FLORIDA
FIRST
PROCESSING
L.P.

Protecting Florida's Environmental Future

RCRA Part B & Air Permit Application

Volume VI

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Florida First Processing, Inc.

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Florida First Processing, Inc.

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Section

L. AIR PERMIT APPLICATION (Continued)

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-3

AIR PERMIT APPLICATION
FOR
TANK TRUCK UNLOADING AREA

DEPARTMENT OF ENVIRONMENTAL REGULATION

Best Available Copy

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Tank Truck Unloading Area [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [X] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lim Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) tank truck unloading a

SOURCE LOCATION: Street west side of Fort Green Rd., 3/4 miles south of County Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27° 43' 15"N Longitude 81° 57' 45"W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing

I certify that the statements made in this application for a construction & operati permit are true, correct and complete to the best of my knowledge and belief. Fur I agree to maintain and operate the pollution control source and pollution co facilities in such a manner as to comply with the provision of Chapter 403, Fl Statutes, and all the rules and regulations of the department and revisions thereo also understand that a permit, if granted by the department, will be non-transfe and I will promptly notify the department upon sale or legal transfer of the perm establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9 28 89 Telephone No. (703) 893-35

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project been designed/examined by me and found to be in conformity with modern engine principles applicable to the treatment and disposal of pollutants characterized i permit application. There is reasonable assurance, in my professional judgment,

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed __________

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers the tank truck unloading operation. Tank trucks which transport bulk organic wastes to the facility are unloaded in the tank truck unloading area. The fugitive emissions of organics from the tank truck breathing are controlled by carbon adsorption beds.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction spring/summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/treatment systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr _____; if seasonal, describe: ____________________

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant?	No
a. If yes, has "offset" been applied?	
b. If yes, has "Lowest Achievable Emission Rate" been applied?	
c. If yes, list non-attainment pollutants.	
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.	No
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII.	No
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?	No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?	No
H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source?	No

a. If yes, for what pollutants? ____________________

b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Please see addendum

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Methylene Chloride	0.00029	0.0000275	0.000145*	0.000145*	1.1	0.00055	
Acetone	0.00012	0.00002775	0.00006*	0.00006*	1.11	0.00055	
Total VOC	0.00041	0.00005125	0.000205	0.000205	2.21	0.001105	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

* Since there are no specific allowable emission rates, the calculated emission rates are reported.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Carbon Adsorption System	VOC	95%	N/A	Manufacturer's Data
	(volatile organic compounds)			

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating. N/A

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

There are no wastes generated except for the spent carbon adsorption beds. These will not be regenerated, instead, they will be burned in the incinerator.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: ______________ ft. Stack Diameter: ______________ ft.

Gas Flow Rate: __________ ACFM __________ DSCFM Gas Exit Temperature: ______________ °F.

Water Vapor Content: ______________ % Velocity: ______________ FPS

SECTION IV: INCINERATOR INFORMATION

N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ______________ Design Capacity (lbs/hr) ______________

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______________

Date Constructed ______________ Model No. ______________

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: __________ ft. Stack Diamter: ______________ Stack Temp. ______________

Gas Flow Rate: ______________ ACFM ______________ DSCFM* Velocity: ______________ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______________

Brief description of operating characteristics of control devices: ______

______

______

______

______

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

______

______

______

______

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS*

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

*Please see addendum.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [x] No BACT is not applicable to this source

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

---

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

---

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

---

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. ________ no. sites ________ TSP ________ ( ) SO^{2}* ________ Wind spd/dir

Period of Monitoring ____ / ____ / ____ to ____ / ____ / ____
month day year month day year

Other data recorded ________________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________

3. Upper air (mixing height) data obtained from (location)________________

4. Stability wind rose (STAR) data obtained from (location)________________

C. Computer Models Used

1. ________________ Modified? If yes, attach description.

2. ________________ Modified? If yes, attach description.

3. ________________ Modified? If yes, attach description.

