Florida Department of
Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

April 25, 1994

Mr. Joseph L. Tessitore
Harding Lawson Associates - Cross/Tessitore & Associates
4763 South Conway Road
Orlando, Florida 32812

Re: Foamex, L.P. Dispersion Modeling Protocol

Dear Mr. Tessitore:

The Department has received and reviewed the April 5, 1994 modeling protocol for Foamex, L.P. The Department approves the modeling protocol with the following comment: Tampa upper air data for 1986 should be used in the modeling meteorological input along with Orlando surface data for 1986. If you have any further modeling questions, you may contact Cleve Holladay at (904) 488-1344. Please submit the permit application with the revised modeling to the Bureau of Air Regulation.

Sincerely,

C. H. Fancy
Chief
Bureau of Air Regulation

CHF/cgh

cc: Charles Collins, CFD
Dennis Nester, OCEPD
Charles Eavenson, Foamex, L.P.

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) and 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC48-214902

Applicant's Name: Foamex, LP

With regard to the above referenced application, the applicant hereby with full knowledge and understanding of applicant's rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed by law. Said waiver is made freely and voluntarily by the applicant, with full knowledge, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 20 day of June 1994.

The undersigned is authorized to make this waiver on behalf of the applicant.

Douglas Terrill

Signature

DOUGLAS TERRILL

Name (Please Type or Print)

Revised April, 1990

Harding Lawson Associates

HLA/CTA

April 5, 1994

26005 F21.816

Mr. Cleve Holladay
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dispersion Modeling Protocol
Foamex, L.P.

Dear Mr. Holladay:

Please find enclosed, for your review and comment, two copies of the Dispersion Modeling Protocol for Foamex, L.P. located in Orlando, Florida. The protocol document is being submitted to your office as a result of a meeting held between FDEP, Foamex, and Harding Lawson Associates - Cross/Tessitore & Associates (HLA/CTA) on January 27, 1994 to discuss a revised permitting approach for Foamex's facility. At this meeting Foamex agreed to FDEP's request that emissions from the facility demonstrate compliance with 90% of the applicable AAAC's and that compliance with 90% of FDEP's AAAC's will be demonstrated by utilizing a dispersion modeling methodology acceptable to your office.

If you have any questions or comments, regarding the enclosed Dispersion Modeling Protocol, please contact John Wolber or Kay Rykowski of our office.

Yours very truly,

HARDING LAWSON ASSOCIATES - CROSS/TESSITORE & ASSOCIATES

John Wolber
Project Scientist

Joseph L. Tessitore, P.E.
Managing Principal

RECEIVED

APR 06 1994

Bureau of
Air Regulation

JMW/JLT/jmw
FMXLET3.DOC/

Engineering and
Environmental Services

4763 South Conway Road, Orlando, FL 32812 407/851-1484 Fax 407/855-0369
A Subsidiary of Harding Associates • Offices Nationwide

Enclosure

cc: Mr. Willard Hanks, FDEP
Mr. Arthur Pereira, Foamex, L.P.
Mr. Doug Terrill, Foamex, L.P.

Dispersion Modeling Protocol
Foamex, L.P.
Flexible Polyurethane Foam Manufacturing Facility
Orlando, Florida

Prepared for

Foamex, L.P.
Regency Industrial Park
1351 Gemini Boulevard
Orlando, Florida 32821

HLA/CTA Project No. 26005 F21.816

John M. Wolber
Project Scientist

Joseph L. Tessitore, P.E.
Managing Principal

April 5, 1994

Harding Lawson Associates · Cross/Tessitore & Associates
Engineering and Environmental Services
4763 South Conway Road
Orlando, Florida 32812 - (407) 851-1484

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TABLES

1.0 INTRODUCTION

Harding Lawson Associates - Cross/Tessitore & Associates (HLA/CTA) has been retained by Foamex, L.P., to prepare and submit to the Florida Department of Environmental Protection (FDEP) an Application for Permit to Construct Air Pollution Source for their flexible polyurethane foam manufacturing facility. The facility is located at 1351 Gemini Boulevard in Orlando, Florida. The facility location is shown in Figure 1. The facility was constructed in 1975 and 1976 and has not previously been permitted by FDEP. The following paragraphs provide a synopsis of the permitting activities leading to the submittal of this modeling protocol document.

On May 29, 1992, an Application for Permit to Construct Air Pollution Source was submitted to FDEP. This initial application documented the facility as an existing source and did not include any proposed modifications. FDEP conducted a preliminary review of the submittal and issued a letter dated June 26, 1992 requesting additional information and requiring a BACT analysis to be conducted for proposed air pollution control systems. Subsequent to this activity, a Consent Order between Foamex, L.P. and the Orange County Environmental Protection Department (OCEPD) was executed on October 1, 1992. The order required Foamex to submit a revised permit application to FDEP in order to comply with the agreement. Thus, on December 3, 1992 a revised permit application was submitted to FDEP to fulfill the requirements of both the comments issued by FDEP on June 26, 1992, and the Consent Order issued by OCEPD on October 1, 1992. This application was submitted without prejudice to the applicant's belief that the PSD requirements do not apply to this source and, therefore, a BACT analysis is not required of this applicant.

FDEP reviewed the application; and, consequently, a meeting was held on June 9, 1993 between FDEP, Foamex, and HLA/CTA to discuss the application. Attending the meeting were Mr. Willard Hanks and Mr. Preston Lewis of FDEP; Mr. Arthur Pereira, Mr. Charles Eavenson and Mr. Joseph Lunderville of Foamex; and Mr. Joseph Tessitore of HLA/CTA. During the meeting, FDEP raised seven issues regarding the permit application and required a written response from Foamex. A document addressing each of these issues was prepared and submitted to FDEP on December 13, 1993.

