

ENTERED

# Signetics

a subsidiary of U.S. Philips Corporation

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

August 31, 1988

Ms. Stacey L. Bennett  
U.S. Environmental Protection Agency  
1445 Ross Avenue  
Dallas, Texas 75202-2733

Dear Ms. Bennett,

During the EID/EPA audit that was conducted at this Facility on August 15, 1988, you determined that we were missing information in our permit regarding 40 CFR 268.7. The section requires that if a generator determines they are managing a restricted waste and it does not meet applicable treatment standards, they must either test a residue of that waste before each shipment or notify the treatment facility, in writing, of the appropriate treatment standards.

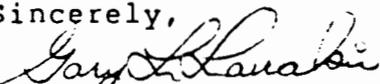
Due to our thorough knowledge of the waste stream (F003), based upon the inputs to the process, we will not test every shipment but will notify the treatment facility (with every shipment of F003 wastes), in writing, of the appropriate treatment standards. This notification will be attached to each Manifest of F003 wastes this plant ships to a treatment facility.

This letter will be attached to our RCRA permit, and followed by Signetics, and at what time the State Environmental Improvement Division adopts the Land Disposal Restrictions into the New Mexico Hazardous Waste Management Regulations, this document will be incorporated into our permit.

I have discussed this with Michael Sanders and Boyd Hamilton of EID and they have agreed with the contents of this letter.

If you have any questions or problems with this letter, please call me at (505) 822-7188.

Sincerely,



Gary M. Mavrakis  
Chemical Support Manager

cc: Michael Sanders-New Mexico Environmental Improvement Division  
Boyd Hamilton-New Mexico Environmental Improvement Division  
Jim Davison-Signetics-Sunnyvale  
Cathy Weber-Signetics-Albuquerque

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**& ENVIRONMENT**

department

**Signetics Hazardous Waste  
Management Permit**

TONNEY ANAYA  
GOVERNOR

DENISE D. FORT  
DIRECTOR



STATE OF NEW MEXICO

ENVIRONMENTAL IMPROVEMENT DIVISION

P.O. Box 968, Santa Fe, New Mexico 87504-0968  
(505) 984-0020

April 1, 1986

Mr. Gary Mavrakis  
Signetics Corporation  
9201 Pan American Freeway, N.E.  
Albuquerque, New Mexico 87184

Re: FINAL OPERATING PERMIT  
SIGNETICS CORPORATION NMD 000709782

Dear Mr. Mavrakis:

The Environmental Improvement Division (EID) and the Environmental Protection Agency (EPA) have made a decision to issue Signetics Corporation a final Resource Conservation and Recovery Act (RCRA) permit to store hazardous waste at their existing facility. This letter constitutes formal notice of the State's portion of the final permit.

The EID announced its tentative decision to issue a permit to Signetics on February 11, 1985 for those portions of RCRA for which New Mexico had received authorization. The only comment EID received was one pertaining to the public notice procedure rather than the issuance of a final permit.

EPA announced its tentative decision to issue a permit to Signetics on November 24, 1985 for the additional RCRA requirements imposed by the enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA) for which New Mexico has not received authorization.

Therefore, pursuant to the New Mexico Hazardous Waste Act Section 74-4-1 et. seq. NMSA, and the New Mexico Hazardous Waste Management Regulations (HWMR-2), Signetics Corporation is hereby issued a final effective permit. This permit includes those portions of RCRA for which the State has received authorization. EPA's portion of the final permit will cover the requirements imposed by HSWA.

Mr. Gary Mavrakis  
Page -2-  
April 1, 1986

As stated in the permit, Signetics must comply with all terms and conditions of the permit, those conditions found in Permit Modules I through IV and any attachments, and the applicable requirements contained in the New Mexico Hazardous Waste Management Regulations.

If I can be of any further assistance, please feel free to contact me at (505) 827-2850.

Sincerely,

*Denise Fort*  
Denise Fort *DF*  
Director

DF:BH:mt

cc: Allyn M. Davis, Director  
Hazardous Waste Management Division  
U.S. EPA Region VI

# Hazardous Waste Facility

## Permit

Permit Number:  
NMD000709782

EPA I.D. Number:  
NMD000709782

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

Pursuant to the New Mexico Hazardous Waste Act, § 74-4-1 *et seq.* NMSA 1978, as amended, and regulations promulgated thereunder by the New Mexico Environmental Improvement Board, a permit is issued to Signetics Corporation (hereafter called the Permittee), to operate a hazardous waste storage facility located in Albuquerque, New Mexico, at 9201 Pan American Freeway N.E., at latitude N35° 05' 20" and longitude W106° 39' 15".

The Permittee must comply with all terms and conditions of this permit. This permit consists of the conditions contained herein (including those in any attachments) and the applicable regulations contained in the New Mexico Hazardous Waste Management Regulations, Parts I through V, as specified in the permit. Applicable regulations are those which are in effect on the date of issuance of this permit.

This permit is based on the assumption that the information submitted in the permit application attached to the Permittee's letter dated August 9, 1984, as modified by subsequent amendments received February 4, 1985, (hereafter referred to as the application) is accurate and that the facility will be operated as specified in the application. Any inaccuracies found in this information may be grounds for the termination or modification of this permit (see HWMR-2, Sections 302.M., N., and O.) and potential enforcement action. The Permittee must inform the New Mexico Environmental Improvement Division (EID) of any deviation from or changes in the information in the application which would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

This permit is effective as of April 1, 1986  
and shall remain in effect until April 1, 1996  
unless revoked and reissued, or terminated (HWMR, Section 302.H.).

New Mexico  
Health and Environment Department  
Environmental Improvement Division

To Be Published On February 11, 1985

PUBLIC NOTICE

New Mexico Health and Environment Department  
Environmental Improvement Division  
725 Saint Michaels Drive  
Santa Fe, New Mexico 87504-9968  
(505) 984-0020

February 11, 1985

NOTICE OF PROPOSED ISSUANCE OF A FINAL PERMIT FOR A FACILITY UNDER  
THE NEW MEXICO HAZARDOUS WASTE ACT

The Environmental Improvement Division (EID) of the New Mexico Health and Environment Department proposes to issue a final permit to Signetics Corporation, 9201 Pan American Freeway N.E., Albuquerque, New Mexico, 87113, for the storage of hazardous waste at their existing facility. The EID permit is to be issued under authority of the New Mexico Hazardous Waste Act, Section 74-4-1 et. seq., NMSA 1978. The facility has been assigned EPA identification number NMD000709782.

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 5000 gallon tanks and will ultimately be shipped to an approved off-site disposal facility.

The permit conditions for the operation of the facility are open to comment from the public. Persons wishing to comment upon the permit application, the proposed permit conditions, or who wish to request a public hearing should submit such comments and requests in writing to the Environmental Improvement Division, Hazardous Waste Section, PO Box 968, Santa Fe, New Mexico 87504-9968, ATTENTION: Trent Thomas. Requests for a public hearing shall state the nature of the issues proposed to be raised in the hearing. These comments and /or requests must be received no later than March 28, 1985 to be considered.

The Environmental Improvement Division's administrative record is on file at the Ground Water and Hazardous Waste Bureau, 725 Saint Michaels Drive, Santa Fe, New Mexico and may be inspected and copied at any time between 8:00 a.m. and 5:00 p.m. In addition, copies of the draft permit and the Fact Sheet are available for review at the New Mexico Environmental Improvement Division District Office, 4215-4219 Montgomery Blvd. N.E., Albuquerque, New Mexico, telephone (505) 841-6580 ( contact Mr. Richard Mitzelfeld ) between the hours of 8:00 a.m. and 4:00 p.m. Monday through Friday. Requests for mailing of copies of the draft permit and the Fact Sheet can be

made by writing to the New Mexico Environmental Improvement Division, Hazardous Waste Section, PO Box 968, Santa Fe, New Mexico 87504-0968, ATTENTION: Trent Thomas, or by calling (505) 984-0020 Ext. 340.

All written comments submitted on the proposed permit will be considered in formulating a final decision. The EID will notify the applicant and each person who submitted a written comment during the public comment period of the final permit decision and/or of any scheduled public hearing.

For additional information contact:

Trent Thomas  
Environmental Improvement Division  
Hazardous Waste Section  
P.O. Box 968  
Santa Fe, New Mexico 87504-0968  
(505) 984-0020 Ext. 340

FACT SHEET  
 SIGNETICS CORPORATION  
 PERMIT NO. NMD000709782

The New Mexico Environmental Improvement Division proposes to issue a final permit under the New Mexico Hazardous Waste Act, Section 74-4-1 et. seq., NMSA 1978, for the operation of a hazardous waste storage facility located at Signetics Corporation, 9201 Pan American Freeway N.E., Albuquerque, New Mexico, 87113. Signetics Corporation is a manufacturer of integrated circuits and routinely generates various hazardous wastes during the normal course of circuit fabrication. The storage facility is to be used to temporarily store hazardous wastes generated by the chemical processes used in manufacturing integrated circuits. As proposed in the permit conditions, Signetics may store the specified hazardous wastes in 55 gallon drums and three 5000 gallon tanks and may include any of the following listed or classes of wastes:

EPA Hazardous Waste No.	Waste Description	Hazard Code
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, o-dichlorobenzene, trichlorofluoromethane; and the still bottoms from the recovery of these solvents .....(T)	
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, n-butyl alcohol, cyclohexanone, methyl isobutyl ketone, methanol; and the still bottoms from the recovery of these solvents .....(I)	
D001	Ignitable Wastes	
D002	Corrosive Wastes	
D004	EP Toxic Wastes - Arsenic	
D009	EP Toxic Wastes - Mercury	

All storage of containers of liquid hazardous waste designated F003 and D001 shall be restricted to Flammable Storage #4 as indicated in Permit Attachment G (Section D.1.) and shall be in previously unused or certified reconditioned DOT Specification 17E closed-head shipping containers of a nominal capacity equal to 55 gallons. Storage of hazardous wastes containing no free liquids which are

designated F003 and D001 shall be in previously unused or certified reconditioned DOT Specification 17H open-head shipping containers of a nominal capacity equal to 55 gallons. The maximum inventory of 55 gallon containers in Flammable Storage #4 shall not exceed 36.

All storage of containers of hazardous waste designated D004 and D009 shall be restricted to Chemical Storage #2 as indicated in Permit Attachment G (Section D.1.) and shall be in previously unused or certified reconditioned DOT Specification 17H open-head shipping containers of a nominal capacity equal to 55 gallons. The maximum inventory of 55 gallon containers in Chemical Storage #2 shall not exceed 64.

All storage of bulk hazardous waste designated F003 and D001 shall be restricted to Tank #3 located in the lined concrete vault indicated in the permit application. The maximum capacity of Tank #3 shall not exceed 4700 gallons.

All storage of bulk hazardous waste designated D002 shall be restricted to Tank #4 and Tank #5 located in the lined concrete vaults indicated in the permit application. The maximum capacity of each tank shall not exceed 4700 gallons.

All wastes which are temporarily stored at Signetics Corporation's Albuquerque facility will ultimately be shipped to an approved off-site disposal facility.

The proposed permit is for a duration of ten years at which time a new permit must be applied for. All of the applicable regulatory requirements contained in HWMR-2, Parts I through III have been incorporated into or satisfied by the permit.

In making any final decision on the draft permit the Director of the Environmental Improvement Division shall give due consideration and the weight he deems appropriate to all comments received during a public comment period.

Persons wishing to comment on the permit application, the draft permit and/or who wish to request a public hearing may do so in writing by submitting such comments and/or requests to the New Mexico Environmental Improvement Division. Requests for a public hearing shall state the nature of the issues proposed to be raised in the hearing. Written comments and requests for a hearing must be received by March 28, 1985 to be considered.

## MODULE I - STANDARD CONDITIONS

### A. EFFECT OF PERMIT

The Permittee is allowed to store hazardous waste in accordance with the conditions of this permit. Any storage of hazardous waste not authorized in this permit is prohibited. Compliance with this permit constitutes compliance, for purposes of enforcement, with the New Mexico Hazardous Waste Act, § 74-4-1 et seq., NMSA 1978. 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 order issued or any action brought under § 74-4-1 et seq. NMSA 1978, or any other law providing for protection of public health or the environment.

### B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in HWMR-2, Section 302.M., N., and O. 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.

### C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

### D. DUTIES AND REQUIREMENTS

1. 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, other than non-compliance authorized by an emergency permit, constitutes a violation of the New Mexico Hazardous Waste Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.
2. Duty to Reapply. If the Permittee wishes to continue an activity allowed by this permit after the expiration date of this permit, the Permittee shall submit a complete application for a new permit at least 180 days before this permit expires.
3. Permit Expiration. This permit and all conditions herein will remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application and through no fault of the Permittee the Director has not issued a new permit.
4. Need to Halt or Reduce Activity Not a Defense. It shall not be a defense for the 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.

5. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
6. 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, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facility or similar systems only when necessary to achieve compliance with the conditions of the permit.
7. Duty to Provide Information. The Permittee shall furnish to the Director, within a reasonable time, any relevant information which the Director 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 Director, upon request, copies of records required to be kept by this permit.
8. Inspection and Entry. The Permittee shall allow the Director, 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 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 facility, 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 purpose of assuring permit compliance or as otherwise authorized by the New Mexico Hazardous Waste Act, any substances or parameters at any location.
9. Monitoring and Records.
  - (a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored representative sample of the waste and appropriate method such as:
    - Solid Waste: Physical/Chemical
    - equivalent. Laboratory methods for Evaluating Solid Waste: Physical
    - revised; Standard Methods for Wastewater, Fifteenth Edition, 1

*Test Methods*  
*Largely self:*  
*Monitoring and Records*
  - Method used to obtain a must be an accepted methods for Evaluating 1982, as revised, or filed in Test Methods SW-846, 1982, as on of Water and Supplement, or current

edition; or an equivalent method as specified in Permit Attachment A (Section C.2., Waste Analysis Plan).

(b) The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit for a period of at least 3 years from the date of the sample, measurement, report or record. These periods may be extended by request of the Director at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.

(c) Records of monitoring information shall specify:

- (i) The dates, exact place, and times of sampling or measurements;
- (ii) The individuals who performed the sampling or measurements;
- (iii) The dates analyses were performed;
- (iv) The individuals who performed the analyses;
- (v) The analytical techniques or methods used; and
- (vi) The results of such analyses.

10. Reporting Planned Changes. The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility.

11. Anticipated Noncompliance. The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

12. 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 HWMR-2, Sections 302.M.2.b., or 302.O.4. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of HWMR-2, Sections 206.A., B., D., 301, and 302.

13. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule or other agreement contained in this permit shall be submitted as follows. (See Permit Attachment B):

(a) Notification of compliance with the manifest requirements of Permit Attachment B shall be submitted no later than 14 days following the initial shipment of hazardous waste requiring such certification;

(b) Certification of the waste minimization program required by Permit Attachment B shall be submitted as requested by the Director or as required by the appropriate Act and/or Regulation.

14. Twenty-four Hour Reporting. The Permittee shall report to the Director any noncompliance with the permit which may endanger health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. This report shall include the following:

- (a) Information concerning the release of any hazardous waste which may endanger public drinking water supplies.
- (b) Information concerning the release or discharge of any hazardous waste, or of a fire or explosion at 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 materials 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.
- (c) The 24 hour report shall be made by calling (505) 827-2929, or (505) 827-9329 (24-hour emergency line)

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); whether the noncompliance has been corrected; and if not, 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 Director waives the requirement and the permittee submits a written report within fifteen (15) days of the time the Permittee becomes aware of the circumstances. The written report shall be submitted by certified mail to:

EID Director  
P.O. Box 968  
Santa Fe, NM 87504-0968

15. Other Noncompliance. The Permittee shall report all other instances of noncompliance not otherwise required to be reported above, at the time monitoring reports, as required by this permit are submitted. The reports shall contain the information listed in condition I. D.14.
16. Other information. Whenever the Permittee becomes aware that he failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the Permittee shall promptly submit such facts or information.
- E. Signatory Requirement. All reports or other information requested by the Director, shall be signed and certified as required by HWMR-2, Section 302.B.
- F. Confidential Information. The Permittee may claim confidential any information required to be submitted by this permit in accordance with HWMR-2, Section 302.Q.
- G. Documents to be Maintained at Facility Site. The Permittee shall maintain at the facility, until closure is completed and certified by an independent registered professional engineer, the following documents and amendments, revisions and modifications to these documents:
- (1) Waste analysis plan required by HWMR-2, Section 206.B.3. and this permit;
  - (2) Personnel training documents and records required by HWMR-2, Section 206.B.6. and this permit,
  - (3) Contingency plan required by HWMR-2, Section 206.B.10. and this permit;
  - (4) Closure plan required by HWMR-2, Section 206.D.1.c. and this permit;
  - (5) Cost estimate for facility closure required by HWMR-2, Section 206.D.3.e.(1) and this permit;
  - (6) Operating record required by HWMR-2, Section 203.C.2.c. and this permit; and
  - (7) Inspection schedules required by HWMR-2, Section 206.B.5.b. and this permit.

## MODULE II - GENERAL FACILITY CONDITIONS

- A. Design and Operation of Facility. The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.
- B. General Waste Analysis. The Permittee shall follow the procedures described in the waste analysis plan contained in Permit Attachment A.

The Permittee shall verify its waste analysis as part of its quality assurance program. The quality assurance program shall be in accordance with current accepted practices such as specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, 1982, as revised, or equivalent methods approved by the Director; and at a minimum ensure that the Permittee maintains proper functional instruments, uses approved sampling and analytical methods, verifies the validity of sampling and analytical procedures, and performs correct calculations.

- C. Security. The Permittee shall comply with the security provisions of HWMR-2, Section 206.B.4.b. and c. by maintaining the electronic surveillance devices, barriers, and warning signs (in English and Spanish) described in Permit Attachment C (Section F.2.).
- D. General Inspection Requirements. The Permittee shall follow the inspection schedules contained in Permit Attachment C (Tables F.1., F.2., and F.4.). The Permittee shall remedy any deterioration or malfunction discovered by an inspection as required by HWMR-2, Section 206.B.5.d.. Records of inspection shall be kept as required by HWMR-2, Section 206.B.5.e.
- E. Personnel Training. The Permittee shall conduct personnel training as required by HWMR-2, Section 206.B.6. This training program shall generally follow the attached manuals, Permit Attachment D. The Permittee shall maintain training documents and records as required by HWMR-2, Sections 206.B.6.d. and e. The training manuals shall be updated, whenever necessary, so as to remain current and accurate.
- F. General Requirements for Ignitable, Reactive, or Incompatible Waste. The Permittee shall comply with the requirements of HWMR-2, Section 206.B.7.a.
- G. Preparedness and Prevention.
1. Required Equipment. At a minimum, the Permittee shall equip the facility with the equipment set forth in the contingency plan, Permit Attachment E, as required by HWMR-2, Section 206.B.9.c.
  2. Testing and Maintenance of Equipment. The Permittee shall test and maintain the equipment specified in the previous permit condition as necessary to assure its proper operation in time of emergency.

3. Access to Communications or Alarm System. The Permittee shall maintain access to the communications or alarm system as required by HWMR-2, Sections 206.B.9.e. and f.
4. Required Aisle Space. At a minimum, the Permittee shall maintain aisle space as required by HWMR-2, Section 206.B.9.g.
5. Arrangements with Local Authorities. The Permittee shall attempt to make arrangements with State and local authorities as required by HWMR-2, Section 206.B.9.h. If State or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

#### H. Contingency Plan.

1. Implementation of Plan. The Permittee shall immediately carry out the provisions of the contingency plan, Permit Attachment E, and follow the emergency procedures described by HWMR-2, Section 206.B.10.m. whenever there is a fire, explosion, or release of hazardous waste or constituents which threatens or could threaten human health or the environment.
2. Copies of Plan. The Permittee shall comply with the requirements of HWMR-2, Section 206.B.10.j.
3. Amendments to Plan. The Permittee shall review and immediately amend, if necessary, the contingency plan, as required by HWMR-2, Section 206.B.10.k.
4. Emergency Coordinator. The Permittee shall comply with the requirements of HWMR-2, Section 206.B.10.l. concerning the emergency coordinator.

#### I. Recordkeeping and Reporting.

1. Operating Record. The Permittee shall maintain a written operating record at the facility in accordance with HWMR-2, Sections 203.C.2.(1), (2), (3), (4), (5), and (6).
2. Biennial Report. The Permittee shall comply with the biennial report requirements of HWMR-2, Section 203.C.3.a.

#### J. Closure.

1. Performance Standard. The Permittee shall close the facility as required by HWMR-2, Section 206.D.2.b. and in accordance with the closure plan, Permit Attachment F.
2. Amendment to Closure Plan. The Permittee shall amend the closure plan in accordance with HWMR-2, Section 206.D.2.c.(2) whenever necessary.
3. Notification of Closure. The Permittee shall notify the Director at least 180 days prior to the date he expects to begin closure.
4. Time Allowed For Closure. After receiving the final volume of hazardous waste, the Permittee shall treat or remove from site all hazardous waste in accordance with the schedule specified in the closure plan, Permit

Attachment F. After receiving the final volume of hazardous waste, the Permittee shall complete closure activities in accordance with the schedule specified in the closure plan, Permit Attachment F.

5. Disposal or Decontamination of Equipment. The Permittee shall decontaminate all facility equipment as required by HWMR-2, Section 206.D.2.e. and the closure plan, Permit Attachment F.
6. Certification of Closure. The Permittee shall certify that the facility has been closed in accordance with the specifications in the closure plan as required by HWMR-2, Section 206.D.2.f.

K. Cost Estimate for Facility Closure

1. The Permittee must adjust the closure cost estimate for inflation within 300 days after each anniversary of the date on which the first closure cost estimate was prepared, as required by HWMR-2, Section 206.D.3.c.(2).
2. The Permittee must revise the closure cost estimate whenever there is a change in the facility's closure plan as required by HWMR-2, Section 206.D.3.c.(3).
3. The Permittee must keep at the facility the latest closure cost estimate as required by HWMR-2, Section 206.D.3.c.(4).

L. Financial Assurance for Facility Closure The Permittee shall demonstrate continuous compliance with HWMR-2, Section 206.D.3.d. by providing documentation of financial assurance, as required by HWMR-2, Section 206.D.3.j., in at least the amount of the cost estimates required by permit condition II.K. Changes in their financial assurance mechanism must be approved by the Director.

M. Liability Requirements The Permittee shall demonstrate continuous compliance with the requirements HWMR-2, Section 206.D.3.h. and the documentation requirements of HWMR-2, Section 206.D.3.j., including the requirements to have and maintain liability coverage for sudden and accidental occurrences in the amount of at least \$1 million per occurrence with an annual aggregate of at least \$2 million, exclusive of legal defense costs.

O. Incapacity of Owners or Operators, Guarantors, or Financial Institutions The Permittee shall comply with HWMR-2, Section 206.D.3.i. whenever necessary.

## MODULE III - STORAGE IN CONTAINERS

- A. Waste Identification. The Permittee may store the following wastes in containers at the facility, subject to the terms of this permit:

EPA Hazardous Waste No.	Waste Description	Hazard Code
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, n-butyl alcohol, cyclohexanone, methyl isobutyl ketone, methanol; and the still bottoms from the recovery of these solvents .....(l)	
D001	Ignitable Wastes	
D004	EP Toxic Wastes - Arsenic	
D009	EP Toxic Wastes - Mercury	

All storage of containers of liquid hazardous waste designated F003 and D001 shall be restricted to Flammable Storage #4 as indicated in Permit Attachment G (Section D.1.) and shall be in previously unused or certified reconditioned DOT Specification 17E closed-head shipping containers of a nominal capacity equal to 55 gallons. Storage of hazardous wastes containing no free liquids which are designated F003 and D001 shall be in previously unused or certified reconditioned DOT Specification 17H open-head shipping containers of a nominal capacity equal to 55 gallons. The maximum inventory of 55 gallon containers in Flammable Storage #4 shall not exceed 36.

All storage of containers of hazardous waste designated D004 and D009 shall be restricted to Chemical Storage #2 as indicated in Permit Attachment G (Section D.1.) and shall be in previously unused or certified reconditioned DOT Specification 17H open-head shipping containers of a nominal capacity equal to 55 gallons. The maximum inventory of 55 gallon containers in Chemical Storage #2 shall not exceed 64.

- B. Condition of Containers. If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the Permittee shall transfer the hazardous waste from such container to a container that is in good condition or otherwise manage the waste in compliance with the conditions of this permit.
- C. Compatibility of Waste with Containers. The Permittee shall assure that the ability of the container to contain any waste is not impaired as required by HWMR-2, Section 206.D.3.c.
- D. Management of Containers. The Permittee shall manage containers as required by HWMR-2, Section 206.D.3.d.

- E. Containment. The Permittee shall maintain the containment system in accordance with the requirements of HWMR-2, Section 206.D.3.f. as specified in the attached plans and specifications, Permit Attachment G.
- F. Special Requirements for Ignitable or Reactive Waste. The Permittee shall not locate containers holding ignitable or reactive waste within 15 meters (50 feet) of the facility's property line.
- G. Special requirements for Incompatible Wastes
1. The Permittee shall not place incompatible wastes or incompatible wastes and materials in the same container unless the requirements of HWMR-2, Section 206.B.7. has been complied with.
  2. The Permittee shall not place hazardous waste in an unwashed container that previously held an incompatible waste or material.
  3. The Permittee shall separate containers of incompatible wastes as indicated in Permit Attachment G (Section F.5.).

**MODULE IV - STORAGE IN TANKS**

A. Waste Identification. The Permittee may store the following wastes in tanks at the facility, subject to the terms of this permit:

EPA Hazardous Waste No.	Waste Description	Hazard Code
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, o-dichlorobenzene, trichlorofluoromethane; and the still bottoms from the recovery of these solvents.....(T)	
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, n-butyl alcohol, cyclohexanone, methyl isobutyl ketone, methanol; and the still bottoms from the recovery of these solvents.....(I)	
D001	Ignitable Wastes	
D002	Corrosive wastes	

All storage of hazardous waste designated F002, F003 and D001 shall be restricted to Tank #3 located in the lined concrete vault indicated in the permit application. The maximum volume of wastes in storage in Tank #3 shall not exceed 4700 gallons.

All storage of hazardous waste designated D002 shall be restricted to Tank #4 and Tank #5 located in the lined concrete vault indicated in the permit application. The maximum volume of wastes in storage in each tank shall not exceed 4700 gallons.

B. Design of Tanks. The permittee shall maintain all tanks as required by HWMR-2, Section 206.D.5.c. as specified in Permit Attachment G. The permittee shall maintain the minimum shell thickness specified below at all times to ensure sufficient shell strength.

<u>Tank</u>	<u>Minimum Shell Thickness</u>
Tank #3	0.125 inch (total shell thickness)
Tank #4	0.43 inch (total shell thickness)
Tank #5	0.43 inch (total shell thickness)

The Permittee must ensure that the thickness of the corrosion barrier veils in Tank #4 and Tank #5 do not decrease below a minimum of 0.118 inch.

In order to ensure that the minimum shell thickness is maintained, the Permittee must perform ultrasonic shell thickness testing on each tank storing hazardous waste at least once every two years as specified in Permit Attachment C (Section F.2.b.(2)) and as a condition of this permit.

C. General Operating Requirements

1. The Permittee shall protect tanks from accelerated corrosion, erosion or abrasion as required by HWMR-2, Section 206.D.5.c.(1), as specified in Permit Attachment G (Section D.2.).
2. The Permittee shall prevent overfilling of tanks, as required by HWMR-2, Section 206.D.5.c.(2), by the methods specified in Permit Attachment G (Section D.2.b.).

D. Special Requirements for Ignitable or Reactive Waste.

1. The Permittee shall not place ignitable or reactive waste in a tank unless the procedures described in Permit Attachment C (Section F.5.) are followed as required by HWMR-2, Section 206.D.5.f.(1).
2. The Permittee shall document compliance with IV.D.1. as required by HWMR-2, Section 206.B.7.c. and place this documentation in the operating record (condition II.I.).
3. The permittee shall maintain buffer zones around covered tanks as specified in Permit Attachment C (Section F.5.), as required by HWMR-2, Section 206.D.5.f.(2).

E. Special requirements for Incompatible Wastes

1. The Permittee shall not place incompatible wastes in the same tank or place hazardous waste in a tank that previously held an incompatible waste or material.
2. The Permittee shall document compliance with IV.E.1. as required by HWMR-2, Section 206.B.7.c. and place this documentation in the operating record (condition II.I.).

# ATTACHMENT A

## SECTION C

### WASTE CHARACTERISTICS

#### C.1 Waste Description:

This section describes the chemical and physical nature of the hazardous wastes stored at the Signetics Albuquerque facility and the waste Analysis Plan for sampling, testing, and evaluating the wastes to assure that sufficient information is available for their safe handling (HWMR 206.B.3).

