General Instrument

General Instrument Corporation
Power Semiconductor Division
172 Spruce Street
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November 10, 1993

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

Mr. Robert Becherer, P.E.
Regional Hazardous Substances Engineer
New York State Department of Environmental Conservation
Building 40
SUNY at Stonybrook
Stonybrook, New York 11790

Attn: Ms. Agnes Gara, Sanitary Engineer, Region 1

Re: CLOSURE PLAN Update (revision H) and
Waste Analysis Plan Update (revision A)
EPA ID No. NYD000348474

Dear Mrs Gara:

As Mr. Desai, of NYSDEC, Albany had requested in his letter of September 28, 1993, I am submitting for your review Revision H of this facility's Closure Plan. It addresses the two violations listed in the above referenced letter.

Should you have any questions, please call either me or Mara Sinayuk at 516-333-8400.

Regards,

John Sapio
Manager of EHS, Facilities & Equipment

Enclosure

cc: Janadrai M. Desai, P.E.
Supervisor
Compliance Inspection Section
Hazardous Waste Compliance Unit
Division of Hazardous Substances Regulation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233
Attn: Mr. Arwind Goswami, Reviewer, Central Office

CLOSURE PLAN

GENERAL INSTRUMENT CORPORATION

POWER SEMICONDUCTOR DIVISION

WESTBURY, NEW YORK 11590

EPA ID No. NYD 000348474

Prepared: December, 1982

Rev-n H: November 9, 1993

Prepared by John Sapio

CLOSURE PLAN

POWER SEMICONDUCTOR DIVISION

TABLE OF CONTENTS

		PAGE NO.
I.	SCOPE	1
II.	PROCESS OPERATIONS	1
III.	LIST OF TYPICAL HAZARDOUS WASTES	4
IV.	WASTE GENERATING OPER-S	4
V.	LIQUID WASTE STORAGE FACILITIES	6
VI.	CLOSURE	8
VII.	CERTIFICATE OF CLOSURE	10
VIII	CLOSURE COST ESTIMATE	10
IX.	APENDIX - SOIL TESTING	14
X.	FACILITY CHANGES SINCE MARCH, 1993	15

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
I	Bulk and containerized hazardous waste	4
II	Closure Cost Estimate	11
III	Closure Schedule	13

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
I	Location Map	2
II	Site Plan	3
III	Process Waste Flow Schematic	7

HAZARDOUS WASTE STORAGE CLOSURE PLAN

WESTBURY FACILITY

I. SCOPE

This plan outlines the procedures to be taken to close the hazardous waste generator and accumulator portions of this facility. Currently all hazardous wastes are generated on site and no hazardous wastes are accepted from any off site facility. Ultimately all these generated wastes are manifested and transported to a licensed TSD facility for disposal within the ninety (90) day holding period limit.

It is the intent of this plan to ensure that there is no post-closure escape of hazardous materials from this facility to the environment.

It should also be noted that there is currently only one (1) active hazardous waste storage tank in use on site. This plan will outline the procedures to be undertaken to remove this system.

There are also satellite accumulation areas located within the building. These consist of alcohol and acetone contaminated Q-tips and wipers which are collected as listed hazardous wastes. There is also a satellite accumulation area for sodium hydroxide contaminated rags. These rags will undergo elementary neutralization and cleaning in an effort to recycle these rags. Those neutralized rags which remain in an unusable condition will be disposed of, all others will be reused. For purposes of this plan it is assumed that all accumulation areas are full.

II. PROCESS OPERATIONS

General Instrument Corporation's Westbury building is a small-sized manufacturing facility involved in the research, development and production of semiconductors. Process operations consist of chemical vapor deposition, diffusion, oxidation, cleaning and etching processes.