4. ________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	________________	grams/sec
SO^2	________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO THE PERMIT APPLICATION FOR TANK TRUCK UNLOADING AREA

Section III - A

The wastes burned/treated at FFPI are transported into the facility by tank trucks and rail cars. There are separate tank truck and rail car unloading/loading areas in the facility. The rail cars have a volume of 30,000 gallons and the tank trucks have a capacity of 6,000 gallons. The fugitive emissions given out as a result of the unloading operation are controlled by carbon adsorption systems.

The types of the wastes received by the facility are described in Section C of the RCRA Part B permit application. The tank truck and rail car unloading/loading areas are described in Section D of the RCRA Part B permit application. In general, the wastes are mixtures of various compatible components. For the purposes of the emission estimates it is assumed that the wastes transported by the railroad tank cars are composed entirely of high Btu liquids, low Btu liquids, and sludges.

The typical composition (by weight) of high Btu liquids is as follows:

Acetone	37% (45.1% by mole, ignoring ash)
Methylene Chloride	56% (46.6% by mole, ignoring ash)
Water	2%
Ash	5%

The typical composition (by weight) of low Btu liquids is as follows:

Acetone	5% (1.74% by mole, ignoring ash)
Methylene Chloride	8% (1.89% by mole, ignoring ash)
Water	86%
Ash	1%

The typical composition (by weight) of sludges is as follows:

Acetone	60% (67% by mole, ignoring ash)
Methylene Chloride	15% (11.4% by mole, ignoring ash)
Water	6%
Ash	19%

Section V - Items 2, 3

The air pollutant emission rates were estimated using the EPA Document Compilation of Air Pollutant Emission Factors, AP-42, Fourth Edition, September 1985. Summary sheets of all the results of all the calculations are enclosed at the end of this addendum.

Emissions of organic vapors given out due to the tank truck breathing are estimated as follows:

$$L_B = 0.0226*M*((P/14.7-P)^{0.68})*(D^{1.73})*(H^{0.51})*(\Delta T^{0.5})*F_P*C*K_C$$

where, L_B = Breathing losses of substance in the tank (lb/yr)
M = Molecular weight of vapors (lb/lb-mole)

P = True vapor pressure of liquid loading (psia)
D = Diameter of the tank truck (ft)
H = Height of the vapor space in the tank truck (ft)
ΔT = Average ambient diurnal temperature change (F°)
F_P = Paint factor (dimensionless)
C = Tank truck diameter adjustment factor (dimensionless)
K_C = Product factor (dimensionless)

The throughputs of the three types of the waste are estimated to be:

High Btu liquids	3,647 tons/yr
Low Btu liquids	7,344 tons/yr
Sludges	14,688 tons/yr

Based on an average density of 10 lbs/gal for the high and low Btu wastes, and 12 lbs/gal for the sludge, the throughputs are:

High Btu liquids	729,400 gallons/yr
Low Btu liquids	1,468,000 gallons/yr
Sludges	2,448,000 gallons/yr

The waste are transported by tank trucks as well as rail cars. It is assumed that the amounts of wastes transported by the trucks and rail cars are proportional to the volumes of the tank truck and rail car respectively. This means that of the 729,400 gallons of high Btu wastes transported into the facility per year, 121,567 gallons are transported by tank trucks and the remaining 607,833 gallons are transported by the rail cars. The breakdown of the wastes transported by tank trucks and rail cars for all the three types of wastes is as follows:

Type of waste	Amount transported by tank trucks (gal)	Amount transported by rail cars (gal)	Number of Tank Trucks	Number of Railroad Tank Cars
High Btu wastes	121,567	607,833	20	20
Low Btu wastes	244,667	1,223,333	41	41
Sludges	408,000	2,040,000	68	68

Please note that this assumption does not in any manner influence the estimation of the total emission rate from the tank truck and rail car unloading operations because the total emission rate will still be based on the actual amount of the wastes transported into the facility. This assumption merely offers a means to break the total emissions down into those emitted due to tank truck unloading and those due to rail car unloading.