The list of hazardous wastes generated at the facility is as follows:

Waste Name	Disposition	Approximate Quantity (1984)
a) Waste Solvent I	5000-gal Tank Storage	40,000 Gallons
b) Waste Hydrofluoric Acid	5000-gal Tank Storage	50,000 Gallons
c) Waste Buffered Oxide Etch	5000-gal Tank Storage	30,000 Gallons
d) Arsenic Contaminated Wastes	55-gal Drum Storage	2 Drums
e) Waste Solvent II	55-gal Drum Storage	15 Drums
f) Mercury-contaminated Wastes	55-gal Drum Storage	2 Drums

a) Waste Solvent I (flash pt. 120 degrees F) - These photolithographic cleaning wastes consist primarily of: Methanol (flash pt. 54 degrees F), Acetone (flash pt. 15 degrees F), Ethylene Glycol (flash pt. 240.8 degrees F), Ethanolamine (flash pt. 195 degrees F), Diethylene Glycol Monobutyl Ether (flash pt. 230 degrees F), and water -- pH 11-12. Due to the low flash points of several materials, it is assigned as category D001 and F003. There may also be trace levels (less than 1%) of 1,1,1-Trichloroethane. Efforts are underway to decrease water from draining into "Solvent" tank in order to allow for cost effective reclamation. The maximum density of the solvent mixture should not exceed 1.5 g/ml (13.2 lbs. per gallon) and it is normally about 1.1 g/ml (9 lbs. per gallon).

b) Waste Hydrofluoric Acid is a product of silicon oxide etching and consists mainly of dilute (.1 - 15%) Hydrofluoric Acid (pH < 1). Due to the low pH, this waste is assigned a D002 label. The maximum expected density of waste is 1.15 g/ml (10.1 lbs. per gallon).

- c) Waste Buffered Oxide Etch is also a product of silicon etching and consists of Hydrofluoric Acid (0.1 - 15%) and Ammonium Fluoride (0.1 - 40%). This waste is sometimes mixed with (b) for transport. The waste is found to have a high concentration of fluorides and a pH of about 4. It has been assigned a D002 label. The maximum density anticipated for this waste is 1.2 g/ml (10.6 lbs/gallon).
- d) Arsenic Contaminated Wastes: This group includes all materials that have been contaminated with solid arsenic like gloves, containers, and rags used in the handling of arsenic. In addition, used vacuum pump oil obtained from selected equipment may be contaminated. While all of these are assigned as D004, not all may meet the extractability criteria, however, they are all viewed as potentially toxic and are disposed as such.
- e) Waste Solvent II is a drummed mixture of proprietary vendor formulas of positive photoresists which include propylene glycol esters (flash pt. 116 Deg. F), resins, glycol esters (flash pt. 240 Deg. F), and acetone (flash pt. 15 degrees F). This is classified as D001 and F003.
- f) Mercury Waste: This group includes all materials that are contaminated with liquid mercury. This includes used mercury vapor lamps, broken mercury thermometers and any material used to clean up mercury spills. It is assigned D009.

Signetics has no reactive wastes generated at this facility and no reactive wastes are managed at this location.

This Section is part of the operating record at Signetics' Chemistry Lab.

C.2 Waste Analysis Plan (HWMR 206.B.3.b):

C.2.a Rationale for Hazardous Waste Designation (206.B.3.b.1):

Table C-1 shows the bases for hazard designation of these hazardous wastes. Exhibit C-1 includes laboratory analyses of the hazardous wastes.

TABLE C-1

SIGNETICS ALBUQUERQUE WASTES - HAZARDS & RATIONALE FOR SELECTION

WASTE	HAZARD	EPA WASTE #	RATIONALE FOR SELECTION
Solvent I	Ignitable	D001, F003	Flashpoint: < 120 Deg F
Hydrofluoric Acid	Corrosive Toxic	D002	pH < 1
Buffered Oxide Etch	Corrosive Toxic	D002	It contains Hydrofluoric Acid. It also has large concentrations of fluorides.
Arsenic Contaminated Waste	EP Toxic	D004	By definition, HWMR 201. B.5.
Solvent II	Ignitable	D001, F003	Flash Pt. < 120 Deg. F
Mercury Contaminated	EP Toxic	D009	By definition, HWMR 201. B.5.

C.2.b Hazardous Waste Parameters and Test Methods  
(HWMR 206.B.3.b.2):

Table C-2 shows the hazardous waste parameters, the test methods and references. These methods are done by in-house and/or commercial laboratories.

TABLE C-2

## HAZARDOUS WASTE PARAMETERS AND THEIR TEST METHODS

HW Parameter	Test Method	Reference
Corrosivity: pH	Electrometric Method 9040	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods U.S. EPA SW-846, 2nd Edition
Corrosion Rate	NACE Test TM-01-69 Method 1110	Ibid
Flash Point	Pensky-Martens Closed Cup Tester Method 1010	Ibid
EP Toxicity	EP Extraction/Toxicity Method 1310	Ibid
Arsenic	Atomic Absorption Method 7061	Ibid
Acetone	GC/FID Method 8015 (Direct Injection)	-Test Methods for Evaluating Solid Waste, Physical/Chemical Methods U.S. EPA SW-846 2nd Edition
Methanol	GC/FID Method 8015	-Ibid
Isopropanol	GC/FID Method 8015	-Ibid
1,1,1-Trichloroethane (b)	GC/HSD Method 8010	-Ibid
Ethanolamine	GC/FID Method 8015	-Ibid
Diethylene Glycol Monobutyl Ether	GC/FID Method 8015	-Ibid
Hydrofluoric Acid	Titration Method C2.STD.8	-SEMI BOSS 1982 (a)
Ammonium Fluoride	Titration Method C2.STD.2	-SEMI BOSS 1982 (a)

TABLE C-2 (CONTINUED)

## HAZARDOUS WASTE PARAMETERS AND THEIR TEST METHODS

HW PARAMETER	TEST METHOD	REFERENCE
Fluorides	Colorimetric (SPADNS) Method 413C	-Std. Methods for Water & Waste Wa- ter 15th Ed.
Normality	Electrochemical Method 413B Titration	-Ibid
Mercury-contami- nated Waste	Atomic Absorption Method 7470, 7471	-Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods U.S. EPA SW-846, 2nd Edition

(a) Book of Semi Standards 1982 Volume 1.

(b) This test is done by outside laboratories only.

**C.2.c Sampling Methods (HWMR 206.B.3.b(3)):**

Table C-3 lists the hazardous wastes stored at the facility and the methods used to sample each. These wastes are sampled by in-house Chemistry Lab personnel. Sampling is controlled by Signetics specification #861-1096.

TABLE C-3

## METHODS USED TO SAMPLE HAZARDOUS WASTES

HAZARDOUS WASTE	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE
Solvent I	Sampling of Solid Wastes, Composite Liquid Waste Sampler, P.7	Composite sample using a "Safety Sampler"-American Scientific Products #H378 02 or a Manning Sampler.	Note 1
Solvent II	Coliwasa	Coliwasa Composite.	Ibid
Hydrofluoric Acid	"Safety Sampler"	"Safety Sampler" Composite from top, middle and bottom of tank.	Ibid
Buffered Oxide Etch	"Safety Sampler"	"Safety Sampler" Composite from top, middle and bottom of tank.	Ibid
Arsenic Contaminated Waste	Sampling of Solid Wastes, Thief-P. 12 Trier-P. 12-14	Representative composite sample from 3 grab samples at top, middle and bottom of drum using a Trier type scoop (laboratory scoop).	Ibid
Mercury Contaminated Waste	Sampling of Solid Wastes, Thief-P. 12 Trier-P. 12-14	Representative composite sample from 3 grab samples at top, middle, and bottom of drum using a Trier type scoop (laboratory scoop).	Ibid

Note 1 Test Methods for the Evaluation of Solid Waste. Physical Methods EPA-SW-846, Second Edition 1982.

C.2.d Analysis Criteria and Frequency:

The analyses criteria and sampling frequencies are listed in Table C-4. This analysis plan will be revised annually. Additional analyses will be performed and Tables revised if a process change could affect the hazardous characteristics of a waste. These analyses are sufficient to meet HWMR 206.B.3.b.

TABLE C-4  
ANALYSIS CRITERIA AND FREQUENCY

WASTE	PARAMETERS	FREQUENCY
Solvent I	Corrosion rate or pH, Flash Point, Methanol, Acetone, Iso-propanol, Ethanol Amine, and Diethylene Glycol Monobutyl Ether.	Biannually
Solvent II	Corrosion rate or pH, Flash Point.	As needed for disposal-at least every 2500 gallons
Hydrofluoric Acid	Corrosion rate or pH, Hydrofluoric Acid, Fluoride, Normality.	Biannually
Buffered Oxide Etch	Corrosion rate of pH, Hydrofluoric Acid, Fluoride, Normality.	Biannually
Arsenic Contaminated Waste	EP Toxicity, (Arsenic)	Annually
Mercury Contaminated Waste	EP Toxicity, (Mercury)	Annually

C.2.e Additional Requirements for Waste Generated Offsite:

This facility only handles on-site generated wastes, therefore, requirements for wastes received from offsite generators do not apply.

RECEIVED

February 6, 1985

FEB 08 1985

HAZARDOUS WASTE SECTION

**Signetics**

a subsidiary of U.S. Philips Corporation

Ms. Denise Fort  
Director  
Environmental Improvement Division  
State of New Mexico  
Crown Building  
725 St. Michael's Drive  
P. O. Box 968  
Santa Fe, NM 87504-0968

Signetics Corporation  
9201 Pan American Freeway, NE  
P.O. Box 10072  
Albuquerque, New Mexico 87116

Dear Ms. Fort:

Signetics agrees that the following conditions of the Solid Waste Disposal Act, P. L. 96-482, as amended by the Hazardous and Solid Waste Amendments of 1984, P. L. 98-616, be made a condition of Signetics' final permit. On the effective date(s) of the permit conditions, Signetics Corporation will comply with said conditions and any regulations pertaining to those conditions which may be promulgated by the U. S. Environmental Protection Agency or the New Mexico Environmental Improvement Board.

Condition 1.

On September 1, 1985, Signetics agrees that any manifest required by the New Mexico Hazardous Waste Act and Regulations, shall contain a certification by the generator that:

- (a) the generator of the hazardous waste has a program in place to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable; and
- (b) the proposed method of treatment, storage, or disposal is that practicable method currently available to the generator which minimizes the present and future threat to human health and the environment.

Condition 2.

Signetics shall submit reports to the Director at least once every two years, setting out:

- (a) the quantities and nature of hazardous waste identified or listed under the New Mexico Hazardous Waste Act and Regulations that we have generated during the year;
- (b) the disposition of all hazardous waste reported under the preceding paragraph;

Page 2  
February 6, 1985

Signetics Corporation  
9201 Pan American Freeway, NE  
PO Box 10070  
Albuquerque, New Mexico 87114

- (c) the efforts undertaken during the year to reduce the volume and toxicity of waste generated; and
- (d) the changes in volume and toxicity of waste actually achieved during the year in comparison with previous years, to the extent such information is available for years prior to enactment of the Hazardous and Solid Waste Amendments of 1984.

Condition 3.

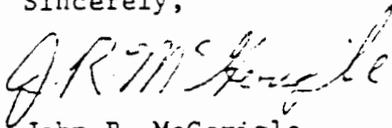
Effective September 1, 1985, if Signetics treats, stores, or disposes of hazardous waste on the premises where such waste is generated, we shall certify, no less often than annually, that:

- (a) we have, in place, a program to reduce the volume or quantity and toxicity of such wastes to the degree determined by the generator to be economically practicable; and
- (b) the proposed method of treatment, storage, or disposal is that practicable method currently available to the generator which minimizes the present and future threat to human health and the environment.

If you have any questions or comments, please contact us. The contact person and party responsible for the hazardous waste management activities at Signetics Albuquerque facility is:

Gary M. Mavrakis  
Chemical Support Section Head  
(505) 822-7188

Sincerely,



John R. McGerigle  
Plant Manager

fm

cc: Bob Smith - ABQ  
Trent Thomas - EID  
Jim Davison - SV

## SECTION F

## PROCEDURES TO PREVENT HAZARDS

The information provided in this section is submitted in accordance with the requirements of HWMR 302.A.4.b.(d),(e),(f),(h),(i). Other regulations addressed to complete this section include HWMR 206.B.4, 206.B.5, 206.B.7, 206.D.4.e, and 206.D.5.d.

F.1 Security:

F.1.a Security Procedures and Equipment:

F.1.a(1) 24-Hour Surveillance System:

Security at Signetics-Albuquerque is provided by Safety and Security Department whose primary task is to monitor entry and exit from the facility, provide security measures for the facility as a whole, and assist in safety measures. Additional guards are subcontracted by Signetics. In the Security Control Center by the lobby entrance, the guards are able to monitor the facility and outside fence by the use of a modular command unit. This unit monitors all outside doors, smoke detectors, duct detectors, the fire system for the plant, and access to the gate into the Shipping/Receiving area. If any alarms are set off, guards are dispatched to that area to investigate. The Security Control Center is manned by two guards 24 hours a day, 7 days a week.

During plant shutdowns, the guards conduct a walkthrough every hour. During the hours of 6:00 p.m. and 6:00 a.m., the guards patrol all areas every two hours. The guards normally work 12-hour shifts.

The guards carry hand-held, two-way radios to report any problems immediately. In addition to the radios, a base station for the speaker system is located in the Control Center. An internal phone system is also available for use by the guards.

Emergency alarm pull stations are also located throughout the facility. All hazardous waste personnel are equipped with pagers and two-way radios so that security personnel can communicate with them.

A television monitor system is installed which has cameras located in the fences shipping/receiving area with the video screen in the Security Control Center.

F.1.a(2) Barrier and Means to Control Entry:

F.1.a(2)(a) Barrier

The entire area, where the hazardous waste storage is located, is enclosed within a 10-foot-high chain link fence. The only entrance is through the Shipping/Receiving gate which is controlled remotely through shipping. The gate is monitored by Security every time the gate is opened. The hazardous waste containers are located inside the fence and behind locked doors.

F.1.a(2)(b) Means to Control Entry:

Access to the facility is controlled by the guards at the plant entrance. All employees are required to show identification badges when reporting to work, and visitors and contractors entering the facility must sign a log sheet and obtain visitor badges. Access to the hazardous waste storage areas are limited to Chemical Support and Facility personnel only. All doors are locked. Other persons requiring access to the rooms must obtain permission from the Chemical Support Section Head and be escorted by an employee of the Chemical Support Department. The hazardous waste tank storage area is located outdoors with tanks underground in protective vaults with metal covers. Access to the vaults is limited to trained personnel who are properly suited with safety equipment.

F.1.a(3) Warning Signs:

Signs which are legible from a distance of 25 feet are posted at the fence gate and on all doors leading into storage areas. The signs are in english and spanish and bear the legend "Danger - All Unauthorized Personnel Keep Out/Peligro - Personal Autorizado Solamente." Also, "Danger - No Smoking" signs have been posted in those areas holding ignitable material.

F.1.b Waiver:

The Signetics-Albuquerque facility does not request a waiver of the requirements stated in HWMR 206.B.4.a regarding injury to intruders and violations by intruders.

F.2 Inspection Schedule:

F.2.a General Inspection Requirements:

The personnel at Signetics-Albuquerque conduct regular inspections of the facility for structural deterioration, operator errors, equipment malfunctions, and discharges that could cause or lead to the release of hazardous waste constituents and adversely affect the environment or threaten human health. Facility security personnel conduct inspections of all plant areas for general health, security, fire, and structural problems. The hazardous waste container and hazardous waste tank storage areas are inspected daily by Chemical Support personnel. The "two man rule" exists when all waste storage areas are being used or inspected. If no other Chemical Support personnel are available at the time of entry, the guard desk will be notified and a guard will accompany the person. There must be a Chemical Support or Facilities employee present whenever entry to the rooms is necessary.

Table F-1 shows the inspection schedule used at Signetics-Albuquerque. The items listed in the Exhibit are considered important because of their role in preventing, detecting, or responding to environmental or human health hazards. Provided on the schedule is a list of problems normally encountered and a designation of the facility department that will conduct the inspection.

F.2.a(1) Types of Problems:

The types of potential problems that are identified during the inspection are also listed in Table F-1.

F.2.a(2) Frequency of Inspection:

The frequency of inspection as well as the facility department that will conduct the inspections are also listed in Table F-1.

F.2.b Specific Process Inspection Requirements:

F.2.b(1) Container Inspection:

Inspections of the container storage area will be conducted by the Chemical Support Department per the inspection schedule labelled "Inspection Schedule for Drummed Hazardous Waste Storage" (See Tables F-2 and

F-3). The Inspection Schedule attached to the Inspection log notes the items to be inspected and the frequency of that inspection. Typical problems encountered with each item off the inspection are provided on the inspection schedule to serve as a reminder to the inspector and to ensure a complete inspection. The inspector is required to check the status of each item and indicate whether its condition is acceptable or unacceptable. If the status of a particular item is unacceptable, appropriate and complete information is recorded, including date and nature of repairs and remedial action.

The inspection sheets are filed in a 3-ring binder in the Chemical Support Office. (A description of the container storage area is detailed in Section D.1.d).

**F.2.b(2) Tank Inspection:**

Inspections of the tank storage area will be conducted by the Chemical Support Department per the inspection schedule labelled "Inspection Schedule for H. W. Storage Tanks" (See Tables F-4 and F-5). Upon completion of the inspection logs, the sheets will be maintained in a 3-ring binder in the Chemical Support Office (a description of the storage tank area is detailed in Section d.2).

Visual inspections will be completed daily or weekly as follows: the inspector will enter the vault area through the vault cover; the inspector will examine the tanks, vault walls, lighting system, and waste feedlines for cracks, leaks, corrosion or erosion of surface; the inspector will also examine whether there has been any accumulation of spills or precipitation in the bottom of the vault. This inspection will be completed from the top of the tank using the vault lighting system and flashlights. Any discrepancies will be recorded on the log and reported to Environmental Affairs.

The overflowing control equipment is the secondary containment vault in which each storage tank is contained. Normally, trucks are scheduled in advance for tank emptying. If the tank overfilled, the waste will collect into the vault. The production process areas will be immediately shut down through verbal communication from Chemical Support personnel and a licensed hazardous waste transporter will be contracted to drain the vault and the tank. The vaults are designed to contain any spill-over that may occur (see Section D.2.c).

The mechanism for waste feed cut-off is by verbal notification to the Production Manager who will halt production at the affected drains. After notification of cut-off, the waste levels in the tanks will be monitored every half hour until the problem is resolved, the waste is removed, and cleanup is completed. Waste feed cut-off systems are not used for safety measures. The wastes would back up into the production equipment and emergency showers causing a health and cleanup hazard. The vaults provide a means where there is minimal exposure of hazardous wastes to employees should there be a tank spill or overflow.

At least once every 2 years, during production shutdown, the vault covers will be removed and a complete inspection of the tank and vault will be made. A ladder will be lowered into the vault so that all areas of the tank and vault are examined. The storage tanks will be emptied by the use of a waste disposer, and inspections will be made of the interior of the tank. Those items inspected will be corrosion, cracking, and bulging of the tank. The inspector will be fully clothed in safety protective gear with air packs. Care will be taken to ensure the avoidance of spills, avoidance of hazardous conditions (reaction, ignition, or toxic exposure), proper cleaning procedures, proper ventilation, adequate lighting and standby and safety equipment are available. An outside lab will be contracted to perform the following:

- a) Interior inspection of the solid-steel tanks:
  - 1) Roof and Structural Supports
    - a) Loss of metal thickness by ultrasonic examination
    - b) Cracks and leaks around or at weld joints
    - c) Cracks and leaks at all nozzle connections
    - d) Visual examination for corrosion
  - 2) Tank Shell
    - a) Cracking of plate joints
    - b) Loss of metal thickness by ultrasonic examination
    - c) Cracks or splitting at seams
    - d) Visual examination for corrosion
  - 3) Tank Bottom
    - a) Unevenness of the bottom
    - b) Visual examination for corrosion, pitting
    - c) Cracks or splitting at seams
    - d) Hammer testing for weak spots
    - e) Metal thickness

b) Interior inspection of fiberglass-reinforced plastic tanks:

- 1) Visual examination for bulging, cracking, exposed fibers, splitting or discoloration
- 2) Cracks at nozzle connections
- 3) Hardness test, and
- 4) Air bubble detection by translucency

F.2.c Remedial Action:

If inspections reveal that non-emergency maintenance is needed, they will be completed as soon as possible to preclude further damage and reduce the need for emergency repairs. If a hazard is imminent or has already occurred during the course of an inspection or any time between inspections, remedial action will be taken immediately. Signetics personnel will notify the appropriate authorities per the Contingency Plan (See Section G.4) and initiate remedial actions. In the event of an emergency involving the release of hazardous constituents to the environment, efforts will be directed towards containing the hazard, removing it, and subsequently decontaminating the affected area. Refer to the Contingency Plan for further details (Section G.4).

F.2.d Inspection Log:

An inspection log for each area is maintained as part of the Facility Hazardous Waste Operations Record for each calendar year in separate 3-ring binders. These logs will be maintained for the life of the facility.

F.3 Waiver of Preparedness and Prevention Requirements:

The applicant does not wish to request a waiver of the preparedness and prevention requirements under HWMR 206.B.9.

F.4 Preventive Procedures, Structures, and Equipment:

Sufficient aisle space is maintained for personnel and equipment access. The aisle spacing is also inspected daily. (See exhibit D-3).

F.4.a Loading/Unloading Operations:

Loading/unloading operations in the facility involve the transfer of material to the container storage areas as described in Section D.1.b. When the containers are prepared for shipment, there is ample space to move the containers by fork lift. The container area is indoors with easy access to all containers. The containers, four per pallet are moved to the loading dock by use of an "EE" fork lift (explosion--proof, non-sparking motor). The containers are then loaded onto the transporter trucks.

Tanks:

When the tank contents reach 4700 gallons, a permitted hazardous waste transporter is contacted to ship the waste to a TSD facility.

The tanks are drained by connecting a drain hose from the truck to the tank. The truck uses a vacuum system to pull the waste into the tanker trailer. Levels of the tank are checked constantly while filling by manually dipping the tanks. The Techs and drivers presently use all safety equipment including goggles, hard hats, rubbersuits, acid/solvent gloves, and rubber boots. Located just east of the loading area is a safety eyewash/shower with easy access. When the waste pickup has been completed, the Tech completes the proper paperwork, makes certain the truck displays the appropriate placards, and examines the surrounding area for any spills which are cleaned up immediately.

F.4.b Runoff:

Runoff from storage areas is described in Section D.1.d. Section B describes the flood plain runoff.

F.4.c Water Supplies:

Ground water contamination is prevented by eliminating the discharge of hazardous materials onto the unprotected ground. The containment structures used are detailed in Section D.2.c.

F.4.d Equipment and Power Failure:

In the event of a brief power interruption, emergency generators will be started to maintain process operations, and the emergency lighting system will activate automatically supplying lighting to all facility buildings and property. If there is a prolonged power outage, process equipment will not be operating, and thus wastes will not be generated.

F.4.e Personnel Protection Equipment:

General information concerning the major chemical components of the wastes in the containers and tanks is provided in Section C - Analysis Plan. Section C presents information regarding various waste streams' toxicity, fire and explosion hazards, and corrosivity. Available protective equipment is presented under Emergency Equipment and Provisions of the Contingency Plan (see Section G.5). Use of protective equipment is covered in the initial and annual Personnel Training Programs (see Section H.1.b), which satisfies the Occupational Safety and Health Standards of 29 CFR Part 1910 Subpart I Personal Protective Equipment.

F.5 Prevention of Reaction of Ignitable, Reactive, or Incompatible Wastes:

F.5.a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste:

Flammable Storage #4 (ignitable waste) and the solvent storage tank are the only areas on the facility property where ignitable wastes are stored. The containers and tanks, as discussed in Section D.1, are compatible with the contained wastes; therefore, the only source of ignition is external to the containers. To prevent a possible source of external ignition, no sparking equipment or flames are allowed in either area. The "Solvent" tank is covered and sealed. Signs are on the areas with legends: "Danger - No Smoking" and "Danger - All Unauthorized Personnel Keep Out."

F.5.b General Precaution for Handling Ignitable Wastes or Accidentally Mixing Incompatible Wastes:

General precautions for handling ignitable or reactive wastes were discussed above. Job specifications prohibit the mixing of "new, non-routine", or incompatible wastes. The storage areas for corrosive and ignitable wastes are in separate rooms as described in Section D.1.d.

F.5.c Management of Ignitable or Reactive Wastes in Containers:

Precautions taken in the container storage area to prevent accidental fire and explosion include the proper storage of containers (e.g., stacking, labeling, and sealing of containers), sloped drains,

and appropriate warning signs. Prior to storage, each container is sealed and labelled. This prevents moisture from entering the drum and identifies the contents of the container and the date wastes are accumulated. Containers are stored on pallets to minimize contact with leaks, or spills, and are not stacked. The area just outside the container area is kept clear of all obstruction in order to allow a non-sparking forklift easy access to all drums. The area incorporates a fire sprinkler system which activates at 286 degrees F.

The flammable container storage area is located 600 feet from the closest company property line (see Exhibit B-2), which is in compliance with the National Fire Code Standards for outdoor storage of containers holding ignitable or reactive wastes.

**F.5.d Management of Incompatible Wastes in Containers:**

The container filling and storage areas for corrosive and solvent (flammable and nonflammable) wastes are located in different rooms as described in Section D.1.d. Since the areas are physically separated and all 5-gallon carboys brought to these areas are labelled for contents, the possibility of mixing these incompatible wastes are minimized. Once filled and labelled, the waste storage drums are not moved from their original storage area until they are shipped out for disposal. The area incorporates a fire sprinkler system which activates at 286 degrees F. Steel drum storage of Ignitable Wastes are recommended by the chemical suppliers.

**F.5.e Management of Ignitable or Reactive Wastes in Tanks:**

Only one of the 5,000 gallon tanks contains a flammable (ignitable) mixture. This flammable waste mixture is gravity fed through a piped system from its point of generation in the production area. Since it is an enclosed system, there is no possibility of mixing this waste stream with an incompatible waste.

The location of the waste storage tanks comply with the siting requirements for flammable liquids contained in the National Fire Protection Association's "Flammable and Combustible Liquid Code." Signetics' waste storage tanks are 850' from property line, 40' from an "important building," and 40' from load-bearing foundations.

Regular inspections, as discussed in Section F.2b(2) will be conducted to ensure safe operations. Venting of the tank is described in Section D.2.b.

**F.5.f Management of Incompatible Waste in Tanks:**

As described in Section D.2.c, each tank is separated from the other and is a separate unit. The waste mixtures are drained through a closed system from its point of generation in the production area. Since it is an enclosed system, there is no possibility of mixing the wastes with each other.

TABLE F-1

## INSPECTION SCHEDULE

Area Equipment (Responsible Group)	Items to be Inspected	Types of Inspections	Frequency
Safety/Emergency Equipment (Chemical Support)	- Industrial Absorbents.	- Out of stock.	Daily
	- Air Purifying Respirator and cartridges.	- Clean, new cartridges.	Monthly
Tank Storage Area (Chemical Support)	- Shovels, garden hose.	- Broken or worn.	Monthly
	- Gloves, safety goggles, Safety suits, boots.	- Out of stock, worn out, clean, broken.	Monthly
Tank Storage Area (Chemical Support)	- Vault.	- Cracks, deterioration, un- even settling.	Weekly
	- Pipes, fittings, valves.	- Leaks, corrosion, damage.	Weekly
Tank Storage Area (Chemical Support)	- Warning signs.	- Damaged, missing.	Weekly
	- Tank shell.	- Corrosion, discoloration, cracks, leakage.	Weekly
Tank Storage Area (Chemical Support)	- Chemical feed lines.	-Cracks, deterioration, cor- rosion, leakage.	Weekly
	- Presence of odors.	-Leakage.	Daily
Tank Storage Area (Chemical Support)	- Level of wastes.	-High level.	Daily
	- Tank shell.	-Corrosion, cracking, bulg- ing.	Every 2 years
Container Storage Area (Chemical Support)	- Drums.	- Corrosion, in proper sec- tion, leaks, spills, open lids.	Daily
	- Labeling on drums.	- Improper ID, date missing.	Daily
Container Storage Area (Chemical Support)	- Personal Protective Equip- ment.	- All items present and clean.	Daily
	- Structural.	- Floors, doors, roofs, in- tact.	Daily
Container Storage Area (Chemical Support)	- Spills.	- No visible chemical spills.	Daily
	- Signs.	- All signs undamaged.	Daily
Container Storage Area (Chemical Support)	- Doors.	- Unlocked.	Daily
	- Drains.	- Plugged, corrosion.	Weekly
Container Storage Area (Chemical Support)	- Aisle space.	- Items piled up in front of storage.	Daily
	- Forklift.	- Non-functional.	Daily

TABLE F-1 (Continued)

Area/Equipment Responsible Group	Items to be Inspected	Types of Problems	Frequency
- Security Devices (Security Department)	- Radio Communication	- All Units Operational.	- Upon Failure
	- Telephone System	- All Lines Operational.	- Upon Failure
	- Emergency Paging System	- All Lines Operational.	- Monthly
	- Emergency Shower/Eyewash	- Water Pressure, Leaking, Upkeep.	- Monthly
	- Air packs	- Air pressure, hose and mask condition.	- Monthly
	- Fire Extinguishers	- Needs charging.	- Monthly
	- Fire Alarm System	- Power failure.	- Per NFPA
	- Emergency Lighting System	- Lights.	- Per NFPA
	- Property Line Fence	- Corrosion, Damage to fence.	- Daily
	- First Aid Equipment and Supplies	- Items out of stock or in-operative	- As used
- Security Cameras	- All units operational	- Upon Failure	
- Sprinkler System	- Sprinkler pressures.	- 2 x/yr	

NFPA = National Fire Protection Association.