The facility is located on a one acre plot at 172 Spruce Street, approximately one-half mile north of Old Country Road and one quarter mile east of Post Avenue in Westbury, Long Island. See Figure I, Location Map. The Westbury facility of the Power Semiconductor Division operates out of a 10,000 square foot single-story building located on the east side of Spruce Street just south of Maple Avenue. Parking is provided on the west side of the building off Spruce Street. See Figure II, Facility Site Plan.

FIGURE I
LOCATION MAP

DISCRETE SEMICONDUCTOR DIVISION
WESTBURY, NASSAU CO., NEW YORK
EPA I.D. NO. NYD000348474

H2M HOLZMACHER, McLENDON & MURRELL, P.C.
CONSULTING ENGINEERS, ENVIRONMENTAL SCIENTISTS and PLANNERS
MELVILLE, N.Y.
FARMINGDALE, N.Y.
RIVERHEAD, N.Y.

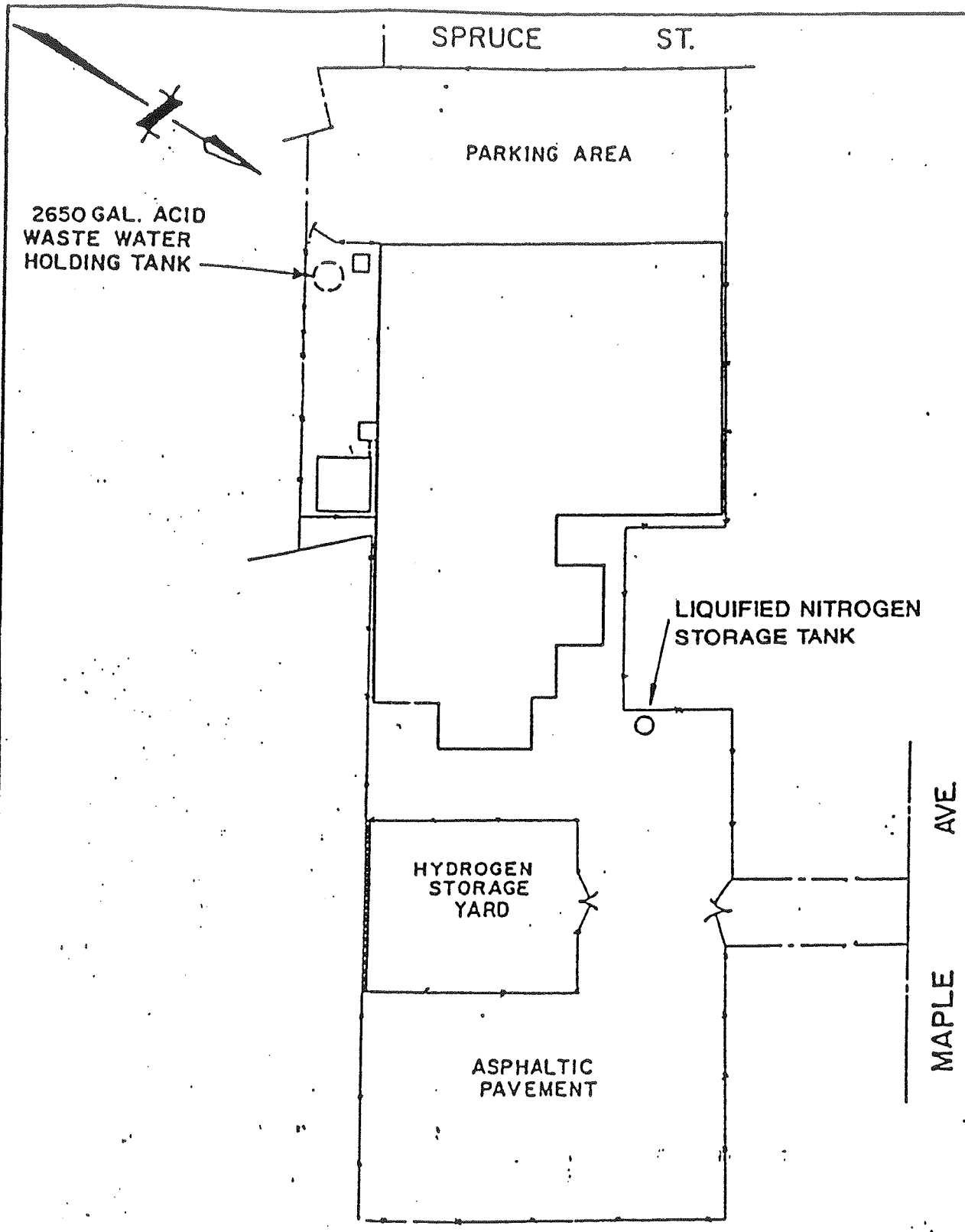

FIGURE II
SITE PLAN

POWER SEMICONDUCTOR DIVISION
WESTBURY, NASSAU CO., NEW YORK

REVISED AUGUST 1989

EPA I.D. NO. NYD000348474

H2M HOLZMACHER, McLENDON & MURRELL, P.C.
CONSULTING ENGINEERS, ENVIRONMENTAL SCIENTISTS and PLANNERS

MELVILLE, N.Y.
FARMINGDALE, N.Y.
RIVERHEAD, N.Y.

III. LIST OF TYPICAL HAZARDOUS WASTES

A. BULK AND CONTAINERIZED HAZARDOUS WASTE

TABLE I

No.	Qty	U.S.Dot Shipping Name	Chemical Component	TSD	EPA Code	CWM Profile#
1	2,650 gal.	RQ Waste Sodium Hydroxide Solution 8, UN1824, pGII; (D002, D007)	Sodium Hydroxide	T	D002 D009	E93488
2	6 gal cont.	Hazardous Waste Solid (Methanol) 15, NA9189 (F001, F003)	Methanol (Clean Room Wipers 98-100%	B	F001 F003	AC9407