There will be acetone and methylene chloride emissions from the tank truck. Since the material being transferred is a mixture, the partial pressures of acetone and methylene chloride were computed (ignoring the ash content) using Raoult's law as follows:

Partial pressure of a component in the mixture

= mole fraction of the component * vapor pressure of the component

The partial pressures of acetone and methylene chloride for the three types of wastes are estimated to be:

High Btu Liquids:

Acetone:	1.668 psia
Methylene chloride:	3.168 psia

Low Btu Liquids

Acetone:	0.0643 psia
Methylene chloride:	0.1285 psia

Sludge

Acetone:	2.479 psia
Methylene chloride:	0.775 psia

Other Data:

Molecular weight of acetone = 58 lb/lb. mole
Molecular weight of methylene chloride = 85 lb/lb.mole
Tank truck diameter = 6 feet
Tank truck length = 29 feet
Equivalent diameter (estimated using above data) = 15 feet
Paint factor = 1
Tank diameter adjustment factor = 0.74
Average vapor space height = 3 feet
Average ambient diurnal temperature change = 20.8 F°
Product factor = 1

Substituting all the above data into the equation gives:

High Btu Liquid Tank Truck

L_B = 207.33 lbs/yr of acetone per tank truck
= 510.74 lbs/yr of methylene chloride per tank truck

Low Btu Liquid Tank Truck

L_B = 20.93 lbs/yr of acetone per truck
= 49.28 lbs/yr of methylene chloride per tank truck

Tank Truck Transporting Sludges

L_B = 283.56 lbs/yr of acetone per tank truck
= 172.47 lbs/yr of methylene chloride per tank truck

The above results assume that the tank trucks breathe for 8,760 hours per year. Since a tank truck is emptied in 24 minutes (at 250 gallons per minute), the breathing duration lasts only 24 minutes. In addition the emissions of these vapors are controlled by a carbon adsorption system having an efficiency of reduction of 95%. Based on the number of tank trucks transporting the organic wastes, and the time taken to empty the tank truck contents, the actual breathing losses are estimated to be as follows:

High Btu Liquids Transport

Uncontrolled Emission Rates:

Acetone: 0.0012 lb/hr per tank truck
0.19 lb/yr from all tank trucks

Methylene chloride: 0.0029 lb/hr per tank truck
0.47 lb/yr from all tank trucks

Controlled Emission Rates:

Acetone: 0.00006 lb/hr per tank truck
0.0095 lb/yr from all tank trucks

Methylene chloride: 0.000145 lb/hr per tank truck
0.0235 lb/yr from all tank trucks

Low Btu Liquid Transport

Uncontrolled Emission Rates:

Acetone: 0.0001 lb/hr per tank truck
0.04 lb/yr from all tank trucks

Methylene chloride: 0.0003 lb/hr per tank truck
0.09 lb/yr from all tank trucks

Controlled Emission Rates:

Acetone: 0.000005 lb/hr per tank truck
0.002 lb/yr from all tank trucks

Methylene chloride: 0.000015 lb/hr per tank truck
0.0045 lb/yr from all tank trucks

Sludge Transport

Uncontrolled Emission Rates:

Acetone: 0.0016 lb/hr per tank truck
0.88 lb/yr from all tank trucks

Methylene chloride: 0.001 lb/hr per tank truck
0.54 lb/yr from all tank trucks

Controlled Emission Rates:

Acetone: 0.00008 lb/hr per tank truck
0.044 lb/yr from all tank trucks

Methylene chloride: 0.00005 lb/hr per tank truck
0.027 lb/yr from all tank trucks

For the purposes of reporting the emission rates in Section III-C, the emission rates are classified as follows:

Maximum (lbs/hr)

The maximum emission rate is an hourly controlled emission rate representing the worst case. The worst case situation here is represented by the high Btu liquid unloading operation. Therefore the hourly emission rate of operation is the maximum emission rate. At a given time a maximum of two tank trucks can unload the organic liquids (high Btu liquids).

Therefore the maximum emission rates of acetone and methylene chloride are:

Acetone: 0.00006 x 2 = 0.00012 lb/hr
Methylene chloride: 0.000145 x 2 = 0.00029 lb/hr

Total organics: 0.00041 lb/hr

Actual (tons/yr)

The actual controlled emission rate (tons/yr) is the controlled emission rate on an annual basis. This is estimated based on the amount of the three kinds of wastes unloaded by the tank trucks on an annual basis. It is the sum of the controlled emission rates of acetone and methylene chloride during the unloading of all the three kind of organic wastes.