On January 27, 1994, another meeting was held between FDEP, Foamex, and HLA/CTA to discuss the information in the December 13, 1993 submittal. In attendance at the meeting were Mr. Willard Hanks and Mr. Claire Fancy of FDEP, Mr. Arthur Pereira of Foamex, and Mr. Joseph Tessitore of HLA/CTA. As a result of the issues discussed at the meeting, the following permitting approach was agreed upon:

1) Foamex will withdraw the existing permit application and submit a revised application in the immediate future.

2) The revised application will address the construction of an improved ventilation system and stack configurations to provide enhanced collection and dispersion of emissions from the facility. The system will be designed such that emissions from the facility will comply with applicable FDEP Acceptable Ambient Air Concentrations (AAAC's).

3) Foamex agreed to FDEP's request that emissions from the facility demonstrate compliance with 90% of the applicable AAAC's.

4) Compliance with 90% of FDEP's AAAC's will be demonstrated by utilizing a dispersion modeling methodology acceptable to Mr. Cleve Holladay of FDEP.

5) Once the revised application has been completed, FDEP will issue an Intent to Permit and a Final Permit within 30 days of the Intent to Permit, assuming that no Administrative Hearing is required.

6) The permit, issued based on the revised application, will require Foamex to construct and install the subject enhanced collection and dispersion system within nine months of the date of permit issuance and to file semi-annual reports on the status of process changes, chemical substitutions, and emission controls in the Flexible Polyurethane Foam Manufacturing Industry.

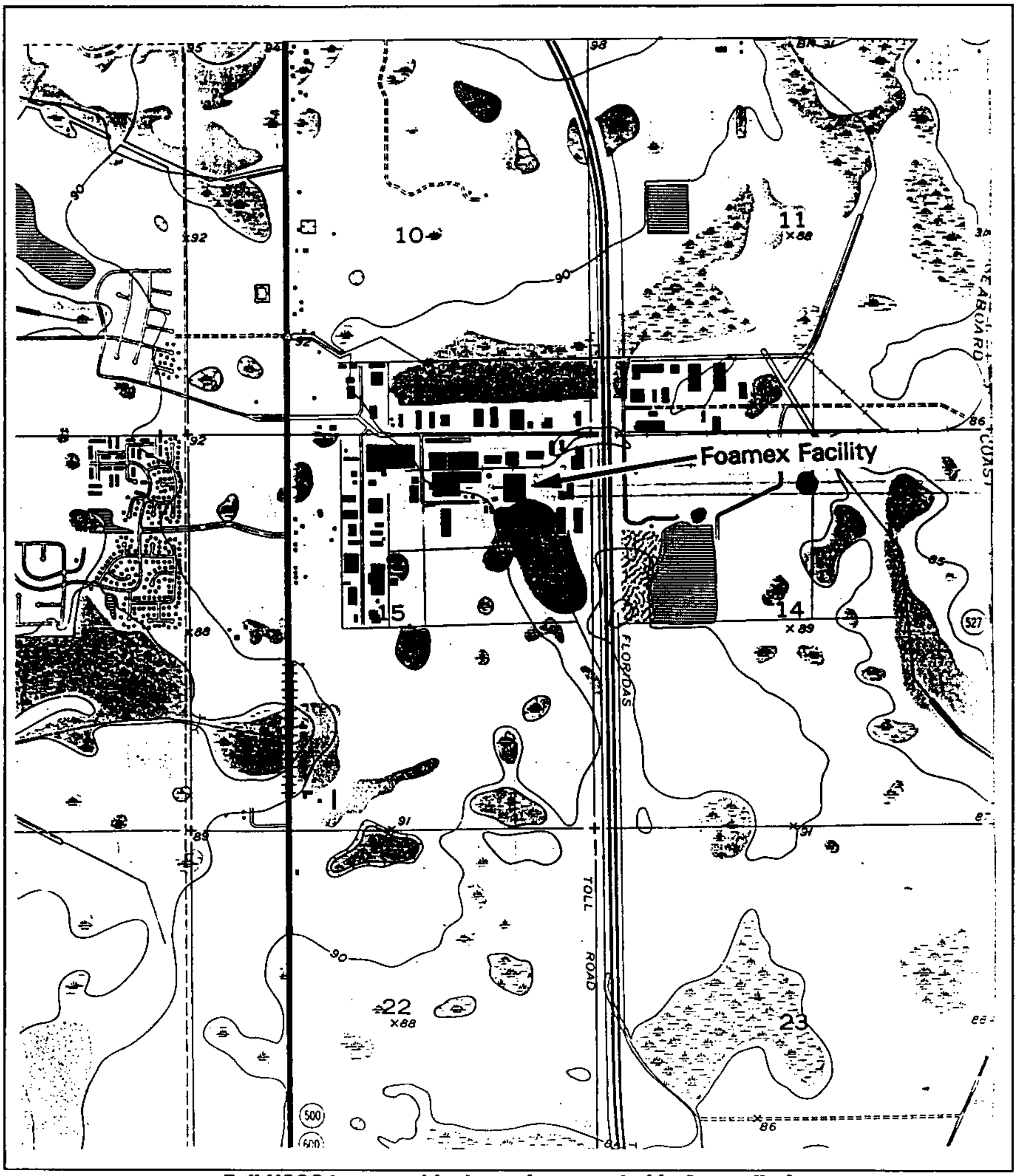
7) The Operating Permit will be valid for a period of five years with the understanding that EPA Title III MACT Standards would ultimately supersede and/or replace the Operating Permit requirements.