3	6 gal cont	Hazardous Waste Solid Methanol and Acetone, 15 NA9189 (F001, F003)	Methanol, Acetone Q-Tips Paper towels 95-100%	B	F001 F003	AC9408

Notes:

Quantity: Item 1 - Monthly pick-up
Item 2 - Once a year lab-pack type pick-up
Item 3 - Once a year lab-pack type pick - up.

TSD: Indicates method of off-site disposal:

B= Burned
T= Treated
R= Recovered
L= Landfilled

CWM - Chemical Waste Management, Inc. (Waste Contractor)

B. TREATMENT STORAGE AND DISPOSAL FACILITY PLANTS LOCATION AND DISTANCE

Model City, New York
CWM Chemical Services, Inc. USEPA ID #NYD0049836679
1550 Balmer Road
Model City, NY 14107
716/754-8231, Dr. John Stanulonis

Emelle, Alabama
CHEMICAL WASTE MANAGEMENT, INC. USEPA ID 3ALD000622464
P.O. Box 55
Emelle, AL 35459
205/652-9721, John Hanley

Sauget, Illinois
TRADE WAST INCINERATION USEPA ID #ILLD098642424
7 Mobile Avenue State Facility ID#1631210009
Sauget, IL 62201
618/271-2804, James Gary

West Carrollton, Ohip
CWM RESOURCE RECOVERY, INC.
4301 Infirmary Road
West Carrollton, OH 45449
513/859-6101, Bob Key

Newark, New Jersey
CHEMICAL WASTE MANAGEMENT OF NJ USEPA ID #NJD089216790
100 Lister Avenue
Newark, NJ 07105
201/465-9100, Sil Lutkewitte

Mileage:

Westbury, NY to Model City, NY	428
Westbury, NY to Emelle, AL	1,144
Westbury, NY to Sauget, IL	981
Westbury, NY to W. Carrollton, OH	645
Westbury, NY to Newark, NJ	60

All referenced facilities were approved as TSDF's for Westbury plant by the Corporate EHS Office.

