlorophenyl)-2-hydroxybenzamide;* Irgasan BS2 $C_{13}H_7Cl_4NO_2$; mol wt 351.03. C 44.48%, H 2.01%, Cl 40.40%, N 3.99%, O 9.12%. Prepn of polyhalosalicylanilides: Bindler, Model, **U.S.** pat. **2,703,332** (1955 to Geigy). Bacteriostat in the manuf of thermoplastic articles: Tell **U.S.** pat. **3,005,720** (1961 to Weco Products).



Crystals, mp 161°. Fluoresces under ultraviolet light. Practically insol in water. Sol in alkaline aq solns and solns of wetting agents. Sol in many organic solvents.

USE: Bacteriostat in formulations of surgical soaps, laundry soaps, rinses, polishes, shampoos, deodorants. Also preservative in textile finishes, certain petroleum products, cellulose esters, cutting oils, coolants. Banned by FDA for use in cosmetics.

9019. Tetracosamethylhendecasiloxane. *Tetracosamethylundecasiloxane.* $C_{24}H_{72}O_{10}Si_{11}$; mol wt 829.83. C 34.75%, H 8.75%, O 19.28%, Si 37.21%. Prepd by reaction of hexamethyldisiloxane with octamethylcyclotetrasiloxane and sulfuric acid: Patnode, Wilcock, *J. Am. Chem. Soc.* **68,** 3 (1946); by cohydrolysis of ethoxytrimethylsilane and diethoxydimethylsilane: Hyde, **U.S.** pat. **2,457,677** (1948 Corning Glass).



Liquid; $bp_{4.7}$ 201°; $bp_{0.5}$ 152°; d_4^{25} 0.9247; n_D^{20} 1.3994. Flash pt 188.33°. Stable. Inert to most chemical reagents and rubber. Maintains about the same viscosity over a wide temperature range. Sol in benzene and the lighter hydrocarbons; slightly sol in alcohol and the heavy hydrocarbons.

USE: As a basis for silicone oils or fluids designed to withstand extremes of temperature; as a foam suppressant in petroleum lubricating oil.

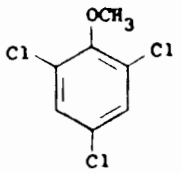
9020. Tetracyanoethylene. *Ethenetetracarbonitrile;* TCNE. C_6N_4; mol wt 128.10. C 56.26%, N 43.74%. $(NC)_2C{=}C(CN)_2$. Prepd by debromination of dibromomalononitrile with copper powder in boiling benzene: Cairns *et al., Am. Chem. Soc.* **80,** 2775 (1958).

Crystals, mp 200°. Begins to sublime at 120°.

USE: In the synthesis of spiro compds, in modified Diels-Alder reactions, as aromatizing agent: Longone, Smith, *Tetrahedron Letters* **1962,** 205.

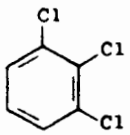
9021. Tetracycline. *4-(Dimethylamino)-1,4,4a,5,5a,6,11,12a-octahydro-3,6,10,12,12a-pentahydroxy-6-methyl-11-dioxo-2-naphthacenecarboxamide;* deschlorobiomycin; tsiklomitsin; Abricycline; Achromycin; Agromicina; Ambromicina; Ambramycin; Bio-Tetra; Bristaciclina; Cefracycline suspension; Criseociclina; Cyclomycin; Democracin; Hostacyclin; Omegamycin; Panmycin; Polycycline; Purocyclin; Sanclomycine; Steclin; Tetrabon; Tetracyn; Tetradecin. $C_{22}H_{24}N_2O_8$; mol wt 444.43. C 59.45%, H 5.44%, N 6.30%, O 28.80%. Prepn: Boothe *et al., J. Am. Chem. Soc.* **75,** 46 (1953); Conover *et al., ibid.* 4622; Conover, **U.S.** pat. **2,69**

...ler. *Monatsh.* **46,** 91 (1925).



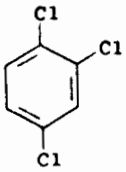
...nic needles from alc, mp 60°, $bp_{738.2}$ 240°, bp_{28} ... odor similar to that of acetophenone. Sublimes ...oom temp. Volatile with steam. Practically insol ... Sol in methanol, dioxane, benzene, cyclohexanone. ...merly as a dye assistant for polyester fibers.

1,2,3-Trichlorobenzene. *vic*-Trichlorobenzene. ... 181.46. C 39.71%, H 1.67%, Cl 58.62%. Pre... 3,4,5-trichloroaniline by diazotization: Cohen, ... *Chem. Soc.* **87,** 1365 (1905); Holleman, *Rec. Trav.* ... 96 (1918); from 2,3,4-trichloroaniline by diazoti... ...dien *et al., Monatsh.* **61,** 431 (1932); from 2,3,4-... ...line by treatment with ethyl nitrite: Beilstein, ... *Ann.* **192,** 234 (1878).



...ts from alc, d 1.69. mp 52.6°. bp 221°. n_D^{19} 1.5776. ...3° (235.4°F). Volatile with steam. Insol in water. ...sol in alc. Freely sol in benzene, carbon disulfide. ...ial grade (mixture of isomeric trichloro-... combat termites. *Caution:* Irritating to ...mbranes.

1,2,4-Trichlorobenzene. *unsym*-Trichlorobenzene. ... mol wt 181.46. C 39.71%, H 1.67%, Cl 58.62%. ...m 2,4-dichloroaniline or 2,5-dichloroaniline or ...ranline by diazotization and treatment with Cu_2-...stein, Kurbatow, *Ann.* **192,** 230 (1878); van der ...Rec. Trav. Chim.* **51,** 104, 110 (1932); from 1,3-di...zene by tetrazotization and treatment with Cu_2Cl_2: ...ber. *Monatsh.* **21,** 278 (1900).



...p 17°; d_{25}^{25} 1.4634; bp 213°; n_D^{25} 1.5524. Flash pt ... Volatile with steam. Insol in water. Sparingly ...soluble with ether, benzene, petr ether, carbon

1,3,5-Trichlorobenzene. *sym*-Trichlorobenzene. ... wt 181.46. C 39.71%, H 1.67%, Cl 58.62%. ...2,4,6-trichloraniline by diazotization and treat... ...ol: Jackson, Lamar, *Am. Chem. J.* **18,** 667 ...van der Baan, *Rec. Trav. Chim.* **56,** 1177

... ether, carbon disulfide, glacial acetic acid.