As mentioned above in items 2, 3, and 4, approval of the permit application is contingent upon the ability of Foamex to demonstrate that the emissions from the Orlando facility will not exceed 90% of FDEP's AAAC's. This protocol document presents the methodology, input parameters, and assumptions to be used in the dispersion modeling analysis to demonstrate compliance with 90% of the AAAC's. In addition, Section 2.0 provides a description of the processes and support operations at the facility.

Based on previous submittals to FDEP and discussions with FDEP, the dispersion modeling analysis will only addressed the following emissions:

- Methylene Chloride from the slabstock foam manufacturing process;
- Toluene Diisocyanate from the slabstock foam manufacturing process and rebond foam manufacturing process; and
- 1,1,1-Trichloroethane from the gluing process during foam fabrication operations.

Figure 1. Location Map
Foamex, L.P. - Orlando Facility
(USGS Topographical Map - Lake Jessamine, Florida Quadrangle)



Full USGS topographical map is presented in Appendix A

2.0 PROJECT DESCRIPTION

Two basic processes are used at the Foamex facility to manufacture polyurethane foam product: Slabstock Polyurethane Foam Production and Rebond Polyurethane Foam Production. These processes are used to manufacture foam products of various density, color and thickness. While the basic processes remain the same, the proportions of raw materials are modified slightly for each batch to achieve the desired product specifications. In addition to the two manufacturing processes, support operations at the facility include tank storage of process chemicals, steam boiler operation, environmental heating, and foam fabrication operations.

2.1 Slabstock Polyurethane Foam Production

In the Slabstock process, a high pressure mixing head and metering pumps are used to mix the specific raw materials required for each product. These raw materials include toluene diisocyanate (TDI), polyol, water, catalysts, surfactants, additives (such as pigments or flame retardants), and methylene chloride, an auxiliary blowing agent. The mixed raw materials are discharged into a trough where the mixture begins to react and flows down a tunnel area. Heat generated by the exothermic reaction volatilizes the methylene chloride thus allowing the foam to reach a predetermined density. The foam begins releasing methylene chloride at this point. The methylene chloride serves to reduce the foam density, or soften it, and to provide cooling of the mixture as it discharges energy during the exothermic reaction. The foam slab travels through the tunnel via a conveyor. After exiting the tunnel the foam slab is cut into sections, referred to as buns. The buns continue down the conveyor and enter the Long Bun Storage Room. The foam continues to release methylene chloride as it travels down the conveyor to the Long Bun Storage Room. The buns are then removed from the conveyor and placed in the room for temporary storage during completion of a twelve hour cure period, continuing to release methylene chloride at a diminishing rate.

Currently, the Slabstock process is equipped with an exhaust system and tunnel which covers part of the mixing head, trough and conveyor line to vent the emissions which occur during the initial stages of the process. This system maintains a negative pressure along the covered portion of the process and vents the methylene chloride emissions to the atmosphere through an existing stack. Emissions of methylene chloride which occur outside of the foam line tunnel, inside the Long Bun Storage Room, and throughout the rest of facility are currently released into the interior of the facility and discharged to the atmosphere through general ventilation fans (50,000 CFM each) located in the ceiling throughout the facility.

The proposed enhanced collection system requires the complete enclosure of the mixing head, trough, and conveyor line in a tunnel. The foam line enclosure will extend from the mixing head to the Long Bun Storage Room. The system will be designed to maintain negative pressure within the foam line enclosure. The foam line enclosure exhaust will be vented to the atmosphere by a 30,000 CFM exhaust fan, or combination of fans totaling 30,000 CFM, via an exhaust stack with a height of 125 feet above ground level. In addition to the foam line enclosure, the proposed enhanced collection system requires the Long Bun Storage Room to be maintained under negative pressure and the exhaust vented to the atmosphere by a 30,000 CFM exhaust fan, or combination of fans totaling 30,000 CFM, via an exhaust stack with a height of 125 feet above ground level. As part the proposed system, the existing ceiling exhaust fans in the Long Bun Storage Room will not be operational. Emissions which do not occur within the foam line enclosure or Long Bun Storage Room will be vented to the atmosphere through the seventeen 50,000 CFM general exhaust fans located in the ceiling throughout the remainder of the facility. To provide enhanced dispersion, these seventeen exhaust fans will be fitted with extensions to increase the their stack heights to 53 feet above ground level.

Based on industry and product information, it is assumed for this modeling protocol document and the permit application, that 60% of the methylene chloride is released from the foam in the foam line enclosure before it reaches the Long Bun Storage Room and 35% is released during the twelve hour cure period in the Long Bun Storage Room. The remaining 5% of the methylene chloride is released during subsequent foam fabrication and processing operations throughout the rest of the facility before shipment of the final product. Also, all TDI emissions associated with the Slabstock production occur within the foam line enclosure and are emitted to the atmosphere via the foam line stack.

2.2 Rebond Polyurethane Foam Production

In the Rebond process, scrap polyurethane foam, either purchased or recovered from the slabstock manufacturing process, is granulated into small pieces approximately 3/4 to one inch in size. This granulated foam is stored by grade, density, and/or by composition in large storage bins. The scrap pieces of polyurethane foam are mixed with an adhesive binder in a blend tank. The binder is a mixture of TDI and polyol. The mixture of scrap foam and binder then transferred from the blend tank to the mold where it is compressed under an air cylinder to a designated size. The product is steamed from the bottom of the mold, which cures the foam . The resulting cylinder of foam is referred to as a log. The foam log is then peeled into a continuous sheet, with a thickness of 1/4 to 3/4 inch, per customer specifications. The foam sheet product is then bonded to a polyethylene film. Finally the foam sheet product is cut to length and packaged into rolls, per customer order.