IV. WASTE GENERATING OPERATIONS

Process operations which generate waste products requiring off-site disposal are confined to the QC, R & D and Epitaxial lab areas. The liquid wastes generated consist of spent acids used in the process operations performed in the lab areas and a sodium hydroxide solution used in several gas scrubbers. **See Waste Analysis Plan for analysis methods.**

The facility has installed a special piping system to collect the various liquid wastes its operations generate. The piping system allows for the two (2) principal types of liquid wastes, namely, acidic waste waters and sodium hydroxide wastes, to be collected and transported to the waste storage tank separately. See Figure (3) III, Process Waste Flow Schematic on page 7.

All piping within the building runs through a concrete lined trench to provide secondary containment. Both the acidic waste water and the sodium hydroxide wastes are directed by a PVC/polypropylene piping system originally installed in 1982. The sodium hydroxide waste system has been upgraded to a fused polypropylene system in 1990. The same year, each piping system was converted to a double wall polypropylene system with a leak detection system installed in the interstitial space. This was started just prior to a point where the piping exits the building and continues to the holding tank. This system was inspected and approved by the Nassau County Department of Health.

V. LIQUID WASTE STORAGE FACILITIES

The Westbury facility utilizes one (1) below grade holding tank to temporarily store liquid wastes generated during the course of its production operations.

The tank is located in a fenced-in area off the southwest side of the facility. See Figure II, Site Plan. Acidic waste-waters from the two (2) process labs and a sodium hydroxide solution from the gas scrubbers are piped separately to a 10,000 liter (2,650 gallon) capacity, double-walled Fiberglass storage tank installed in 1982. The two (2) waste streams are combined inside the tank. The tank is equipped with a vacuum-control leakage warning system, a remote level indicator and a two stage automatic level warning system. The tank interior was decontaminated, sandblasted and additional layers applied as a precautionary measure in 1990. This work was inspected by the Nassau County Department of Health. As indicated in Figure II, Site Plan, the waste water storage tank is set below grade off the southwest side of the facility.