TABLE F-2

## INSPECTION SCHEDULE FOR DRUMMED HAZARDOUS WASTE STORAGE

ITEM	DAILY	WEEKLY	MONTHLY
- Visual inspection of area for containers in proper section (By Classification).	X		
- Visual inspection of waste containers for leaking or deterioration.	X		
- Inspection for proper container marking as per Signetics' Specification #854-5004.	X		
- Inspection for proper segregation of waste as per Signetics' Specification #854-5004.	X		
- Check height of drum stacking (no stacking allowed).	X		
- Visual inspection of walls, floors, and ceiling for discoloration and stains.	X		
- Check for locked doors to storage areas.		X	
- Inspect slotted drains in storage areas.		X	
- Check emergency showers.			X
- Check warning signs on exterior of containment rooms.	X		
- Check for aisle space needed for drum movement.	X		
- Check that drums are elevated on pallets.	X		
- Check inventory of industrial absorbents used to contain spills or leaks per inventory list.	X		
- Check forklift for corrosion, malfunction.	X		

The above inspections are performed by Chemical Support Technicians.

TABLE F-3

INSPECTION LOG FOR DRUMMED HAZARDOUS WASTE STORAGE

ITEM	FREQUENCY	RECORD INSPECTION SATISFACTORY	RECORD INSPECTION UNSATISFACTORY
1. Visual inspection of area for containers in proper section.	Daily	_____	_____
2. Visual inspection of waste containers for leaking or discoloration.	Daily	_____	_____
3. Inspection for proper container marking/per Signetics' Specification #854-5004.	Daily	-----	-----
4. Inspection for proper segregation of waste per Signetics' Specification #854-5004	Daily	-----	-----
5. Check height of drum stacking (no stacking allowed).	Daily	_____	_____
6. Visual inspection of walls, floors, and ceiling for discoloration and stains.	Daily	-----	-----
7. Check for locked doors.	Daily	-----	-----
8. Inspect slotted drains.	Weekly	-----	-----
9. Check emergency showers.	Monthly	-----	-----
10. Check warning signs on exterior of containment rooms.	Daily	-----	-----
11. Check for aisle space needed for drum movement 20".	Daily	-----	-----
12. Check that drums are elevated on pallets.	Daily	-----	-----
13. Check inventory of chemical absorbents used to contain spills or leaks per Inventory List.	Daily	-----	-----
14. Check forklift for corrosion, malfunction.	Daily	-----	-----

Necessary Action:-----  
 -----  
 -----

Environmental Affairs Notified of Discrepancy By:-----Date:-----

Inspected by:----- Shift:----- Date:----- Time:-----am/pm

Action was completed by:----- Date:-----

TABLE F-4

INSPECTION SCHEDULE FOR HAZARDOUS WASTE STORAGE TANKS

ITEM	DAILY	WEEKLY
1. Visual Inspection of Vault Cover & Ladder:		
. Corroding parts		X
. Loose rivets or bolts		X
. Worn or broken parts		X
2. Visual Inspection of Waste Tanks:		X
. Discoloration of paint		X
. Cracks at connections, seams		X
. Buckles, bulges		X
. Water collection on tank top		X
. Vents are clear		X
3. Electrical:		
. Light bulb on		X
. Corrosion on conduit		X
. Defective switches for lights		X
. Vent fan on	X	
4. Visual Inspection of Vault:		
. Rust spots		X
. Blisters, film-lifting		X
. Cracks or spalled concrete		X
. Low spots where liquids can collect		X
. Anchor bolt distortion		X
. Presence of odors	X	
5. Visual Inspection of Piping:		
. Cracks and distortion		X
. Bulging		X
. Corrosion		X
. Leaks	X	
. Flange seal leaks	X	
. Loose or corroded bolts		X
. Inspect trench for liquids		X
6. Check Tank Levels:		
. Waste Hydrofluoric Acid	X	X
. Waste BOE	X	
. Waste Solvent	X	

The above inspections are performed by Chem Support Technicians.

TABLE F-5  
INSPECTION LOG FOR HAZARDOUS WASTE STORAGE TANKS

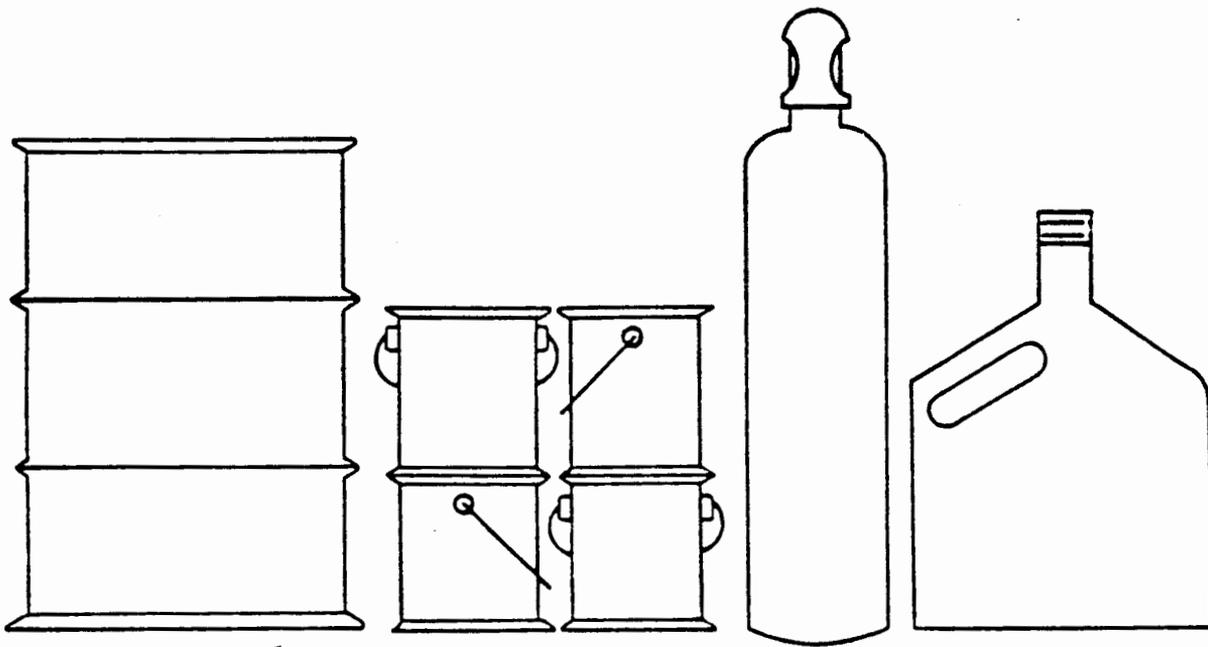
ITEM	FREQUENCY	RECORD INSPECTION SATISFACTORY	RECORD INSPECTION UNSATISFACTORY
1. Visual Inspection of Vault Cover and Ladder	Weekly	-----	-----
. Corroding parts	Weekly	-----	-----
. Loose rivets or bolts	Weekly	-----	-----
2. Visual Inspection of Waste Tanks:			
. Discoloration of paint	Weekly	-----	-----
. Cracks at connections, seams	Weekly	-----	-----
. Buckles, bulges	Weekly	-----	-----
. Water collection on tank top	Weekly	-----	-----
. Vents are clear	Weekly	-----	-----
3. Electrical:			
. Light bulb on	Weekly	-----	-----
. Corrosion on conduit	Weekly	-----	-----
. Defective switches for lights	Weekly	-----	-----
. Vent fan on	Daily	-----	-----
4. Visual Inspection of Vault:			
. Rust spots	Weekly	-----	-----
. Blisters, film-lifting	Weekly	-----	-----
. Cracks or spalled concrete	Weekly	-----	-----
. Low spots where liquids can collect	Weekly	-----	-----
. Anchor bolt distortion	Weekly	-----	-----
. Presence of odors	Daily	-----	-----
5. Visual Inspection of Piping:			
. Cracks and distortion	Weekly	-----	-----
. Bulging	Weekly	-----	-----
. Corrosion	Weekly	-----	-----
. Leaks	Daily	-----	-----
. Flange seal leaks	Daily	-----	-----
. Loose or corroded bolts	Weekly	-----	-----
. Inspect trench for liquids	Weekly	-----	-----
6. Check Tank Levels:			
. Waste Hydrofluoric Acid	Daily	FT-----	IN-----
. Waste BOE	Daily	FT-----	IN-----
. Waste Solvent	Daily	FT-----	IN-----

Necessary Action-----

Environmental Affairs Notified if Discrepancy: -----

Inspected by:----- Shift:----- Date:----- Time:-----am/pm

# INTRODUCTION TO HAZARDOUS MATERIALS



## PROTECTIVE SAFETY EQUIPMENT TO BE USED IN A FAB AREA

1. Protective equipment will be provided by the company and must be worn as required in the work area.
2. Lab Coats (White or Blue Smocks) - This garment is issued to the employee not as safety or protective equipment for the employee, but for protection of our delicate products. Clothing usually has a high degree of lint, dirt and other contaminating debris which can destroy our products if not properly controlled. Smocks should never be used in place of safety equipment for any reason.
3. Hair Covering - There are a few Fab areas that require the wearing of hats. This is to protect the delicate products that are being produced from hair contaminates. They are to be worn at all times in the Fab area and must not be taken off. Keep long hair tucked into hats or tied back.
4. Glasses - Protective glasses should be worn at all times in the Fab area. The kind of glasses worn must be chosen with consideration given to the job being performed, location of your work station, and the working environment.
  - A. Safety Glasses with Side Shields - Mandatory in the Wafer Fab area. They are used for protection from chips, flying objects and splashed chemicals. Operators using microscopes and other optical equipment may remove glasses ONLY during actual inspections, when glasses may interfere with optical accuracy.
  - B. Safety Glasses with Tinted Lenses - These should be used to protect eyes of operators working around ultra violet lights. Tinted glasses will be provided at all U.V. inspection stations. Ask your Supervisor if your U.V. station does not have them available.
  - C. Prescription Safety Glasses with Tinted Shields - Any employee who must wear eye glasses will be supplied with prescription safety glasses by Signetics. You may choose to have either plain or tinted lenses. Supervisors can provide purchase requisitions for these glasses. Expenses for new examinations will not be covered by the company.
  - D. Contact Lenses - These shall not be worn by an employee engaged in operations involving the following:
    - (1) Exposure to dusts
    - (2) Exposure to corrosive or irritant liquids, gases, or smokes
    - (3) Exposure to flammable liquids
    - (4) Exposure to fiberglass
  - E. Visitor Glasses - These must be worn by any visitor coming into the Fab area. They are plastic, non-tinted glasses which protect only against chemical spills. They are not shatter resistant, and therefore provide no protection from flying objects such as chips.
  - F. Chemical Goggles with Safety Strap - These provide better protection for the eyes when working with chemicals because of a closer fit to the face.



6. Visor with Full Face Shield (Tinted or Clear Lens) - These provide the best protection for the face and eyes from flying objects and chemical accidents. The curvature of the shield gives added protection to the chin area as well.
5. Gloves - Gloves are probably the most important item of your protective equipment. If you make sure your gloves are free from defects, select those appropriate to the materials being used, and wear your gloves according to specification, they will provide the necessary hand protection from burns and from contact with toxic substances.

Safety Rules for Gloves:



- (1) Test Gloves - Protective gloves must be tested by the wearer for defects before and after each use. Partially inflate gloves with N<sub>2</sub> air jet or twisting motion. While holding the base of the glove closed, test glove for leaks by visual inspection and by listening for escaping air. The gloves may also be immersed in water for bubble test. If any detection of a leak is suspected, discard the gloves. Gloves showing evidence of deterioration must also be discarded, even if not leaking.
- (2) Glove Disposal - Mutilate gloves, by cutting them, when throwing away so they cannot be used accidentally by others.
- (3) Chemical Exposure of Gloves - Chemically contaminated gloves must be disposed of with other chemically contaminated waste.
- (4) Remove Jewelry - Rings and bracelets should not be worn since they can cause punctures in the gloves. They should be left in your locker if worn to work.
- (5) Trim Fingernails - To prevent puncturing gloves, keep your nails smooth and trimmed with no jagged edges.
- (6) Rinse Gloves - Rinse gloves in water immediately following any chemical contact. NEVER touch your face, glasses or any other part of your body in order to avoid chemical burns. Frequent rinsing of gloves while working with chemicals also prolongs glove life.
- (7) Form Cuff - Roll down the top of gloves  $\frac{1}{2}$  to 1 inch, to form a cuff. This will prevent fluids from running down the glove and onto exposed skin of the arm.

6. Vinyl Aprons - This protective apron is worn over the bunnysuit in all operations (class 100 room) where hazardous chemical contact is expected and chemical resistant protection is required.



Safety Rules for Aprons:

Label Apron - A distinguishing mark must be placed on the front side of the apron to identify the front from the back of the apron. This will prevent confusing the two sides of the apron and alleviate contact with chemical spills and personal clothing.

7. Armguards (Gauntlets) - These are made of translucent vinyl material and should be worn by employees handling or working near hazardous chemicals. They are worn over gloves, keeping gloves cuffed. The top of the gauntlets should come above the elbows.

## GLOVES

A protective covering for the hands. When wearing gloves, our hands have a tendency to sweat excessively. If you suspect a leak in your gloves, remove your gloves, wash your hands and recheck your gloves.

### TYPES OF GLOVES USED AT SIGNETICS

GLOVES	COLOR	PRIMARY AREA OF USE	PROTECTIVE PURPOSE	SAFE USAGE
Vinyl Dust Free	Clear	Fab Operations	Worn as part of the Bunny suit in ultra clean Class 100 rooms where lint control is most strict. Protects product from body contamination (hair, skin, oil).	
Pacific Polymers	Orange	Fab Operations	Handling of either acids or solvents.	Check for air leaks before and after use - fully rinse with water.
Neoprene	Black	Fab Operations	Handling of either acids or solvents.	"
Nitrile Rubber	Blue-Green	Fab Operations	Handling of solvents	"
Latex	Tan	Fab Operations	Handling of acids	"
Thermal-Resistant Cloth (asbestos form)	White		1) Handling of larger hot quartz glass. 2) Cryoprotective - handling extreme cold situations. Example: Liquid nitrogen tanks.	
Edmunts	White	Outside Fab	General Maintenance	

ACCIDENT PREVENTION SIGNS

Industry has currently adopted a set of key terms as developed under the Occupational Safety and Health Act (O.S.H.A.) that may be used for accident prevention and general safety measures within the workplace. These words, known as "Signal Words" are listed below and are arranged in a decreasing order of severity. The purpose is to allow you, a safety conscious employee, a means of evaluating the degree of a potential hazard within the working environment.



Highest Degree of Hazard

Color(s)

Danger signs have a white background with "Danger" in white letters on a red oval inside a black rectangular panel. Wording in black letters.

Use: Danger signs should be used only where an immediate hazard exists. There should not be any variation in the type of design or signs posted to warn of specific dangers and radiation hazards.

Danger signs indicate immediate danger and warning that special precautions are necessary. The skull and crossbones must also be displayed with the word "DANGER" for highly toxic chemicals.

\*\*\*\*\*



Intermediate Degree  
of Hazard  
(Specific)

Color(s)

Caution signs have a yellow background. "Caution" should be in yellow letters on a black rectangular panel. Other wording must be in black letters.

Use:

Caution Signs should be used only to warn against potential hazards or to caution against unsafe practices. All employees shall be instructed that caution signs indicate a possible hazard against which proper precautions should be taken.



Color(s)

Notice Signs have a white back-ground. "Notice" should be in white letters on a blue rectangle. Wording is in black letters.

Use:

Notice Signs are primarily used as information signs for employees.

Low Degree of Hazard  
(Informational)



Color(s)

Be Careful Signs have a white back-ground. "BE CAREFUL" should be in white letters on a green rectangle. Wording is in black letters.

Use:

Be Careful Signs are designed as safety instruction signs and should be used where there is a need for general instructions and suggestions relative to safety measures.

Lowest Degree of Hazard



Other Information Signs and Safety Instruction Signs may be of a variety of designs and colors. Information Signs will convey information not necessarily of a safety nature, and Safety Instruction Signs should be used for general instruction relative to safety measures.

## INTRODUCTION TO HAZARDOUS MATERIALS

### VOCABULARY WORDS

#### Hazardous Material

Any material that is a flammable, corrosive, oxidizer, poison, explosive or radioactive is considered by the D.O.T. (Dept. of Transportation) to be hazardous. Hazardous materials have properties which make them harmful if used improperly.

#### Flammable

A flammable material is capable of being easily ignited and of burning with extreme force.

#### Pyrophoric

Pyrophoric refers to materials that are spontaneously combustible, which means they will burn when released into the air, without an ignition source such as a flame or spark.

#### Flash Point

When talking about flammables, a flash point refers to the temperature at which a liquid gives off enough vapors to support ignition.

#### Corrosive

Corrosive materials are highly reactive and will cause destruction of many materials upon contact. Corrosives are divided into two major groups - acids and bases. Corrosive acids have a pH of less than 2, while corrosive bases have a pH of greater than 12.5.

#### Oxidizer

Oxidizing materials will decompose readily to yield oxygen. Since oxygen is needed to create or sustain a fire, violent reactions may occur when an oxidizer is mixed with a combustible material, such as wood, paper, or powders.

### Poison

A material is considered a poison if it causes serious damage or death to a person when it is inhaled, absorbed or eaten, even in small amounts. Poisonous materials are often referred to as toxic materials.

### Explosive

An explosive material has the capacity to react with great force and speed.

### Radioactive

A radioactive material emits certain atomic particles or energy that are destructive to human tissue, thus radioactive materials are always used under strict controls in specified areas.

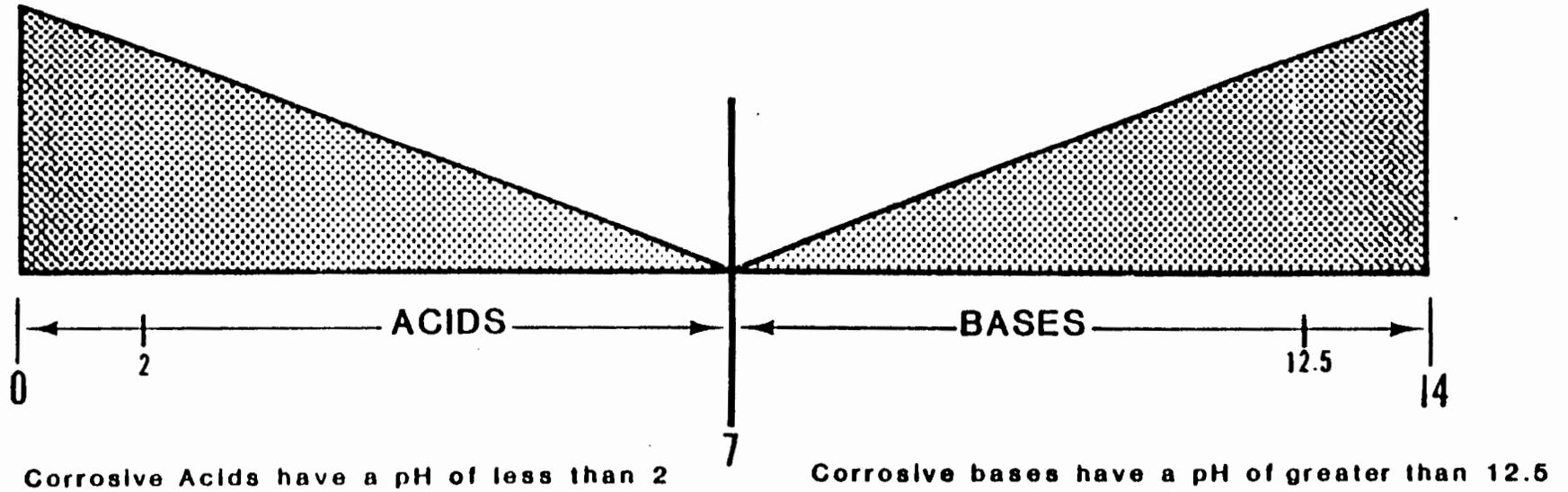
### Cryogenic

Cryogenic refers to a state of extreme cold - temperatures below  $-101^{\circ}$  C. Gases are usually stored and transferred in a cryogenic (liquified) state to conserve space.

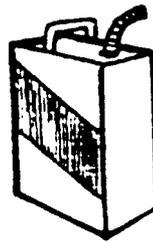
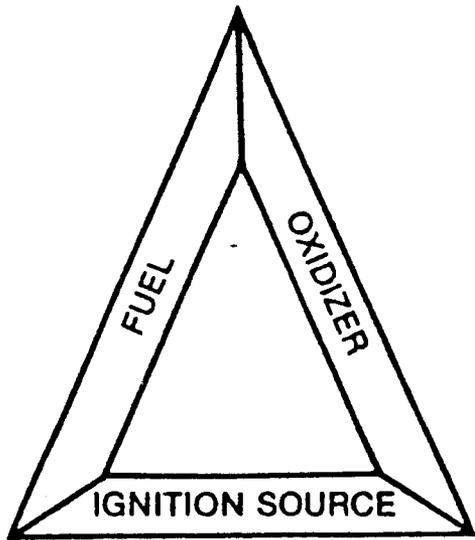
### Organic

Refers to materials that contain the element carbon as a basic unit of structure. These materials are often derived from living matter. Examples of organic materials include oil, grease, wood, and rubber.

## pH CHART



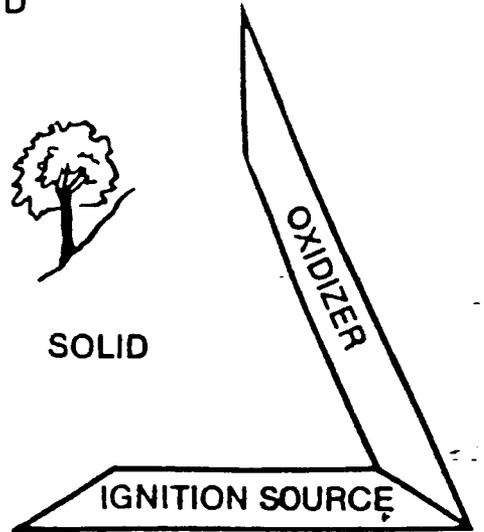
A neutralized material will have a pH of between 5 and 9



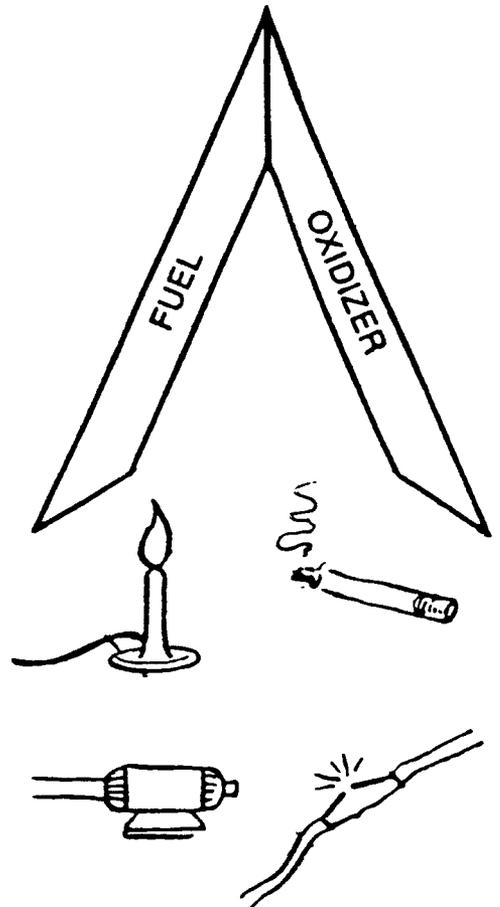
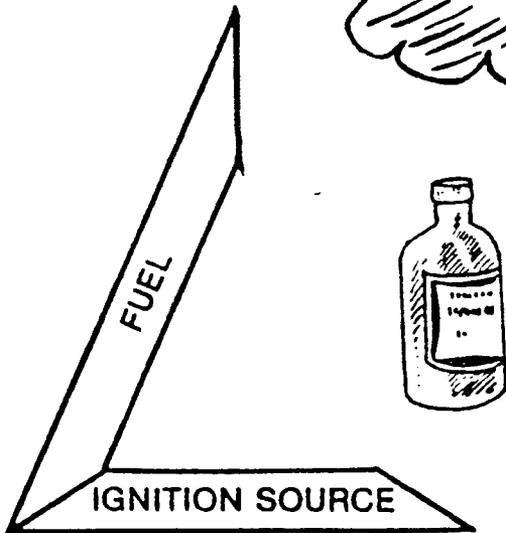
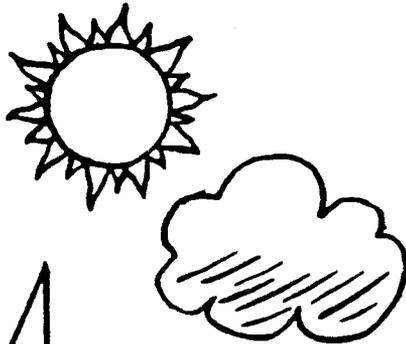
LIQUID



SOLID



GAS



## GENERAL CHEMICAL SAFETY RULES

### General

1. Do not eat, drink, or smoke in any area where chemicals are used. Anything you put in your mouth may have been contaminated by chemicals.
2. Do not lean against sinks. The plastic sinks absorb a certain amount of acid that cannot be cleaned off.

### Safety Equipment

1. Proper safety equipment, as issued by the company, must be worn as required by the spec when working with chemicals.
2. Proper methods for checking safety equipment must be followed. Defective equipment should be discarded and replaced immediately.
3. Never touch your face or body with your safety equipment on to avoid transferring a harmful substance.
4. Always rinse off safety equipment (especially gloves) and wipe them dry before removing to reduce any possibility of contact.

### Storing and Using

1. Whenever possible, store all hazardous materials below eye level.
2. Be sure all chemicals are accurately labeled and dated.
3. Insure that chemical storage areas have adequate lighting to avoid selecting the wrong chemical by mistake.
4. When carrying bottles of chemicals, support them from below as well as at the neck.
5. Always carry hazardous materials in their proper containers.
6. Never pour water into acid. This may cause a reaction which will splash acid everywhere. Always pour acid slowly into running water. Remember AAA - Always Add Acid to water.

### Storing and Using (continued)

7. Check for sources of ignition before pouring flammable liquids.
8. Wipe up all small spills and splashes immediately, and always clean your work area with water after using acids.
9. Never mix two or more chemicals together unless you are completely sure of the reaction that will occur. Many chemicals react violently when mixed together, while others will release poisonous fumes when mixed.
10. Properly discard old chemicals which may contain unknown decomposition products.

### First Aid

1. The immediate first aid for a corrosive burn is to place the affected area under cold running water for 15 to 20 minutes.
2. In the event of contact with a large amount of a corrosive use the showers and eyewash stations located in every chemical use area. It is wise to become familiar with the operation of this equipment to expedite the washing of an affected area in an actual emergency. Remember that a person with a corrosive splashed in the eye will not be able to see and must be led quickly to the eye wash station by a fellow worker.
3. If clothing comes into contact with chemicals, change immediately and wash any affected area. Contaminated clothing should be discarded.

### POURING CHEMICALS

When pouring chemicals always:

1. Wear all of the proper safety equipment and clothing.
2. Read labels carefully and positively identify product.
3. Open all containers slowly.
4. Pour with the handle in the downward position.
5. Pour under a fume hood.



# C O R R O S I V E S

## CHARACTERISTICS

Corrosives will cause destruction and degeneration of many materials, including human tissue, upon contact.

## EXAMPLES

### Gases:

Hydrogen Chloride      Boron Trifluoride  
Dichlorosilane  
Boron Trichloride

### Liquids-Acids:

Hydrofluoric  
Sulfuric  
Nitric  
Acetic  
Phosphoric

### Liquids-Bases:

Ammonium Hydroxide  
Sodium Hydroxide



## SAFETY MEASURES

### Gases:

- 1-Keep away from high moisture areas.
- 2-Store separately from other F-COPER materials.
- 3-Observe the General Cylinder Safety Rules.

### Liquids:

- 1-Avoid skin and eye contact by wearing all appropriate safety equipment.
- 2-Store separately from all other F-COPER materials.
- 3-Avoid inhalation of these materials.

# OXIDIZERS

## CHARACTERISTICS

An oxidizer will decompose readily to yield oxygen, and may react with other materials.

## EXAMPLES

Gases:

Oxygen  
Chlorine

Liquids:

Hydrogen Peroxide  
Nitric Acid  
Sulfuric Acid



## SAFETY MEASURES

Gases:

1. Keep all organic materials such as solvents, oils, and lubricants away from gas fittings and connectors.
- 2-Store separately from other F-COPER materials.
- 3-Follow the General Cylinder Safety Rules.

