A 100-year start on tomorrow

November 7, 1980

Mr. Asdakorn Limpiti
Energy and Environmental Analysis, Inc.
2607A Carver Street
Durham, North Carolina 27705

Dear Mr. Limpiti:

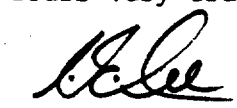
Subject: Submission of Completed Questionnaire in Connection with Development of a New Source Performance Standard for the Polymers and Resins Industry

Enclosed is the completed questionnaire submitted in response to Mr. Jack Farmer's August 25, 1980 notification letter. This completed questionnaire contains requested information about the polymer manufacturing facility at Tenneseee Eastman Company. We understand that EPA will use this information in the development of a New Source Performance Standard for the polymers and resins industry.

The information designated as "Confidential" that we are disclosing to Energy and Environmental Analysis, Inc. (EEA) is considered by Tennessee Eastman Company to be proprietary information and, as such, is entitled to protection from unauthorized disclosure in accordance with the non-disclosure agreement regarding EPA Contract No. 68-02-3061, which was executed by EEA and Tennessee Eastman Company on October 2, 1980.

If you have any questions concerning this information, please contact Mr. J. C. Edwards, (615) 246-2111, Extension 2444.

Yours very truly,



Robert E. Lee
Director, Manufacturing Staff

drp

Enclosure

cc: Mr. Edwin Vincent
U. S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

ENCLOSURE 4

PLANT SURVEY QUESTIONNAIRE

Polymer Name: Poly(ethylene terephthalate)

Parent Corporation Name: Eastman Kodak Company

Subsidiary Name: Tennessee Eastman Company

Mailing Address: P. O. Box 511

Kingsport, Tennessee 37660

Plant Name: Tennessee Eastman Company

Physical Location: Lincoln Street

(including county and
air quality control region.) Sullivan County; Tennessee 207

Person EPA should contact regarding information supplied in this questionnaire.

Name: J. C. Edwards

Title: Manager, Clean Environment Program

Mailing Address: P. O. Box 511

Kingsport, TN

Telephone Number: ----- (615)246-2111, Ext. 2444

Date Questionnaire Completed: September 24, 1980

DOCKET NO.

Category II-B

The following information is located in the confidential files of the Director, Emission Standards and Engineering Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina. This information is confidential, pending final determination by the Administrator, and is not available for public inspection.

Page 2. Capacity information claimed confidential.