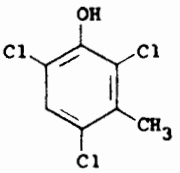
9445. α,α,β-Trichloro-*n*-butyraldehyde. *2,2,3-Trichlorobutanal;* butylchloral; anhydr butylchloral; butyrchloral; crotonchloral. $C_4H_5Cl_3O$; mol wt 175.45. C 27.38%, H 2.87%, Cl 60.63%, O 9.12%. $CH_3CHClCCl_2CHO$. Prepd by the action of chlorine on acetaldehyde: Krämer, Pinner, *Ber.* **3,** 883 (1870); Pinner, *Ann.* **179,** 24 (1875); on paraldehyde: *idem;* on crotonaldehyde after saturation with gaseous HCl: High, **U.S.** pat. **2,280,290** (1942); Brown, Plump, **U.S.** pat. **2,351,000** (1944). From crotonaldehyde and chlorine: Ropp *et al., Org. Syn.* **coll. vol. IV,** 130 (1963). *See also* Butylchloral Hydrate.

Oily liquid. Pungent, disagreeable odor; d_4^{20} 1.3956; bp_{760} 164.5-165.5°; bp_{25} 57-60°. n_D^{20} 1.47554. Freely sol in water forming butylchloral hydrate; sol in alcohol forming an alcoholate; sol in ether. Polymerizes.

9446. 2,3,6-Trichloro-*p*-cresol. *2,3,6-Trichloro-4-methylphenol;* 2,3,5-trichloro-4-hydroxytoluene; 2,3,5-trichloro-4-hydroxy-1-methylbenzene. Prepared by chlorination of *p*-cresol: Zincke *et al., Ann.* **328,** 268 (1903).

Long needles from glacial acetic acid or petr ether. mp 66-67°. Slightly sol in water; freely sol in the usual organic solvents, and in dil alkali and soda solns.

9447. 2,4,6-Trichloro-*m*-cresol. *2,4,6-Trichloro-3-methylphenol;* 2,4,6-trichloro-3-hydroxytoluene. $C_7H_5Cl_3O$; mol wt 211.48. C 39.75%, H 2.38%, Cl 50.30%, O 7.57%. Prepd by chlorination of *m*-cresol, chlorination of thymol in the presence of iron, or by action of concd sulfuric acid on 2,4,4-trichloro-3-methyl-6-isopropyl-$\Delta^{2,5}$-cyclohexadienone: Crowther, McCombie, *J. Chem. Soc.* **103,** 536 (1913).



Needles or plates from water or petr ether. mp 45-47°; bp 265°, bp_{14} 142-144°. Volatile with steam. Slightly sol in water, benzene, petr ether, glacial acetic acid. Freely sol in methanol, alc, chloroform, xylene, ether and in alkali solns.

9448. 4,5,6-Trichloro-*o*-cresol. *2,3,4-Trichloro-6-methylphenol;* 3,4,5-trichloro-2-hydroxytoluene; 1-methyl-2-hydroxy-3,4,5-trichlorobenzene. Prepd by chlorination of 1-methyl-2-hydroxy-4-chlorobenzene: Kohn, Syreia, *J. Am. Chem. Soc.* **70,** 3950 (1948).

Needles from petr ether, mp 77°. Slightly soluble in water; freely sol in the customary organic solvents and in caustic alkali solns.

9449. 1,1,1-Trichloroethane. Methylchloroform; Chlorothene. $C_2H_3Cl_3$; mol wt 133.42. C 18.00%, H 2.27%, Cl 79.72%. CH_3CCl_3. Prepd by the action of chlorine on 1,1-dichloroethane: Sutton, *Proc. Roy. Soc.* **A133,** 673 (1931); by the catalytic addition of HCl to 1,1-dichloroethylene: **Ger.** pat. **523,436** (1931); **U.S.** pat. **2,209,000** (Nutting, Huscher, 1940). Review of mfg processes: Faith, Keyes & Clark's *Industrial Chemicals,* F. A. Lowenheim, M. K. Moran, Eds. (Wiley-Interscience, New York, 4th ed., 1975) pp 836-843.

Liquid. Nonflammable. Solidifies at −32.5°; d_4^{20} 1.3376; bp_{760} 74.1°; n_D^{20} 1.43838. Insoluble in water. Absorbs some water. Sol in acetone, benzene, carbon tetrachloride, methanol, ether.

USE: In cold type metal cleaning, also in cleaning plastic molds. *Caution:* Irritating to eyes, mucous membranes, and, in high concns, narcotic.

9450. 1,1,2-Trichloroethane. Vinyl trichloride. $C_2H_3Cl_3$; mol wt 133.42. C 18.00%, H 2.27%, Cl 79.73%. CH_2Cl-$CHCl_2$. Prepd by catalytic chlorination of ethane or ethylene: Joseph, **U.S.** pat. **2,752,401** and Pye, **U.S.** pat. **2,752,402** (both 1956 to Dow); Reynolds, **U.S.** pat. **2,783,286** (1957 to Olin Mathieson).

Nonflammable liquid; pleasant odor; d_4^{20} 1.4416; solidif −35°; bp 113-114°; n_D^{20} 1.4711. Insol in water; misc with alcohol, ether, and many other organic liquids. LD_{50} orally in rats: 0.58 ml/kg, H. F. Smyth *et al., Am. Ind. Hyg. Assoc. J.* **30,** 470 (1969).

USE: Solvent for fats, waxes, natural resins, alkaloids. *Caution:* Irritating to eyes, mucous membranes, and, in high concns, narcotic.

9451. 2,2,2-Trichloroethanol. Trichloroethyl alcohol. $C_2H_3Cl_3O$; mol wt 149.42. C 16.08%, H 2.02%, Cl 71.19%, O 10.71%. CCl_3CH_2OH. Prepd by reduction of the corresponding ester, acid chloride, or acid with lithium aluminum hydride: Sroog *et al., J. Am. Chem. Soc.* **71,** 1710 (1949). Manufacture by reduction of chloral hydrate with an amine borane: Chamberlain, Schechter, **U.S.** pat. **2,898,379** (1959 to Callery Chem.).

Hygroscopic liquid, ethereal odor. At low temps it crystallizes in rhombic tablets. mp at 18°; bp 151-153°; d_{20}^{20} 1.55. Sol in about 12 parts water; miscible with alcohol or ether. pH of aq soln is 5-6, but on prolonged contact with water some free acid is formed. *Keep well closed and protected from light.* LD_{50} orally in rats: 600 mg/kg, *Handbook of Toxicology* **vol. 1,** W. S. Spector, Ed. (Saunders, Philadelphia, 1955) pp 302-303.