Liquids:

- 1-Avoid skin and eye contact by wearing all appropriate safety equipment.
- 2-Store separately from all other F-COPER materials, particularly avoiding contact with acids, solvents, and lubricating substances such as oils and greases.
- 3-Handle only in well-ventilated areas.

# P O I S O N S

## CHARACTERISTICS

A poison may cause serious damage upon exposure to even low concentrations.

## EXAMPLES

### Gases:

Hydrogen Fluoride  
Chlorine  
Carbon Monoxide

Boron Trifluoride  
Hydrogen Chloride  
Phosphine

### Liquids and Solids:

Arsenic  
Arsenic- containing materials

Mercury



## SAFETY MEASURES

### Gases:

- 1-Avoid inhalation.
- 2-Store separately from other F-COPER materials.
- 3-Follow the General Cylinder Safety Rules.

### Liquids and Solids:

- 1-Avoid inhalation.
- 2-Keep off of skin and clothes.
- 3-Store separately from other F-COPER materials.

IT IS THE EMPLOYEES' RESPONSIBILITY TO REPORT IMMEDIATELY ANY CONTACT WITH A POISONOUS MATERIAL TO THE IMMEDIATE SUPERVISOR AND TO THE PLANT HEALTH SERVICES.

# EXPLOSIVES

## CHARACTERISTICS

Explosives have the capacity to react with great speed and force.

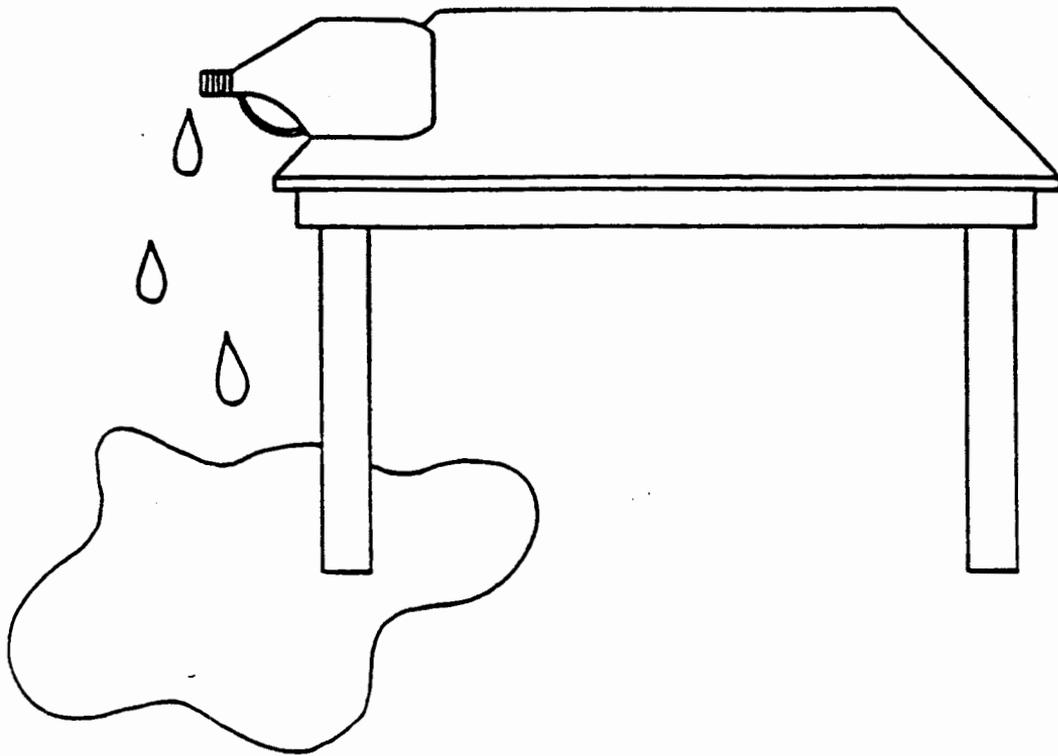


# RADIOACTIVES

## CHARACTERISTICS

A radioactive material has radioactive properties which may cause intense and immediate damage upon exposure.

# INTRODUCTION TO SPILL CONTROL AND CLEANUP



## SPILL CONTROL AND CLEANUP OUTLINE

### I INTRODUCTION

Knowing the procedures of safe spill cleanup is necessary to prevent hazardous situations in production areas.

### II SPILL CLASSIFICATION & RESPONSE

#### A. Very Small Spills

1. Six inches or less in diameter
2. These are cleaned up by workers in the area using "paper" towels and water.
3. EXCEPTIONS- arsenic and mercury - see your specs for these materials

#### B. Larger Spills

1. Take the Following Immediate Action Steps
  - a) Notify workers in the Area
  - b) Increase ventilation
  - c) Notify supervisor
  - d) If spill is greater than one gallon, also notify Security

### III CLEANUP PROCEDURES FOR LARGER SPILLS

#### A. Exceptions

1. Again, this procedure does not apply to arsenic, lead or mercury - refer to your job spec. for these materials.

#### B. General Control & Cleanup Steps

1. Identify - container markings, pH indicator or characteristic odor
2. Contain - keep from spreading
3. Neutralize & Absorb - use commercial neutralizer/absorbent with color indicator or use other available substitutes/
4. Bag & Label

# INTRODUCTION TO SPILL CONTROL AND CLEANUP VOCABULARY

## Common Spill Substances:

### Solvents

Any material which is capable of dissolving another material is considered to be a solvent. Solvents generally have a sweet odor and most are flammable.

### Corrosives

A corrosive is a highly reactive material that will cause destruction of many materials upon contact, including human tissue. Corrosives are either strong acids, with a pH of less than 2, or strong bases, with a pH of greater than 12.5. Because different types of corrosives require different spill control materials, the following groups of corrosives are referred to in this module.

- Normal Acids: This refers to acids such as hydrochloric, phosphoric, hydrofluoric and sulfuric. All of these acids have a pH of less than 2, and have no other unusual characteristics when in normal concentrations.
- Fume-Producing Acids: In addition to having a pH of less than 2, certain highly concentrated acids produce acidic fumes when exposed to air. Such acids are highly concentrated hydrofluoric, nitric, and sulfuric.
- Bases: Bases are characterized by pH levels of greater than 12.5. Sodium Hydroxide is an example of a base.

## Spill Related Terms:

### Absorbent

A material which is dry and porous enough to contain liquid material is an absorbent. Examples of common absorbents are sand, paper towels, and diatomaceous earth. There are also available commercially available absorbents such as Solusorb<sup>TM</sup>, Neutrasorb<sup>TM</sup>, Neutracid<sup>TM</sup> and Neutrasol<sup>TM</sup>.

Spill Related Terms continued:

Neutralize

To neutralize means to counteract the corrosive activity or a material. Bases and acids both must be neutralized before they are absorbed. Sodium bicarbonate and soda ash are "natural" neutralizers. Commercially available neutralizers include Neutrasorb<sup>TM</sup>, Neutrasol<sup>TM</sup>, and Neutrakit<sup>TM</sup>.

## SPILL CONTROL AND CLEANUP PROCEDURE

The Spill Control and Cleanup Procedure you will use in cleaning up most types of spills is as follows:

- ONE IDENTIFY THE SPILL
- TWO CONTAIN THE SPILL
- THREE NEUTRALIZE THE SPILL IF NECESSARY AND ABSORB THE SPILL
- FOUR PROPERLY BAG ALL SPILL CLEANUP MATERIALS AND CLEAN THE SPILL AREA

Note: The above procedure is not to be used on spills of Arsenic, Lead Dust, or Mercury.

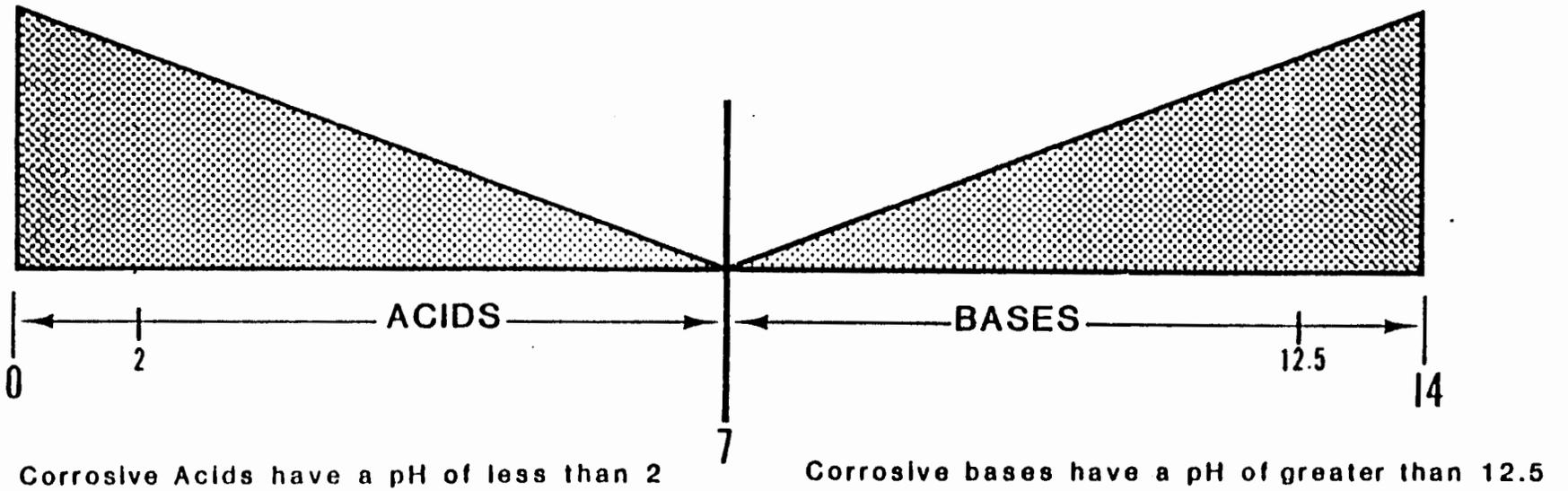
### IMMEDIATE ACTION STEPS

Immediately after a spill occurs that is six inches or greater in diameter, the following steps should be taken

- FIRST All workers in the immediate area should be notified to stay clear of the spill area.
- SECOND If the spill is in enclosed or poorly ventilated area outside of a fab, attempt to increase fresh air ventilation.
- THIRD Notify the immediate supervisor in the area.

Note: If the spill is of one gallon or more, the safety and security department must also be notified.

# pH CHART



A neutralized material will have a pH of between 5 and 9

## SOLVENT SPILL

### Identifying Characteristics

Sweet Odor

Flammable Vapors

### Examples

N-Butyl Acetate

Acetone

Isopropyl Alcohol

Xylene

### Cleanup Material

Preferred: Solusorb<sup>TM</sup> activated charcoal

Will work: Spill pillows, paper towels, diatomaceous earth,  
sand

### Special Considerations

Because of the highly flammable nature of solvents, extreme care should be taken to keep away from the spill any kind of ignition source. In addition, spill cleanup materials must be placed in a flameproof container until taken away for proper disposal.

## NORMAL ACID SPILLS

### Identifying Characteristics

pH less than 2, indicating a strong acid

### Examples

Hydrochloric

Hydrofluoric

Phosphoric

Sulfuric

### Cleanup Material

Preferred: one that neutralizes the acid and absorbs at the same time. Neutrasorb<sup>TM</sup> is a commercially produced product that does this.

Will work: Sodium Bicarbonate, Soda Ash\*

### Special Considerations

\*1-If Neutrasorb<sup>TM</sup> is not used, a pH test must be performed to determine when the spill is neutralized.

## FUME PRODUCING ACID SPILL

### Identifying Characteristics

pH less than 2, indicating a strong acid  
Highly irritating fumes

### Examples

Highly concentrated hydrofluoric  
Highly concentrated nitric\*  
Highly concentrated sulfuric

### Cleanup Material

Preferred: one that suppresses the fumes and neutralizes the acid. Neutrasol<sup>TM</sup> is a commercially produced product that does this.\*\*

### Special Considerations

- 1-Respiratory protection should be worn when cleaning up a fume-producing acid spill to avoid inhalation of the fumes.
- \*2-When cleaning up a nitric spill of concentrations greater than 50%, the spill must be first diluted slowly with water before adding Neutrasol<sup>TM</sup> to avoid a violent reaction.
- \*\*3-After using Neutrasol<sup>TM</sup> to neutralize the spill, the spill liquid must be absorbed using paper towels, spill pillows or another acceptable absorbent material.

BASE SPILLS

Identifying Characteristics

pH greater than 12.5, indicating a strong base (corrosive)

Examples

Sodium Hydroxide

Cleanup Material

Preferred: one that neutralizes the base and absorbs the spill. Neutracid<sup>TM</sup> is a commercially produced product that does this.

Will work: an acid, such as acetic, diluted with water\*

Special Considerations

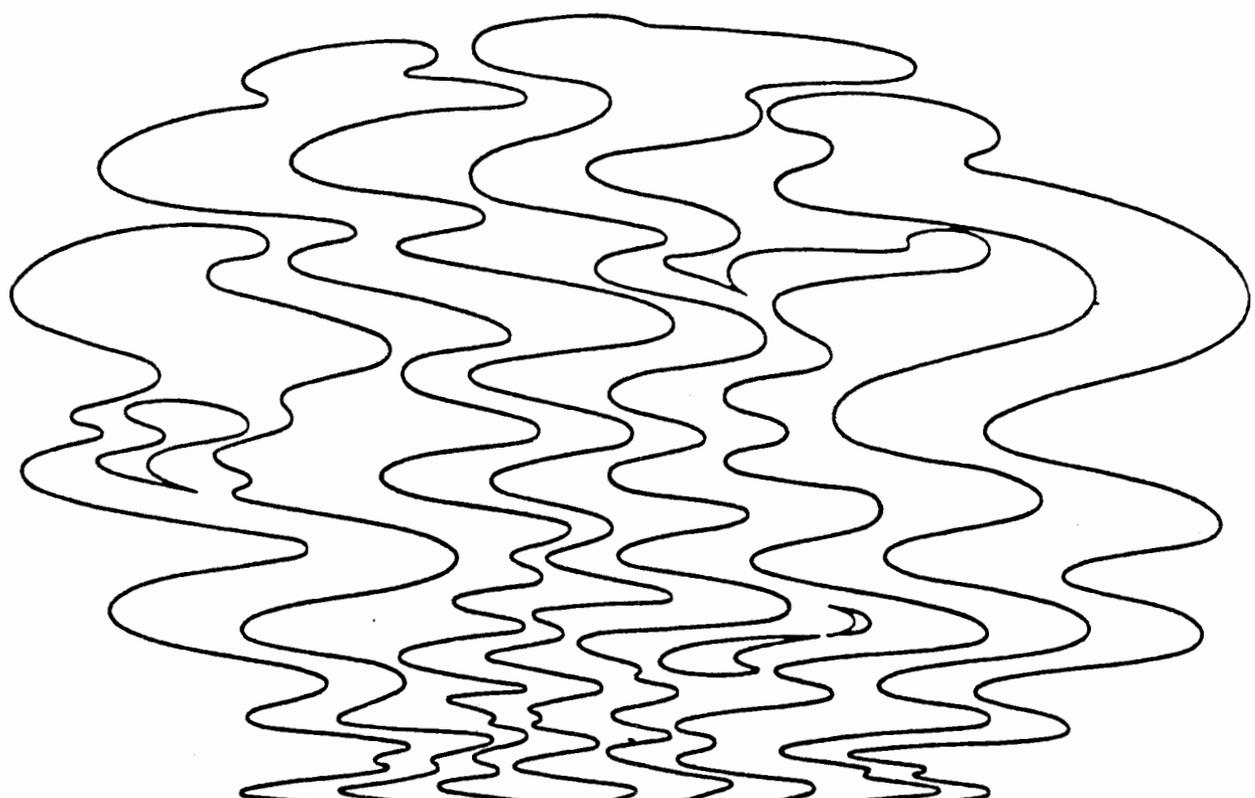
- 1-If Neutracid<sup>TM</sup> is not used, a pH test must be performed to determine when the spill is neutralized. Additionally, the spill must be diked and absorbed using an absorbent material such as spill pillows, or paper towels.
- \*2-Caution must be used when adding water to any acid. Always add acid to the water, pouring very slowly to avoid a chemical reaction.

INTRODUCTION TO HAZARDOUS MATERIALS  
REVIEW 2



Instructions: Match each characteristic with the appropriate placard by placing the letter in the space below the placard.

- A. Will decompose readily to yield oxygen.
- B. Capable of being easily ignited and burning with extreme force.
- C. May cause acute damage or death when exposed to even low concentrations.
- D. Has radioactive properties
- E. Will cause degeneration and destruction of many materials upon contact.
- F. Must be treated with extreme caution to avoid explosion.



**THE GASEOUS PHASE  
OF  
CHEMICALS**

## PROTECTIVE SAFETY EQUIPMENT TO BE USED IN A FAB AREA

1. Protective equipment will be provided by the company and must be worn as required in the work area.
2. Lab Coats (White or Blue Smocks) - This garment is issued to the employee not as safety or protective equipment for the employee, but for protection of our delicate products. Clothing usually has a high degree of lint, dirt and other contaminating debris which can destroy our products if not properly controlled. Smocks should never be used in place of safety equipment for any reason.
3. Hair Covering - There are a few Fab areas that require the wearing of hats. This is to protect the delicate products that are being produced from hair contaminants. They are to be worn at all times in the Fab area and must not be taken off. Keep long hair tucked into hats or tied back.
4. Glasses - Protective glasses should be worn at all times in the Fab area. The kind of glasses worn must be chosen with consideration given to the job being performed, location of your work station, and the working environment.
  - A. Safety Glasses with Side Shields - Mandatory in the Wafer Fab area. They are used for protection from chips, flying objects and splashed chemicals. Operators using microscopes and other optical equipment may remove glasses ONLY during actual inspections, when glasses may interfere with optical accuracy.
  - B. Safety Glasses with Tinted Lenses - These should be used to protect eyes of operators working around ultra violet lights. Tinted glasses will be provided at all U.V. inspection stations. Ask your Supervisor if your U.V. station does not have them available.
  - C. Prescription Safety Glasses with Tinted Shields - Any employee who must wear eye glasses will be supplied with prescription safety glasses by Signetics. You may choose to have either plain or tinted lenses. Supervisors can provide purchase requisitions for these glasses. Expenses for new examinations will not be covered by the company.
  - D. Contact Lenses - These shall not be worn by an employee engaged in operations involving the following:
    - (1) Exposure to dusts
    - (2) Exposure to corrosive or irritant liquids, gases, or smokes
    - (3) Exposure to flammable liquids
    - (4) Exposure to fiberglass
  - E. Visitor Glasses - These must be worn by any visitor coming into the Fab area. They are plastic, non-tinted glasses which protect only against chemical spills. They are not shatter resistant, and therefore provide no protection from flying objects such as chips.
  - F. Chemical Goggles with Safety Strap - These provide better protection for the eyes when working with chemicals because of a closer fit to the face.



6. Visor with Full Face Shield (Tinted or Clear Lens) - These provide the best protection for the face and eyes from flying objects and chemical accidents. The curvature of the shield gives added protection to the chin area as well.

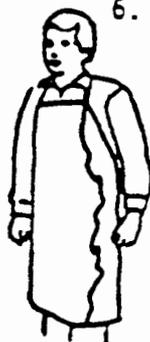
5. Gloves - Gloves are probably the most important item of your protective equipment. If you make sure your gloves are free from defects, select those appropriate to the materials being used, and wear your gloves according to specification, they will provide the necessary hand protection from burns and from contact with toxic substances.

Safety Rules for Gloves:



- (1) Test Gloves - Protective gloves must be tested by the wearer for defects before and after each use. Partially inflate gloves with  $N_2$  air jet or twisting motion. While holding the base of the glove closed, test glove for leaks by visual inspection and by listening for escaping air. The gloves may also be immersed in water for bubble test. If any detection of a leak is suspected, discard the gloves. Gloves showing evidence of deterioration must also be discarded, even if not leaking.
- (2) Glove Disposal - Mutilate gloves, by cutting them, when throwing away so they cannot be used accidentally by others.
- (3) Chemical Exposure of Gloves - Chemically contaminated gloves must be disposed of with other chemically contaminated waste.
- (4) Remove Jewelry - Rings and bracelets should not be worn since they can cause punctures in the gloves. They should be left in your locker if worn to work.
- (5) Trim Fingernails - To prevent puncturing gloves, keep your nails smooth and trimmed with no jagged edges.
- (6) Rinse Gloves - Rinse gloves in water immediately following any chemical contact. NEVER touch your face, glasses or any other part of your body in order to avoid chemical burns. Frequent rinsing of gloves while working with chemicals also prolongs glove life.
- (7) Form Cuff - Roll down the top of gloves  $\frac{1}{2}$  to 1 inch, to form a cuff. This will prevent fluids from running down the glove and onto exposed skin of the arm.

6. Vinyl Aprons - This protective apron is worn over the bunnysuit in all operations (class 1000 room) where hazardous chemical contact is expected and chemical resistant protection is required.



Safety Rules for Aprons:

Label Apron - A distinguishing mark must be placed on the front side of the apron to identify the front from the back of the apron. This will prevent confusing the two sides of the apron and alleviate contact with chemical spills and personal clothing.

7. Armguards (Gauntlets) - These are made of translucent vinyl material and should be worn by employees handling or working near hazardous chemicals. They are worn over gloves, keeping gloves cuffed. The top of the gauntlets should come above the elbows.

8. Shoes - Shoes must be completely enclosed. Sandals, clogs, and canvas tennis shoes cannot be worn. Leather or vinyl tennis shoes can be worn. The Supervisor will interpret the heel height requirement for each employee in accordance with safety policy G-4.



A. Closed shoes are required in all areas except:

- (1) Office areas
- (2) Cafeterias
- (3) Data Processing & Computer Room (R&D and Arques building)
- (4) Circuit Layout & Computer Room (R&D)
- (5) Main Hallways

B. An individual who has occasion to go in any area other than the above specified locations will be required to have closed shoes. This will be strictly enforced by the Area Supervisor.

### SAFETY EQUIPMENT DEMONSTRATION

- REQUIRED BY LAW
- ALL AVAILABLE IN STORES
- SIGNETICS WILL PROVIDE
- SHOES LEATHER OR SIMULATED LEATHER
- HEELS NOT GREATER THAN 2 INCHES
- SAFETY GLASSES (MINIMUM)
  1. SHIELD
  2. PLAIN OR DARK
  3. PRESCRIPTION FREE, EXCLUDES EXAM
- APRON
  - FULL LENGTH
- GLOVES (PROBOOTS)
  1. TEST EACH TIME
  2. WASH WITH WATER AFTER USE



## GLOVES

protective covering for the hands. When wearing gloves, our hands have a tendency to sweat excessively. If you suspect a leak in your gloves, remove your gloves, wash your hands and recheck your gloves.

### TYPES OF GLOVES USED AT SIGNETICS

GLOVES	COLOR	PRIMARY AREA OF USE	PROTECTIVE PURPOSE	
Vinyl Dust Free	Clear	Fab Operations	Worn as part of the Bunny suit in ultra clean Class 100 rooms where lint control is most strict. Protects product from body contamination (hair, skin, oil).	
Pacific Polymers	Orange	Fab Operations	Handling of either acids or solvents.	Check for air leaks before, during, and after use - fully rinse w H <sub>2</sub> O
Neopreme	Black	Fab Operations	Handling of either acids or solvents.	Check for air leaks before, during, and after use - fully rinse w H <sub>2</sub> O
Thermal-Resistant Cloth (asbestos form)	White		1) Handling of larger hot quartz glass. 2) Cryoprotective - handling extreme cold situations. Example: Liquid nitrogen tanks.	
Edmunts	White	Outside Fab	General Maintenance	

ACCIDENT PREVENTION SIGNS

Industry has currently adopted a set of key terms as developed under the Occupational Safety and Health Act (O.S.H.A.) that may be used for accident prevention and general safety measures within the workplace. These words, known as "Signal Words" are listed below and are arranged in a decreasing order of severity. The purpose is to allow you, a safety conscious employee, a means of evaluating the degree of a potential hazard within the working environment.



Highest Degree of Hazard

Color(s)

Danger signs have a white background with "Danger" in white letters on a red oval inside a black rectangular panel. Wording in black letters.

Use: Danger signs should be used only where an immediate hazard exists. There should not be any variation in the type of design or signs posted to warn of specific dangers and radiation hazards.

Danger signs indicate immediate danger and warning that special precautions are necessary. The skull and crossbones must also be displayed with the word "DANGER" for highly toxic chemicals.

\*\*\*\*\*



Intermediate Degree of Hazard (Specific)

Color(s)

Caution signs have a yellow background. "Caution" should be in yellow letters on a black rectangular panel. Other wording must be in black letters.

Use:

Caution Signs should be used only to warn against potential hazards or to caution against unsafe practices. All employees shall be instructed that caution signs indicate a possible hazard against which proper precautions should be taken.



Color(s)

Notice Signs have a white back-ground. "Notice" should be in white letters on a blue rectangle. Wording is in black letters.

Use:

Notice Signs are primarily used as information signs for employees.

Low Degree of Hazard  
(Informational)

\*\*\*\*\*

Color(s)

Be Careful Signs have a white back-ground. "BE CAREFUL" should be in white letters on a green rectangle. Wording is in black letters.

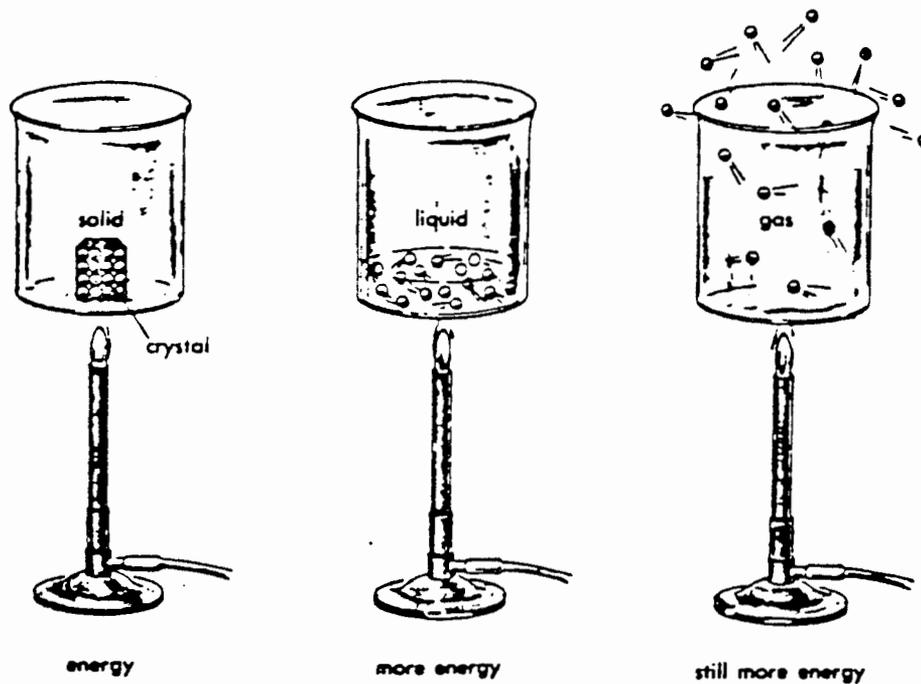
Use:

Be Careful Signs are designed as safety instruction signs and should be used where there is a need for general instructions and suggestions relative to safety measures.



Lowest Degree of Hazard

Other Information Signs and Safety Instruction Signs may be of a variety of designs and colors. Information Signs will convey information not necessarily of a safety nature, and Safety Instruction Signs should be used for general instruction relative to safety measures.



### GASEOUS DIFFUSION

Gas movement or diffusion is defined as the ability of a gas to spread out spontaneously and to move through another gas until it completely fills the container. For example, suppose a container of a particularly odorous gas, say hydrogen sulfide ( $H_2S$ ), were opened in the front of a crowded lecture hall. Those people in the front row would soon detect it, and gradually, the odor would become noticeable to the people sitting farther and farther back, until eventually, the gas could be smelled in every spot in the room. The  $H_2S$  molecules would spontaneously make their way throughout the entire room, moving between and intermingling with the gaseous molecules of the air.

### DEFINITION OF A COMPRESSED GAS:

For regulatory purposes, a compressed gas is defined by the D.O.T. as any material or mixture that, when enclosed in a container, has an absolute pressure, (addition of all the gas pressures in the mixture), exceeding 40.0 pounds per square inch (psia) at 70°F; or 2) regardless of the pressure at 70°F, has an absolute pressure exceeding 104 psi at 130°F; or 3) any flammable liquid material having a vapor pressure exceeding 40.0 psi absolute at 100°F.

# CHEMICAL HANDLING

## THE GAS PHASE

Compressed gas containers, when constructed according to the applicable Department of Transportation (D.O.T.) specifications and maintained in accordance with D.O.T. Hazardous Materials Regulations, are considered safe for the purposes in which they are intended. ACCIDENTS OCCURRING DURING THE TRANSPORTATION, HANDLING, USAGE, AND STORAGE OF THESE CONTAINERS CAN ALMOST INVARIABLY BE TRACED TO FAILURE IN FOLLOWING THE D.O.T. REGULATIONS OR TO ABUSE OR MISHANDLING OF THE CONTAINERS -- Therefore, any reduction in accident levels can be directly related to the employees' knowledge, joined with a safe working environment.