II. Process

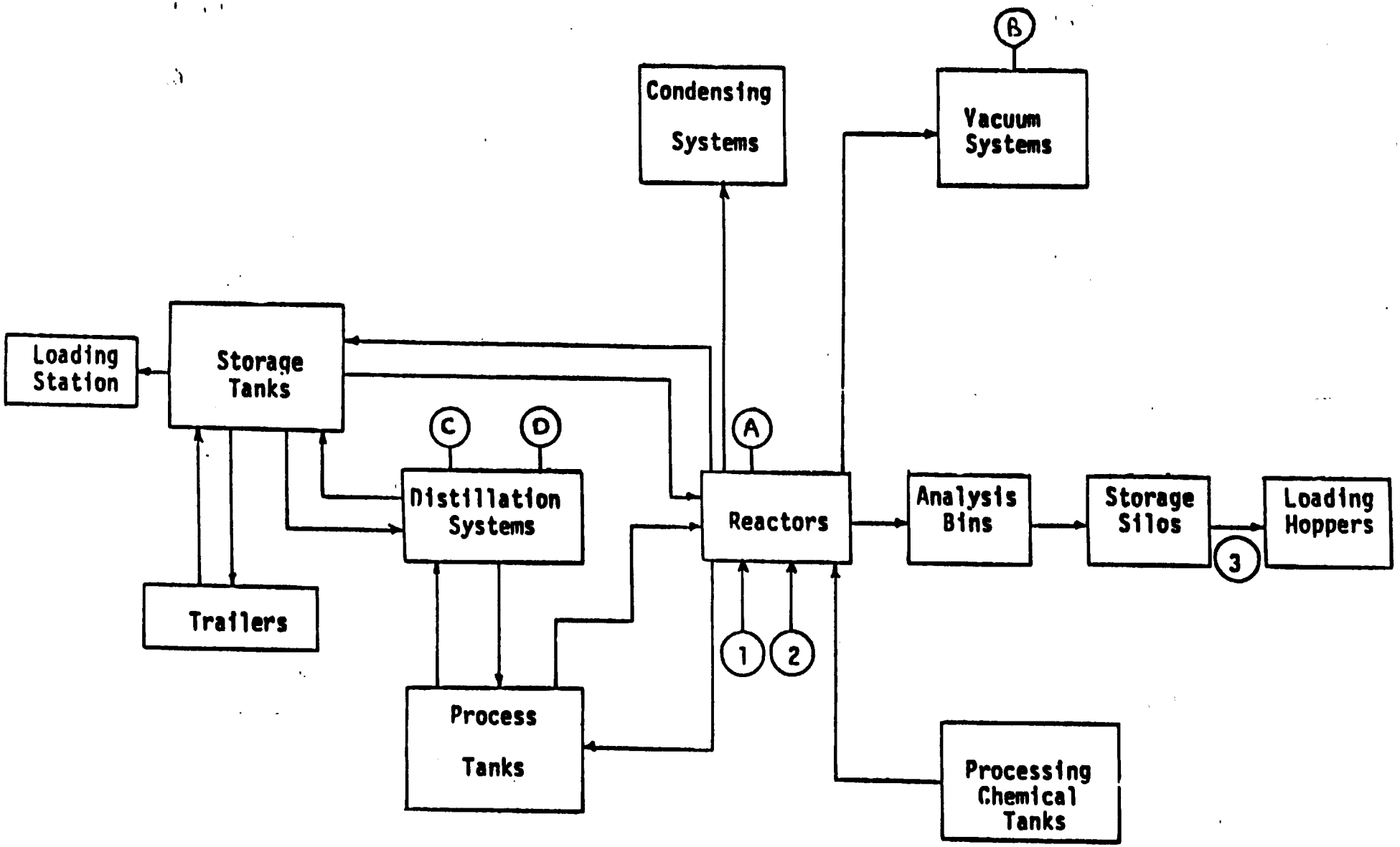
1. Process Name and Type:

Continuous Melt Phase Polymerization

2. Flow Sheet: (overall process block diagram)

(See Attachment A) Page 4

ATTACHMENT A



II. **Process:** (continued)

3. Raw Materials and Products.

Raw Materials

Name	Quantity	Composition	wt percent X or vol percent
Dimethyl Terephthalate	379.6M lbs.	99 + %	
Ethylene Glycol	245.0M lbs.	99 + %	

By-product

Name	Quantity	Composition	wt percent X or vol percent
Methanol	125.3	MeOH 91.0 Misc. Low Boilers 5.0 Water 4.0	