The TDI emissions from the Rebond process are currently vented to the atmosphere through two identical 1,000 CFM exhaust fans located in the ceiling directly above the process. These two exhaust fans will be increased in size to 15,000 CFM each and will be fitted with extensions to increase the their stack heights to 53 feet above ground level.

2.3 Tank Storage

The Foamex facility includes eleven above ground storage tanks for receiving and holding of the various raw materials used in the foam production processes. Table 1 provides a summary of the tanks, dimensions and products stored. Only one tank, Tank 10, is used for storage of methylene chloride. Methylene chloride emissions from Tank 10 were calculated using EPA's Storage Tank Emissions Calculation program, TANKS version 1.0, and are presented in the permit application. Foamex proposes to install a pressure relief valve on Tank 10 to minimize standing losses. No physical or operational changes to the remaining storage tanks are proposed. Based on previous submittals to FDEP, methylene chloride emissions from Tank 10 will not be addressed in the dispersion modeling analysis.

2.4 Steam Boiler

Foamex operates a natural gas fired industrial boiler rated at 100 HP. This boiler is used to convert an average of 1,570 gallons of water to steam each day for use in the Rebond process. No changes to the operation of the steam boiler are proposed. Emissions from the steam boiler will not be addressed in the dispersion modeling analysis.

2.5 Environmental Heating

There are thirteen indirect fired heaters existing at the Foamex facility. Of these, nine are used as needed during the winter months for heating the manufacturing and administrative areas of the facility. It is estimated that these heaters operate less than 400 hours per year. The remaining four heaters are not operational. Table 2 provides a listing of the individual heaters and the rated capacity of each. Emissions from the heaters will not be addressed in the dispersion modeling analysis.

2.6 Foam Fabrication Operations

During foam fabrication operations, the foam buns manufactured during the Slabstock process are cut to size, assembled, glued according to customer specifications. The fabrication operations take place throughout the facility, except for the long bun storage room. Approximately 3.1 lbs/hr of Aldobond 120 glue or equivalent is used during these operations. The glues used in the foam fabrication operations contain 1,1,1-trichloroethane. Of the glues used by Foamex, Aldobond 120 has the maximum concentration of 1,1,1-trichloroethane (81% weight). Based on previous submittals to FDEP, the emissions of 1,1,1-trichloroethane from the gluing operation will be analyzed in the dispersion modeling analysis. The 1,1,1-trichloroethane emissions from the gluing operation are vented to the atmosphere through the seventeen exhaust fans located in the ceiling throughout the facility, which will be modified as part of the proposed enhanced collection and dispersion system.

2.7 Requested Permitted Operating Time

For the processes and supporting operations discussed above, the requested hours of operation in the permit application are as follows:

- Slabstock Polyurethane Foam Production: 3 hrs/day; 4 days/wk; 52 wks/yr;
- Rebond Polyurethane Foam Production: 12 hrs/day, 6 days/wk, 52 wks/yr;
- Tank Storage: 24 hrs/day, 7 days/wk, 52 wks/yr;
- Steam Boiler: 24 hrs/day, 7 days/wk, 52 wks/yr;
- Environmental Heating: 400 hrs/yr; and
- Foam Fabrication Operations: 12 hrs/day, 6 days/wk, 52 wks/yr.

Table 1. Summary of Storage Tank Data
Foamex, L.P. - Orlando, Florida

Tank Number	Product	Height (feet)	Diameter (feet)	Vent Diameter (inches)
1	Polyol	35	12	2
2	Polyol	35	12	2
3	TDI	35	12	2
4	Polyol	35	12	3
5	Polyol	35	12	3
6	TDI	35	12	1.75
7	Empty	16	10.5	2
8	Polymer	16	10.5	2
9	Empty	35	12	2
10	Methylene Chloride	37(long)	7	1.25
11	Empty	30(long)	7	1

Table 2. Indirect Fired Heaters
Foamex, L.P. - Orlando, Florida

Heater Number	Manufacturer	Model Number	Operational?	Maximum Heat Input (Btu/hr)
1	Bryant	200-341	Yes	200,000
2	Bryant	200-341	No	200,000
3	Hastings	GF200XE	Yes	200,000
4	Hastings	GF200XE	No	200,000
5	Hastings	GF200XE	Yes	200,000
6	Hastings	GF200XE	Yes	200,000
7	Hastings	GF200XE	Yes	200,000
8	Hastings	GF200XE	Yes	200,000
9	Hastings	GF200XE	Yes	200,000
10	Hastings	GF200XE	Yes	200,000
11	Bryant	200-341	No	200,000
12	Bryant	200-341	No	200,000
13	Peereless	1067	Yes	250,000
TOTAL (operational boilers only)				1,850,000

4 inoperable

3.0 DISPERSION MODELING METHODOLOGY

As previously stated, the dispersion modeling analysis will only address the following emissions from the Foamex facility:

- Methylene Chloride from the slabstock foam manufacturing process;
- Toluene Diisocyanate from the slabstock foam manufacturing process and rebond foam manufacturing process; and
- 1,1,1-Trichloroethane from the gluing process during foam fabrication operations.

The methodology to be followed in the dispersion modeling analysis is as follows:

1) A downwash/Good Engineering Practice (GEP) stack height analysis will be conducted utilizing EPA's new Building Profile Input Program (BPIP), dated 94074.
2) Emission rates for each compound and process will be calculated based on maximum daily and annual usage of each compound.
3) The EPA Industrial Source Complex - Short Term model (ISCST2), dated 93109, will be used to predict the 8-hour and 24-hour impacts of each compound and annual impacts of methylene chloride from the facility.
4) The resulting concentrations will then be compared with 90% of FDEP's AAAC's for each compound.