The actual emission rates of acetone and methylene chloride are as follows:

Acetone: 0.0095 + 0.002 + 0.044 = 0.0555 lbs/yr
(0.00002775 tons/yr)

Methylene chloride: 0.0235 + 0.0045 + 0.027 = 0.055 lb/yr
(0.0000275 tons/yr)

Potential emission rate (lbs/yr)

The potential emission rate is the total uncontrolled emission rate of methylene chloride and acetone from the tank truck unloading operation. This is estimated as follows:

Acetone: 0.19 + 0.04 + 0.88 = 1.11 lbs/yr (0.000555 tons/yr)

Methylene chloride: 0.47 + 0.09 + 0.54 = 1.1 lb/yr (0.00055 tons/yr)

Section V - Items 4, 5

The air pollution control device employed to control the breathing losses from the trucks will be a single unit carbon adsorber, consisting of one 55-gallon canister containing 200 pounds of carbon. The carbon has an adsorptive capacity of approximately 20% by weight, and one canister will be capable of removing 40 pounds of organic vapor before saturation. The carbon canister will be capable of controlling the maximum emissions of organic compounds at greater than 95% efficiency.

Replacement time for the carbon canister

There is no inflow to the trucks during the unloading operation, and working losses (from the tank to which the organic liquid from the trucks is transferred) will be vented to the incinerator or organic liquid storage and handling carbon adsorption system. Therefore the only losses from the trucks will be breathing losses. The uncontrolled breathing losses from both the trucks unloading high Btu liquids were estimated to be:

Acetone:	0.0012 lb/hr/tank truck
Methylene chloride:	0.0029 lb/hr/tank truck
Total Organics:	0.0082 lb/hr for two tank trucks

The carbon adsorption system will control the organic vapor emissions by at least 95%. Therefore the controlled emission rate of total organics will be:

$$0.0082 * (1-0.95) = 0.00041 \text{ lb/hr}$$

The rate of absorption of the vapors will be:

$$0.0082 - 0.00041 = 0.00779 \text{ lb/hr}$$

The time required to replace the carbon canister is estimated as follows:

$$\frac{\text{40 pounds organic vapor for saturation}}{\text{carbon canister}} \times \frac{\text{hr}}{\text{0.00779 lbs organic vapor removed}}$$