THERAP CAT: Hypnotic, anesthetic.

9452. Trichloroethylene. *Trichloroethene;* ethinyl trichloride; Tri-Clene; Trielene; Trilene; Trichloran; Trichloren; Algylen; Trimar; Triline; Tri; Trethylene; Westrosol; Chlorylen; Gemalgene; Germalgene. C_2HCl_3; mol wt 131.40. C 18.28%, H 0.77%, Cl 80.95%. $CCl_2{=}CHCl$. Usually prepd from *sym*-tetrachloroethane by elimination of HCl (by boiling with lime): **Ger.** pat. **171,900.** By passing tetrachloroethane vapor over $CaCl_2$ catalyst at 300°: **Ger.** pat. **263,457;** without catalyst at 450-470°: **Brit.** pat. **575,530** (1946 to du Pont). Review of mfg processes: S. A. Miller, *Chem. Process Eng.* **47,** 268 (1966); Faith, Keyes & Clark's *Industrial Chemicals,* F. A. Lowenheim, M. K. Moran, Eds. (Wiley-Interscience, New York, 4th ed., 1975) pp 844-848. Toxicity and metabolism: E. Browning, *Toxicity and Metabolism of Industrial Solvents* (Elsevier, New York, 1965) pp 189-212.

Nonflammable, mobile liquid. Characteristic odor resembling that of chloroform. d_4^4 1.4904; d_4^{15} 1.4695; d_4^{20} 1.4649. Vapor density: 4.53 (air = 1.00). Solidifies at −84.8°. bp_{760} 86.7°; bp_{400} 67.0°; bp_{200} 48.0°; bp_{100} 31.4°; bp_{60} 20.0°; bp_{20} −1.0°; bp_{10} −12.4°; bp_5 −22.8°; $bp_{1.0}$ −43.8°; n_D^{17} 1.47914; n_D^{25} 1.45560. Practically insol in water; misc with ether, alcohol, chloroform. Dissolves most fixed and volatile oils. Slowly dec (with formn of HCl) by light in the presence of moisture. Trichloroethylene for medicinal purposes may contain some thymol or ammonium carbonate (not more than 20 mg/100 ml) as a stabilizer. Industrial grades of trichloroethylene may contain other stabilizers such as triethanolamine stearate and cresol. LD_{50} orally in rats: 4.92 ml/kg; LC (4 hrs) in rats: 8000 ppm, Smyth *et al., Am. Ind. Hyg. Assoc. J.* **30,** 470 (1969).

Caution: Use with adequate ventilation. Preserve trichloroethylene in sealed, light-resistant ampuls or in frangible, light-resistant glass tubes. Avoid prolonged exposure of the product to excessive heat. It must be dispensed in the unopened glass container in which it was placed by the manufacturer.

Human Toxicity: Moderate exposures can cause symptoms similar to alcohol inebriation. Higher concns can have narcotic effect. Deaths occurring after heavy exposure have been attributed to ventricular fibrillation. Liver injury is not definitely established in occupational exposures. Found to induce hepatocellular carcinomas in National Cancer Institute tests on mice: *Chem. & Eng. News* **54,** 4 (Apr. 5, 1976).

USE: Solvent for fats, waxes, resins, oils, rubber, paints, and varnishes. Solvent for cellulose esters and ethers. Used dry cleaning. In the manuf of organic chemic ceuticals, such as chloroacetic acid.

THERAP CAT: Analgesic (inhalation).

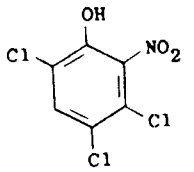
THERAP CAT (VET): Inhalant anesthetic.

9453. Trichlorofluoromethane. Trichlorc methane; fluorotrichloromethane; Freon 11 Arcton 9. CCl_3F; mol wt 137.38. C 8.74%, 13.83%. Prepn: Henne, *Organic Reactions* Manuf: Faith, Keyes & Clark's *Industrial Ch* Lowenheim, M. K. Moran, Eds. (Wiley-Inte York, 4th ed., 1975) pp 325-330.

Liquid at temps below 23.7°. Faint etherea flammable. $d_4^{17.2}$ 1.494; d_{gas}^{25} 5.04 (air = 1). mp 23.7°; bp_{400} +6.8°; bp_{200} −9.1°; bp_{100} −23.0°; bp_{40} −39.0°; bp_{20} −49.7°; bp_{10} −59.0°; bp_5 −84.3°. Crit temp 198°; crit press. 43.2 atm (6 abs). $n_D^{18.5}$ 1.3865. Dipole moment 0.45. Prac water. Sol in alcohol, ether, other, organic toxic than carbon dioxide, but decomposes materials by flames or high heat.

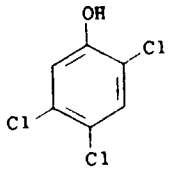
USE: In refrigeration machinery requiring a fective at negative pressures. As aerosol pro *tion:* May be narcotic in high concentrations *Note:* Consult latest Government regulati aerosol propellant.

9454. 3,4,6-Trichloro-2-nitrophenol. 2- chlorophenol; 2,4,5-trichloro-6-nitrophenol; $H_2Cl_3NO_3$; mol wt 242.44. C 29.72%, H 0.8 N 5.78%, O 19.80%. Prepd by dissolving phenol in glacial acetic acid and treating wi acid: Kohn, Fink, *Monatsh.* **58,** 73 (1931); *J. Chem. Soc.* **1943,** 235.



Pale yellow crystals from petr ether, mp USE: To combat the sea lamprey, an eel attacks trout, especially in the Great Lakes

9455. 2,4,5-Trichlorophenol. Collunos $C_6H_3Cl_3O$; mol wt 197.46. C 36.49%, H 1.5 53.87%. Prepd by treating 1,2,4,5-tetrachl methanolic NaOH in autoclave at 160° for s rison *et al., J. Chem. Soc.* **1943,** 235; Agfa, (1925); *Chem. Zentr.* **1925, I,** 2411.



Needles from alcohol or ligroin. Stron mp 67°. Sublimes. bp_{746} 248°. bp_{760} 253°. acid. K at 25° = 4.3 × 10^{-8}. Soly (g/1 25°): acetone 615; benzene 163; carbon ether 525; denatured alcohol formula 30, 5 liquid petrolatum (at 50°) 56; soybean oil water <0.2. LD_{50} orally in rats: 0.82 g *Fed. Proc.* **2,** 76 (1943).