## THE GASEOUS STATE

### PROPERTIES AND UNIQUE HAZARDS:

The air that surrounds us is a sea of mixed gases, called the atmosphere. It is not necessary, then, to search very far to find a gas whose properties we may study. Among the familiar characteristics of air which are, in fact, properties of all gases, are listed below.

1. GASES MAY BE COMPRESSED. A fixed quantity of gas may be made to occupy a smaller volume by applying pressure.
2. GASES EXPAND TO FILL THEIR CONTAINERS UNIFORMLY. This property is known as diffuseness. (see definition sheet on diffusion).
3. ALL GASES HAVE LOW DENSITY. The density of air, for example, is 0.0013 g/cc. This means that a cubic foot of air weighs less than 1.2 ounces--a very small weight for that large a volume, compared with the weight of a similar volume of things we can "see" physically.
4. GASES MAY BE MIXED. "There's always room for more," is a phrase that may be applied to gases. You may add the same or a different gas to that gas already occupying a rigid container of fixed volume, provided there is no chemical reaction between them.
5. A CONFINED GAS EXERTS PRESSURE ON THE WALLS OF ITS CONTAINER UNIFORMLY IN ALL DIRECTIONS. This pressure is a unique property of the gas, independent of external factors such as gravitational forces.
6. LOW FLASH POINT. The flash point is the lowest temperature at which a liquid (compressed gas) or volatile solid gives off a vapor sufficient to form an ignitable mixture with the air near the surface of the liquid. (i.e. propane > acetone >  $H_2O$  >  $H_2SO_4$ )
7. USUALLY HAS NO ODOR. Most gases usually show no detectable odor or visible characteristics to the human senses. Examples would be Carbon Monoxide (CO) or Carbon dioxide  $CO_2$ .

## INTRODUCTION TO HAZARDOUS MATERIALS

### VOCABULARY WORDS

#### Hazardous Material

Any material that is a flammable, corrosive, oxidizer, poison, explosive or radioactive is considered by the D.O.T. (Dept. of Transportation) to be hazardous. Hazardous materials have properties which make them harmful if used improperly.

#### Flammable

A flammable material is capable of being easily ignited and of burning with extreme force.

#### Pyrophoric

Pyrophoric refers to materials that are spontaneously combustible, which means they will burn when released into the air without an ignition source such as a flame or spark.

#### Flash Point

When talking about flammables, a flash point refers to the temperature at which a liquid gives off enough vapors to support ignition.

#### Corrosive

Corrosive materials are highly reactive and will cause destruction of many materials upon contact. Corrosives are divided into two major groups - acids and bases. Corrosive acids have a pH of less than 2, while corrosive bases have a pH of greater than 12.5.

#### Oxidizer

Oxidizing materials will decompose readily to yield oxygen. Since oxygen is needed to create or sustain a fire, violent reactions may occur when an oxidizer is mixed with a combustible material, such as wood, paper, or powders.

### Poison

A material is considered a poison if it causes serious damage or death to a person when it is inhaled, absorbed or eaten, even in small amounts. Poisonous materials are often referred to as toxic materials.

### Explosive

An explosive material has the capacity to react with great force and speed.

### Radioactive

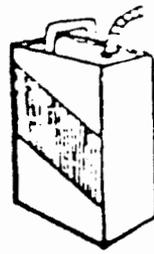
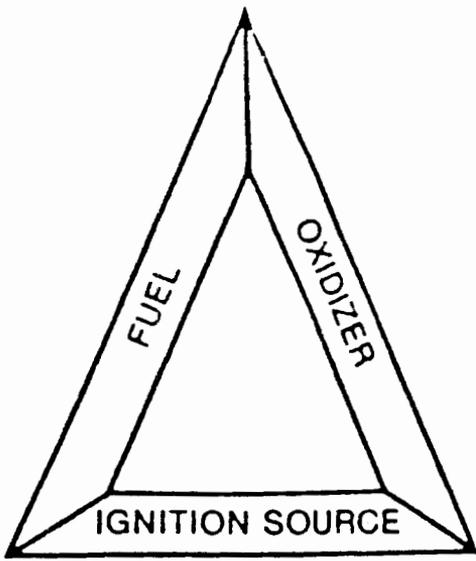
A radioactive material emits certain atomic particles or energy that are destructive to human tissue, thus radioactive materials are always used under strict controls in specified areas.

### Cryogenic

Cryogenic refers to a state of extreme cold - temperatures below  $-101^{\circ}$  C. Gases are usually stored and transferred in a cryogenic (liquified) state to conserve space.

### Organic

Refers to materials that contain the element carbon as a basic unit of structure. These materials are often derived from living matter. Examples of organic materials include oil, grease, wood, and rubber.



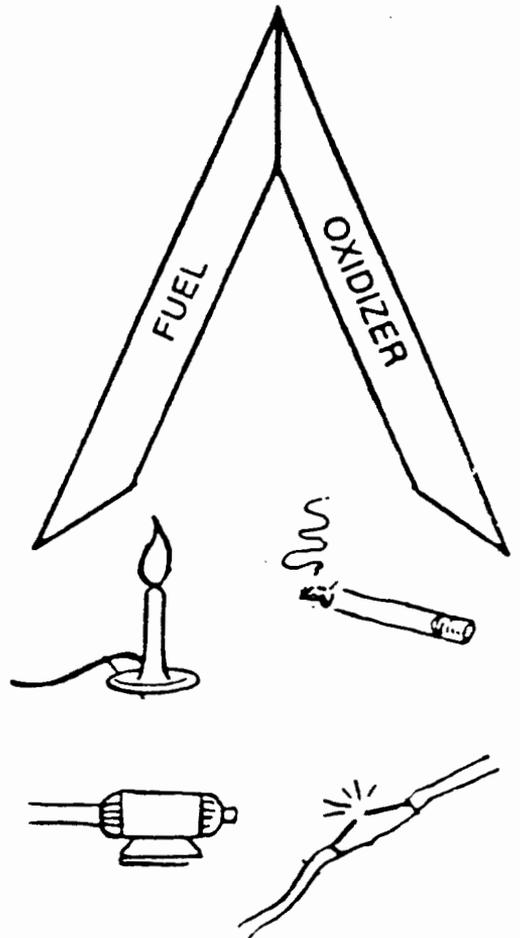
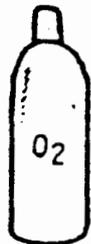
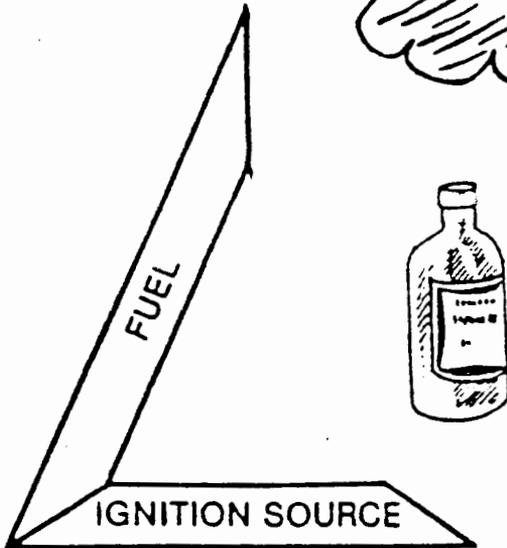
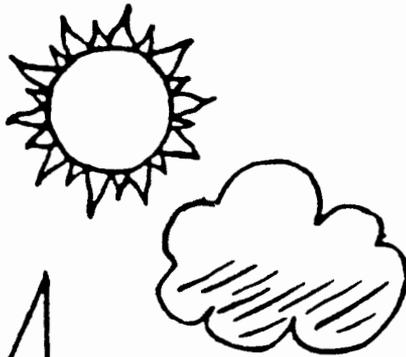
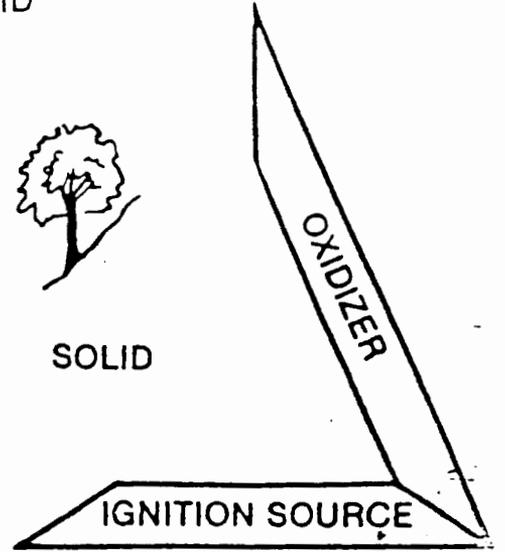
LIQUID



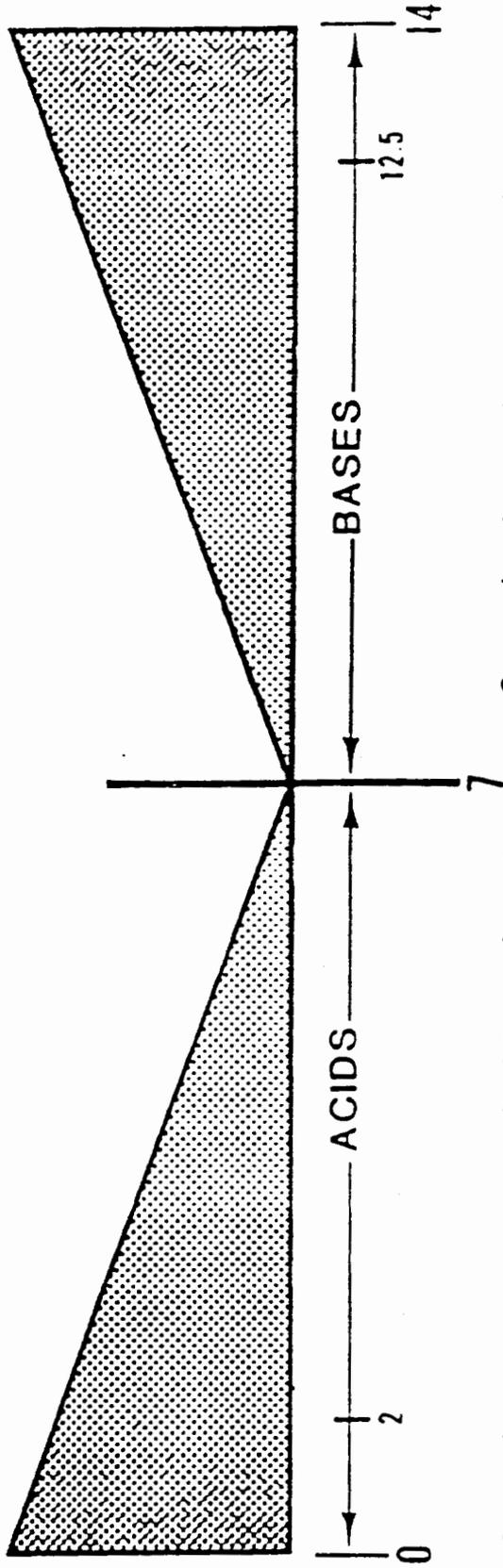
SOLID



GAS



# pH CHART



Corrosive Acids have a pH of less than 2

Corrosive bases have a pH of greater than 12.5

A neutralized material will have a pH of between 5 and 9

CHEMICALS AND SERVICES

Table of Contents

Acetic Acid, Glacial  
Acetone  
\* Ammonia  
Ammonium Hydroxide  
\* Argon  
Arsenic Lump  
\* Boron Trichloride  
\* Boron Trifluoride  
Buffered Oxide Etch 20:1  
Buffered Oxide Etch 34:5  
\* Carbon Dioxide  
\* Chlorine  
Chromium Trioxide  
Developer MF-312  
Developer MF-315  
Developer NMD-3  
Developer MF-317  
\* Dichlorosilane  
Ethylene Glycol  
\* Freon-11  
\* Freon-13B1  
\* Freon-14  
\* Freon-23  
Freon-TF  
Garratt-Callahan SS-Cat  
Garratt-Callahan 12L  
Garratt-Callahan 23L  
Garratt-Callahan 34A  
Garratt-Callahan 38A  
Garratt-Callahan 42NF  
Garratt-Callahan 82  
Garratt-Callahan 202  
Garratt-Callahan 291  
\* Helium  
\* Hexamethyldisilazane (H.M.D.S.)  
Hydrochloric Acid  
Hydrofluoric Acid  
\* Hydrogen  
\* Hydrogen Chloride  
Hydrogen Peroxide  
Isopropyl Alcohol  
Lecanol Detergent  
\* Mapp Gas  
Methanol  
Mity Etch (Aluminum)

Nitric Acid  
\* Nitrogen, Gas  
Nitrogen, Liquid  
\* Nitrogen, Trifluoride  
\* Oxygen  
\* Phosphine  
Phosphoric Acid  
Phosphorus Oxychloride  
Positive Photoresist OFPR-800  
Positive Photoresist 1400-27  
Positive Photoresist Kodak 820  
Potassium Hydroxide  
\* Silane  
Stripper R-10  
\* Sulfur Hexafluoride  
Sulfuric Acid  
1,1,1, - Trichloroethane (TCA)  
Triton X-100

## SIGNETICS GASES

- I. FLAMMABLE-ignites easily, burns rapidly. Isolate from all combustible materials.
- A. Hydrogen-colorless, odorless
  - B. Silane-pyrophoric
  - C. \*Phosphine-highly toxic, pyrophoric, decayed fish smell
  - D. Dichlorosilane-acid gas
  - E. Propane
  - F. MAPP Gas
- II. CORROSIVES-destructive to human skin and metals when gas comes in contact with moisture or water.
- A. Hydrogen Chloride
  - B. Boron Trichloride
  - C. Boron Trifluoride
  - D. Ammonia
- III. OXIDIZERS-store away from all combustible material and sources of ignition. Keep lubricants away (never use grease or oil on valves or compressed gas cylinder threads).
- A. Oxygen
- IV. POISONS-hazardous in small quantities.
- A. Chlorine
  - B. Phosphine-\*DOT designated poison
- V. NON-FLAMMABLE-stable, inert gas. Will cause suffocation or asphyxiation.
- A. Nitrogen
  - B. Helium
  - C. Argon
  - D. Freon
  - E. Sulfur Hexafluoride
  - F. Carbon Dioxide
- VI. CRYOGENS-extremely cold gases.
- A. Liquid Oxygen
  - B. Liquid Nitrogen
  - C. Liquid Hydrogen

# FLAMMABLES

## CHARACTERISTICS

Flammables are capable of being easily ignited and of burning with extreme force.

## EXAMPLES

### Gases:

Propane                      \*Silane  
Acetylene  
Hydrogen  
\*Phosphine  
Dichlorosilane              (\*Pyrophoric)

### Liquids:

Alcohols - Methanol, Ethanol, and Isopropyl Alcohol  
Aromatic Hydrocarbons - Hexamethyldisilazane (H.M.D.S.)  
Ethers - Diethylene glycol monobutyl ether (R-10), Resist 820  
Ketones - Acetone  
Other - 1400 Photo Resist

### Solids:

RED PHOSPHORUS

## SAFETY MEASURES

### Gases:

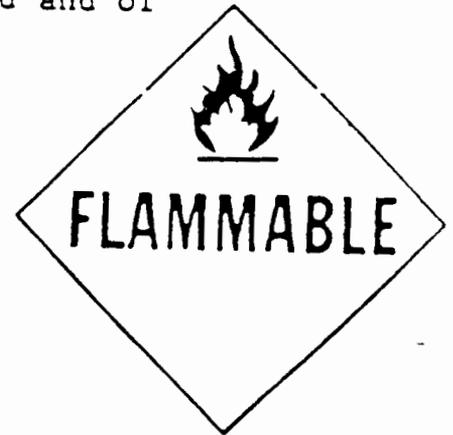
- 1-Keep away from flames and other ignition sources.
- 2-Store separately from all other F-COPER materials.
- 3-Observe the General Cylinder Safety Rules.

### Liquids:

- 1-Keep away from flames and other ignition sources.
- 2-Store separately from all other F-COPER materials.
- 3-Do not pour any large quantities outside of a fume hood.

### Solids:

- 1-Separate from oxidizers and corrosive liquids.
- 2-Keep away from high moisture areas.



# CORROSIVES

## CHARACTERISTICS

Corrosives will cause destruction and degeneration of many materials, including human tissue, upon contact.

## EXAMPLES

### Gases:

Hydrogen Chloride      Boron Trifluoride  
Dichlorosilane  
Boron Trichloride

### Liquids-Acids:

Hydrofluoric  
Sulfuric  
Nitric  
Acetic  
Phosphoric

### Liquids-Bases:

Ammonium Hydroxide  
Sodium Hydroxide



## SAFETY MEASURES

### Gases:

- 1-Keep away from high moisture areas.
- 2-Store separately from other F-COPER materials.
- 3-Observe the General Cylinder Safety Rules.

### Liquids:

- 1-Avoid skin and eye contact by wearing all appropriate safety equipment.
- 2-Store separately from all other F-COPER materials.
- 3-Avoid inhalation of these materials.

# O X I D I Z E R S

## CHARACTERISTICS

An oxidizer will decompose readily to yield oxygen, and may react with other materials.

## EXAMPLES

Gases:

Oxygen  
Chlorine

Liquids:

Hydrogen Peroxide  
Nitric Acid  
Sulfuric Acid



## SAFETY MEASURES

Gases:

1. Keep all organic materials such as solvents, oils, and lubricants away from gas fittings and connectors.
- 2-Store separately from other F-COPER materials.
- 3-Follow the General Cylinder Safety Rules.

Liquids:

- 1-Avoid skin and eye contact by wearing all appropriate safety equipment.
- 2-Store separately from all other F-COPER materials, particularly avoiding contact with acids, solvents, and lubricating substances such as oils and greases.
- 3-Handle only in well-ventilated areas.

# P O I S O N S

## CHARACTERISTICS

A poison may cause serious damage upon exposure to even low concentrations.

## EXAMPLES

Gases:

Hydrogen Fluoride  
Chlorine  
Carbon Monoxide

Boron Trifluoride  
Hydrogen Chloride  
Phosphine

Liquids and Solids:

Arsenic  
Arsenic- containing materials

Mercury



## SAFETY MEASURES

Gases:

- 1-Avoid inhalation.
- 2-Store separately from other F-COPER materials.
- 3-Follow the General Cylinder Safety Rules.

Liquids and Solids:

- 1-Avoid inhalation.
- 2-Keep off of skin and clothes.
- 3-Store separately from other F-COPER materials.

IT IS THE EMPLOYEES' RESPONSIBILITY TO REPORT IMMEDIATELY ANY CONTACT WITH A POISONOUS MATERIAL TO THE IMMEDIATE SUPERVISOR AND TO THE PLANT HEALTH SERVICES.

# EXPLOSIVES

## CHARACTERISTICS

Explosives have the capacity to react with great speed and force.

## EXAMPLES

No explosive materials are used in I.C. production.

## SAFETY MEASURES

Extreme caution should be used around any material labeled as an explosive.



# RADIOACTIVES

## CHARACTERISTICS

A radioactive material has radioactive properties which may cause intense and immediate damage upon exposure.

## EXAMPLES

Gases:

Krypton

Liquids and Solids:

Cadmium  
Thallium  
Thorium



## SAFETY MEASURES

Gases, Liquids, and Solids:

1-Refer to the job specification for details. Special training will be supplied by the company for any employee handling radioactive materials.

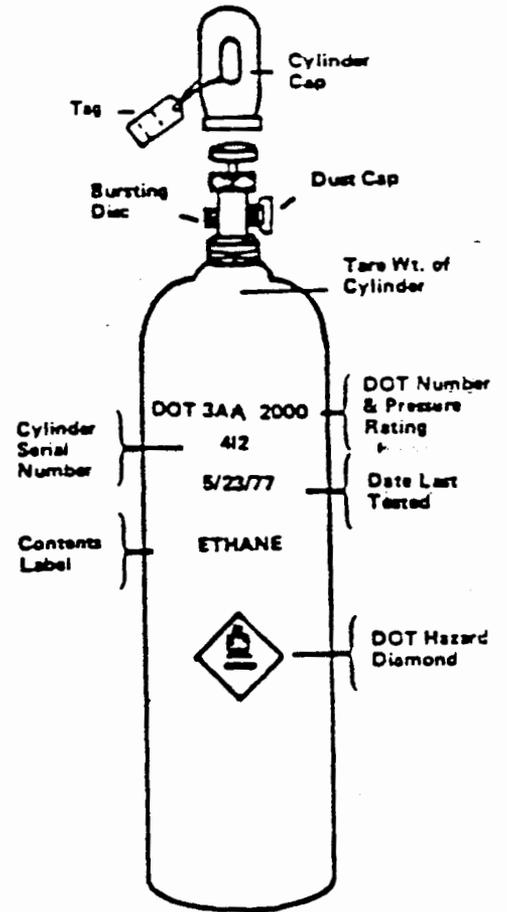
# COMPONENTS OF THE COMPRESSED GAS CYLINDER

The cylinder itself should be received in good condition with properly identified and fitted components as indicated to the left. Cylinder caps must always be in place except when the cylinder is in service.

A tag should identify the contents and warn of any special dangers. Color coding is not a standardized means of identification and should never be used as such. Content markings on the shoulder of the cylinder comply with OSHA 1910.252 and ANSI Z 48.1-1954.

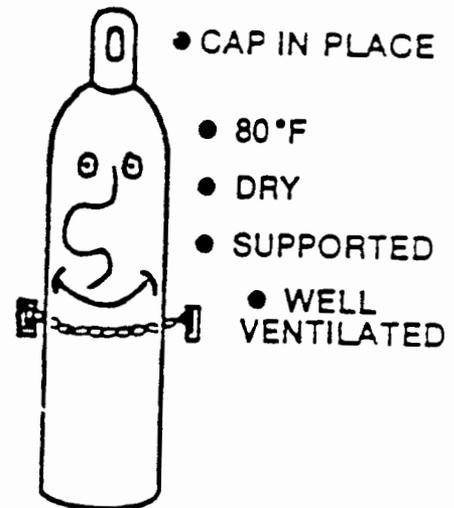
Except for Class A poisons, fluorine, and lecture bottles, safety devices specified by DOT protect the cylinder from rupturing due to excess heat and/or pressure. Safety devices are located on the bottom of acetylene cylinders. Never tamper with any safety device.

A DOT hazard diamond is required for the interstate transportation of cylinders.



## PROTECT FROM

HEAT                      RUST  
DENTS                    CORROSION  
VALVE DAMAGE



## LEAK TESTING

### SECTION 1: VISUAL INSPECTION

Visual inspection is the simplest way to find gross leaks in a gas system. Examine the lines and fittings for signs of corrosion or deposits. Hydrogen chloride (HCl) and other chloride gases will cause corrosion at the point of leakage. Silane (SiH<sub>4</sub>) and diborane (B<sub>2</sub>H<sub>6</sub>) leave powdery deposits around leaks. Leaks should be found by other methods, however, before they become large enough for this method to be applicable.

### SECTION 2: BUBBLE TESTING

Using a soap solution or a liquid leak-test solution (such as Snoop) on gas lines and fittings is a good way to locate leaks. The system must be pressurized to above the normal operating pressure with an inert gas (usually nitrogen or hydrogen), and the solution should be applied carefully to all connections and welds. Flooding with the solution is not required. A leak is indicated by bubbles. To detect small leaks in areas that are hard to see, a bright light and a mirror are useful.

### **NOTE:**

Do not use Snoop or any other solution on a line that contains a hygroscopic gas (one that will absorb moisture) such as HCl or ammonia (NH<sub>3</sub>), because even a small leak will draw a significant amount of moisture into the line.

### SECTION 3: PRESSURE DROP TEST

This leak test method can be used only where a pressure gauge or a transducer is available in the system. The principal areas where this test can be used are:

- A bell jar
- Gas supply lines
- A dopant source line in a gas panel. (To use this method, the pressure on both sides of the regulator must be equalized by turning the regulator all the way in. Do not forget to readjust the regulator after the test.)
- A dichlorosilane (SiH<sub>2</sub>Cl<sub>2</sub>) line in a gas panel. To perform a pressure-drop test, turn off the source and allow the gas system temperature and pressure to stabilize. Record the starting pressure and time and leave the system overnight. Then record the final pressure and time and compare them to the original readings. For proper test conditions, ambient temperature must be the same at the beginning and end of the test.

#### SECTION 4: VACUUM LEAK TEST

This method can be used to test any reactor that has an exhaust vacuum pump or to which a vacuum pump can be attached. A vacuum gauge or a transducer also must be installed in the system. To use this method, close the inlet valves to the process chamber and operate the vacuum pump to create a vacuum in the system. Then close the exhaust gate valve to isolate the chamber. Record the beginning vacuum reading and compare it to a final reading taken after a known period of time. Initial leak-up rate may be high due to outgassing. If so, the test should be repeated until the leak rates are reproducible.

#### SECTION 5: HYDROGEN LEAK TESTING

A hydrogen leak tester can be used to find leaks in the process chamber and in portions of the gas panel. The system is pressurized with hydrogen ( $H_2$ ), and a hydrogen detector is used to probe the lines and fittings for leaks. This method can be used on any line that can be pressurized with hydrogen ( $SiCl_4$ ,  $SiHCl_3$ , or dopant lines).

#### SECTION 6: LEAK TEST WITH AMMONIA FUMES

Chloride leaks can be located by using ammonia ( $NH_3$ ) fumes from a squeeze bottle. Use ammonia detergent or ammonium hydroxide. Use only the fumes; do not use the liquid. When ammonia fumes contact a chloride gas, white smoke or white powder will appear around the leak. This test can be used on gas lines that contain  $HCl$ ,  $SiCl_4$ ,  $SiHCl_3$ , or  $SiH_2Cl_2$ .

#### SECTION 7: LEAK TEST WITH CHLORIDE FUMES

Ammonia leaks can be located by using chloride fumes from a squeeze bottle. Use diluted  $HCl$ . Use only the fumes; do not use the liquid. Leaks will appear as white smoke or white powder around the point of leakage.

#### SECTION 8: HELIUM LEAK TESTING

This is the most precise way to test a gas panel for leaks. The following paragraphs provide a general guideline that can be used on most reactors. The following equipment is needed:

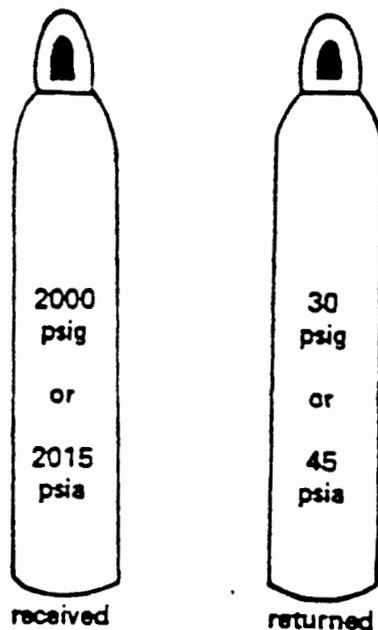
1. Helium leak detector
2. Liquid nitrogen ( $LN_2$ ) source
3. Regulated helium tank
4. Assorted caps and plugs.

Begin the leak test with the following preliminary steps as they apply to your reactor:

1. Ensure that the main vacuum pump (if used) is running and that the pump ballast valve is closed.
2. Install the leak detector connecting plumbing and the 30-1-30 compound pressure gauge valve assembly to the leak check port on the gas panel.

3. Cap all lines at the entrance to the gas panel.
4. Close the foreline purge valve.
5. Open all manual valves at the gas panel inlet.
6. Ensure all flow controllers are open.
7. Turn down all gas panel regulators.
8. Verify that the helium leak detector is operational and properly calibrated.
9. Cap the atmospheric vent.
10. Install an isolation valve on any vacuum vents.
11. Install the caps and plugs in any open jets and lines.