8-24-annual for all Air pollutants

4.0 SOURCE DATA

The source data to be used in the dispersion modeling analysis are presented in Table 3 below. The location of each source is shown in Figure 2.

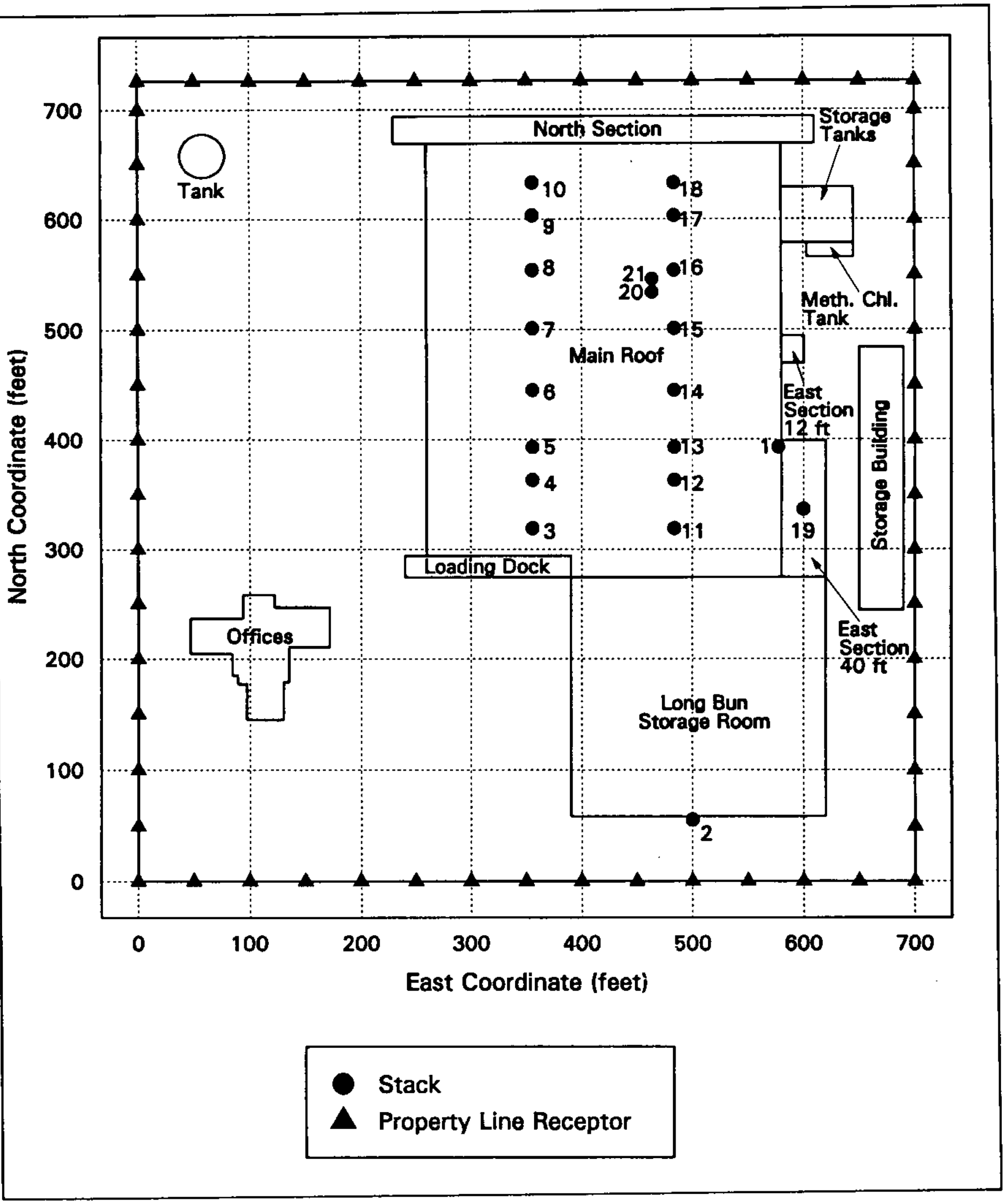
Table 3. Stack and Exhaust Fan Stack Parameters
Foamex, L.P. - Orlando, Florida

Source Number	Description	Stack Height[a] Above Ground Level (feet)	Stack Inside Diameter (inches)	Stack Gas Flow Rate (ACFM)	Stack Gas Exit Temp. (°F)	Stack Gas Exit Velocity (ft/sec)	Stack Location Coordinates[b] (feet) East	North
1	Foam Line Stack	125	33.75	30,000	80	80.481	577	393
2	Long Bun Storage Room Stack	125	33.75	30,000	80	80.481	500	56
3	Exhaust Fan	53	43.5	50,000	80	80.744	356	319
4	Exhaust Fan	53	43.5	50,000	80	80.744	356	363
5	Exhaust Fan	53	43.5	50,000	80	80.744	356	393
6	Exhaust Fan	53	43.5	50,000	80	80.744	356	445
7	Exhaust Fan	53	43.5	50,000	80	80.744	356	501
8	Exhaust Fan	53	43.5	50,000	80	80.744	356	554
9	Exhaust Fan	53	43.5	50,000	80	80.744	356	603
10	Exhaust Fan	53	43.5	50,000	80	80.744	356	633
11	Exhaust Fan	53	43.5	50,000	80	80.744	484	319
12	Exhaust Fan	53	43.5	50,000	80	80.744	484	363
13	Exhaust Fan	53	43.5	50,000	80	80.744	484	393
14	Exhaust Fan	53	43.5	50,000	80	80.744	484	445
15	Exhaust Fan	53	43.5	50,000	80	80.744	484	501
16	Exhaust Fan	53	43.5	50,000	80	80.744	484	554
17	Exhaust Fan	53	43.5	50,000	80	80.744	484	603
18	Exhaust Fan	53	43.5	50,000	80	80.744	484	633
19	Exhaust Fan	53	43.5	50,000	80	80.744	600	336.5
20	Rebond Exhaust Fan	53	24	15,000	80	79.577	464	534
21	Rebond Exhaust Fan	53	24	15,000	80	79.577	464	546

a. Elevation of top of stack above ground level. Stack base elevation = 0 feet.

b. See Figure 2 for stack locations.