Sodium salt sesquihydrate, ***Dowicide B.*** cording to **U.S.** pat. **1,991,329** (1935 to (g/100 g solvent at 25°); acetone 163; formula 30, 186; ethylene glycol 33; met 113. pH of satd aq soln 11.0-13.0.

Complex with triisobutyl phosphate, *chlorex.* Prepn: Bouillenne-Wallrand *et* (1961 to Pechiney). Liquid. $bp_{0.01}$ 94-10

USE: Fungicide, bactericide.

9456. 2,4,6-Trichlorophenol. Dowicid $C_6H_3Cl_3O$; mol wt 197.46. C 36.49%, O 8

in rats: 5.0 ml/kg. H. F. Smyth et al., *Am. Ind. Hyg. Assoc. J.* **30**, 470 (1969).

USE: Solvent for fats, waxes, natural resins, alkaloids. *Caution:* Irritating to eyes, mucous membranes, and, in high concns, narcotic.

9451. 2,2,2-Trichloroethanol. Trichloroethyl alcohol. $C_2H_3Cl_3O$; mol wt 149.42. C 16.08%, H 2.02%, Cl 71.19%, O 10.71%. CCl_3CH_2OH. Prepd by reduction of the corresponding ester, acid chloride, or acid with lithium aluminum hydride: Sroog *et al., J. Am. Chem. Soc.* **71,** 1710 (1949). Manufacture by reduction of chloral hydrate with an amine borane: Chamberlain, Schechter, **U.S.** pat. **2,898,379** (1959 to Callery Chem.).

Hygroscopic liquid, ethereal odor. At low temps it crystallizes in rhombic tablets. mp at 18°; bp 151-153°; d_{20}^{20} 1.55. Sol in about 12 parts water; miscible with alcohol or ether. pH of aq soln is 5-6, but on prolonged contact with water some free acid is formed. *Keep well closed and protected from light.* LD_{50} orally in rats: 600 mg/kg. *Handbook of Toxicology* **vol. 1,** W. S. Spector, Ed. (Saunders, Philadelphia, 1955) pp 302-303.

THERAP CAT: Hypnotic, anesthetic.

9452. Trichloroethylene. *Trichloroethene;* ethinyl trichloride; Tri-Clene; Trielene; Trilene; Trichloran; Trichloren; Algylen; Trimar; Triline; Tri; Trethylene; Westrosol; Chlorylen; Gemalgene; Germalgene. C_2HCl_3; mol wt 131.40. C 18.28%, H 0.77%, Cl 80.95%. $CCl_2{=}CHCl$. Usually prepd from *sym*-tetrachloroethane by elimination of HCl (by boiling with lime): **Ger.** pat. **171,900.** By passing tetrachloroethane vapor over $CaCl_2$ catalyst at 300°: **Ger.** pat. **263,457;** without catalyst at 450-470°: **Brit.** pat. **575,-530** (1946 to du Pont). Review of mfg processes: S. A. Miller, *Chem. Process Eng.* **47,** 268 (1966); Faith, Keyes & Clark's *Industrial Chemicals,* F. A. Lowenheim, M. K. Moran, Eds. (Wiley-Interscience, New York, 4th ed., 1975) pp 844-848. Toxicity and metabolism: E. Browning, *Toxicity and Metabolism of Industrial Solvents* (Elsevier, New York, 1965) pp 189-212.

Nonflammable, mobile liquid. Characteristic odor resembling that of chloroform. d_4^4 1.4904; d_4^{15} 1.4695; d_4^{20} 1.4649. Vapor density: 4.53 (air = 1.00). Solidifies at −84.8°. bp_{760} 86.7°; bp_{400} 67.0°; bp_{200} 48.0°; bp_{100} 31.4°; bp_{60} 20.0°; bp_{20} −1.0°; bp_{10} −12.4°; bp_5 −22.8°; $bp_{1.0}$ −43.8°; n_D^{17} 1.47914; n_D^{25} 1.45560. Practically insol in water; misc with ether, alcohol, chloroform. Dissolves most fixed and volatile oils. Slowly dec (with formn of HCl) by light in the presence of moisture. Trichloroethylene for medicinal purposes may contain some thymol or ammonium carbonate (not more than 20 mg/100 ml) as a stabilizer. Industrial grades of trichloroethylene may contain other stabilizers such as triethanolamine stearate and cresol. LD_{50} orally in rats: 4.92 ml/kg; LC (4 hrs) in rats: 8000 ppm, Smyth *et al., Am. Ind. Hyg. Assoc. J.* **30,** 470 (1969).

Caution: Use with adequate ventilation. Preserve trichloroethylene in sealed, light-resistant ampuls or in frangible, light-resistant glass tubes. Avoid prolonged exposure of the product to excessive heat. It must be dispensed in the unopened glass container in which it was placed by the manufacturer.

Human Toxicity: Moderate exposures can cause symptoms similar to alcohol inebriation. Higher concns can have narcotic effect. Deaths occurring after heavy exposure have been attributed to ventricular fibrillation. Liver injury is not definitely established in occupational exposures. Found to induce hepatocellular carcinomas in National Cancer Institute tests on mice: *Chem. & Eng. News* **54,** 4 (Apr. 5, 1976).

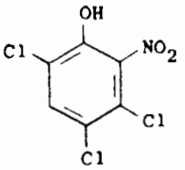
USE: Solvent for fats, waxes, resins, oils, rubber, paints, and varnishes. Solvent for cellulose esters and ethers. Used for solvent extraction in many industries. In degreasing, in Lowenheim, M. K. Moran, Eds. (Wiley-Int York, 4th ed., 1975) pp 325-330.

Liquid at temps below 23.7°. Faint ethere flammable. $d_4^{17.2}$ 1.494; d_{gas}^{25} 5.04 (air = 1). m 23.7°; bp_{400} +6.8°; bp_{200} −9.1°; bp_{100} −23.0 bp_{40} −39.0°; bp_{20} −49.7°; bp_{10} −59.0°; bp −84.3°. Crit temp 198°; crit press. 43.2 atm (abs). $n_D^{18.5}$ 1.3865. Dipole moment 0.45. Pra water. Sol in alcohol, ether, other, organic toxic than carbon dioxide, but decompose materials by flames or high heat.

USE: In refrigeration machinery requiring fective at negative pressures. As aerosol pr *tion:* May be narcotic in high concentration

Note: Consult latest Government regulat aerosol propellant.