4. Number of:

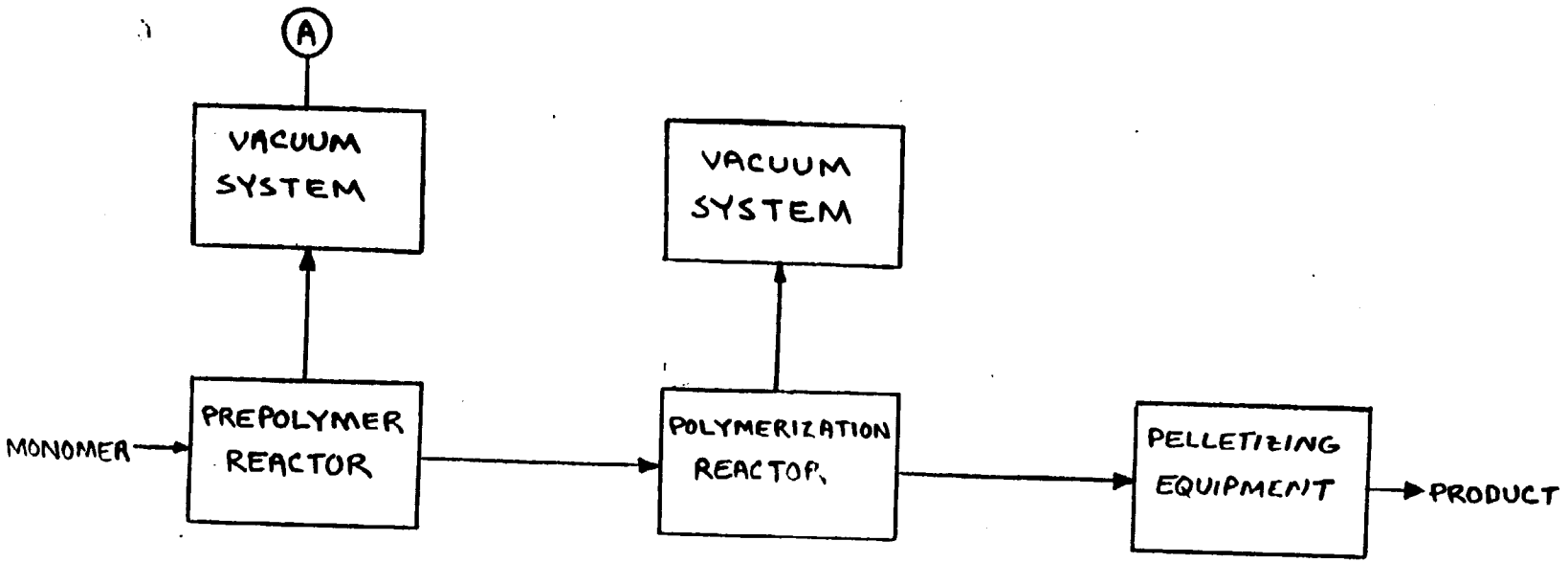
Pumps 100
Compressors 0
Valves 1,500
Pressure Relief Devices 270
Cooling Tower 1
Agitators 32
Open-Ended Valves or Line 250
Sampling Connections 100
Flanges 4,000

Which Handle Volatile Organic Compound (VOC)

II. **Process** (continued)

5. **Polymerization Section Process Flow Sheet:** (For example; polymerization reactor, vent gas compressors, and any other polymerization unit operations.)