$$= \quad 5{,}135 \text{ hours} \approx 214 \text{ days}$$

```
EMISSIONS DUE TO BREATHING FROM TANK TRUCKS AND RAIL CARS

VEHICLE: TANK TRUCK                TANK TRUCK CAPACITY:           6000 GALLONS
                                   TANK TRUCK DIAMETER:              6 FEET
                                   TANK TRUCK LENGTH:               29 FEET


ESTIMATED TRANSPORT OF HIGH BTU LIQUIDS BY TANK TRUCKS:         121567 GALLONS PER YEAR
ESTIMATED TRANSPORT OF LOW BTU LIQUIDS BY TANK TRUCKS:          244667 GALLONS PER YEAR
ESTIMATED TRANSPORT OF SLUDGES BY TANK TRUCKS:                  408000 GALLONS PER YEAR

ASSUMING A TANK TRUCK CAPACITY OF 6000 GALLONS:

# OF TANK TRUCKS NEEDED TO TRANSPORT HIGH BTU LIQUIDS =             20
# OF TANK TRUCKS NEEDED TO TRANSPORT LOW BTU LIQUIDS =              41
# OF TANK TRUCKS NEEDED TO TRANSPORT SLUDGES =                      68

EACH TRUCK TAKES 24 MINUTES TO UNLOAD, AT A RATE OF 250 GPM

# OF HOURS ALL THE TANK TRUCKS WILL BE BREATHING, PER YEAR =        52

CASE I

MATERIAL TRANSPORTED:      HIGH BTU LIQUIDS

PARTIAL PRESSURE OF ACETONE:           1.668 PSIA
PARTIAL PRESSURE OF MECL2:             3.168 PSIA

MOLECULAR WEIGHT OF ACETONE:              58 POUNDS PER POUND MOLE
MOLECULAR WEIGHT FOR MECL2:               85 POUNDS PER POUND MOLE

PAINT FACTOR:                                       1
EQUIVALENT DIAMETER OF THE TANK TRUCK:             15 FEET
TANK DIAMETER CORRECTION FACTOR:                 0.74
AVERAGE VAPOR SPACE HEIGHT:                         3 FEET
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE:      20.8 DEG F
PRODUCT FACTOR:                                     1


BREATHING LOSSES (USING AP-42 EQUATION):       207.33 POUNDS PER YEAR OF ACETONE PER TRUCK
                                   AND         510.74 POUNDS PER YEAR OF MECL2 PER TRUCK

THESE YEARLY EMISSION RATES ASSUME CONTINUOUS BREATHING FOR 8760 HOURS A YEAR.
THEREFORE, CORRECTION HAS TO BE MADE FOR THE ACTUAL TIME ALL THE TANK TRUCKS TRANSPORTING HIGH BTU LIQUIDS BREATH.
THIS TIME IS:            8 HOURS (BASED ON 20 TANK TRUCKS UNLOADING FOR 24 MINUTES EACH)

THEREFORE THE ACTUAL BREATHING LOSSES ARE:       0.19 POUNDS PER YEAR OF ACETONE
                                   AND           0.47 POUNDS PER YEAR OF MECL2

                                   OR,         0.0012 POUNDS PER HOUR OF ACETONE PER TRUCK
                                               0.0029 POUNDS PER HOUR OF MECL2 PER TRUCK
```

```
EMISSIONS DUE TO BREATHING FROM TANK TRUCKS AND RAIL CARS

VEHICLE: TANK TRUCK                  TANK TRUCK CAPACITY:           6000 GALLONS
                                     TANK TRUCK DIAMETER:              6 FEET
                                     TANK TRUCK LENGTH:               29 FEET


ESTIMATED TRANSPORT OF HIGH BTU LIQUIDS BY TANK TRUCKS:           121567 GALLONS PER YEAR
ESTIMATED TRANSPORT OF LOW BTU LIQUIDS BY TANK TRUCKS:            244667 GALLONS PER YEAR
ESTIMATED TRANSPORT OF SLUDGES BY TANK TRUCKS:                    408000 GALLONS PER YEAR

ASSUMING A TANK TRUCK CAPACITY OF 6000 GALLONS:

# OF TANK TRUCKS NEEDED TO TRANSPORT HIGH BTU LIQUIDS =                20
# OF TANK TRUCKS NEEDED TO TRANSPORT LOW BTU LIQUIDS =                 41
# OF TANK TRUCKS NEEDED TO TRANSPORT SLUDGES =                         68

EACH TRUCK TAKES 24 MINUTES TO UNLOAD, AT A RATE OF 250 GPM

# OF HOURS ALL THE TANK TRUCKS WILL BE BREATHING, PER YEAR =           52

CASE II

MATERIAL TRANSPORTED:      LOW BTU LIQUIDS

PARTIAL PRESSURE OF ACETONE:          0.0643 PSIA
PARTIAL PRESSURE OF MECL2:            0.12B5 PSIA

MOLECULAR WEIGHT OF ACETONE:              58 POUNDS PER POUND MOLE