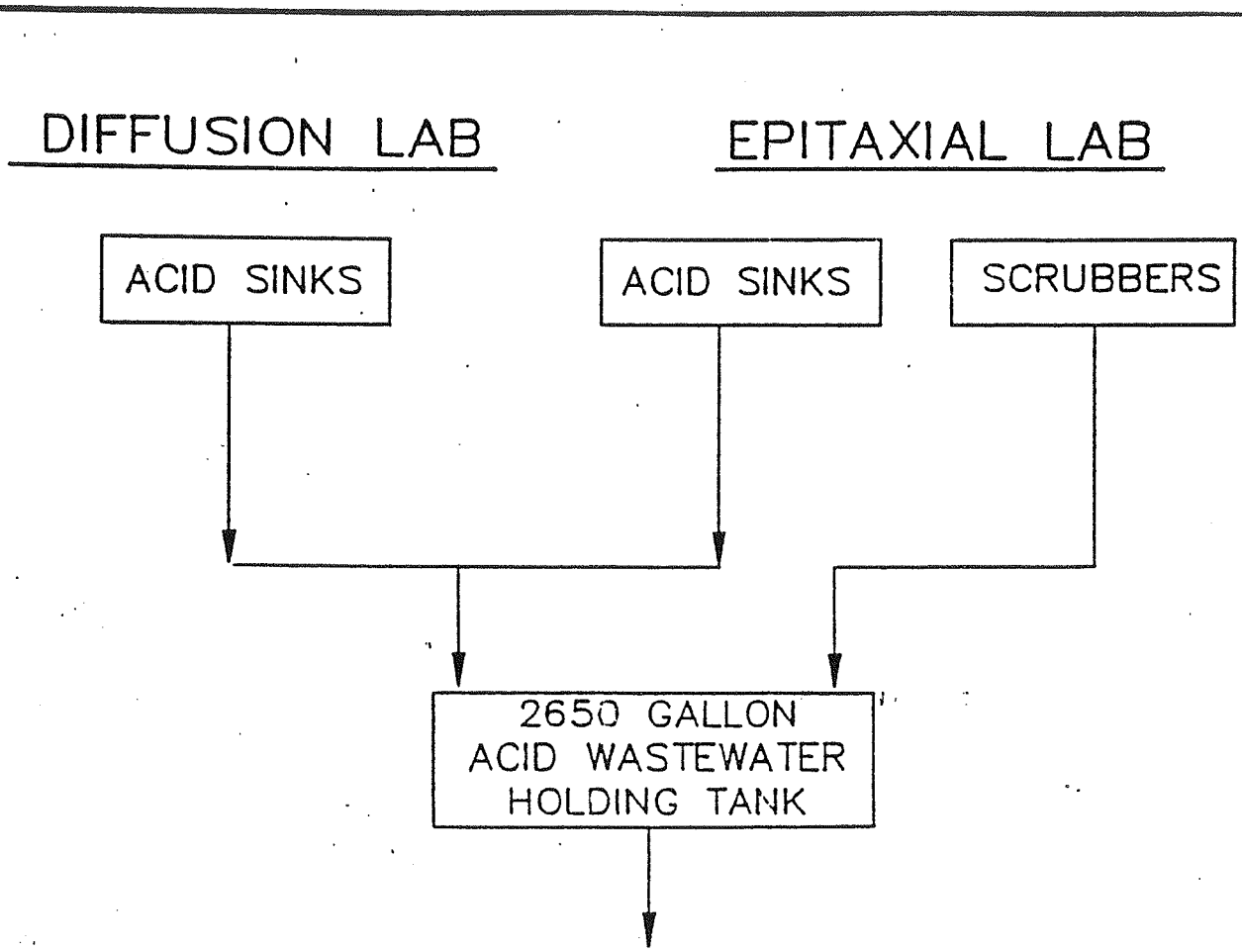

FIGURE 3
PROCESS WASTE FLOW SCHEMATIC

POWER SEMICONDUCTOR DIVISION
WESTBURY, NASSAU CO., NEW YORK
EPA ID. NO. NYD000348474

VI. CLOSURE

In general, the closure of Westbury's waste storage facilities will entail the removal of all liquids and any sludges or residues from the storage tank and the cleaning and disposition of the tank and its appurtenances.

The first step towards closure will be to shut down all process operations which generate the waste waters requiring off-site disposal. After the final volume of liquid wastes has been collected, the storage tank should be pumped out and the waste disposed of by a licensed industrial waste scavenger. The maximum volume of liquid wastes requiring disposal will be 2,650 gallons of acidic wastewater/sodium hydroxide scrubber waste.

Piping System

The facility's active liquid waste collection piping would be thoroughly flushed using a high pressure/low volume clean water rinse. Flushing from the two (2) separate piping systems would be collected in the storage tank. An estimated 200 gallons of pipe flushing will be generated by the cleaning of each piping system (400 gallons total). This flushing will be sampled and analyzed (see WASTE ANALYSIS PLAN). Once clean, the collection piping inside the facility can be disassembled. Piping from the facility to the active storage tank should be leak tested utilizing the existing leak-detection system to confirm its integrity before disassembly.

As the drain lines do not carry fluids under pressure, a simple leak checking procedure may alternatively be utilized. One end of each piping system is to be securely capped and the other end modified to have a vertical rise of three feet above the level of the drain line. The entire drain line is then to be filled with water, flush to the top of the three foot rise, covered and allowed to stand overnight. If the water level is within 1/4 inch of the original level the line will be considered to be leak tight. A one quarter inch allowance will account for any entrapped air which might migrate to the top of the column of water.