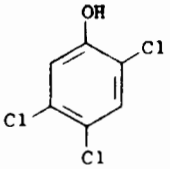
9454. 3,4,6-Trichloro-2-nitrophenol. 2-chlorophenol; 2,4,5-trichloro-6-nitrophenol: $H_2Cl_3NO_3$; mol wt 242.44. C 29.72%, H 0.8 N 5.78%, O 19.80%. Prepd by dissolving phenol in glacial acetic acid and treating wi acid: Kohn, Fink, *Monatsh.* **58,** 73 (1931); *J. Chem. Soc.* **1943,** 235.



Pale yellow crystals from petr ether, mp 9

USE: To combat the sea lamprey, an eel- attacks trout, especially in the Great Lakes r

9455. 2,4,5-Trichlorophenol. Collunoso $C_6H_3Cl_3O$; mol wt 197.46. C 36.49%, H 1.53 53.87%. Prepd by treating 1,2,4,5-tetrachlo methanolic NaOH in autoclave at 160° for se rison *et al., J. Chem. Soc.* **1943,** 235; Agfa, G (1925); *Chem. Zentr.* **1925, I,** 2411.



Needles from alcohol or ligroin. Strong mp 67°. Sublimes. bp_{746} 248°. bp_{760} 253°. W acid. K at 25° = 4.3 × 10^{-8}. Soly (g/100 25°): acetone 615; benzene 163; carbon te ether 525; denatured alcohol formula 30, 525; liquid petrolatum (at 50°) 56; soybean oil water <0.2. LD_{50} orally in rats: 0.82 g k *Fed. Proc.* **2,** 76 (1943).

Sodium salt sesquihydrate, ***Dowicide B.*** Fl cording to **U.S.** pat. **1,991,329** (1935 to Do (g/100 g solvent at 25°); acetone 163; den formula 30, 186; ethylene glycol 33; metha 113. pH of satd aq soln 11.0-13.0.

Complex with triisobutyl phosphate, C_{18} ***chlorex.*** Prepn: Bouillenne-Wallrand *et al.* (1961 to Pechiney). Liquid. $bp_{0.01}$ 94-103°.

USE: Fungicide, bactericide.

9456. 2,4,6-Trichlorophenol. Dowicide H_3Cl_3O; mol wt 197.46. C 36.49%, O 8.10

Exhibit B-2

U.S. Environmental Protection Agency, Region 6
and the
New Mexico Environmental Improvement Division
Public Notice of Final Permit

The Regional Administrator of the U.S. Environmental Protection Agency (EPA) Region 6, and the Director of the New Mexico Environmental Improvement Division (EID) have made a decision to issue a final Hazardous Waste Management Permit under the Resource Conservation and Recovery Act of 1976 (RCRA). The final RCRA permit is to be issued to Signetics Corporation for the temporary storage of hazardous waste at their existing facility. This facility is located at 9201 Pan American Freeway, N.E., Albuquerque, New Mexico, and has been assigned the EPA identification number NMD000709782.

The State of New Mexico is authorized to operate a hazardous waste management program in lieu of the Federal program for those portions of RCRA in effect prior to the enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA). HSWA imposes additional requirements on hazardous waste management facilities which will be administered and enforced by the EPA until the State of New Mexico receives additional authorization for these requirements. Therefore, both the EPA and the EID of the New Mexico Health and Environment Department must issue a permit to Signetics Corporation. The EID announced it tentative decision to issue a permit to Signetics on February 11, 1985, and the EPA on November 24, 1985.

The final permit contains conditions for the temporary storage of hazardous waste at the existing facility. Signetics is a manufacturer of integrated circuits, and generates various hazardous wastes during the normal course of circuit fabrication. The permit conditions establish requirements for the temporary storage of certain corrosive, toxic, and solvent wastes. The hazardous wastes will be stored in 55 gallon drums and three 5,000 gallon tanks. The waste is ultimately shipped to an approved offsite facility.

The final permit is based on the administrative records of both the EPA Region 6 and the EID. The administrative record consists of the final and draft permit, the fact sheet and statement of basis, the response to all comments made during the comment periods, and the permit application submitted by Signetics Corporation.

The EPA's administrative record relative to this final permit is on file in the Library of EPA Region 6, 1201 Elm Street, Dallas, Texas 75270, and may be viewed and copied (at a charge of $0.20 per copy sheet) at any time between 8:30 a.m. and 4:00 p.m. Monday through Friday, except holidays. The EID administrative record is on file at the Groundwater and Hazardous Waste Bureau, 1190 Saint Francis Drive in the Harold Runnels Building, Santa Fe, New, Mexico 87504, and may be viewed and copied at any time between 8:00 a.m. and 5:00 p.m. Monday through Friday, except holidays.

The decision by the EPA and the EID to issue a final permit to Signetics considered all comments made with respect to the draft permit during the comment periods. Any person who commented on the draft permit who believes that any condition of the permit is inappropriate, or that EPA's and/or EID's decision to issue a final permit is inappropriate, may petition the Administrator of EPA regarding conditions in EPA's portion of the permit, and the Director of EID, regarding conditions in EID's portion of the permit, to review any condition of the permit.

Commentors must submit all reasonably available arguments and factual grounds supporting their position, including all supporting materials, on or before March 31, 1986. All supporting materials shall be included in full and may not be incorporated by reference unless they are already part of the administrative record in this permit action or consist of State or Federal statutes and regulations, EPA documents of general applicability, or other generally available reference materials. Commentors shall make supporting material not already included in the administrative record available to the EPA and the EID. All requests for reviews of any permit condition must be received by March 31, 1986.

Since the final permit incorporates portions from the EPA and the EID, requests for reviews should be directed to both agencies at:

Office of the Administrator
Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

and

New Mexico Environmental Improvement Division
Hazardous Waste Section
P.O. Box 968
Santa Fe, New Mexico 87504-0968
Attn: Peter H. Pache, Manager

U.S. Environmental Protection Agency, Region 6
Public Notice of Draft Permit

The U.S. Environmental Protection Agency (EPA) has reviewed a permit application for the storage of hazardous waste from Signetics Corporation, 9201 Pan American Freeway N.E., Albuquerque, New Mexico 87113. The review was conducted pursuant to the Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA). The EPA has made a tentative determination to issue a permit to Signetics Corp. (EPA Identification Number NMD000709782) under the authority of the RCRA, as amended by the HSWA.