Figure 2. Stack Locations, Downwash Structures, and Property Line Receptors
Foamex, L.P. - Orlando Facility



5.0 BUILDING DOWNWASH/GEP STACK HEIGHT ANALYSIS

A building downwash/GEP Stack Height analysis will be conducted to determine the GEP stack height for each source and the wind direction-specific building dimensions to be used as inputs to the ISCST2 model. The downwash analysis will be conducted utilizing EPA's BPIP program (dated 94074). The location and heights of all of the buildings at the facility will be input to the BPIP program. The location of the buildings are shown in Figure 2 and the heights of the buildings are presented in the Table 4 below. The heights of the buildings were determined from Foamex's facility plot/elevation plan, which can be found in Appendix B. The location and height of each stack will also be input to BPIP. The resulting wind direction-specific building dimensions from BPIP will be used as inputs to the ISCST2 model.

Table 4. Building Heights
Foamex, L.P. - Orlando Facility

Building	Height
Offices	14 feet
Tank	32 feet
Long Bun Storage Room	50 feet
East Section - 40 ft	40 feet
Main Roof	35 feet
Loading Dock	16 feet
East Section - 12 ft	12 feet
Storage Tanks	36 feet
North Section	16 feet
Storage Building	22 feet
Methylene Chloride Tank	10 feet

7.0 METEOROLOGICAL DATA

One full year of hourly meteorological data will be used for the ISCST2 modeling. Orlando, Florida (NWS No. 12815) surface data and Tallahassee, Florida (NWS No. 12842) upper air data for the year 1986 will be used. The overall maximum concentration for each averaging time predicted using this meteorological data will be used as the final result.

8.0 TERRAIN CONSIDERATIONS

The Foamex facility is located in an industrial park in Orlando, Florida and is surrounded by relatively flat terrain with an elevation of approximately 90 feet above sea level, which can be seen on the USGS map presented in Appendix A. Based on the surrounding flat terrain and that preliminary ISCST2 modeling has indicated the maximum ground level concentrations will occur within 1000 meters of the facility, terrain elevations will not be entered as input to the ISCST2 model. Also, complex terrain will not be addressed because there is no terrain exceeding stack top elevation located near the facility.

9.0 RURAL/URBAN DISPERSION COEFFICIENTS

The rural dispersion coefficients will be used in the dispersion modeling analysis. The use of the rural dispersion coefficients was determined based on a review of aerial photographs and land use data, obtained from Orange County, which showed that less than 50% of the land use within 3.0 kilometers of the facility is of the types I1, I2, C1, R2, and R3. This method of determination is recommended in the EPA "Guideline on Air Quality Models (Revised)".