If the piping fails the leak testing procedure, soil sampling will be performed along the piping run to determine the extent of any soil contamination (see Appendix, Soil Testing).

Storage Tank

The interior of the hazardous waste holding tank should be cleaned by power washing with clean water. Wastewater generated by this cleaning is estimated at 200 gallons. The combined wastewater generated by flushing the laboratory apparatus, collection piping and cleaning the tanks (600 gallons total) should be pumped out and disposed of off-site by a licensed industrial waste scavenger. These waters will be sampled and analyzed to ensure the tank is clean. See Waste Analysis Plan.

Removal of tanks and/or soils

If the vacuum alarm on the 10,000 liter holding tank indicates any loss of tank integrity to the outside environment, the area surrounding the affected underground storage tank will have soil borings taken and analyzed to determine if any soil contaminations may have occurred. The area of concern would be defined by a perimeter no greater than 10 feet off the side of any tank wall.

After being cleaned and pumped dry, the storage tank and its appurtenances shall be excavated and removed. The tank should be removed to an approved licensed facility.

If any soil contamination was found during the soil testing (see Appendix A for testing methods and parameters) contaminated soils will be manifested and removed for disposal off-site at a designated facility, approximately 75 miles distance. After tank/piping/soil removal is completed, the area will be backfilled to grade with clean fill (sand or soil).

VII CERTIFICATION OF CLOSURE

Upon completion of the liquid waste storage facility closure, this facility and an independent registered professional engineer will submit to the NYSDEC, certification documenting that the facility was closed in accordance with the procedures outlined in the closure plan.

VIII CLOSURE COST ESTIMATE

A cost estimate to close General Instrument Corporations's Westbury liquid waste storage facility is presented in Table II, Closure Cost Estimate. The cost estimate has been divided into nine (9) main categories dealing with waste disposal, facility cleaning, soil boring, analysis, excavation and restoration.

Waste disposal costs represent the cost to pump out and dispose of any liquid waste in storage at the time of closure. The maximum storage capacity for acidic wastewater and sodium hydroxide scrubber wastes is 10,000 liters (2,650 gallons). Current costs for pump out, transportation and disposal at a licensed TSD facility is $ 1400.00 (approximately $0.528 per gallon).

Table II

Closure Cost Estimate

I.	Hazardous Waste Disposal (Includes pumping, transportation, manifesting, and disposal).	
	A. Acid wastewater/sodium hydroxide waste	1400.00
	B. 2 Fiber drums of listed hazardous wastes	754.00
II	Collection system & tank cleaning (includes labor material and equipment)	
	A. Pipe flushing and tank cleaning	5000.00
	B. Laboratory analysis 5 @ $150/ea.	750.00
	C. Disposal of flushing/cleaning wastes	2800.00
III	Leak test exterior piping	
	A. 1 day at $500/day	500.00
IV	Soil borings and analysis	
	A. Labor 1 day @ $1000/day	1000.00
	B. Laboratory extraction and analysis; 10 @ $210/unit	2100.00
V	Contaminated soil excavation	
	A. 5 cu. yd. removal @ $200/cu yd.	1000.00
	B. Disposal @ $200/cu yd.	1000.00
	C. Transportation @ $172/cu yd.	860.00
	Subtotal	17,164.00

continued

(continued)

Table II

Closure Cost Estimate

VI	Removal and transportation of decontaminated items (includes piping, tanks, vault)	
	A. Crane and operator 1 day	800.00
	B. Labor 4 man-days @ $480/day	1920.00
	C. Transportation	660.00
VII	Site Restoration (includes labor material and equipment)	
	A. 15 cu. yds. clean fill	1200.00
VIII	Contingencies	3712.00
IX	Contracted Engineering & Administration (includes inspections and certification)	3000.00
	Total estimated closure cost	$ 28,456.00

Facility cleaning costs include the decontamination of the two piping systems and the storage tank. The estimate for soil borings and analysis assumes a failure of the piping system to pass the leak testing procedure. Numerous analyses are also included for testing the results of the various cleaning procedures. The site restoration not only includes replacement of the volumes of the vault and tanks, but also an assumed 5 cubic yards of contaminated soils.