The State of New Mexico is authorized to operate a hazardous waste management program in lieu of the Federal program for those portions of RCRA in effect prior to the enactment of the HSWA. The HSWA imposes additional requirements on hazardous waste management facilities which will be administered and enforced by the EPA until the State of New Mexico receives additional authorization for these requirements. Therefore, both the EPA and the New Mexico Environmental Improvement Division (NMEID) of the State Health and Environment Department will determine whether to issue a permit to Signetics Corporation. The NMEID announced its tentative determination to issue a permit to Signetics Corporation on February 11, 1985.

The proposed permit contains conditions for the temporary storage of hazardous waste at the existing facility. Signetics Corporation is a manufacturer of integrated circuits and generates various hazardous wastes during the normal course of circuit fabrication. The proposed conditions establish requirements for the temporary storage of certain corrosive, toxic, and solvent wastes. The hazardous wastes will be stored in 55 gallon drums and three 5,000 gallon tanks. The waste will ultimately be shipped to an approved off-site disposal facility.

Persons wishing to comment on the EPA's draft permit should submit their comments in writing to:

U.S. EPA, Region 6
Hazardous Waste Compliance Branch (6H-CP)
1201 Elm Street
Dallas, Texas 75270
Attn: William Rhea, Chief

All persons, including the applicant, who believe any condition of the draft permit is inappropriate or that the EPA's tentative decision to prepare a draft permit is inappropriate, must raise all reasonably ascertainable issues and submit all reasonably available arguments and factual grounds supporting their position, including all supporting materials, by the close of the public comment period. All supporting materials shall be included in full and may not be incorporated by reference unless they are already part of the administrative record in this permit action or consist of State or Federal statutes and regulations, EPA documents of general applicability, or other generally available reference materials. Commenters shall make supporting material not already included in the administrative record available to the EPA. All comments must be received by January 17, 1986.

Interested persons may submit written comments on the draft permit and written requests for a public hearing to the addressee below no later than January 17, 1986. All comments should include the name and address of commenter (writer) and a concise statement of the exact basis of any comment and request for public hearing. Also, the commenter should include supporting relevant facts upon which each comment is based. The public comment and request for public hearing procedures may be found in the Federal Regulations at 40 CFR 124.11.

The EPA's administrative record, including all data submitted by the applicant, the Statement of Basis, the draft permit, maps showing the exact facility location, and comments received is on file in the library of the EPA Region 6, 1201 Elm Street, Dallas, Texas and may be reviewed and copied (at a charge of $0.20 per copy sheet) at any time between 8:30 a.m. and 4:00 p.m. Monday through Friday except holidays. In addition, copies of the draft permit and the Statement of Basis are available for review at the New Mexico EID District Office, 4215-4219 Montgomery Boulevard N.E., Albuquerque, New Mexico.

Any relevant comments received by January 17, 1986, will be considered in the formulation of final determinations regarding the EPA's permit. After consideration of all written comments and of the requirements and policies in the RCRA and the HSWA, the EPA will make a final decision to either issue, modify or deny the permit. At that time, the EPA will notify the applicant and each person who has submitted written comments or requested notice of the final permit decision. The final permit decision will become effective thirty (30) days after the service of notice of the decision unless a later date is specified or review is requested under 40 CFR §124.19. If no comments requested a change in the draft permit, the final permit will become effective immediately upon issuance.

II

RESPONSE TO COMMENTS
to
EPA DRAFT HAZARDOUS WASTE MANAGEMENT PERMIT
for
SIGNETICS CORPORATION, ALBUQUERQUE, NEW MEXICO
(EPA I.D. NUMBER NMD000709782)

On November 24, 1985, the United States Environmental Protection Agency (EPA) Region 6, announced the draft Hazardous Waste Management Permit for the requirements of the Hazardous and Solid Waste Amendments of 1984 for the existing storage facility at the Signetics Corporation facility in Albuquerque, New Mexico. The EPA announced the draft permit by:

1. Having published a legal notice in the Albuquerque Journal;

2. having radio announcements made over 77 KOB Radio, Albuquerque, New Mexico; and

3. mailing over 600 copies of the public notice to interested persons in New Mexico.

The public notice invited the public to comment on the draft permit and to request a public hearing. A hearing was not requested. Written comments were received from one individual, one Federal agency, and Region 6 Office of Regional Council and Permits Acting Section Chief.

To summarize, the comments can be divided into three types. These types are: One comment opposed the facility; one comment expressed concern regarding the impact on wildlife resources in the event of a release; and three comments requested clarification of permit conditions. Attached is the response to all comments made to EPA.

ATTACHMENT

COMMENT 1

A discharge of hazardous material from the site could have significant adverse impacts to wildlife resources. The Rio Grande is a warm water fishery with species consisting of catfish, walleye, trout, carp, panfish, suckers, minnows, and dace.

The cottonwood bosque that occurs along the Rio Grande is the largest remaining cottonwood gallery forest in the Southwest. This area is utilized by 18 species of reptiles and amphibians, 34 species of mammals and 277 species of birds. Waterfowl are particularly common along the river and bald eagles and whooping cranes can occur south of Albuquerque in the Rio Grande Valley.

Commentor: 1

RESPONSE

The hazardous waste at Signetics is stored in tanks and containers. The tanks are in vaults which act as a secondary containment system. The vaults are designed to contain 192 percent of the contents of each tank. Therefore, in the event of tank failure, the vault would retain the contents of the tank. Any releases from containerized wastes will be retained in sumps or piped directly to tanks of compatible waste.

COMMENT 2

There is enough evidence at this time to believe that storage facilities for nuclear wastes in New Mexico are not a safe disposal method or in a safe location.

Commentor: 2

RESPONSE

The permit being issued to Signetics Corporation allows for the storage of hazardous waste which is generated during the manufacturing process. This hazardous waste is regulated under the Resource Conservation and Recovery Act and does not include storage of any radioactive or nuclear waste.

COMMENT 3

Permit Condition A.13 needs to be clarified to include that the Regional Administrator can extend the required period for retention of records beyond three years as allowed for by 40 CFR 270.30(j)(2).

Commentor: 3

RESPONSE

Permit Condition A.13 has been changed to reflect the requirements of 40 CFR 270.30(j)(2).

COMMENT 4

Permit Condition B.4 needs to be clarified by indicating that the Permittee must comply with Permit Conditions B.4(a) and (b) if the Permittee becomes aware of additional solid waste management units.

Commentor: 3

RESPONSE

Permit Condition B.4 has been clarified by adding the word "additional".

COMMENT 5

Permit Condition B.4(b) needs to be clarified by indicating that the Permittee must submit preliminary assessment type information, not a preliminary assessment.