(See Attachment B) Page 7



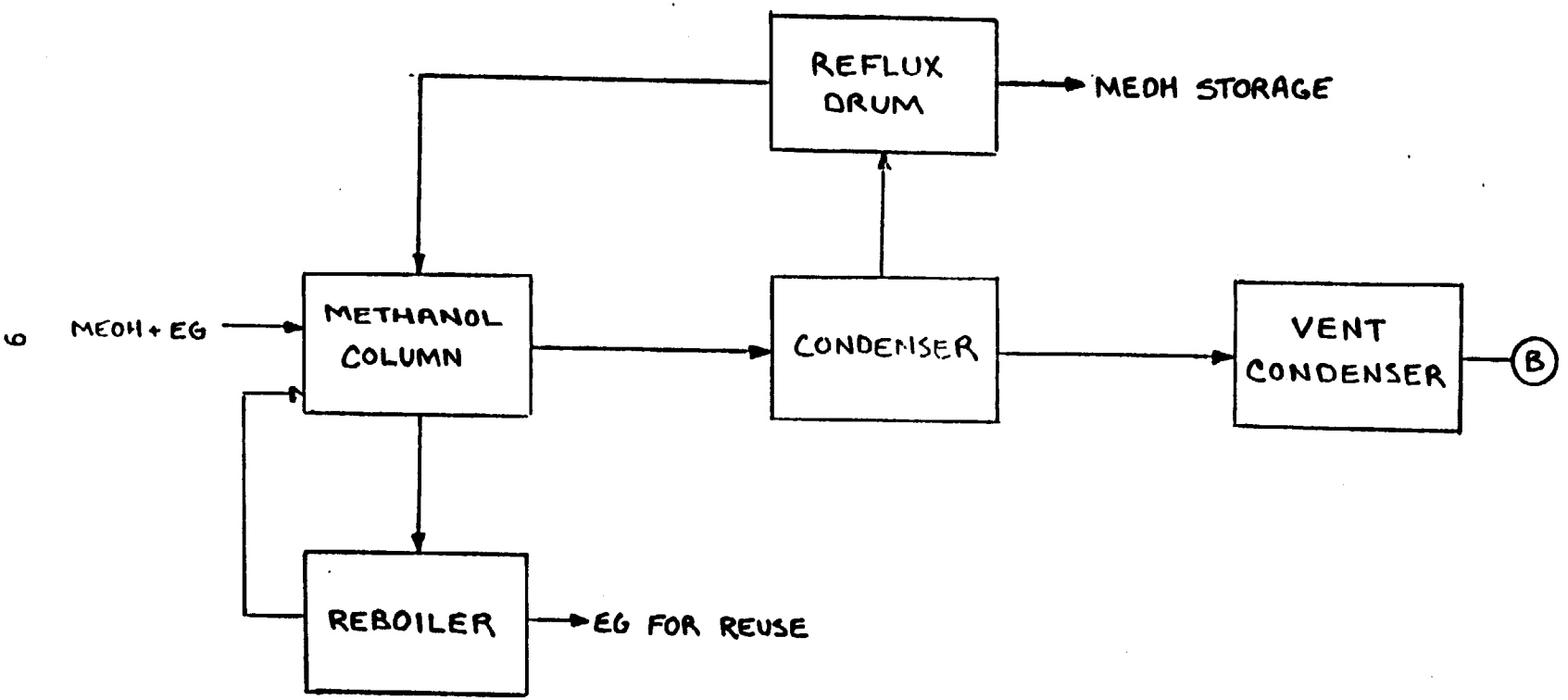
ATTACHMENT B

POLYMERIZATION REACTOR SECTION

II. **Process** (continued)

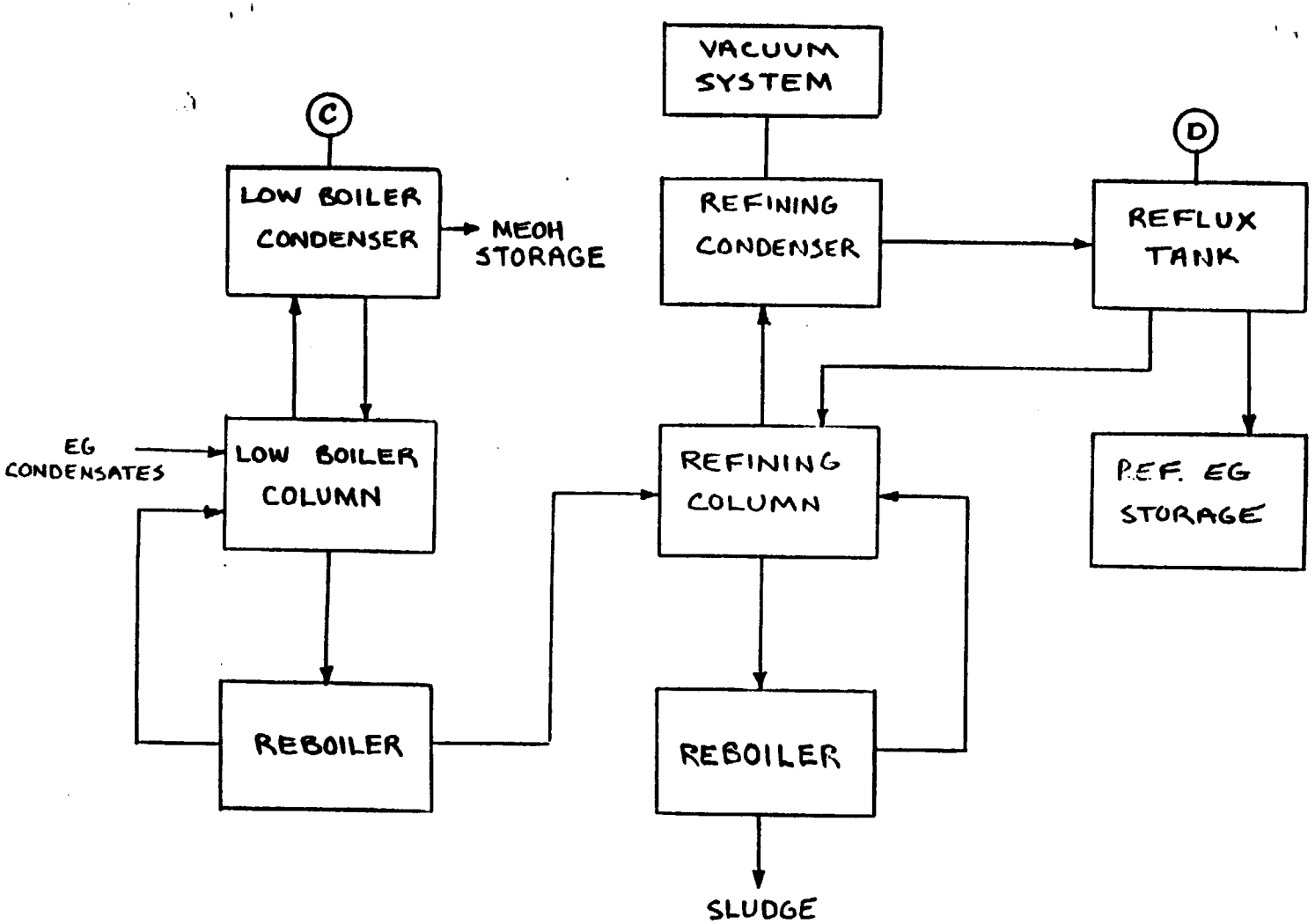
6. **Material Recovery/Separation Section Flow Sheet:** (i.e., Process deactivation/decanting, diluent recovery, solvent recovery, polymer drying, catalyst drying, devolatilizing and other similar unit operations.)

(See Attachments C - Page 9, D - Page 10)



ATTACHMENT C

METHANOL RECOVERY



ATTACHMENT D

ETHYLENE GLYCOL RECOVERY

III. Emissions (Composition and Flow) for Polymerization Section:

Stream Name: Prepolymer Vacuum Discharge - Attachment B

The stream flow shown on Polymerization section flow sheet by number/letter: A

Check One: basis on 100% capacity X ; basis on production rate ; (specified)

1) flow 50 SCFM; N_2 temperature 77 °F; pressure Atm. psig

ACFM Check One: lb/hr X ; wt% ; vol% (For composition and composition range)

lb/hr

Component Name	Formula[a)]	State	Average Amount or Composition	Composition Range
Nitrogen	N_2	Gas	220 lbs/hr.	0-440 lbs/hr.
Methanol	CH_3OH	Vapor	0.0091 lbs/hr.	0-0.1 lbs/hr.

a) Give approximate molecular weight if the exact formula is not specified.

*Volatile organic compound (VOC) should be described as fully as possible

III. (continued)

For stream flow shown on Polymerization section flow sheet by letter/ number A stream name Prepolymer Vacuum Discharge.

2. Composition Variation

Nitrogen

The nitrogen discharged from this vent is used to control pressure in the Prepolymer Reactor. Usage will vary with vacuum operation.