A contingency of fifteen percent was included in the closure cost estimate. As shown in Table I, the total closure cost, including engineering and administration is estimated at $ 28,456.00

CLOSURE SCHEDULE

A schedule for closing the facility's liquid waste storage facility is presented in Table II, below:

TABLE III

CLOSURE SCHEDULE

1. Notification of proposed closure to NYSDEC - 180 days prior to generating final volume of liquid waste.

2. Pump out and dispose of liquid wastes in storage - within 90 days of generating final volume of liquid waste.

3. Clean storage facility and removal of all rinses and residues - within 180 days of generating final volume of liquid waste.

4. Final inspection and closure certification - immediately following item 3.

As shown in Table III, this facility will notify NYSDEC 180 days prior to closing the liquid waste storage facility and will complete the facility closure within 180 days of generating its final volume of waste.

IX. **APPENDIX**

Soil Testing

The soil testing shall include the following:

(1) TANK SOIL SAMPLE COLLECTION - four (4) soil borings shall be taken as close as possible (10 to 14 inches) to the side of the tank storage area at ninety (90) degree intervals (north, south, east, west). A core sample shall be collected from each boring at a depth just below the bottom of the tank (approximately fourteen feet below grade for the 10,000 liter tank). Additional core samples shall be taken at a distance of at least thirty (30) feet from the tank storage area to collect a background sample. The background sample shall be taken at the same relative depth as those taken at the tank. Additional core samples may be taken at increased depths and tested (see analyses).

(2) PIPE SOIL SAMPLE COLLECTION - soil borings shall be taken as close as possible (10 to 14 inches) to the side of the piping at ten (10) foot intervals on alternate sides of the piping runs. A core sample shall be collected from each boring at a depth just below the bottom of the pipe (approximately 2 1/2 feet below grade). Additional core samples shall be taken from each boring at five (5) foot intervals below the pipe. A fifth soil boring shall be taken at a distance of at least thirty (30) feet from piping to collect a background sample. The background sample shall be taken at a depth of approximately 2 1/2 feet below grade.

(3) SOIL SAMPLE IDENTIFICATION - each soil sample shall be assigned an alphanumeric identification code referencing the depth at which the sample was taken and the compass orientation of the boring (e.g. N-14, S-19...).

(4) ANALYSES - extracts from each soil sample shall be collected in accordance with the Toxicity Characteristic Leaching Procedure (TCLP) methods. This liquid extract will then be analyzed for EP Toxic Metals. Each extract sample shall be analyzed for the following contaminants: nitrate, fluoride, cadmium, chromium, copper, lead and silver. The testing parameters chosen were based upon prior analyses of the waste-water stored within the tank.

We propose to test the soil samples in several stages. During the first stage, only the background soil sample and the soil samples taken just below the bottom of the tank (i.e., N-14, S- 14, E-14 and W-14) or piping shall be analyzed. Based upon our analytical results, a determination can be made as to whether or not the soil located just below the tank/pipe indicates any signs of contamination. If the first stage testing indicates a high degree

of contamination, the next four samples (N-19, S-19, E-19, and W-19) shall be analyzed.

This procedure will be continued until sample analyses indicate that the soil is uncontaminated. Analytical data developed during the soil testing can then be used to determine what, if any, soil must be excavated and removed from the site.

X. FACILITY CHANGES SINCE MARCH, 1993

1. All trichlorisilane cylinders were moved from inside the main building to a dedicated, explosion proof, climate controlled prefab safety storage building on the south side of the site.

2. Manufacturing Capacity Expansion - the third Gemini Production Reactor was installed. The two bell jar unit has its own air exhaust emission scrubbers.

JS/an