Commentor: 4

RESPONSE

Permit Condition B.4(b) has been changed to require that the Permittee submit "preliminary assessment information".

STATEMENT OF BASIS
for
SIGNETICS CORPORATION
HAZARDOUS WASTE MANAGEMENT FACILITY
ID #NMD000709782

I. Introduction

The Resource Conservation and Recovery Act (RCRA) of 1976 Subtitle C mandated that hazardous wastes are treated, stored, and disposed in a manner safe to human health and the environment.

The Environmental Protection Agency (EPA) using this authority has created a cradle-to-grave hazardous waste management system. This regulatory program has been delegated to the State of New Mexico. RCRA was amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA) which contained provisions which were effective immediately, including in the RCRA authorized States such as New Mexico. Until the State of New Mexico becomes authorized for the HSWA, the EPA will administer the HSWA provisions. Therefore, to have a full RCRA permit, the permittee must have a permit from the State of New Mexico for the authorized RCRA program and a permit from the EPA for the HSWA provisions. The draft permit proposed by the EPA only covers the HSWA provisions and standard permit conditions.

This Statement of Basis was prepared in accordance with 40 CFR 124.7.

II. Facility Description

Signetics Corporation is located at 9201 Pan American Freeway, N.E., Albuquerque, New Mexico. Signetics Corporation may store specified hazardous wastes in tanks and containers pursuant to the permit issued by the State of New Mexico under the authority of the New Mexico Hazardous Waste Act.

III. Basis for Draft Permit Conditions

The permit conditions in Part A are standard to all RCRA permits under the authority of 40 CFR 264, 270, and 124.

The specific permit conditions are under the authority of:

Condition	Requirement
B.1	Units to be Permitted
B.2	40 CFR 264.73
B.3	40 CFR 266.23(b)
B.4	40 CFR 264.101
B.5	Definitions

IV. Public Participation

A. Public Comment Procedures

The purpose of public participation is to ensure that all interested citizens have knowledge of the EPA's proposed permitting activities and opportunity to comment on the draft permit to Signetics Corporation. This public comment period is to ensure that the EPA has an opportunity to benefit from any information that the public might have relevant to the draft permit. The public comment and the request for public hearing procedures may be found in 40 CFR 124.11 and 124.12. All comments and requests for public hearing must be submitted in writing to the addressee listed in subsection C not later than January 17, 1986. (The written request for a public hearing must state the nature of the issues which are proposed to be raised in the hearing.)

The Regional Administrator shall give due consideration to all comments received in making his final determination regarding the draft permit. Within thirty (30) days after final permit decision, any person who submitted timely written comments or participated in the public hearing may petition the Administrator to review any condition of the permit decision.

B. Locations of Available Information

The administrative record (with the exception of materials readily available) is on file in the library of EPA Region 6, 28th Floor, 1201 Elm Street, Dallas, Texas 75270, and may be inspected and copied (at a charge of $0.20 per copy sheet) at any time between 8:30 a.m. and 4:00 p.m. Monday through Friday except for Holidays. In addition, copies of the permit application, draft permit, and Statement of Basis are available for review at the New Mexico Environmental Improvement Division District Office, 4215-4219 Montgomery Boulevard N.E., Albuquerque, New Mexico.

C. EPA Contact

Interested persons may submit written comments on the draft permit and written requests for a public hearing to the addressee below no later than January 17, 1986. All comments should include the name and address of the commenter (writer) and a concise statement of the exact basis of any comment and request for public hearing. Also, the commenter should include supporting relevant facts upon which the comment is based. In addition, all requests for information, including request for copies of the draft permit and Statement of Basis should be made to:

EPA Region 6
Hazardous Waste Compliance Branch (6H-CP)
1201 Elm Street
Dallas, Texas 75270
Attn: William Rhea, Chief

U.S. Environmental Protection Agency, Region 6
and the
New Mexico Environmental Improvement Division
Public Notice of Final Permit

The Regional Administrator of the U.S. Environmental Protection Agency (EPA) Region 6, and the Director of the New Mexico Environmental Improvement Division (EID) have made a decision to issue a final Hazardous Waste Management Permit under the Resource Conservation and Recovery Act of 1976 (RCRA). The final RCRA permit is to be issued to Signetics Corporation for the temporary storage of hazardous waste at their existing facility. This facility is located at 9201 Pan American Freeway, N.E., Albuquerque, New Mexico, and has been assigned the EPA identification number NMD000709782.

The State of New Mexico is authorized to operate a hazardous waste management program in lieu of the Federal program for those portions of RCRA in effect prior to the enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA). HSWA imposes additional requirements on hazardous waste management facilities which will be administered and enforced by the EPA until the State of New Mexico receives additional authorization for these requirements. Therefore, both the EPA and the EID of the New Mexico Health and Environment Department must issue a permit to Signetics Corporation. The EID announced it tentative decision to issue a permit to Signetics on February 11, 1985, and the EPA on November 24, 1985.

The final permit contains conditions for the temporary storage of hazardous waste at the existing facility. Signetics is a manufacturer of integrated circuits, and generates various hazardous wastes during the normal course of circuit fabrication. The permit conditions establish requirements for the temporary storage of certain corrosive, toxic, and solvent wastes. The hazardous wastes will be stored in 55 gallon drums and three 5,000 gallon tanks. The waste is ultimately shipped to an approved offsite facility.

The final permit is based on the administrative records of both the EPA Region 6 and the EID. The administrative record consists of the final and draft permit, the fact sheet and statement of basis, the response to all comments made during the comment periods, and the permit application submitted by Signetics Corporation.

The EPA's administrative record relative to this final permit is on file in the Library of EPA Region 6, 1201 Elm Street, Dallas, Texas 75270, and may be viewed and copied (at a charge of $0.20 per copy sheet) at any time between 8:30 a.m. and 4:00 p.m. Monday through Friday, except holidays. The EID administrative record is on file at the Groundwater and Hazardous Waste Bureau, 1190 Saint Francis Drive in the Harold Runnels Building, Santa Fe, New, Mexico 87504, and may be viewed and copied at any time between 8:00 a.m. and 5:00 p.m. Monday through Friday, except holidays.

The decision by the EPA and the EID to issue a final permit to Signetics considered all comments made with respect to the draft permit during the comment periods. Any person who commented on the draft permit who believes that any condition of the permit is inappropriate, or that EPA's and/or EID's decision to issue a final permit is inappropriate, may petition the Administrator of EPA regarding conditions in EPA's portion of the permit, and the Director of EID, regarding conditions in EID's portion of the permit, to review any condition of the permit.