Methanol

The amount of methanol discharged from this vent will depend on the operation of the Prepolymer Reactor and vacuum system. Normally this variation will not be more than ± 10% of the average amount shown.

3. Method Used to Determine Composition and Flow

X ENGINEERING ESTIMATES

_____ DESIGN CALCUALTIONS

_____ ANALYTICAL MEASUREMENTS

III. (continued)

For stream flow shown on Polymerization section flow sheet by letter/number A stream name Prepolymer Vacuum Discharge.

4. Sample Procedure

The emissions from this vent have been determined by Engineering calculations and material balances. This vent discharges to the atmosphere through a Barometric Seal leg and has not been sampled in the past.

5. Analytical Procedure

Not applicable.

6. Sampling Frequency

Not applicable.

7. Confidence Level

Not applicable.

8. Ease of Sampling

A step ladder would be required to obtain access to the top of the barometric leg.

III. Emissions (Composition and Flow) for Material Recovery/Separation Section:

Stream Name: Methanol Column Condenser - Attachment C

The stream flow shown on Material Recovery/Separation flow sheet by number/letter B.

Check One: basis on 100% capacity X; basis on production rate _____; (specified _____)

1) flow 1.2 SCFM; N_2 temperature 100 °F; pressure Atm. psig

_____ ACFM Check One: lb/hr X; wt% _____; vol% _____ (for composition and composition range)

_____ lb/hr

Component Name	Formula a)	State	Average Amount or Composition	Composition Range
Nitrogen	N_2	Gas	8.7 lb/hr.	0-8.7 lb/hr.
Methanol	CH_3OH	Vapor	8.2 lb/hr.	0-82.0 lb/hr.

a) Give approximate molecular weight if the exact formula is not specified.

*Volatile organic compound (VOC) should be described as fully as possible

III. (continued)

For stream flow shown on Material Recovery/Separation section flow sheet by letter/number B stream name Methanol Column Condenser.

2. Composition Variation:

The Nitrogen emission from this vent is from a rotameter and should remain constant.

The amount of Methanol discharged from this vent will remain constant except during upset conditions at which time the maximum value listed could be reached.

3. Method Used to Determine Composition and Flow:

X ENGINEERING ESTIMATES

_____ DESIGN CALCULATIONS

_____ ANALYTICAL MEASUREMENTS

III. (continued)

For stream flow shown on Material Recovery/Separation reaction flow sheet by letter/number B stream name Methanol Column Condens

4. Sampling Procedure:

This vent has not been sampled. Emissions have been determined by Engineering calculation.

5. Analytical Procedure:

Not applicable.

6. Sampling Frequency:

Not applicable.

7. Confidence Level:

Not applicable.

8. Ease of Sampling:

Readily accessible.

III. **Emissions (Composition and Flow) for Material Recovery/Separation Section:**

Stream Name: Ethylene Glycol Recovery - Low Boiler Column - Attachment D

The stream flow shown on Material Recovery/Separation flow sheet by number/letter C.

Check One: basis on 100% capacity X ; **basis on production rate** _____ ; **(specified** _____ **)**

1) **flow** _____ **SCFM; temperature** 77 °F; **pressure** 0.2 **psig**

_____ **ACFM Check One: lb/hr** X ; **wt%** _____ ; **vol%** _____ **(for composition and composition range)**

X lb/hr (See below)

Component Name	Formula a)	State	Average Amount or Composition	Composition Range
Nitrogen	N_2 28	Gas	5.62 lb/hr.	0-5.62 lb/hr.
2-Methyl-1,3 Dioxolane	$CH_3CH(OCH_2)_2$	Vapor	0.66 lb/hr.	0-.73 lb/hr.
Methanol	CH_3OH 32.04	Vapor	0.36 lb/hr.	0-.40 lb/hr.
Water	H_2O 18	Vapor	0.04 lb/hr.	0-.05 lb/hr.