MOLECULAR WEIGHT FOR MECL2:               85 POUNDS PER POUND MOLE

PAINT FACTOR:                                      1
EQUIVALENT DIAMETER OF THE TANK TRUCK:            15 FEET
TANK DIAMETER CORRECTION FACTOR:                0.74
AVERAGE VAPOR SPACE HEIGHT:                        3 FEET
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE:     20.8 DEG F
PRODUCT FACTOR:                                    1


BREATHING LOSSES (USING AP-42 EQUATION):        20.93 POUNDS PER YEAR OF ACETONE PER TRUCK
                                     AND        49.28 POUNDS PER YEAR OF MECL2 PER TRUCK

THESE YEARLY EMISSION RATES ASSUME CONTINUOUS BREATHING FOR 8760 HOURS A YEAR.
THEREFORE, CORRECTION HAS TO BE MADE FOR THE ACTUAL TIME ALL THE TANK TRUCKS TRANSPORTING LOW BTU LIQUIDS BREATH.
THIS TIME IS:           16 HOURS (BASED ON 41 TANK TRUCKS UNLOADING FOR 24 MINUTES EACH)

THEREFORE THE ACTUAL BREATHING LOSSES ARE:       0.04 POUNDS PER YEAR OF ACETONE
                                     AND         0.09 POUNDS PER YEAR OF MECL2

                                     OR,       0.0001 POUNDS PER HOUR OF ACETONE PER TRUCK
                                               0.0003 POUNDS PER HOUR OF MECL2 PER TRUCK
```

```
EMISSIONS DUE TO BREATHING FROM TANK TRUCKS AND RAIL CARS

VEHICLE: TANK TRUCK                 TANK TRUCK CAPACITY:           6000 GALLONS
                                    TANK TRUCK DIAMETER:              6 FEET
                                    TANK TRUCK LENGTH:               29 FEET


ESTIMATED TRANSPORT OF HIGH BTU LIQUIDS BY TANK TRUCKS:          121567 GALLONS PER YEAR
ESTIMATED TRANSPORT OF LOW BTU LIQUIDS BY TANK TRUCKS:           244667 GALLONS PER YEAR
ESTIMATED TRANSPORT OF SLUDGES BY TANK TRUCKS:                   408000 GALLONS PER YEAR

ASSUMING A TANK TRUCK CAPACITY OF 6000 GALLONS:

# OF TANK TRUCKS NEEDED TO TRANSPORT HIGH BTU LIQUIDS =               20
# OF TANK TRUCKS NEEDED TO TRANSPORT LOW BTU LIQUIDS =                41
# OF TANK TRUCKS NEEDED TO TRANSPORT SLUDGES =                        68

EACH TRUCK TAKES 24 MINUTES TO UNLOAD, AT A RATE OF 250 GPM

# OF HOURS ALL THE TANK TRUCKS WILL BE BREATHING, PER YEAR =          52

CASE III

MATERIAL TRANSPORTED:      SLUDGES

PARTIAL PRESSURE OF ACETONE:           2.479 PSIA
PARTIAL PRESSURE OF MECL2:             0.775 PSIA

MOLECULAR WEIGHT OF ACETONE:              58 POUNDS PER POUND MOLE
MOLECULAR WEIGHT FOR MECL2:               85 POUNDS PER POUND MOLE

PAINT FACTOR:                                       1
EQUIVALENT DIAMETER OF THE TANK TRUCK:             15 FEET
TANK DIAMETER CORRECTION FACTOR:                 0.74
AVERAGE VAPOR SPACE HEIGHT:                         3 FEET
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE:      20.8 DEG F
PRODUCT FACTOR:                                     1


BREATHING LOSSES (USING AP-42 EQUATION):       283.56 POUNDS PER YEAR OF ACETONE PER TRUCK
                                    AND        172.47 POUNDS PER YEAR OF MECL2 PER TRUCK

THESE YEARLY EMISSION RATES ASSUME CONTINUOUS BREATHING FOR 8760 HOURS A YEAR.
THEREFORE, CORRECTION HAS TO BE MADE FOR THE ACTUAL TIME ALL THE TANK TRUCKS TRANSPORTING SLUDGES BREATH.
THIS TIME IS:           27 HOURS (BASED ON 68 TANK TRUCKS UNLOADING FOR 24 MINUTES EACH)

THEREFORE THE ACTUAL BREATHING LOSSES ARE:       0.88 POUNDS PER YEAR OF ACETONE
                                    AND          0.54 POUNDS PER YEAR OF MECL2

                                    OR,        0.0016 POUNDS PER HOUR OF ACETONE PER TRUCK
                                               0.0010 POUNDS PER HOUR OF MECL2 PER TRUCK
```