Commentors must submit all reasonably available arguments and factual grounds supporting their position, including all supporting materials, on or before March 31, 1986. All supporting materials shall be included in full and may not be incorporated by reference unless they are already part of the administrative record in this permit action or consist of State or Federal statutes and regulations, EPA documents of general applicability, or other generally available reference materials. Commentors shall make supporting material not already included in the administrative record available to the EPA and the EID. All requests for reviews of any permit condition must be received by March 31, 1986.

Since the final permit incorporates portions from the EPA and the EID, requests for reviews should be directed to both agencies at:

Office of the Administrator
Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

and

New Mexico Environmental Improvement Division
Hazardous Waste Section
P.O. Box 968
Santa Fe, New Mexico 87504-0968
Attn: Peter H. Pache, Manager

RESPONSE TO COMMENTS
to
EPA DRAFT HAZARDOUS WASTE MANAGEMENT PERMIT
for
SIGNETICS CORPORATION, ALBUQUERQUE, NEW MEXICO
(EPA I.D. NUMBER NMD000709782)

On November 24, 1985, the United States Environmental Protection Agency (EPA) Region 6, announced the draft Hazardous Waste Management Permit for the requirements of the Hazardous and Solid Waste Amendments of 1984 for the existing storage facility at the Signetics Corporation facility in Albuquerque, New Mexico. The EPA announced the draft permit by:

1. Having published a legal notice in the Albuquerque Journal;

2. having radio announcements made over 77 KOB Radio, Albuquerque, New Mexico; and

3. mailing over 600 copies of the public notice to interested persons in New Mexico.

The public notice invited the public to comment on the draft permit and to request a public hearing. A hearing was not requested. Written comments were received from one individual, one Federal agency, and Region 6 Office of Regional Council and Permits Acting Section Chief.

To summarize, the comments can be divided into three types. These types are: One comment opposed the facility; one comment expressed concern regarding the impact on wildlife resources in the event of a release; and three comments requested clarification of permit conditions. Attached is the response to all comments made to EPA.

The decision by the EPA and the EID to issue a final permit to Signetics considered all comments made with respect to the draft permit during the comment periods. Any person who commented on the draft permit who believes that any condition of the permit is inappropriate, or that EPA's and/or EID's decision to issue a final permit is inappropriate, may petition the Administrator of EPA regarding conditions in EPA's portion of the permit, and the Director of EID, regarding conditions in EID's portion of the permit, to review any condition of the permit.

Commentors must submit all reasonably available arguments and factual grounds supporting their position, including all supporting materials, on or before March 31, 1986. All supporting materials shall be included in full and may not be incorporated by reference unless they are already part of the administrative record in this permit action or consist of State or Federal statutes and regulations, EPA documents of general applicability, or other generally available reference materials. Commentors shall make supporting material not already included in the administrative record available to the EPA and the EID. All requests for reviews of any permit condition must be received by March 31, 1986.

Since the final permit incorporates portions from the EPA and the EID, requests for reviews should be directed to both agencies at:

Office of the Administrator
Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

and

New Mexico Environmental Improvement Division
Hazardous Waste Section
P.O. Box 968
Santa Fe, New Mexico 87504-0968
Attn: Peter H. Pache, Manager

Exhibit B-3

PHILIPS

Philips Semiconductors

Law Department
Philips Semiconductors
a North American Philips Company

811 E. Arques Avenue
P.O. Box 3409
Sunnyvale, CA 94088-3409
(408) 991-2000

March 30, 1993

Mr. Rich Mayer
U.S. EPA Work Assignment Manager
U.S. EPA Region XI
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Re: Signetics Company
EPA ID NO. NMOOO709782

Dear Rich:

This is to confirm our meeting on Monday, April 5, 1993, at 1:30 P.M. in your office. During our meeting I would like to generally discuss the background information concerning the landfill and the proposed special conditions identified in RCRA Part B Permit. As I indicated in our recent telephone conversation we are attempting to locate the installation logs for the current monitoring wells and anticipate providing copies for your review at our meeting.

In the meantime, if have any questions, please feel free to contact me.

Sincerely,

James N. Casey
Counsel

JNC:cb

cc: Gary Mavrakis

Exhibit B-4 Rec'd Jun 2 1994

PHILIPS

PHILIPS

Philips Semiconductors

Law Department

Philips Semiconductors
a North American Philips Company
811 E. Arques Avenue
P.O. Box 3409
Sunnyvale, CA 94088-3409
(408) 991-2000

May 31, 1994

Ms. Nancy Rinehart Morlock
Environmental Engineer
U.S. EPA
1445 Ross Avenue
Dallas, TX 75202-2733

Re: ***Philips Semiconductors, Albuquerque (Formerly Signetics Company)***

Dear Nancy:

As a followup to our telephone conversation yesterday, Philips Semiconductors Part B Permit expires in 1995. Accordingly, the period to commence renewal process is quickly approaching. In an attempt to get "ahead of the curb" we have begun our process of renewing the Albuquerque operation and future needs. In doing so, we are seriously considering converting to a "90-day accumulator" status. Philips Semiconductors Albuquerque had been operating under a 90-day accumulation program a a matter of good practice. Accordingly, I would like to discuss further the conversion to a 90-day accumulator status as provided for in 58 (Fed.Reg.37, [illegible]). We realize C.F.R. Part 264 closure and accompanying financial assurance requirements remain applicable until the "unit" is permanently taken out of service.

In addition to the Part B, I would like to take the opportunity to apprise you of our preliminary plans to expand on the Albuquerque site. As I briefly mentioned, the expansion would consist of administrative and engineering space.

Finally, I have tentatively scheduled an unrelated business trip to the Dallas area during the last two weeks of June. If your schedule permits, I would like to schedule a brief meeting to review the above plans. I will contact you next week to arrange a mutually convenient date.

I look forward to meeting you again and if you have any questions in the meantime, please do not hesitate to contact me.

Sincerely,

James N. Casey
Counsel

JNC:cb

cc: Jim Cochran
Keith Hampe

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: 12/16/03
2. Requestor's Name: Gulfstream World Wide
3. Requestor's Address: Box 81200
4. Phone No.: (505) -255-5422
5. Company Being Represented: Phillips S
6. Address: 5h 01 PAM Avenue
7. Document/File being requested to be reviewed or copied: Philips Semiconductor ~~RECA~~ RCRA file from Haz Waste Bureau

Signature

The cost of requestor copying is 25 cents per page.

Please send this request to:
Tammy Martinez
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
or fax: (505) 827-1628