Avg MW =

a) Give approximate molecular weight if the exact formula is not specified.

*Volatile organic compound (VOC) should be described as fully as possible _____

III. (continued)

For stream flow shown on Material Recovery/Separation section flow sheet by letter/number C stream name Low Boiler Column Condenser.

2. Composition Variation:

Nitrogen

Nitrogen is purged to the column vent through a rotameter. Flow variations should be very small.

Low Boilers

The low boiler composition is dependent upon the operating condition of the column. The composition should not vary more than 10% from the average values given.

3. Method Used to Determine Composition and Flow:

X ENGINEERING ESTIMATES

_____ DESIGN CALCULATIONS

_____ ANALYTICAL MEASUREMENTS

III. (continued)

For stream flow shown on Material Recovery/Separation reaction flow sheet by letter/number C stream name Low Boiler Condenser

4. Sampling Procedure:

This vent is not routinely sampled. Emissions are based on Engineering calculations.

5. Analytical Procedure:

Not applicable.

6. Sampling Frequency:

Not applicable.

7. Confidence Level:

Not applicable.

8. Ease of Sampling:

Step ladder required.

III. **Emissions (Composition and Flow) for Material Recovery/Separation Section:**

Stream Name: Ethylene Glycol Recovery - Refining Column - Attachment D

The stream flow shown on Material Recovery/Separation flow sheet by number/letter D .

Check One: basis on 100% capacity X ; **basis on production rate** _____ ; **(specified** _____ **)**

1) **flow** _____ **SCFM; temperature** 77 °F; **pressure** Atm. **psig**

_____ **ACFM Check One: lb/hr** X ; **wt%** _____ ; **vol%** _____ **(for composition and composition range)**

X **lb/hr** (See below)

Component Name	a) Formula	State	Average Amount or Composition	Composition Range
Nitrogen	N_2	Gas	306 lb/hr.	0-306 lb/hr.

a) Give approximate molecular weight if the exact formula is not specified.

*Volatile organic compound (VOC) should be described as fully as possible

III. (continued)

For stream flow shown on Material Recovery/Separation section flow sheet by letter/number D stream name Refining Column.

2. Composition Variation:

Nitrogen is purged into the Refining System through a rotameter. Variations in flow should be very small.

3. Method Used to Determine Composition and Flow:

X ENGINEERING ESTIMATES

_____ DESIGN CALCULATIONS

_____ ANALYTICAL MEASUREMENTS

III. (continued)

For stream flow shown on Material Recovery/Separation reaction flow sheet by letter/number D stream name Refining Column

4. Sampling Procedure:

This vent is not routinely sampled.

5. Analytical Procedure:

Not applicable.

6. Sampling Frequency:

Not applicable.

7. Confidence Level:

Not applicable.

8. Ease of Sampling:

Step ladder required.

IV. Emission control device

for device shown on block diagram by number _____.
Device name _____.

1. Engineering description.

No emission control devices used; hence, none registered for this process.

IV. (continued)

For device shown on block diagram by number _____.

device name _____.

2. Capital Cost of Emission Control System:

a) Capital Cost

Major equipment cost: $_____each

Total installed cost: $_____each

Year:	Cost:
____	_____
____	_____
____	_____

IV. (continued)

For device shown on block diagram by number _____

b) Check List. Mark whether items listed are included in total cost included in IV.2.a Do not give dollar value.

Yes	No	Cost	Explanation
		Site development	
		Buildings	
		Laboratory equipment	
		Stack	
		Rigging etc.	
		Piping	
		Insulation	
		Instruments	
		Instrument panels	
		Electrical	
		Facilities outside battery limits*	
		Storage tanks, spheres drums, bins, silos	
		Catalyst	
		Spare parts and non-installed parts	

*Such as - process pipe lines such as steam, condensate, water, gas, fuel, air, fire, instrument and electric lines.