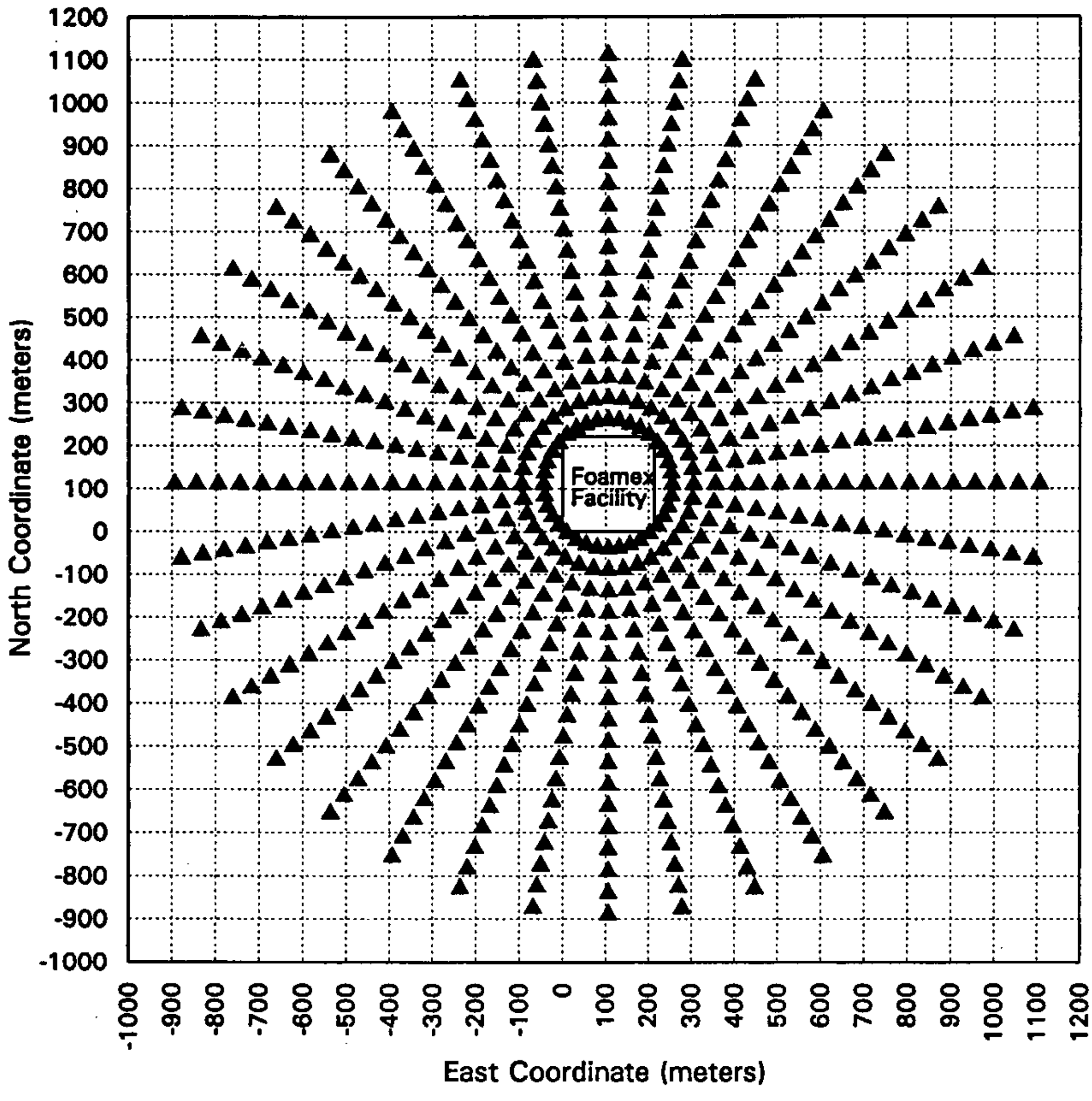
10.0 RECEPTORS

A polar receptor grid will be used in the dispersions modeling analysis. The origin of the polar receptor grid will be the center of Foamex facility property. The grid will contain a total of 648 receptors. The grid will consist of eighteen rings, one every 50 meters, starting at 150 meters from the origin and extend out to a distance of 1000 meters. The grid will start at 150 meters from the origin because this is the closest full ring that can be located outside of the facility's property boundary. The grid will not extend beyond 1000 meters because, as stated previously in Section 8.0, preliminary ISCST2 modeling has indicated that the maximum ground level concentrations will occur within 1000 meters of the facility. The grid will also consist of 36 radials, one every 10°, starting at 10°. The polar receptor grid is shown in Figure 3.

A total of 58 discrete receptors will also be used in the modeling analysis. The discrete receptors will be placed every 50 feet along the property boundary and at the corners of the of property boundary as shown in Figure 2.

No receptor heights will be input in order to calculate ground level concentrations only.

Figure 3. Polar Receptor Grid
Foamex, L.P. - Orlando, Florida



11.0 REGULATORY DEFAULT OPTION

The regulatory default option will be selected for the ISCST2 model. The options selected with the regulatory default option are as follows:

- Use stack-tip downwash (except for Schulman-Scire downwash);
- Use buoyancy-induced dispersion (except for Schulman-Scire downwash);
- Do not use gradual plume rise (except for building downwash);
- Use upper-bound concentration estimates for sources influenced by building downwash from super-squat buildings; and
- Use default vertical potential temperature gradients.

12.0 COMPOUNDS AND APPLICABLE STANDARDS

The impacts of the compounds listed in Table 5 below will be analyzed in the air quality modeling report and the resulting concentrations will be compared with 90% of the listed applicable FDEP Acceptable Ambient Air Concentrations.

Table 5. Compounds to be Analyzed and AAAC's
Foamex, L.P. - Orlando, Florida

Compound	Averaging Time	FDEP AAAC ($\mu g/m^3$)	90% of FDEP AAAC ($\mu g/m^3$)
Methylene Chloride	8-hour	1,740	1,566
	24-hour	417.6	375.8
	Annual	2.1	1.9
Toluene Diisocyanate	8-hour	0.36	0.32
	24-hour	0.0864	0.0778
1,1,1-Trichloroethane	8-hour	38,200	34,380
	24-hour	9,168	8,251

13.0 CONCENTRATIONS CALCULATED

For comparison with the FDEP AAAC's the 50 maximum concentrations will be calculated for each compound by the ISCST2 model for 8-hour and 24-hour averaging times. The annual average concentration will also be calculated for methylene chloride by the ISCST2 model by using the PERIOD keyword in the averaging times parameter list.

14.0 EMISSION RATES

Maximum hourly and daily usage rates were used to calculate the 8-hour and 24-hour average emission rates for each compound listed in Table 5. The maximum annual usage of methylene chloride was used to calculate the annual average emission rate of methylene chloride from the facility. The calculation of the emission rates to be used in the analysis is shown below and summarized in Table 6.

Compounds to be modeled:

Methylene Chloride
Toluene Diisocyanate (TDI)
1,1,1-Trichloroethane

Methylene Chloride emission distribution:

Foam Line Stack	=	60%
Long Bun Storage Room Stack	=	35%
17 Exhaust Fans	=	5%

It is assumed that the 17 exhaust fans' emissions are equally distributed among all 17 exhaust fans.