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-4

AIR PERMIT APPLICATION
FOR
RAILROAD TANK CAR UNLOADING AREA

DEPARTMENT OF ENVIRONMENTAL REGULATION

Best Available Copy

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Railroad Tank Car Unloading Area [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [X] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) RR Tank Car Unloading Ar

SOURCE LOCATION: Street west side of Fort Green Rd., 3/4 miles south of County Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27° 43' 15"N Longitude 81° 57' 45"W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing,

I certify that the statements made in this application for a construction & operatio permit are true, correct and complete to the best of my knowledge and belief. Furt I agree to maintain and operate the pollution control source and pollution con facilities in such a manner as to comply with the provision of Chapter 403, Flo Statutes, and all the rules and regulations of the department and revisions thereof also understand that a permit, if granted by the department, will be non-transfer and I will promptly notify the department upon sale or legal transfer of the permi establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-351

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project been designed/examined by me and found to be in conformity with modern enginee principles applicable to the treatment and disposal of pollutants characterized in permit application. There is reasonable assurance, in my professional judgment,

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed Dick M. Miller

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers the rr tank car unloading operation. RR tank cars which transport bulk organic wastes to the facility are unloaded in the rr tank car unloading area. The fugitive emissions of organics from tank car breathing are controlled by carbon adsorption beds.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction spring/summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/treatment systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr ____ ; if seasonal, describe: ____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant?	No
a. If yes, has "offset" been applied?	
b. If yes, has "Lowest Achievable Emission Rate" been applied?	
c. If yes, list non-attainment pollutants.	
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.	No
3. Does the State "Prevention of Significant Deteriotiation" (PSD) requirement apply to this source? If yes, see Sections VI and VII.	No
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?	No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?	No
H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source?	No

a. If yes, for what pollutants? ____

b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Please see addendum

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Please see addendum for emissions estimates

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Methylene Chloride	0.000405	0.00039	0.000405*	0.000405 *	15.58	0.0078	
Acetone	0.000165	0.00039	0.000165*	0.000165 *	15.51	0.0078	
Total	0.00057	0.00078	0.00057*	0.00057*	31.09	0.0156	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

* Since there are no specific allowable emission rates, the calculated emission rates are reported.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Carbon Adsorption System	VOC (volatile organic compounds)	95%	N/A	Manufacturer's Data

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: __________ Percent Ash: __________

Density: __________ lbs/gal Typical Percent Nitrogen: __________

Heat Capacity: __________ BTU/lb __________ BTU/gal

Other Fuel Contaminants (which may cause air pollution): __________

F. If applicable, indicate the percent of fuel used for space heating. N/A

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

There are no wastes generated except for the spent carbon adsorption beds. These will not be regenerated, instead, they will be burned in the incinerator.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: ____________ ft. Stack Diameter: ____________ ft.

Gas Flow Rate: ________ ACFM ________ DSCFM Gas Exit Temperature: ____________ °F.

Water Vapor Content: ____________ % Velocity: ____________ FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ____________ Design Capacity (lbs/hr) ____________

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ____________

Date Constructed ____________ Model No. ____________

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ________ ft. Stack Diamter: ____________ Stack Temp. ____________

Gas Flow Rate: ____________ ACFM ____________ DSCFM* Velocity: ____________ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: ☐ Cyclone ☐ Wet Scrubber ☐ Afterburner

☐ Other (specify) ____________

Brief description of operating characteristics of control devices: ____________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS*

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

*Please see addendum

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [x] No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [x] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

---

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

---

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data *N/A: PSD is not applicable to the FFPI facility.*

1. __________ no. sites __________ TSP __________ ( ) SO^2* __________ Wind spd/dir

Period of Monitoring _____ / _____ / _____ to _____ / _____ / _____
month day year month day year

Other data recorded ______________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________________

3. Upper air (mixing height) data obtained from (location)________________________

4. Stability wind rose (STAR) data obtained from (location)________________________

C. Computer Models Used

1. ________________________________ Modified? If yes, attach description.

2. ________________________________ Modified? If yes, attach description.

3. ________________________________ Modified? If yes, attach description.

4. ________________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	________________________________	grams/sec
SO^2	________________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO THE PERMIT APPLICATION FOR RAILROAD TANK CAR UNLOADING AREA

Section III - A

The wastes burned/treated at FFPI are transported into the facility by tank trucks and rail cars. There are separate tank truck and rail car unloading/loading areas in the facility. The rail cars have a volume of 30,000 gallons and the tank trucks have a capacity of 6,000 gallons. The fugitive emissions given out as a result of the unloading operation are controlled by carbon adsorption systems.