To do an orderly test of the gas panel, begin with a leak check of a core unit of the gas panel. Once the leak integrity of this core section has been established, test additional portions of the system. Establish the leak integrity of these additional portions before proceeding to the next portion of the system. By adding parts of the system and establishing their respective leak integrity, a complete system leak check can be done with a minimum of time and effort.



$$\begin{aligned}
 \text{psia} &= \text{psig} + 15 \text{ psi} \\
 \left( \begin{array}{l} \text{pounds per} \\ \text{square inch} \\ \text{absolute} \end{array} \right) &= \left( \begin{array}{l} \text{pounds per} \\ \text{square inch} \\ \text{gauge} \end{array} \right) + \left( \begin{array}{l} 15 \text{ pounds} \\ \text{per square} \\ \text{inch} \end{array} \right)
 \end{aligned}$$

## GENERAL PROCEDURES FOR CORRECT HANDLING OF GASES IN CYLINDERS:

- 1) Avoid exposing stored cylinders to moisture, corrosive chemicals or fumes. Rust will damage the cylinders and will often cause the valve caps to stick.
- 2) Always ensure that the valve caps are on when moving or transporting gas cylinders. Never drop a gas cylinder, full or empty, and never bump them into each other.
- 3) Never use pilers or a similar tool to open the cylinder valve. Some valves are opened with a special key supplied by UNITOR and other valves are equipped with hand wheels. It is dangerous to force the valve open by knocking or heating. All valves should be closed when not in use.
- 4) Never try to refill gas cylinders on your own. This also applies to mixing gases in cylinders and transferring gas from one cylinder to another.
- 5) Initials and stamps engraved on the cylinder shells must not be changed or obliterated. Labels and tags should not be removed.
- 6) Gas cylinders which have been exposed to fire must be put aside for inspection and not be returned together with other empty cylinders.
- 7) Always make sure that used cylinders are returned with valve protection caps on.
- 8) Containers must not be filled except by the owner or with owners consent. (Containers and pressure design vary for certain gases, plus, many gases can not be mixed safely.)
- 9) Containers should always bear legible content markings. Labels, decals, stencils, and tags must never be removed or defaced.
- 11) Almost all gases must be stored standing upright. They should be secured properly and be located where they can not be knocked over. (Liquid gases are sometimes used in a horizontal position. Always ask if you notice containers laying down-- this is very unsafe.)
- 12) Containers must never be painted.
- 13) Damaged compressed gas containers should not be used. They should be immediately returned to the Gas Supplier.
- 14) Containers should never be misused! (Never used compressed gas containers as rollers, supports, stools or for any other purpose than to contain the content as received).
- 15) Compressed gas containers are subject to EXPLOSION when exposed to high temperatures. Containers should always be in a cool place (never over 125°F).

- 16) Empty containers should be appropriately labeled. Empty containers mean: CYLINDER IS USED -- DOES NOT MEAN VOID OF CONTENTS!
- 17) Cylinders should be stored with like gases only. Many gases can not be mixed safely. Storage area temperature should be regulated so that it does not exceed 100°F (37.8°C)
- 18) Containers should never be located where they block exits, stairways or normal pathways.
- 19) Compressed gases should be used only for its intended purpose! Compressed gas should ~~not~~ be used to dust off clothing or fool around -- this may cause serious injury to eyes or body, or create a fire hazard.
- 20) Containers not in use - The user shall keep the container valves closed at all times (charged or empty) except when the container is in use. By "in use" it is meant when gas is flowing from the container, when the container gas is maintaining pressure in a supply line, or when the container is standing by during and between operations utilizing the gas.
- 21) Returning empty containers - ~~Before~~ returning empty containers, the valve shall be closed and container valve protective caps, if used, shall be replaced. Cylinders equipped with valve outlet caps or plugs, or sealing valve caps shall be returned with these caps or plugs in a gas tight condition. Empty containers shall be labeled or ~~marked~~ according to DOT regulations.
- 22) Trucks - Containers shall not ~~be~~ dragged or slid. Where practical, the user should use a suitable hand truck, fork truck, roll platform or similar device with container secured for transporting.
- 23) Pressure regulators - A suitable pressure regulating device shall be used where gas is admitted to a system of lower pressure rating than the supply pressure, and where, due to the gas capacity of the supply source, the system pressure rating may be exceeded. \*Note -- this is a requirement regardless of the possible presence of a pressure-relief device protecting the system.
- 24) System pressure relief device - A suitable pressure relief device shall be used to protect a system utilizing a compressed gas where the system has a pressure rating less than the compressed gas supply source and where, due to the gas capacity of the supply source, the system pressure rating may be exceeded.
- 25) Connections - Connections that do not fit shall not be forced. Threads on regulator connections or other auxiliary equipment shall match those on container valve outlet. Detailed dimensioned drawings of standard container valve outlet and inlet connections are published in the "American National and Canadian Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections". (ANSI B 57.1 and CSA B 96).

- 26) Leaking containers - If a container leaks, and the leak cannot be remedied by tightening a valve gland or packing nut, the valve shall be closed, and a tag attached to it stating that the container is unserviceable. If the gas is toxic, utilize appropriate gas mask or self-contained breathing apparatus. If it is flammable, keep away from ignition sources. Remove the leaking container outdoors to a well ventilated location, or place under an exhaust ventilating system suitable for the product (gas cabinet).

If the gas is flammable, toxic or corrosive, place an appropriate sign at the container (or hood or cabinet) warning against these hazards. The gas supplier shall be notified and his instructions followed as to the return or disposition of the container.

- 27) Container valve - Container valve shall be opened slowly. Valve outlets shall be pointed away from yourself and other persons. On valves without handwheels, the wrenches provided by, or recommended by, the gas supplier shall be used. On valves with handwheels, wrenches shall not be used except when designed for that purpose. Valve wheels shall not be hammered in attempting to open or close the valve. For valves that are hard to open, or frozen because of corrosion, the supplier shall be contacted for instructions.

- 28) PURGING

To purify or to make free of an unwanted substance, such as an impurity or foreign material, in a closed system, where maintaining the highest degree of purity is essential.

#### PRINCIPLES OF PURGING

 WHY?

The PRIMARY reason for a purging procedure, at Signetics, is to remove all reactive elements regarded as undesirable (such as air) so that gas purity is maintained during the cylinder change.

A SECONDARY reason for purging a gas system is for general employee safety during the compressed gas cylinder changeover.

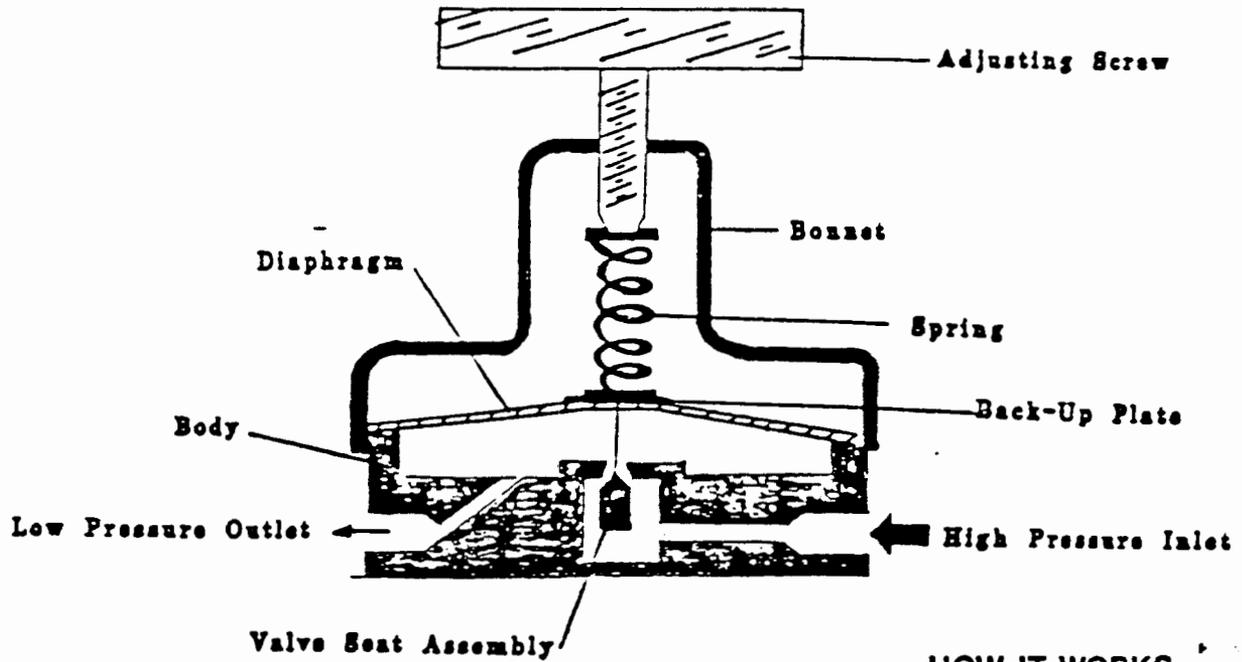
#### PRINCIPLES OF PURGING

##### PURGING GASES

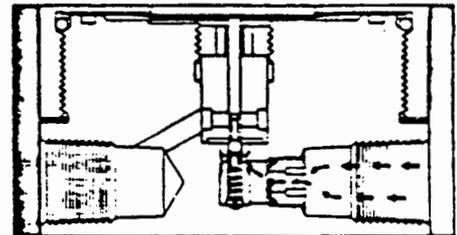
The purging process is routinely performed by utilizing a nonreactive or inert gas such as

nitrogen (N<sub>2</sub>)

THE SINGLE STAGE  
PRESSURE REDUCTION REGULATOR

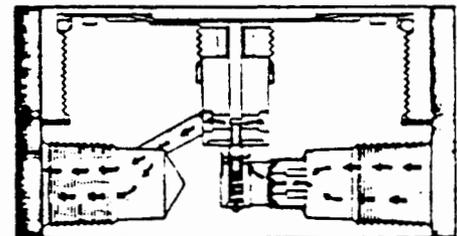


HOW IT WORKS



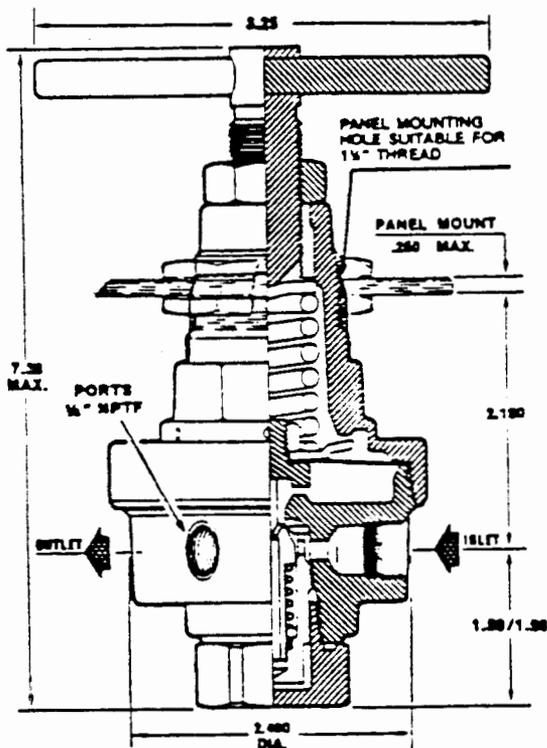
CLOSED

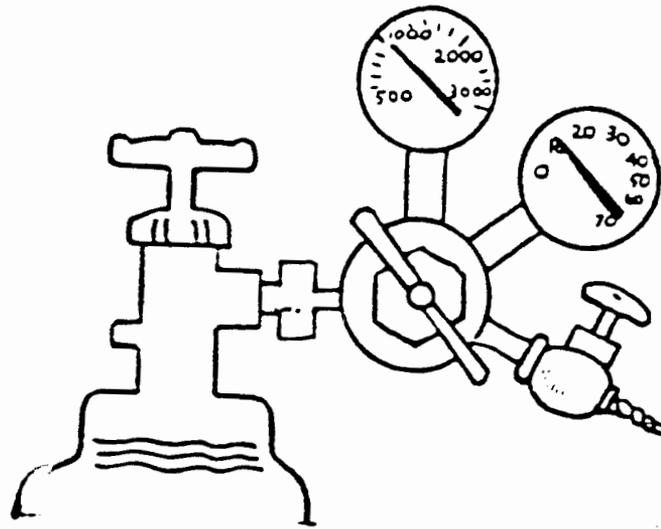
With poppet against seat, full upstream pressure is applied to poppet effecting a dead tight seal.



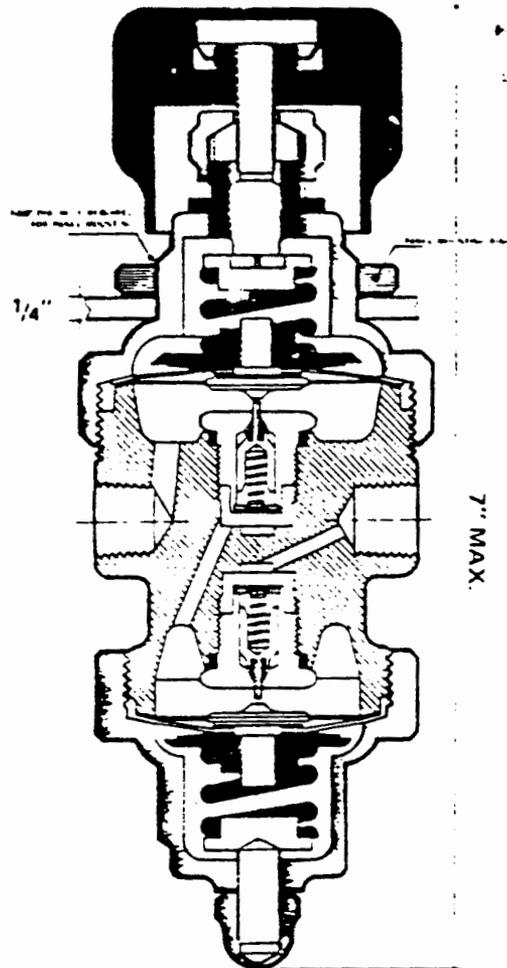
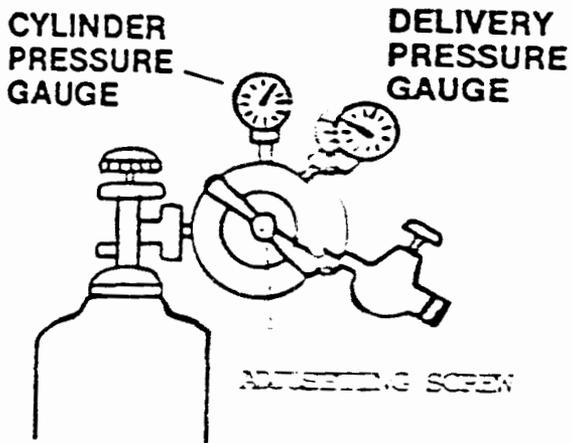
REGULATING

As downstream process demands flow, the pressure acting on the bottom of the diaphragm decays, allowing the adjusting spring force to push the poppet down. This in turn unseats the poppet allowing flow to begin and pressure under the diaphragm to increase until balance is achieved between adjusting spring force and downstream pressure. This condition continues until process ceases. At this point, increasing pressure overcomes spring force, moving diaphragm up and allowing piston to close.





PRESSURE GAUGES



TWO-STAGE REGULATOR

INTRODUCTION TO HAZARDOUS MATERIALS  
REVIEW 2



Instructions: Match each characteristic with the appropriate placard by placing the letter in the space below the placard.

- A. Will decompose readily to yield oxygen.
- B. Capable of being easily ignited and burning with extreme force.
- C. May cause acute damage or death when exposed to even low concentrations.
- D. Has radioactive properties
- E. Will cause degeneration and destruction of many materials upon contact.
- F. Must be treated with extreme caution to avoid explosion.

HAZARDOUS WASTE HANDLING COURSE

SIGNETICS CORPORATION

PREPARED FOR

CHEMICAL OPERATORS

## OBJECTIVES

- TO KNOW THE RESPONSIBILITIES OF A HAZARDOUS WASTE GENERATOR, STORER, AND SHIPPER
- TO KNOW THE PROPER STORAGE AND HANDLING OF HAZARDOUS WASTES
- TO BE ABLE TO INSPECT HAZARDOUS WASTE STORAGE AREAS
- TO PREPARE HAZARDOUS WASTES FOR SHIPPING

## SCOPE

- WASTE HYDROFLUORIC ACID
- WASTE BUFFERED OXIDE ETCH
- WASTE "SOLVENT"
- WASTE PHOTORESIST/ACETONE
- WASTE CONTAMINATED WITH ARSENIC OR MERCURY
- OTHER

## PREREQUISITES

- ° CHEMICAL HANDLING
- ° FIRE EXTINGUISHER
- ° SELF-CONTAINED BREATHING APPARATUS
- ° FORKLIFT
- ° FIRST AID
- ° AIR MONITORING

## LAWS THAT AFFECT US

- RESOURCE CONSERVATION AND RECOVERY ACT (RCRA 1976)
- CLEAN WATER ACT (CWA 1980)
- COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA 1980) ALSO KNOWN AS "SUPERFUND"
- HAZARDOUS MATERIALS TRANSPORTATION ACT (HMTA 1980)
- PENALTIES \$25,000/DAY/OFFENCE + IMPRISONMENT

40, 49 CFR (CODE OF FEDERAL REGULATIONS)

## DEFINITIONS

EPA	(ENVIRONMENTAL PROTECTION AGENCY)
DOT	(DEPARTMENT OF TRANSPORTATION)
OSHA	(OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
RQ	(REPORTABLE QUANTITY)
HW	(HAZARDOUS WASTE)
TSDF	(TREATMENT, STORAGE, DISPOSAL FACILITY)
ORM	(OTHER REGULATED MATERIAL)
N.O.S.	(NOT OTHERWISE SPECIFIED)
N.O.I.	(NOT OTHERWISE INDEXED)
MSDS	(MATERIAL SAFETY DATA SHEET) OR (OSHA FORM 20)

HAZARDOUS MATERIAL

HAZARDOUS SUBSTANCE

HAZARDOUS CHEMICAL

HAZARDOUS WASTE

## HAZARDOUS CHARACTERISTICS

### EPA

- ° CORROSIVE (HF)
- ° TOXIC (ARSENIC)
- ° REACTIVE
- ° IGNITABLE (ACETONE)
- ° PROCESSES (DEGREASING)

### DOT

- 1) RADIOACTIVE MATERIAL
- 2) POISON A (PHOSPHINE)
- 3) FLAMMABLE GAS
- 4) NON-FLAMMABLE GAS (NITROGEN)
- 5) FLAMMABLE LIQUID (ACETONE)
- 6) OXIDIZER (HYDROGEN PEROXIDE)
- 7) FLAMMABLE SOLID
- 8) CORROSIVE MATERIAL (LIQUID) (HF)
- 9) POISON B (ARSENIC)
- 10) CORROSIVE MATERIAL (SOLID)
- 11) IRRITATING MATERIALS
- 12) COMBUSTIBLE LIQUID >110 GAL CAP
- 13) ORM-B
- 14) ORM-A
- 15) COMBUSTIBLE LIQUID < 110 GAL CAP
- 16) ORM-E

REQUIREMENTS FOR A GENERATOR:

- DETERMINE WASTE CHARACTERISTIC
- INTERNAL TRACKING OF HAZARDOUS WASTE
- CLEAN CONTAINERS, LABELS
- GENERATOR ID, ACCOUNTABILITY
- RECORD KEEPING
- ANNUAL REPORT
- EXTERNAL MANIFEST
- EXCEPTION REPORT (35 DAYS)

## REQUIREMENTS FOR A STORER:

### STORAGE AREAS:

- ° COMPATIBILITY
- ° AISLE SPACE
- ° SECURITY
- ° SAFETY EQUIPMENT
- ° DRAINS
- ° VENTILATION
- ° FIRE EQUIPMENT
- ° COMMUNICATION EQUIPMENT/ALARMS

EQUIPMENT MAINTENANCE

PERSONNEL TRAINING

MANAGEMENT OF CONTAINERS/TANKS

CONTINGENCY PLANS

REQUIREMENTS FOR A STORER:

WASTE CHEMICAL MANIFEST

DRUM LOG

PERIOD REPORT

ANNUAL REPORT

INSPECTION AND MAINTENANCE LOGS

SPECIFICATIONS

INSPECTION SCHEDULE FOR DRUMMED HAZARDOUS WASTE STORAGE

ITEM	DAILY	WEEKLY	MONTHLY
Visual inspection of area for containers in proper section	X		
Vis. Insp. of Waste Containers for leaking or deterioration	X		
Insp. for proper container marking	X		
Insp. for proper segregation of waste	X		
Check height of drum stacking (not to exceed double stacking, no stacking for ignitables)	X		
Vis. insp. of walls, floors, and ceiling for discoloration and stains	X		
Check for locked doors		X	
Inspect slotted drains		X	
Check emergency showers			X
Check fire extinguisher			X
Check warning signs on exterior of containment rooms	X		
Check for aisle space needed for drum movement	X		
Check that drums are elevated on pallets	X		
Check inventory of industrial absorbents used to contain spills or leaks	X		
Check forklift for corrosion, malfunction	X		

The above inspections are performed by Chemical Support Operators.

INSPECTION LOG FOR DRUMMED HAZARDOUS WASTE STORAGE

<u>ITEM</u>	<u>FREQ.</u>	<u>RECORD INSPECTION</u>
1. Visual Inspection of area for containers in proper section	Daily	_____
2. Vis. Insp. of waste containers for leaking or discoloration	Daily	_____
3. Insp. for proper container marking	Daily	_____
4. Insp. for proper segregation of waste	Daily	_____
5. Check height of drum stacking (not to exceed double stacking, no stacking for ignitables)	Daily	_____
6. Vis. insp. of walls, floors, and ceiling for discoloration and stains	Daily	_____
7. Check for locked doors	Daily	_____
8. Insp. slotted drains	Weekly	_____
9. Check emergency showers	Monthly	_____
10. Check fire extinguisher	Monthly	_____
11. Check warning signs on exterior of containment rooms	Daily	_____
12. Check for aisle space needed for drum movement	Daily	_____
13. Check that drums are elevated on pallets	Daily	_____
14. Check inventory of chemical absorbents used to contain spills or leaks.	Daily	_____
15. Check forklift for corrosion, malfunction	Daily	_____

Necessary Action: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Inspected by \_\_\_\_\_ Shift: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Action was completed by: \_\_\_\_\_ Date: \_\_\_\_\_

THIS RECORD WILL BE RETAINED AT CHEMICAL SUPPORT FOR A MINIMUM OF 3 YEARS

INSPECTION LOG FOR HAZARDOUS WASTE STORAGE TANKS

ITEM	FREQ.	RECORD INSPECTION
1. VISUAL INSPECTION OF VAULT COVER AND LADDER:		
. Corroding parts	Weekly	_____
. Loose rivets or bolts	Weekly	_____
. Worn or broken parts	Weekly	_____
2. VISUAL INSPECTION OF WASTE TANKS:		
. Discoloration of paint	Weekly	_____
. Cracks at connections, seams	Weekly	_____
. Buckles, bulges	Weekly	_____
. Water collection on tank top	Weekly	_____
3. ELECTRICAL:		
. Light bulb on	Weekly	_____
. Corrosion on conduit	Weekly	_____
. Defective switches for lights	Weekly	_____
. Vent fan on	Daily	_____
4. VISUAL INSPECTION OF VAULT:		
. Rust spots	Weekly	_____
. Blisters, film-lifting	Weekly	_____
. Cracks or spalled concrete	Weekly	_____
. Low spots where liquids can collect	Weekly	_____
. Anchor bolt distortion	Weekly	_____
. Presence of odors	Daily	_____
5. VISUAL INSPECTION OF PIPING:		
. Cracks and distortion	Weekly	_____
. Bulging	Weekly	_____
. Corrosion	Weekly	_____
. Leaks	Daily	_____
. Flange seal leaks	Daily	_____
. Loose or corroded bolts	Weekly	_____
. Inspect trench for liquids	Weekly	_____
6. CHECK TANK LEVELS:		
. Waste Hydrofluoric Acid	Daily	____ FT ____ IN
. Waste BOE	Daily	____ FT ____ IN
. Waste Solvent	Daily	____ FT ____ IN

Necessary Action: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Inspected by: \_\_\_\_\_ Shift: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Action was Completed by \_\_\_\_\_ Date: \_\_\_\_\_

THIS RECORD WILL BE RETAINED AT FACILITIES FOR A MINIMUM OF 3 YEARS.

INSPECTION SCHEDULE FOR HAZARDOUS WASTE STORAGE TANKS

ITEM	DAILY	WEEKLY
1. Visual Inspection of Vault Cover & Ladder:		
. Corroding parts		X
. Loose rivets or bolts		X
. Worn or broken parts		X
2. Visual Inspection of Waste Tanks:		
. Discoloration of paint		X
. Cracks at connections, seams		X
. Buckles, bulges		X
. Water collection on tank top		X
3. Electrical		
. Light bulb on		X
. Corrosion on conduit		X
. Defective switches for lights		X
. Vent fan on	X	
4. Visual Inspection of Vault		
. Rust spots		X
. Blisters, film-lifting		X
. Cracks or spalled concrete		X
. Low spots where liquids can collect		X
. Anchor bolt distortion		X
. Presence of odors	X	
5. Visual Inspection of Piping		
. Cracks and distortion		X
. Bulging		X
. Corrosion		X
. Leaks	X	
. Flange seal leaks	X	
. Loose or corroded bolts		X
. Inspect trench for liquids		X
6. Check Tank Levels		
. Waste Hydrofluoric Acid	X	
. Waste BOE	X	
. Waste Solvent	X	

The above inspections are performed by Chem Support Operators.

REQUIREMENTS OF A SHIPPER:

HAZARDOUS MATERIALS TABLE 49 CFR 172.101

- ° +, E, A, W
- ° PROPER SHIPPING NAME
- ° HAZARD CLASS
- ° ID NO.
- ° LABEL REQUIRED
- ° PACKAGING
- ° PLACARDS

REQUIREMENTS OF A SHIPPER:

- SHIPPING PAPERS
- MANIFEST
- MARKING
- LABELLING
- PLACARDING
- EMPTY
- PACKAGING
- VEHICLE INSPECTIONS

REQUIREMENTS OF A SHIPPER:

° SHIPPING PAPERS:

- PRIORITY FOR HAZARDOUS MATERIALS
- LOCATION IN TRUCK
- REPORTABLE QUANTITIES

"RQ, HYDROFLUORIC ACID SOLUTION, CORROSIVE  
MATERIAL UN 1790"

- CERTIFICATION  
LEGIBLY SIGNED

REQUIREMENTS OF A SHIPPER:

- ° MANIFEST
  - DOCUMENT NOS.
  - GENERATOR ID
  - TRANSPORTER ID
  - TSDF ID
  - SHIPPING NAMES, QUANTITIES
  - CERTIFICATION
  - PRINTED AND SIGNED NAME
  - DISCREPANCIES

REQUIREMENTS OF A SHIPPER:

° MARKING

- PROPER SHIPPING NAME
- IDENTIFICATION NO.
- LEGIBLE, DURABLE, UNOBSCURED
- CONSIGNEE ADDRESS

REQUIREMENTS OF A SHIPPER:

- ° LABELLING
  - "FLAMMABLE", "CORROSIVE", ETC.
  - CARGO AIRCRAFT ONLY
  - "THIS END UP"
  - LABELS ON EACH PACKAGE
  - LEGIBLE, DURABLE, UNOBSCURED

REQUIREMENTS OF A SHIPPER:

° PLACARDING

- ANY AMOUNT EVEN WHEN "EMPTY"

CLASS A EXPLOSIVES

CLASS B EXPLOSIVES

POISON A

FLAMMABLE SOLID

RADIOACTIVE MATERIAL

- < 1,000 LBS OTHER CLASSES, NO PLACARDS NECESSARY
- $\geq$  1,000 LBS PLACARDS REQUIRED
- MIXED LOAD PLACARD AS "DANGEROUS" IF EACH COMPONENT < 5,000 LBS
- IF ANY COMPONENT > 5,000 LBS, INDIVIDUAL PLACARD
- SHIPPER PROVIDES AND AFFIXES PLACARDS ON ALL FOUR SIDES OF TRUCK
- VISIBLE, UNOBSCURED

REQUIREMENTS OF A SHIPPER:

- ° EMPTY
  - WHEN A CONTAINER IS TRIPLE-RINSED
  - A CONTAINER OR INNER LINER CONTAINS LESS THAN 1 INCH OF HAZARDOUS WASTE
  - A CONTAINER CONTAINS LESS THAN 3% OF THE ORIGINAL TOTAL CONTENTS WHEN FULL.

REQUIREMENTS OF A SHIPPER:

° PACKAGING

- DOT DRUMS 17E, 17H

° SHIPPING DRUMS:

- LABEL
- HAZARDOUS WASTE LABEL
- "THIS SIDE UP"
- NAME AND ADDRESS OF CONSIGNEE

REQUIREMENTS OF A SHIPPER:

° VEHICLE INSPECTIONS

TANK TRUCK

- HOSES INTACT
- PLACARDS ON FOUR SIDES
- TIRES IN GOOD CONDITION
- UN NOS.
- VALVE ON TANK WITH LOCK
- COMPATIBLE LINER
- DRIVER EQUIPPED WITH SAFETY GEAR

TRAILER

- APPEARANCE
- ODORS
- SECURED CARGO
- SEGREGATION OF CARGO
- PLACARDS ON FOUR SIDES
- TIRES IN GOOD CONDITION

DRIVER SIGNS MANIFEST!

## SOME METHODS OF HAZARDOUS WASTE DISPOSAL

- UNDERGROUND INJECTION WELL
- LANDFILL
- TREATMENT, CHEMICAL, BIOLOGICAL
- SOLIDIFICATION
- EVAPORATION, AERATION
- LANDFARMING
- INCINERATION
- RECLAMATION

WHAT DO WE DO TO INSURE COMPLIANCE?