Maximum hourly methylene chloride usage rate = 1,593 lb/hr

Maximum daily slabstock foam production hours of operations = 3.0 hr/day

Maximum daily methylene chloride usage = 1,593 lb/hr x 3.0 hr/day = 4,779 lb/day

8-hour average methylene chloride emission rate = 4,779 lb/day ÷ 8 hr/day = 597.375 lb/hr

Distributed 8-hour average methylene chloride emission rates:

Foam Line Stack	=	597.375 lb/hr x 60%	=	358.425 lb/hr
Long Bun Storage Room Stack	=	597.375 lb/hr x 35%	=	209.08125 lb/hr
17 Exhaust Fans	=	597.375 lb/hr x 5%	=	29.86875 lb/hr
Each Exhaust Fan	=	29.86875 lb/hr ÷ 17	=	1.756985 lb/hr

24-hour average total methylene chloride emission rate = 4,779 lb/day ÷ 24 hr/day = 199.125 lb/hr

Distributed 24-hour average methylene chloride emission rates:

Foam Line Stack	=	199.125 lb/hr x 60%	=	119.475 lb/hr
Long Bun Storage Room Stack	=	199.125 lb/hr x 35%	=	69.69375 lb/hr
17 Exhaust Fans	=	199.125 lb/hr x 5%	=	9.95625 lb/hr
Each Exhaust Fan	=	29.86875 lb/hr ÷ 17	=	0.58566 lb/hr

Maximum annual methylene chloride usage = 490,850 lb/yr

Annual average total methylene chloride emission rate = 490,850 lb/yr ÷ 8,760 hr/yr = 56.033 lb/hr

Distributed annual average methylene chloride emission rates:

Foam Line Stack	=	56.033 lb/hr x 60%	=	33.6198 lb/hr
Long Bun Storage Room Stack	=	56.033 lb/hr x 35%	=	19.61155 lb/hr
17 Exhaust Fans	=	56.033 lb/hr x 5%	=	2.80165 lb/hr
Each Exhaust Fan	=	29.86875 lb/hr ÷ 17	=	0.1648 lb/hr

Maximum slabstock foam production TDI emission rate = 0.37 lb/hr

Maximum daily slabstock foam production hours of operations = 3.0 hr/day

Maximum daily slabstock foam production TDI emissions = 0.37 lb/hr x 3.0 hr/day = 1.11 lb/day

TDI emission factor = 0.000028 lb emitted/lb used

Maximum hourly rebond process TDI usage rate = 162 lb/hr

Maximum hourly rebond process TDI emission rate = 162 lb/hr x 0.000028 lb/lb = 0.0046 lb/hr

Maximum daily rebond process hours of operation = 12.0 hr/day

8-hour average TDI emission rates:

Foam Line Stack	=	1.11 lb/day ÷ 8 hr/day	= 0.13875 lb/hr
2 Rebond Exhaust Fans	=	0.0046 lb/hr x 8 hr/day ÷ 8 hr/day	= 0.0046 lb/hr
Each Rebond Exhaust Fan	=	0.0046 lb/hr ÷ 2	= 0.0023 lb/hr

24-hour average TDI emission rates:

Foam Line Stack	=	1.11 lb/day ÷ 24 hr/day	= 0.04625 lb/hr
2 Rebond Exhaust Fans	=	0.0046 lb/hr x 12 hr/day ÷ 24 hr/day	= 0.0023 lb/hr
Each Rebond Exhaust Fan	=	0.0023 lb/hr ÷ 2	= 0.00115 lb/hr

Maximum hourly glue usage rate = 3.1 lb/hr

Maximum 1,1,1-trichloroethane content of glue = 81%

Maximum hourly 1,1,1-trichloroethane emission rate = 3.1 lb/hr x 81% = 2.5 lb/hr

Maximum daily foam fabrication hours of operation = 12.0 hr/day

8-hour average 1,1,1-trichloroethane emission rates:

17 Exhaust Fans	= 2.5 lb/hr x 8 hr/day ÷ 8 hr/day	= 2.5 lb/hr
Each Exhaust Fan	= 2.5 lb/hr ÷ 17	= 0.14706 lb/hr

24-hour average 1,1,1-trichloroethane emission rates:

17 Exhaust Fans	= 2.5 lb/hr x 12 hr/day ÷ 24 hr/day	= 1.25 lb/hr
Each Exhaust Fan	= 1.25 lb/hr ÷ 17	= 0.07353 lb/hr

Table 6. Emission Rates
Foamex, L.P. - Orlando, Florida

		Emission Rates for Compounds to be Modeled						
		Methylene Chloride			Toluene Diisocyanate		1,1,1-Trichloroethane	
Source Number	Source Description	8-hour (lb/hr)	24-hour (lb/hr)	Annual (lb/hr)	8-hour (lb/hr)	24-hour (lb/hr)	8-hour (lb/hr)	24-hour (lb/hr)
1	Foam Line Stack	358.425	119.475	33.6198	0.13875	0.04625	0.0	0.0
2	Long Bun Storage Room Stack	209.08125	69.69375	19.61155	0.0	0.0	0.0	0.0
3	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
4	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
5	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
6	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
7	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
8	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
9	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
10	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
11	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
12	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
13	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
14	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
15	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
16	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
17	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
18	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
19	Exhaust Fan	1.756985	0.58566	0.1648	0.0	0.0	0.14706	0.07353
20	Rebond Exhaust Fan	0.0	0.0	0.0	0.0023	0.00115	0.0	0.0
21	Rebond Exhaust Fan	0.0	0.0	0.0	0.0023	0.00115	0.0	0.0

APPENDIX A

USGS TOPOGRAPHICAL MAP
LAKE JESSAMINE, FLORIDA QUADRANGLE

APPENDIX B

FACILITY PLOT/ELEVATION PLAN

DISTRIBUTION

Dispersion Modeling Protocol
Foamex, L.P.
Flexible Polyurethane Foam
Manufacturing Facility
Orlando, Florida

April 5, 1994

Copy No. 3

Copies 1 - 2:	Mr. Cleve Holladay FDEP - Bureau of Air Regulation Twin Towers Office Building 2600 Blair Stone Road Tallahassee, Florida 32399-2400
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Copy 6:	Job File

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