- ° SEGREGATE WASTE
- ° TRAINING
- ° ENVIRONMENTAL AFFAIRS, LEGAL
- ° CONSULTANTS
- ° LAB ANALYSES
- ° REGULATORY AGENCIES
- ° PLANT PHILOSOPHIES
- ° SPECIFICATIONS - ZERO DEFECTS
- ° INTERNAL AUDITS
- ° DISPOSAL SITE AUDITS

## SECTION G

## CONTINGENCY PLAN

This Contingency Plan is designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or nonsudden release of hazardous waste or hazardous constituents to air, soil, or surface water. The provisions of the plan will be carried out immediately whenever there is a fire, explosion, spill or release of hazardous waste constituents which could threaten human health or the environment. The plan is submitted in compliance with New Mexico Hazardous Waste Management Regulations 1984 Part 206.B.10.

**G.1 General Information:**

Name:	Signetics Corporation (NMD 000709782)
Location:	9201 Pan American Freeway, N.E. Albuquerque, NM 87113
Phone:	(505) 822-7000, 822-7188
Operation:	Generator and Storer Metal-oxide semiconductor Integrated Circuits Manufacturing (SIC 3674)
Site Plan:	See Exhibit G-1
Description of Activities:	1 x 5000 gal. waste Hydrofluoric Acid storage tank. 1 x 5000 gal. waste Buffered Oxide Etch storage tank. 1 x 5000 gal. waste "Solvent" storage. 100 x 55 gal. drummed hazardous waste storage. Exhibit G-4 includes a maximum inventory of virgin chemicals, should contingencies arise.

G.1.a Waste Description:

This section describes the chemical and physical nature of the Hazardous Wastes stored at the Signetics Albuquerque facility:

<u>Waste Name</u>	<u>Disposition</u>	<u>Approximate Quantity (1984)</u>
a) Waste Solvent I	5000/gl Tank Storage	40,000 Gallons
b) Waste Hydro-fluoric Acid	5000/gl Tank Storage	50,000 Gallons
c) Waste Buffered Oxide Etch	5000/gl Tank Storage	30,000 Gallons
d) Arsenic Contaminated Wastes	55/gl Drum Storage	2 Drums
e) Waste Solvent II	55/gl Drum Storage	15 Drums
f) Mercury-contaminated Wastes	55/gl Drum Storage	2 Drums

- a) Waste Solvent I (flash pt. 120 degrees F) - These photolithographic cleaning wastes consist primarily of: Methanol (flash pt. 54 degrees F), Acetone (flash pt. 15 degrees F), Ethylene Glycol (flash pt. 240.8 degrees F), Ethanolamine (flash pt. 195 degrees F), Diethylene Glycol Monobutyl Ether, (flash pt. 230 degrees F), and water - pH 11-12. Due to the low flash points of several materials, it is assigned as category D001 and F003. There may also be trace levels (< 1%) of 1,1,1-Trichloroethane. Efforts are underway to decrease water content from draining into "Solvent" tank in order to allow for cost effective reclamation.
- b) Waste Hydrofluoric Acid is a product of silicon oxide etching and consisting mainly of .1-5% Hydrofluoric Acid (pH < 1). Due to the low pH, it is assigned D002.
- c) Waste Buffered Oxide Etch is also a product of silicon etching and includes Hydrofluoric Acid (0.1 - 5%) and Ammonium Fluoride (0.1 - 20%). The pH is 4. This waste is sometimes mixed with (c) for transport. It has also a high concentration of fluorides and is therefore segregated. It is assigned D002.

- d) Arsenic Contaminated Wastes: This group includes all materials that have been contaminated with solid arsenic like gloves, containers, and rags used in the handling of arsenic. While all of these are assigned as D004, not all may meet the extractability criteria, however, they are all viewed as potentially toxic and are disposed as such.
- e) Waste Solvent II is drummed mixtures of proprietary vendor formulas of positive photoresists which include cellosolve acetate (flash pt. 124 degrees F), other glycol esters, and acetone (flash pt. 15 degrees F). This is classified as D001 and F003.
- f) Mercury Waste: This group includes all materials that are contaminated with liquid mercury. This includes used mercury vapor lamps, broken mercury thermometers and any material used to clean up mercury spills. It is assigned D009.

Wastes designated for 5,000/gal tank storage are drained through plumbing connected to the manufacturing area. All plumbing are accessible to routine visual inspection, except the drain lines in the HW storage areas, CS1 and FS4.

Most drummed wastes are accumulated in the work area and removed as soon as the drum is full (within 72 hours) to the proper hazardous waste storage area. Other drums re situated in the storage area and small quantities are brought to the area and accumulated.

## G.2 Emergency Coordination:

In the event of an emergency involving hazardous chemical release or discharge, the Emergency Coordinators have the responsibility of determining the extent of the hazard and the authority to initiate emergency response. The Emergency Coordinators are accessible by telephone and pager (see below).

The Emergency Coordinators are familiar with all aspects of the facility Contingency Plan and the locations and characteristics of wastes handled. Secondary and backup Coordinators are also familiar with the above Hazardous Waste Management Contingency Plan. In addition, the Emergency Coordinators have the authority to commit the resources needed to carry out the Contingency Plan. Secondary and Backup coordinators are also familiar with above Hazardous Waste Management activities and plans and also, in the absence of Primary Emergency Coordinators, are authorized to carry out coordination responsibilities and actions.

Emergency Coordinators:

Primary

Pat Herring - Ext. 7255 or Pager #73  
Safety and Security Manager  
Home: 785-9 Tramway Ln., N.E.  
Albuquerque, NM 87122  
(505)

Gary M. Mavrakis - Ext. 7188 or Pager #163  
Chemical Support Section Head  
Home: 4504 Bryan, N.W.  
Albuquerque, NM 87114  
(505) 897-2773

Secondary

Bill Boyce - Ext. 7308  
Human Resources Manager  
Home: 5816 Nugget Avenue, N. E.  
Albuquerque, NM 87111  
(505) 292-6394

G.3 Implementation of the Contingency Plan:

The decision to implement the Contingency Plan depends upon whether or not an imminent or actual incident could threaten human health or the environment. The purpose of this section is to provide guidance to the emergency coordinator in making this decision by providing decision-making situations in those areas where HW is stored:

1. Fire and/or Explosion That Could Effect the HW Storage Areas:
  - a. A fire causes the release of toxic fumes.
  - b. The fire spreads and could possibly ignite materials at other locations onsite or could cause heat-induced explosions.
  - c. The fire could possibly spread to offsite areas.
  - d. Use of water or water and chemical fire suppressant could result in contaminated runoff.
  - e. An imminent danger exists that an explosion could occur, causing a safety hazard because of flying fragments or shock waves.

- f. An imminent danger exists that an explosion could ignite other hazardous waste at the facility.
- g. An imminent danger exists that an explosion could result in release of toxic material.
- h. An explosion has occurred.

2. Spills or Material Release:

- a. The spill could result in release of flammable liquids or vapors, thus causing a fire or gas explosion hazard.
- b. The spill could cause the release of toxic liquids or fumes.
- c. The spill that could contaminate soil or water on site.
- d. The spill cannot be contained onsite, resulting in offsite soil contamination and/or ground or surface water pollution.

G.4 Emergency Response Procedures: (HWMR 206.B.10.m):

G.4.a Notification:

Whenever there is an imminent or actual emergency situation, the Emergency Coordinator, or his designee when the emergency coordinator is not on call or the on scene personnel if the emergency coordinator is in route, must immediately:

- (1) Activate internal facilities alarm or communication systems, where applicable, to notify all facility personnel; and
- (2) Notify appropriate state or local agencies with designated response roles if their help is needed.

G.4.b Identification:

Whenever there is a release, fire, or explosion from the HW storage areas, the Emergency Coordinator will immediately identify the character, exact source, amount, and a real extent of any released materials. He may do this by observation or review of facility records or manifests and, if necessary, by chemical analysis.

G.4.c Assessment:

Concurrently, the emergency coordinator assesses possible hazards to human health and/or the environment that may result from the release, fire, or explosion. This assessment considers both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or chemical agents used to control fire and heat-induced explosions). If needed, the National Response Center will be called (800-424-8802).

If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten health, or the environment, outside the facility, he will report his findings as follows:

- (1) If his assessment indicates that evacuation of local areas may be advisable, he will immediately notify appropriate authorities. He is available to help appropriate officials decide whether local areas should be evacuated; and
- (2) He will immediately notify either the government officials designated as the on-scene coordinator for that geographical area (in the applicable regional contingency plan, or the National Response Center (using their 24-hour toll-free number (800) 424-8802 and the New Mexico Environmental Improvement Division (505) 827-9329.

The report includes:

- a. Name and telephone number of reporter;
- b. Name and address of facility;
- c. Time and type incident (e.g., release, fire);
- d. Name and quantity of material(s) involved to the extent known;
- e. The extent of injuries, if any; and
- f. The possible hazards to human health, or the environment, outside the facility.

G.4.d Control Procedures:

Potential accidents fall under three general classifications: (1) fire and/or explosions, (2) spills or material release, (3) floods. Natural disasters such as earthquakes or tornados are assumed to fall into one of these three classifications.

### Fire and/or Explosion:

The drum and tank storage areas can be easily accessed by fire-fighting and other emergency vehicles and equipment. Paved blacktop within these areas is kept clear at all times.

During times of power failure or severe weather, Security personnel will be assigned to protect personnel and property. If a fire should break out, concentration will be placed on preventing the fire from spreading to nearby areas.

The following actions will be taken in the areas affected by the fire or explosion:

1. Fire doors in buildings will be closed.
2. Hazardous work in all areas will be shut down immediately.
3. All additional equipment and ignition sources will be shut down, as necessary and practical.
4. The area will be cleared of all personnel not actively involved in fighting the fire. These persons are to report to the designated rally points for accountability.
5. Traffic will be blocked off.
6. All injured persons will be removed, and medical treatment will be administered by qualified personnel.
7. Signetics Safety and Security Department personnel will respond with extinguishers and fire hoses.

The switchboard operator will not be called unless absolutely necessary so that he remains free to handle only emergency calls.

Area or plan evacuation will be necessary in case of major fire or explosion. Specifics are outlined under general evacuation procedures (see exhibit G-2). All personnel have been trained in evacuation procedures and means of exit from their respective work areas. Until evacuation is signaled, personnel who are not in an affected area will stay in their respective work areas. Contract personnel and visitors will be cleared from the area and instructed to report to a security area or office area. An "all clear" signal will be given when the fire has been extinguished and the safety of personnel is no longer endangered. All emergency equipment used in the emergency must be cleaned and fit for use prior to resumption of plant operation in the affected areas.

### Spills or Material Release:

In the event of a major emergency involving a chemical spill, the following general procedures will be used for rapid and safe response and control of the situation:

If an employee discovers a chemical spill or process upset resulting in a vapor release, he or she will immediately report it to the area supervisor.

The area supervisor will contact the Guard Station at the time of the incident. The Guard Station will then contact the Emergency Coordinator or their designee. When contacted, the Emergency Coordinator will obtain information pertaining to the following:

1. The material spilled or released.
2. Location of the release or spillage of hazardous material.
3. An estimate of quantity released and the rate at which it is being released.
4. The direction in which the spill or vapor or smoke release is heading. Any injuries involved.
5. Fire and/or explosion or possibility of these events.
6. The area and materials involved and the intensity of the fire or explosion.

This information will help the Emergency Coordinator to assess the magnitude and potential seriousness of the spill or release. If the accident is determined to lie within the company's emergency response capabilities, the Emergency Coordinator will contact and utilize the necessary inplant personnel. If the accident is beyond plant capabilities, the Emergency Coordinator will contact the appropriate agencies.

In the event of a leak or spill from drums in Flammable Storage #4, the released material will be contained due to the structure of the room and drain to the solvent tank. The level of the solvent tank will be checked by reading the digital level monitor located in the Chemical Support office.

The initial response to any emergency will be to protect human health and safety, and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

In the event of a leak or spill in the tank area, production will be halted. The vault surrounding the tank storage area has the capacity to hold the largest tank and any rainfall. Immediately after the spill is detected, a transporter will be summoned to remove any standing liquids and ship the spilled material to a TSD facility.

If, for some reason, a chemical spill is not contained within the vault, an area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. If the spill is large and involves a tank or a pipeline rupture, initial isolation of at least 100 feet from the nearest sewer drain will be used. Small spills or leaks from a tank or pipe will require evacuation of at least 50 feet in all directions to allow cleanup and repair and to prevent exposure. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible, the area will be roped or otherwise blocked off.

If the spill results in the formation of a toxic vapor cloud (by reaction with surrounding materials or by outbreak of fire) and its release (due to high vapor pressures under ambient conditions), further evacuation will be enforced. Where necessary, an area at least 500 feet wide and 1000 feet long will be evacuated downwind if volatile materials are spilled.

If a large quantity of spilled material ignites, neighboring residents and industries will be notified. Because winds in the areas tend to vary, the quickest and most accurate assessment of meteorological conditions is accomplished by calling the National Weather Service at (505) 243-1371 or 243-1453.

If the control and cleanup of a spill, release, or fire is within the capabilities of company personnel and local response teams, the New Mexico Environmental Improvement Division, the National Response Center or the City of Albuquerque Water Dept. will not be notified unless one of the following occurs:

- o A spill discharges to the sewer or storm drains and the quantity of hazardous material spilled is equal to or greater than the reportable quantity specified under 40 CFR Part 117.
- o The spill involves other hazardous materials not listed in CFR but used at the plant if they pose an actual or potential hazard to life or property.

G.4.e Prevention of Recurrence of Spread of Fires, Explosions, or Releases:

During the emergency, the Emergency Coordinator takes all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other material or hazardous waste at the facility. These measures include, where applicable, stopping processes and operations, collecting and containing released waste, and removal and/or isolation of containers. If the facility stops operations in response to a fire, explosion or release, the Emergency coordinator will monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.

G.4.f Storage and Treatment of Released Material:

Immediately after an emergency, the Emergency Coordinator directs the treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other materials that results from release, fire, or explosion at the facility. (This will be carried out in accordance with all Hazardous Waste regulations.)

G.4.g Incompatible Wastes:

The Emergency Coordinator ensures that in the affected area(s) of the facility no waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed.

G.4.h Post-Emergency Equipment Maintenance:

After an emergency event, all emergency equipment listed in Section G5 will be cleaned so that it is fit for use or it will be replaced. Before operations are resumed, an inspection of all safety equipment will be conducted as discussed in Section F-2. The level of the solvent tank will be checked by reading the digital level monitor to determine if any material was released from Flammable Storage #4. The contents will then be pumped out for proper hazardous waste disposal. The Regional Administrator, state, and local authorities will be notified that post-emergency equipment maintenance has been performed and operations will be resumed.

G.4.i Container Spills and Leakage:

The only containers that may spill are those containing Ignitable Wastes. The Arsenic Contaminated Wastes are in solid state. The Ignitables are stored in a room with floors that slope towards a drain that leads to the "Solvent" Waste Tank. Any residuals will be absorbed with absorbents like neutrasorb and disposed of appropriately. Should the wastes ignite, fire extinguishers or the sprinkler systems will be activated. The City Fire Dept. will be called for aid. All water will drain towards "Solvent" tank, and will subsequently be removed by hazardous waste transporters to Treatment, Storage, Disposal facilities.

G.4.j Tank Spills and Leakage:

Any tank spills or leakage will be contained in the vaults. Commercial hazardous waste vendors will be called for an emergency pick up. The tank will be repaired or replaced. The vault will be inspected for integrity of coatings and cracks.

Should the "Solvent" tank contents ignite, the vault cover will be left on to deplete air. Drain valves leading to the tank will also be closed. After cooling, the lid will be raised and halon or chemicals will be used to extinguish any flames. Should the tank ignite while the vault cover is off, fire extinguishers and hoses will be used. Attempts will be made to extinguish the flame and the City Fire Dept. will be called upon. The water should be contained in the vault which will be disposed of by a commercial hazardous waste facility.

G.5 Emergency Equipment (HWMR 206.13.10.h):

The following equipment items are located in the vicinity of the hazardous waste storage areas:

- a) Portable fire extinguishers
- b) Self-contained breathing apparatus
- c) First Aid Kit
- d) Emergency eye wash and shower
- e) Spill control and clean up equipment
- f) Protective clothing and equipment
- g) Communication and alarm equipment
- h) Water sprinklers
- i) Telephones and extensions
- j) Atmospheric chemical contamination detectors
- k) Oxygen deficiency detector

G.5.a Portable Fire Extinguishers:

Portable fire extinguishers are available for fire control. The extinguishers are ABC type. Type A is capable of extinguishing fires involving ordinary combustible materials such as wood, cloth, paper, rubber, and many plastics; Type B is capable of extinguishing fires involving flammable liquids, oils, greases, tars, oil base paints, lacquers, and flammable gases; and Type C is capable of extinguishing fires involving energized electrical equipment. All extinguishers comply with National Fire Code standards for portable fire extinguishers, and they are inspected after each use or at least monthly. Records of these inspections are noted on the fire extinguishers by Security. These are located along walls outside Flammable Storage areas.

G.5.b Self-Contained Breathing Apparatus:

Self-contained breathing apparatus (18-minute capacity) are located in the hallway between Corrosive and Flammable Storage in cases of hazardous fumes. The equipment is inspected by Security once/month and the log is kept in Security. If any discrepancies are found, the air pack is serviced. There are spare cylinders on hand.

G.5.c First Aid Kit:

First Aid Supplies include: bandages, slings, first aid ointments, disinfectants, and emergency oxygen supply. These are located in Chem Support and in Security Control Center.

G.5.d Emergency Eye Wash and Shower:

Emergency eyewash and showers are located in each storage area and also outdoors by the tank storage. Each unit consists of a drench showerhead with a "panic bar" operated valve. A sign reading "EMERGENCY SHOWER AND EYEWASH FOUNTAIN" is posted at each unit.

G.5.e Spill Control and Clean Up Equipment:

Equipment for use in containing and cleaning up spilled hazardous wastes are stored in the respective corrosive or flammable storage areas. These include:

Hydrofluoric Acid pretreatment	Dust Pan
Acid-neutralizing absorbent	Brush
Alkali-neutralizing absorbent	Shovel
Solvent absorbing material	Empty DOT Drums
Vermiculite	

G.5.f Protective Clothing and Equipment:

Protective clothing and equipment are provided for employees during normal and emergency operations. Hard hats, protective eyewear, steel-toed boots or close-toed shoes and universal gloves are minimum protective clothing required.

Other clothing and equipment available in Chem Support include:

Plastic aprons and gauntlets	Face Shield
Rubber Boots	Disposable respirators
Chemical cartridge respirators	Rain suits
Chemical-resistant suits	Self-contained breathing apparatus

G.5.g Communication and Alarm Equipment:

General Purpose Plant-wide Emergency Equipment include:

- 1 Esterline modular command evacuation alarm system (Plant Wide)
- 1 Motorola two-way radios
- 1 Motorola pager system
- 1 Esterline modular command security supervisor system (Plant Wide)
- 1 Emergency vehicle
- Emergency exits tied into modular command and
- 1 Public address system

The above equipment are located in Security Control Center.

G.5.h Water Sprinklers:

The sprinkler head spacing in the hazardous waste storage area is 144 sq. feet. The sprinkler system is designed such that the water flow from one head will trigger an alarm in Security. The system is inspected on a twice yearly basis.

G.5.i Telephones and Extensions:

The telephones and their extensions are located by the hazardous waste storage area. Ext. 7171 is an emergency number and will reach Security.

G.5.j Atmospheric Chemical Contamination Detectors:

These " Draeger " tubes are used to detect a variety of fumes in acid, flammable and poison groups. These are stored in the Safety Department.

G.5.k Oxygen Deficiency Detector:

This is equipment used to detect less than 19.5% oxygen content in the atmosphere. This equipment is stored in Chem Support area.

G.6 Coordination Agreements (HWMR 206.B.10.j):

Signetics has made the following arrangements to assist in response to emergency situations:

1. Commercial Disposal companies with emergency response capabilities will provide 48-hour response for waste pickups. Commercial Disposal companies will also provide 10-hour response to aid in emergency response services.
2. Copies of the Contingency Plan have been given to the local police and fire departments, the hospital, and the state and local Emergency Response Teams. These agencies have received a copy of the plan (acknowledgement of receipt are in Exhibit G-3).

Albuquerque Fire Academy  
1510 Kitt Carson, S. W.  
Albuquerque, NM 87103  
(505) 766-7900

St. Joseph's Hospital Emer. Rm.  
400 Walter Street, N. E.  
Albuquerque, NM 87102  
(505) 848-8000

Hazardous Waste Bureau  
Environmental Impr. Div.  
Harold Runnels Building  
1190 St. Francis Drive  
P. O. Box 968  
Santa Fe, NM 87504-0968  
(505) 827-2929

Albuquerque Police Dept.  
9500 Montgomery, N. E.  
Albuquerque, NM 87111  
(505) 766-4680

Fire Dept.  
Station 15  
6600 Academy Road, N. E.  
Albuquerque, NM 87109  
(505) 766-7130

G.7 Evacuation Plan (HWMR 206.B.10.i):

The facility personnel will be evacuated if the Emergency Coordinator decides that their personal safety is in danger. The evacuation is initiated by the Emergency Coordinator, who is also the Safety and Security Manager and is carried out with the assistance of the Safety and Security Department. His directions will be given verbally on the P. A. system. The safety rules and evacuation procedures are attached (Exhibit G-3). Evacuation routes from the Hazardous Waste Management facility are indicated by the arrows. The Hazardous Waste Management area is outside, so any direction away from the building is a recommended route. Hazardous Waste Management personnel will go to the evacuation holding area in the west parking lot and remain there awaiting further instructions from the Emergency Coordinator.

G.8 Required Reports (HWMR 206.B.10.m(10)):

In the event of an environmental incident, the owner or operator must notify the State Environmental Improvement Division's Emergency Response office at (505) 827-9329. The secondary Emergency Coordinator will call the New Mexico Environmental Improvement Division Emergency Number and report the incident.

After an environmental incident, the Emergency Coordinator will insure that:

- a. No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and
- b. All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

Operations may only be resumed when the facility is in compliance and cleanup procedures are completed.

The Emergency Coordinator notes in the operating record the time, date, and details of any incident that requires implementing the Contingency Plan. Within 15 days after the incident, he will submit a written report of the incident to the Director. The report must include:

- a. Name, address, and telephone number of the owner or operator;
- b. Name, address, and telephone number of the facility;
- c. Date, time, and type of incident (e.g., fire, explosion);

- d. Name and quantity of material(s) involved;
- e. The extent of injuries, if any;
- f. An assessment of actual or potential hazards to human health or the environment, where this is applicable; and
- g. Estimated quantity and disposition of recovered material that resulted from the incident.

G.9 Plan Update Procedures (HWMR 206.B.10.j):

The Emergency Coordinator will revise this Contingency Plan in accordance with the experience acquired during each emergency situation and will send copies of the revisions to each holder to the original plan.

- 1. Albuquerque Fire Department (2)
- 2. Albuquerque Police Department
- 3. St. Joseph's Hospital
- 4. Pat Herring (Security Manager)
- 5. Jim Buhler (Facilities Manager)
- 6. Signetics Corporate Environmental Affairs Group
- 7. Director, Environmental Improvement Division

The Contingency Plan will be amended by the secondary Emergency Coordinator if: facility permit is revised, facility changes substantially in design, construction, etc., list of emergency coordinators or equipment changes, and if the plan fails in an emergency. The plan will be reviewed for completeness at a minimum of once every two years.

## SECTION I

CLOSURE PLAN, POST-CLOSURE PLAN, AND  
FINANCIAL REQUIREMENTS

This Section is submitted in accordance with the requirements of HWMR 206.D.2. This plan identifies all steps that will be necessary to partially close the facility at any point during its intended operating life and to completely close the facility at the end of its intended operating life. A post-closure plan is not required because this is not a disposal facility and all wastes will be removed at closure.

Signetics will maintain an onsite copy of the approved closure plan and all revisions to the plan until the certification of closure completeness has been submitted and accepted by the Director of EID. Signetics will notify the Director at least 180 days prior to beginning final closure. The closure date for the entire facility will be AD 2050. Upon completion of closure, we will submit to the EID a certification by both Signetics and by Professional Engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

**I.1      Closure Plan:****I.1.a    Closure Performance Standard (HWMR 206.D.2.b):**

This Closure Plan is a controlled maintenance system designed to minimize or eliminate threats to human health and discharge of hazardous waste into the environment. The facility stores wastes generated solely from its manufacturing operations. If there is evidence of any spills or leaks, samples will be taken and analyzed to determine the extent of contamination in the soil and if necessary, in groundwater. Any contaminated soil will be excavated, removed, and disposed of at a proper disposal facility. Any contaminated groundwater will be remedied. The following sections discuss in detail efforts to be made at Signetics to satisfy the closure performance standard.

**I.1.b    Partial and Final Closure Activities (HWMR 206.D.2.C.(a)):**

At the time of this writing, no partial closures are planned. However, the cleanup procedures are outlined by area so that the appropriate sections of the final closure plan may be used for partial closure. In the event of a

partial closure, the closure plan will be rewritten to reflect the change. At a maximum, we expect the operation to consist of storage of 100 drums and 3 x 5,000 gallon tanks during the life of the facility. The closure date for the entire facility is scheduled to be AD 2050.

I.1.c Maximum Waste Inventory (HWMR 206.D.2.C.(b)):

The following table shows the maximum inventory of wastes in storage at any given time during the operating life of Signetics.

1 x 5,000 gl	Waste Hydrofluoric Acid
1 x 5,000 gl	Waste Buffered Oxide Etch (Hydrofluoric Acid/Ammonium Fluoride)
1 x 5,000 gl	Waste "Solvent I"
36 x 55 gl	Waste "Solvent II"
64 x 55 gl	Arsenic or Mercury-Contaminated Waste

I.1.d General Closure Procedures:

A) Signetics will utilize its employees and outside contractors for final closure of the facility. The activities involved are:

- 1) Removal of hazardous waste inventory
- 2) Decontamination of hazardous waste drain pipes
- 3) Disposal of tank contents
- 4) Decontamination of tanks
- 5) Decontamination of containment vaults
- 6) Disposal of tanks
- 7) Disposal of drum inventory
- 8) Clean up drum storage area

The work involved in decontamination will be supervised and performed by qualified Signetics personnel, except where stated otherwise. Safety precautions will be taken during decontamination procedures to prevent personal injury. Personnel will be equipped with the necessary safety equipment such as goggles, gloves, boots, respirators and coverall clothing.

No open flames, sparking tools, or smoking will be allowed near the Ignitable Storage Area. A combustible gas detector capable of measuring lower explosion limits (LEL) will be available to the workers to assess any hazards posed by ignitable vapors. Fire extinguishers will be made available.

The appropriate absorbent and neutralizing materials will be available in case of a spill during clean-up procedures (i.e., Solusorb for organic solvents, Neutrasorb for acids, and Neutracid for bases). Should any spill-control materials be employed, the resulting waste will be placed in a 55-gallon drum available at the clean-up site. This drum will be disposed of with the other drummed wastes generated during clean-up.

Before leaving the work area, members of the clean-up team will rinse off their boots, and other contaminated clothing, and wash areas of exposed skin. They will be inspected for cleanliness by a supervisor before leaving the site.

Equipment used in the clean-up (pumps, safety gear, scrub brushes, steam-cleaning equipment, etc.) will be washed with water, or steam cleaned if necessary, to ensure it is clean after its final use. A visual inspection or lab analysis of each article will be made before it is declared decontaminated and can be stored or returned.

The inspections of equipment cleanliness and personnel will be made by the clean up team supervisor. Visual inspections made by clean-up personnel to assure decontamination will be recorded by the supervisor.

The soil is not expected to be contaminated by waste storage at Signetics. Soil contamination is avoided because the wastes are stored in tanks situated within coated concrete vaults to provide primary and secondary containment. Any spills in the past will have been decontaminated at the time, as specified in the Container Management Plan and "Contingency Plan." This closure plan will be revised should contamination or leaks be detected during the operating life of the facility.

The following is a suggested list of clean-up materials:

- 1 long handled squeegee
- 1 long handled shovel
- 1 - 2 brooms
- Dustpan
- 3 mil thick plastic bags
- 40 55-gal drums
- 5 sets of clean-up clothing
- Sampling bottles and equipment

Steam cleaner  
Scrub brushes  
Pump (Hand or electric)  
Neutralizing and Absorbent materials  
Portable combustible gas detector  
Fire extinguisher  
Garden hose and water  
pH paper

**I.1.e Decontamination and Closure of Drum Storage:**

The last of the hazardous waste containing drums will be properly labelled, marked, manifested and shipped by a permitted transporter to a disposal facility (e.g. IT Corporation, Chemical Waste Management). If spills or leaks remain, the storage area will be cleaned by scraping or absorbing with Neutrasorb. The residuals will be drummed and analyzed (if necessary) and shipped to a TSD as above. Analysis of residual material will depend on the location where they are obtained from, either Chemical Storage #2 or Flammable Storage #4. For material collected in Chemical Storage #2, analysis will determine the level of mercury and/or arsenic in the residue. Material obtained from Flammable Storage #4 will be tested to determine if it should be considered as an ignitable material.

**I.1.f Decontamination and Closure of Tank Storage:**

After manufacturing shutdown, the drain lines leading to the hazardous waste storage tanks will be rinsed copiously with water. The pH of the rinsate will be tested to be greater than 5 at the last clean-out trap. The two acid storage tanks will be rinsed with water and the rinsate removed by a commercial vendor or, where appropriate, pumped into wastewater neutralization. The procedures will be repeated until the pH of the rinsate is greater than 5.

The solvent-containing tank will be rinsed and filled with 5,000 gallons of water and pumped out for hazardous waste disposal. It will then be visually inspected for sludge. If there is sludge in the tank, a sample will be collected and analyzed for ignitability and EP toxicity.

Sludge which is non-hazardous will be left alone. Sludge with hazardous characteristics will be removed from the tanks by scraping the tank bottom with long-handled shovels and squeegees from outside the tank through the 24-inch manhold. The sludge will be collected in a 55-gallon drum and then stored with the other wastes generated during clean-up until the final waste pick-up. It is anticipated that less than one drum of waste sludge will be collected.

Many of the solvents stored in this tank have flash points below 100 degrees C and the residue of these solvents may result in a sludge that is ignitable. The solvent waste stream does not include any EP toxic material, however, as many solvents are used for cleaning purposes, it is possible that over the life of the tank insoluble EP toxic materials may be partitioned and concentrate as a sludge on the bottom of the tank.

A steam-cleaning unit will be rented to decontaminate the tanks. Steam (a typical unit operated at 700 psi and 22 degrees F) will be injected into the tank.

The resulting wash water will be sampled for total organic carbon (TOC), and be pumped into 55-gallon drums to be stored until the final waste pick-up. Waste water discharge which will meet the POTW waste water discharge requirements will be directed into the waste water treatment system.

The solvent tank collects both routine, large-volume, process solvents and the small volume special-purpose solvents. The mixture of these solvents is complex and the use of TOC measurements will give an accurate indication of when all solvents or oily residue have been removed from the surfaces of the tank.

The decontaminated tanks will be disconnected from the pipes and the tie-down straps and then be removed from the concrete vault by crane. The tanks will either be sold for scrap or transferred to another Signetics site. All hazardous waste pipes will be dismantled and collected for disposal at Class I facilities.

Residual liquids remaining in vaults as a result of decontamination will be pumped into wastewater neutralization or drums. Surfaces will be washed down. It is estimated that a maximum of 1,000 gallons or 20 drums of liquids will be generated from the above procedures. The drums will be disposed of as hazardous wastes.

I.1.g Schedule for Closure (HWMR 206.D.2.d.):

Exhibit I-1 is the anticipated closure schedule. The Director will be notified 180 days before beginning closure. Final closure will be supervised and certified by an independent Professional Engineer in addition to Signetics' personnel.

I.1.h Extension for Closure Time:

At this time, we do not require an extension for closure time.

I.2 Post-Closure Plans:

Post-closure care will not be needed for this facility because this is not a disposal facility.

I.3 Notice in Deed and Notice to Local Land Authority:

Because Signetics is only a hazardous waste storage facility and not a disposal facility, notation is not necessary in the deed informing potential purchasers of restrictions associated with a disposal site, as required by HWMR 206.D.2.i.j.

I.4 Closure Cost Estimate (HWMR 206.D.3.c):

An estimated \$80,000 (June 1985 cost estimate) will be needed to close the Signetics hazardous waste storage facilities. The closure costs are presented by activity in Table I-1. Activities include removal of waste inventory, decontamination, disposal of rinsates, removal of tanks, lab analyses, and closure certification.

This closure cost estimate will be kept on file at the Signetics facility. It will be revised whenever a change in the closure plan affects the cost of closure. It will be adjusted annually (from the date of its original development) to reflect changes in closure cost brought about by inflation. The Department of Commerce's Annual Implicit Price Deflator for Gross National Product\* will be used to make this adjustment.

\* Department of Commerce, Survey of Current Business.

TABLE I-1

## COST OF CLOSURE ESTIMATE

<b>A. <u>Tanks</u></b>	
a) Chemicals for neutralization of rinsate	\$ 1,000
b) Disposal Cost of 20,000 gallons of contents and rinsates	26,000
c) Disposal Cost of 20 drums of contaminated liquids from vaults @ \$100/drum	2,000
d) Disposal of contaminated scraps, plumbing	5,000
e) Crane rental - 8 hours @ \$100/hour	800
f) Steam cleaner rental 2 days @ \$100/day	200
g) Laboratory analyses of sludges and residuals	2,000
h) Plant labor 96 hours @ \$10/hour	960
i) Supervision 50 hours @ \$30/hour	1,500
	-----
	Sub Total.....\$39,460
<b>B. <u>Other Containers</u></b>	
a) Disposal cost of 100 drums @ \$100/drum	\$10,000
b) Plant labor 16 hours at \$10/hour	160
c) Lab analyses of various drums	5,000
	-----
	Sub Total.....\$15,160

TABLE I-1 (CONTINUED)

<u>C. General</u>	
a. Safety clothing and equipment @ \$100/worker	\$ 500
b. Certification	
1) Signetics supervisor 24 hours @ \$30/hour	720
2) New Mexico Professional Engineer 60 hours @ \$60/hour	3,600
c. Solid wastes left from clean-up 10 drums @ \$100/drum	1,000
	-----
Sub Total.....	\$ 5,820
<u>D. Total of Subtotals</u>	
a. Tanks	\$39,460
b. Other Containers	15,160
c. General	5,820
	-----
	\$60,440
<u>E. Peripheral</u>	
a. 15% Administrative	\$ 9,426
b. 15% Contingencies	9,426
	-----
Total Closure Cost (1985 Dollars).....	\$79,292

I.5 Financial Assurance Mechanism for Closure  
(HWMR 206.D.3.d.):

I.5.a Financial Test and Corporate Guarantee for Closure  
(HWMR 206.D.3.d.(5)):

Per the document in Exhibit I-2, Signetics has elected to utilize the Financial Test as a mechanism for assuring closure funds. This document will be updated within 90 days after the close of each succeeding fiscal year.

I.6 Post-Closure Cost Estimate (HWMR 206.D.3.e):

Since all wastes will be disposed of offsite, there will be no post-closure activities or costs.

I.7 Financial Assurance Mechanism for Post-Closure (HWMR 206.D.3.f):

Since all wastes will be disposed of offsite, there will be no post-closure activities or costs.

I.8 Liability Insurance (HWMR 206.D.3.h):

I.8.a Sudden Insurance (HWMR 206.D.3.h.(1)):

Signetics has obtained liability insurance for sudden and accidental occurrences in the amount of \$4 million per occurrence with an annual aggregate of \$8 million exclusive of legal defense costs. A copy of the signed certificate of liability insurance has been sent to the Director by certified mail. The certificate is worded as specified in HWMR 206.D.3.j.(10) (see Exhibit I-3).

I.8.b Nonsudden Insurance (HWMR 206.D.3.h.(2)):

Signetics is a storage facility, therefore, no liability insurance is required for a nonsudden accidental occurrence.

I.8.c Financial Test (HWMR 206.D.3.h.(3)):

Signetics has an insurance policy for sudden and accidental occurrences, therefore, the financial test is not necessary.

I.8.d Variance Procedures (HWMR 206.D.3.h.(3)):

Signetics will not request the Director for a reduction of liability amounts.

I.8.e Adjustment Procedures (HWMR 206.D.3.h.(4)):

If the Director increases the amounts of liability coverage or elects to improve nonsudden liability coverage requirements, Signetics will immediately seek an adjustment to the insurance policy discussed above.

# ATTACHMENT G

## SECTION D

### PROCESS INFORMATION

This section discusses specific process information for the storage of containers and tanks (HWMR 206.D.4).

#### D.1 Containers:

##### D.1.a Description of Containers:

The primary containment devices are 55-gallon metal drums. The two types of drums used at Signetics are reconditioned DOT 17H and reconditioned DOT 17E containers. Signetics buys all drums needed for waste disposal. The DOT 17H drums are open-head, 18 gauge body/bottom, with 14 gauge heads. The DOT 17E drums are bung type, 18 gauge body/bottom/head (see Exhibit D-2).

The DOT 17H drums are used for contaminated solid Toxic wastes while the DOT 17E drums are used for Ignitable Wastes. Steel drums for the Ignitable Wastes are recommended by the manufacturers of the virgin chemicals.

##### D.1.b Container Management Practices:

All drums are stored indoors between 60-80 degrees F. For liquid wastes, the drums are filled from smaller containers in the storage areas. The transferred wastes are brought by personnel to the storage areas in 5-gallon Nalgene carboys. For solid wastes, these are bagged and brought to the drum storage and transferred into the drums. The wastes include used Photoresist Acetone Mixture and Arsenic or Mercury-contaminated solid materials. These wastes are accompanied by chemical manifests during transit (see Exhibit D-1).

In the storage areas (Chemical Storage #2 and Flammable Storage #4) (Exhibit D-3), the recipient drums are placed on pallets, four drums/pallet. Before any drums are used, an EPA hazardous waste label is attached to the recipient drums and a drum number assigned. Each label is filled out with the following information: Proper D.O.T. shipping name, UN number, generator name, address, city, state, zip, EPA identification number, EPA waste number, and the accumulation start date. Labels required by the D.O.T. are applied to the drums prior to shipment. The age of the drums is tracked by the date on the EPA label. The drums are stored on pallets to elevate them from contact with standing liquids. All drums are single stacked.

A drum will be opened to add wastes approximately 10-20 times before it is filled. The only tool used for opening and closing drums is a bung wrench. To transfer liquid wastes, the Chemical Tech pours the waste through a spigot carefully to avoid spillage. The two-inch bung caps are replaced each time waste chemicals are poured into the drums. To transfer contaminated solid materials, the Chemical Tech places the Hazardous Waste plastic bag into the drum and replaces the top head and bolt rings to the drum. This procedure is followed for every addition to the drum. When additions are made to either drum, the Chemical Tech fills out on a Hazardous Waste Drum Log (See Exhibit D-9) the date the addition was made, type of waste added, chemical manifest reference no., and the Tech's initials. These logs are filled out for each drum used and are placed in same area as drums. After the drums are full, the drum logs are maintained in a permanent file by drum number.

The drums are placed by the Chemical Tech in the designated area as outlined by yellow-striped warning tape.

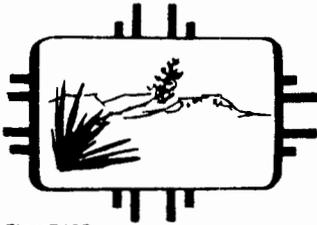
The Ignitable Wastes and Arsenic-Contaminated Solid Wastes are stored in separate areas due to possible incompatibility. No smoking or open flames are allowed in the vicinity of the storage areas.

The storage areas are inspected daily to assure that the drums are in good condition and that the base remains impervious and is in good condition. Inspection logs are completed and kept on file in Chemical Support for the life of the facility.

#### D.1.c Location of Waste Storage:

The two areas where the wastes are stored are: 1) Chemical Storage #2 (solid waste contaminated with mercury or arsenic) and 2) Flammable Storage #4 (Ignitable Waste). Both areas have signs designating them as DANGER areas with only authorized personnel allowed to enter. (Signs are in both English and Spanish.

Flammable Storage #4 has total capacity of 36 drums single stack, while Chemical Storage #2 has a potential total capacity of 64 drums double stacked whose maximum height does not exceed 8'. When necessary, the two storage areas can be expanded with more floor space allocated for hazardous wastes.



NEW MEXICO  
HEALTH AND ENVIRONMENT  
DEPARTMENT

Post Office Box 968  
Santa Fe, New Mexico 87504-0968

GARREY CARRUTHERS  
Governor

LARRY GORDON  
Secretary

CARLA L. MUTH  
Deputy Secretary

September 1, 1988

Mr. Gary Mavrakis  
Chemical Support Manager  
Signetics Corporation  
P.O. Box 10272  
Albuquerque, New Mexico 87184

**Certified Return Receipt Requested**

RE: NMD 000709782

Dear Mr. Mavrakis:

Your request of August 16, 1988 to make a minor change to your operating permit paragraph D.1.d. of Attachment G is hereby granted. The subject paragraph is corrected to state flammable storage #4 has an area of 550 square feet rather than 572 square feet.

Thank you for bringing this matter to our attention. If you have any questions please contact Mr. C. Kelley Crossman on my staff at 827-2923.

Sincerely,

  
Kirkland L. Jones, Ph.D.  
Acting Director

KLJ/CKC/pv

cc: Janie Hernandez, EPA (6H-HS)

RECEIVED

AUG 19 1988

HAZARDOUS WASTE SECTION

**Signetics**

is subsidiary of U.S. Philips Corporation

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

August 16, 1988

Mr. Kelley Crossman  
Environmental Improvement Division  
Harold Runnels Building  
1190 St. Francis Dr.  
Santa Fe, NM 87504-0968

Re: Minor modification request

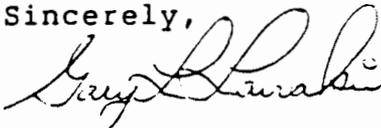
Dear Mr. Crossman:

Per our phone conversation on August 9, 1988, I am requesting a minor modification (40 CFR Part 270.42) to our RCRA Operating Permit issued April 1, 1986. This request is due to a safety requirement by the City of Albuquerque.

We are presently building a Chemical Receiving Dock that will allow chemicals to be safely transported to the storage areas. This dock is located adjacent to Flammable Storage #4, as described in our permit in section D.1.d. Due to the nature of the dock construction, the City of Albuquerque is requiring a safety fire escape door which needs to be built into Flammable Storage #4. The dimensions of the space, required to be taken out of FS4, will be 4'8" by 4'8" accounting for 21.8 square feet of floor space. I have attached drawings which show our current and the modified arrangements. The escape area will be walled with a ceiling so that there will be no access from the outside into FS4. All other aspects of the room will remain unchanged.

If you have additional questions regarding this request, please notify me at (505)822-7188.

Sincerely,



Gary M. Mavrakis  
Chemical Support Manager

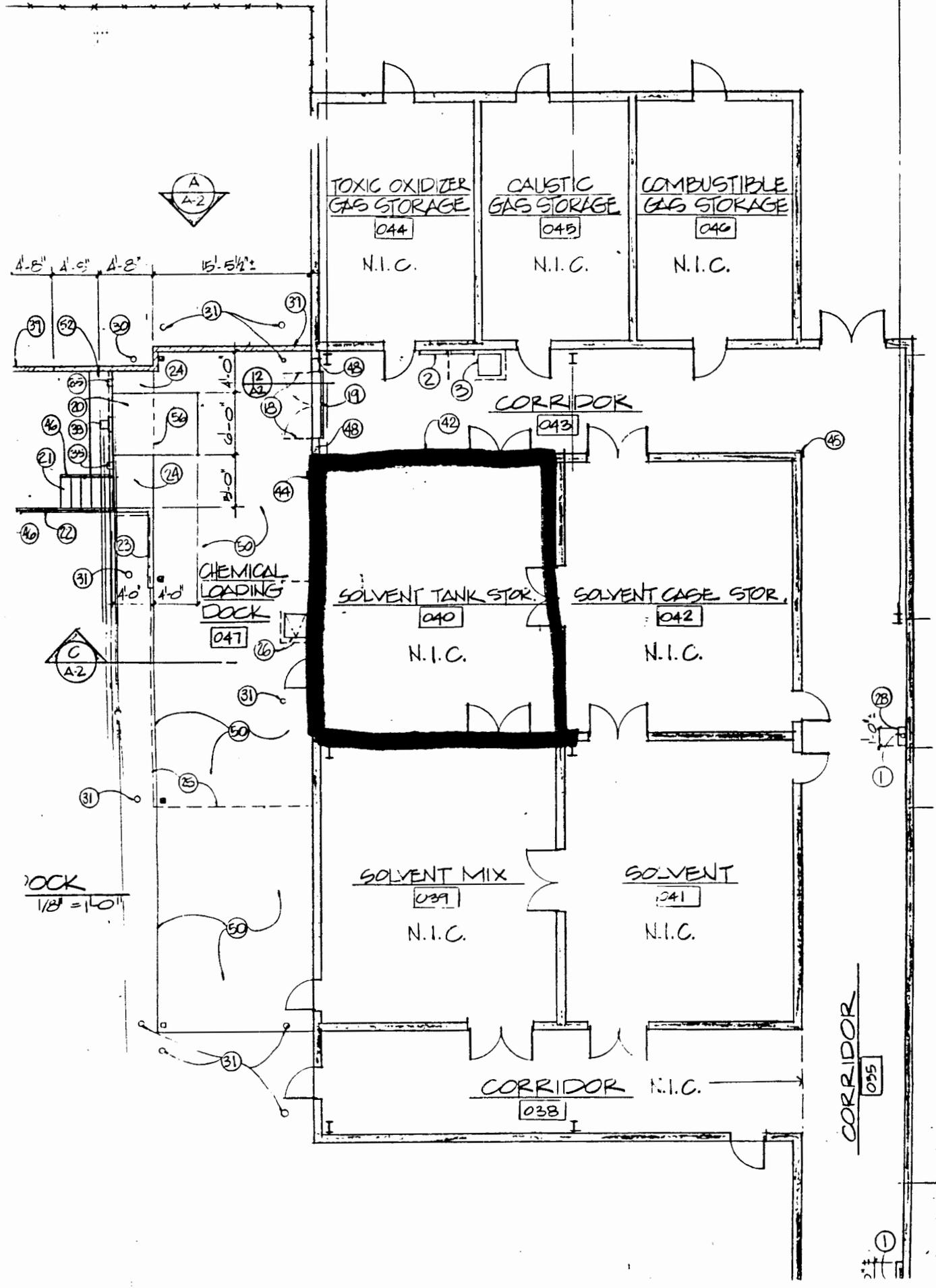
cc: Jim Davison-Signetix Sunnyvale  
Cathy Weber-Signetix Albuquerque

CURRENT

7.4

8.3

9.5



4'-8" 4'-6" 4'-8" 15'-5 1/2"

4'-0" 4'-0" 4'-0" 4'-0"

DOCK  
1/8" = 1'-0"

TOXIC OXIDIZER  
GAS STORAGE

044

N.I.C.

CAUSTIC  
GAS STORAGE

045

N.I.C.

COMBUSTIBLE  
GAS STORAGE

046

N.I.C.

CORRIDOR

043

SOLVENT TANK STOR.

040

N.I.C.

SOLVENT CASE STOR.

042

N.I.C.

SOLVENT MIX

039

N.I.C.

SOLVENT

041

N.I.C.

CORRIDOR

038

CORRIDOR

035



D.1.d Description of Container Storage Area:

There are two container storage areas located inside the facility. The area where the Arsenic or Mercury-Contaminated Waste is located is within Chemical Storage #2. The Ignitable Waste is stored in Flammable Storage #4 (See Exhibit D-3).

<sup>58</sup>  
Flammable Storage #4 - has inside dimensions of 22' by 26' with ~~572~~ square feet of floor space. The floor is an 8" concrete slab and the walls are 8" concrete masonry units. (All walls are one hour fire-rated.) The room is also equipped with make-up and exhaust air. The room has 6' double doors on the west, north, and east walls. There is a 3' door in the southeast section of the room. These doors on the north and east walls are fire rated for one hour. The doors on the west and southeast are strictly for occupancy separation. The floor-to-ceiling height slopes from north to south (26-1/4' to 25-1/2').

The roof has a 4' x 4' x 1/4" explosion vent which will open when the internal pressure of the room exceeds 600 pounds per square inch. The roof is metal beam with a 10.5" concrete waffle slab covered with a 4" concrete topping over a waterproof membrane.

The floor is at a slope which drops four inches from each wall to the center. The floor has a 4" floor drain which is attached to a drain line running to the "Solvent" Waste Tank. The tank has a 5,000 gallon capacity which is sufficient to contain 10% (200 gals.) of the stored drums. Spills or leaks will be cleaned up by applying commercial flammable absorbing agents and disposed of properly.

Chemical Storage #2 - has 2611 square feet of floor space (See Exhibit D-3 for dimensions of the room). The floor is an 8" concrete slab with walls which are 8" masonry units. The container storage area is located in the southwest corner of the room and is bound by yellow stripe tape with 172 square feet of available storage space. The room has 10' wide electric roll-up gates on the north and south walls of the room. The room also has 3' doors on the north and south walls. The floor-to-ceiling height slopes from north to south (26-1/4' to 25-1/2').

The roof is metal beam with two layers of 1-5/8" rigid fiberglass insulation covered with a 4" concrete topping over a waterproof membrane.

The floor has a 3" drain line that runs north into the piping trench. Here the line is attached to a 6" acid waste drain which is connected to the waste water treatment system. The piping trench is equipped with a sump, air pump, and level controls in case of a spill. As the level rises, the float turns on the air pump. The discharge enters the wastewater treatment system. Since the hazardous wastes stored in this room are in solid state, no drainage of hazardous waste will occur. Run-on into both storage areas is controlled by the asphalt drive on south side of each area being sloped away from the storage areas.

**D.1.e Test for Free Liquids:**

Elemental arsenic is purchased as a solid and used in the manufacturing process as a solid. It does not come into contact with liquids. The only wastes are the rags and gloves used to transfer the material. These wastes are collected from the glove box, bagged, labelled, and accumulated in drums. From knowledge of the process, there are no liquids in the arsenic waste drums. The same applies to the mercury containing lamps.

**D.2 Tanks (HWMR 206.D.5):**

**D.2.a Description of Tanks:**

There are three tanks in use at this facility for storage of hazardous wastes. These tanks were purchased as new during June, 1982. The location of the three tanks is shown in Exhibit D-3. Tank 5 is a 5000-gallon tank holding Hydrofluoric Acid Waste. Tank 4 is 5000-gallon tank containing Buffered Oxide Etch Waste. Tank 3 is 5000-gallon tank containing mixed Ignitable Solvent Waste. The waste in these three tanks is picked up by a waste transporter and taken to a TSD facility.

All three tanks are supported vertically, underground in covered vaults. These vaults are concrete and coated with chemically-resistant resins. The tanks are UL labelled. (See Exhibit D-4). Tanks 4 and 5 are flat bottom with flat tops. The tanks are fiberglass with reinforced plastic filament and supported by 5/16" nominal diameter Siemen-Martin grade steel PVC (ASTM-A - 475) extended jackets. They are made

by the reinforced plastic filament winding process providing a smooth inner surface, an interior layout from 20-30% by weight of noncontinuous glass strands having fiber lengths from 0.5 to 2.0 inches and an exterior layer of continuous roving interspersed with chopped strand glass reinforcement. The ultimate stress is 120,000 psi. The tanks are 10' in diameter and 8'6" high. The tanks were built in 1982 and conform to PS 15-69 (Voluntary Product Standard) and ASTM D3299-74 tank design criteria. The seams were constructed using the Centrifugal Molding Process. The tanks are synthetic veiled (corrosion barrier veil resistant) with a thickness of 7/32-11/32". They are corrosion resistant to 10% HF @ 150 degrees F or to 30% HF @ 100 degrees F. Other pertinent characteristics:

- Wind Load 25psf (87mph)
- Wind Stress safety 3 to 1
- Resin to glass ratio 75/25-30
- Minimum 300 lbs live load with safety factor
- 3" vent with polypropylene screen
- Seismic load = 0.1 Zone III

Tank 3 is flat bottom with a flat top. The tank is constructed of mild steel with a wall thickness of 3/16". The tank is 10' in diameter and 8' 6" in height. The tank was constructed in 1982 and conforms to UL58-76 (steel underground tank for flammable and combustible liquids) and ASTM A36 tank design criteria. The seams are double welded butt, API 12F. The tank has a corrosion allowance of <0.002" per year.

Each tank is equipped with a 3" fill line which attaches to the main drain system from the process area. The piping material used to carry the waste from the generation point to the waste tanks is as follows:

1. From generation points to main drain line:

- HF & BOE Lines 2" SCH 80 DWV Pipe
- Solvent Line 2" SCH 40 Mild Steel Pipe

2. From main drain line to waste storage tanks:

- HF & BOE Lines 4" SCH 80 PVC Pipe
- Solvent Line 4" SCH 40 Mild Steel Pipe

3. Welding Method:

- DWV Line Fuse SEal
- PVC Line Glue
- Mile Steel Line Jointed by Threaded Steel Fittings

The tanks are attached to the bottom of each vault by four tank tie-down lugs. Each lug has two anchor 3/4" stainless steel bolts for attachment. Tanks 4 and 5 use viton gaskets with the bolts and tank 3 uses a teflon gasket. The tanks are designed to contain the highest specific gravity chemical used at Signetics.

Each tank is equipped with 24" standard manways, suction line, one feed line, level sensor, and two 3" blind flanges. Tanks 4 and 5 are equipped with goose-neck vents while tank 3 has a 3" vent line which runs through the trench system and attaches to the outside of the building and vents to atmosphere. The tanks are normally closed. None of the tanks has an inner liner. Due to the nature of the design and construction of the tanks, outer coatings are not required. All the tanks have 3" hose connections on the manhole covers for ease of unloading onto tank trucks. (See Exhibit D-4).

**D.2..b Tank Management Practices:**

The waste tanks collect liquids through gravity feed from the sinks in the manufacturing process. The segregated wastes drain through pipes in the manufacturing area service aisles. The pipes penetrate the floor to the basement which then follow the service trench for 270 feet until connection with each tank. The pipes are accessible for visual inspections (see Exhibit D-5). The levels of the tanks are monitored daily by reading the Wesmar DLM 12 Digital level monitor. This information is recorded daily onto the Hazardous Waste Storage Tank Log. The tanks are equipped with level monitors which have visual alarms that light up when the levels of each tank reach 5'9" and again when level reaches 7'6". (Full tank height is 8'.) The daily level monitoring ensures that the Chemical Tech is aware of the level of each tank.

When the storage of Tanks 4 and 5 reach a combined total of 4700 gallons, the waste is transported to a TSD facility. Since Tank 3 is used as the containment "sump" for FS#4, the waste is transported to a TSD facility when the level reaches 4000 gallons. So that the "sump" condition is maintained at all times, waste solvent generation is stopped when the level in the tank reaches 4800 gallons.

The tanks are vented to atmosphere so there exists no pressure buildup in the tanks and the tanks are operated outside at ambient temperatures. Since no off-site wastes are collected, the tank wastes are "predictable" due to permanent drain hookups in manufacturing.

On a daily basis, an inspection log (See Section F) for the tanks is completed. The items checked are: visual inspection of tanks, visual inspection of vault, waste chemical feed systems, and the presence of odors. Every month the trench area is inspected. The visual inspection program allows for identification of potential problems and expedites preventive maintenance and good housekeeping procedures for the plant. During the inspection, the Chemical Tech checks for leaking pipes and pumps, tank corrosion, puddles, deterioration of support or foundations, stains on walls, stains along drainage areas, and all forms of deterioration in containment facilities. Construction plans specify that none or minimal buried or concealed drain lines be installed in order to facilitate inspection and easy detection of problems.

A complete record of the inspection logs and preventive maintenance actions is kept at the facility.

D.2.c Description of Secondary Containment:

Secondary containment for the underground storage tanks is provided by a concrete vault for each tank. See Exhibit D-6. The overall inside dimensions for each vault is 11' wide by 11' long and 13' 10" deep. Each vault has a one-foot blockout used for ventilation of the areas. Usable containment dimensions are 11' wide by 11' long and 10' 8" deep. Vault 3 is coated on the base and walls with Ceilcote Ceilcrete 6650 B (See Exhibit D-7a). Vaults 4 and 5 are coated with Ceilcote Flakeline 232 (See Exhibit D-7b) on the base and the walls.

There exists no drains in the secondary containment vaults. The usable containment capacity for each vault is 9,600 gallons which represents 192% of the 5000 gallon tank capacity.

The concrete walls and base are 8" thick and reinforce with rebar. The rebar is 3/4" running vertically while being crosshatched with 1/2" rebar.

Each vault is covered with a 1/4" thick checker plate vault cover whose dimensions are 11' 7-3/4" x 11' 7-3/4". Each cover has a continuous neoprene gasket glued to the edge so that water seepage is minimal. Each cover has a 25-5/8" x 25-5/8" manhole with hinged cover for access to vault. Two 12" x 12" handholds with hinged covers are also attached for access to the suction line and the open vault (see Exhibit D-8).

D.3 Wastes Piles, Surface Impoundment and Landfill:

There are no waste piles, surface impoundments, incinerators or land treatment, or landfill facilities at this site.

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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 (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 its 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 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 the final permit to Signetics considered all comments made with respect to the draft permit during the comment periods. Any person which commented on the draft permit who believes any condition of the permit is inappropriate or that EPA's and/or EID's decision to issue the 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 include 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 FID, 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.

## 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 92 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) iff 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".

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 11<sup>th</sup> day of February 1986  
by [Signature]  
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.

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 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 1224.15.
- 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(h)(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.119 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.110 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.220 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.221 Signatory Requirement.  
All reports or other information requested by the Regional Administrator shall be signed and certified according to 40 CFR 270.11.

R. SPECIFIC

R.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(h).

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.

R.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.