The types of the wastes received by the facility are described in Section C of the RCRA Part B permit application. The tank truck and rail car unloading/loading areas are described in Section D of the RCRA Part B permit application. In general, the wastes are mixtures of various compatible components. For the purposes of the emission estimates it is assumed that the wastes transported by the railroad tank cars are composed entirely of high Btu liquids, low Btu liquids, and sludges.

The typical composition (by weight) of high Btu liquids is as follows:

Acetone	37% (45.1% by mole, ignoring ash)
Methylene Chloride	56% (46.6% by mole, ignoring ash)
Water	2%
Ash	5%

The typical composition (by weight) of low Btu liquids is as follows:

Acetone	5% (1.74% by mole, ignoring ash)
Methylene Chloride	8% (1.89% by mole, ignoring ash)
Water	86%
Ash	1%

The typical composition (by weight) of sludges is as follows:

Acetone	60% (67% by mole, ignoring ash)
Methylene Chloride	15% (11.4% by mole, ignoring ash)
Water	6%
Ash	19%

Section V - Items 2, 3

The air pollutant emission rates were estimated using the EPA Document Compilation of Air Pollutant Emission Factors, AP-42, Fourth Edition, September 1985. Summary sheets of the results of all the calculations are enclosed at the end of this addendum.

Emissions of organic vapors given out due to the railroad tank car breathing are estimated as follows:

$$L_B = 0.0226*M*((P/14.7-P)^{0.68})*(D^{1.73})*(H^{0.51})*(\Delta T^{0.5})*F_P*C*K_C$$

where, L_B = Breathing losses of substance in the tank (lb/yr)
M = Molecular weight of vapors (lb/lb-mole)

P = True vapor pressure of liquid loading (psia)
D = Diameter of the railroad tank car (ft)
H = Height of the vapor space in the railroad tank car (ft)
ΔT = Average ambient diurnal temperature change (F°)
F_P = Paint factor (dimensionless)
C = Railroad tank car diameter adjustment factor (dimensionless)
K_C = Product factor (dimensionless)

The throughputs of the three types of the waste are estimated to be:

High Btu liquids	3,647 tons/yr
Low Btu liquids	7,344 tons/yr
Sludges	14,688 tons/yr

Based on an average density of 10 lbs/gal for the high and low Btu wastes, and 12 lbs/gal for the sludge, the throughputs are:

High Btu liquids	729,400 gallons/yr
Low Btu liquids	1,468,000 gallons/yr
Sludges	2,448,000 gallons/yr

The waste are transported by tank trucks as well as rail cars. It is assumed that the amounts of wastes transported by the trucks and rail cars are proportional to the volumes of the tank truck and rail car respectively. This means that of the 729,400 gallons of high Btu wastes transported into the facility per year, 121,567 gallons are transported by tank trucks and the remaining 607,833 gallons are transported by the rail cars. The breakdown of the wastes transported by tank trucks and rail cars for all the three types of wastes is as follows:

Type of waste	Amount transported by tank trucks (gal)	Amount transported by rail cars (gal)	Number of Tank Trucks	Number of Railroad Tank Cars
High Btu wastes	121,567	607,833	20	20
Low Btu wastes	244,667	1,223,333	41	41
Sludges	408,000	2,040,000	68	68

Please note that this assumption does not in any manner influence the estimation of the total emission rate from the tank truck and rail car unloading operations because the total emission rate will still be based on the actual amount of the wastes transported into the facility. This assumption merely offers a means to break the total emissions down into those emitted due to tank truck unloading and those due to rail car unloading.

There will be acetone and methylene chloride emissions from the railroad tank car. Since the material being transferred is a mixture, the partial pressures of acetone and methylene chloride were computed (ignoring the ash content) using Raoult's law as follows:

Partial pressure of a component in the mixture

= mole fraction of the component * vapor pressure of the component

The partial pressures of acetone and methylene chloride for the three types of wastes are estimated to be:

High Btu Liquids:

Acetone: 1.668 psia
Methylene chloride: 3.168 psia

Low Btu Liquids

Acetone: 0.0643 psia
Methylene chloride: 0.1285 psia

Sludge

Acetone: 2.479 psia
Methylene chloride: 0.775 psia

Other Data:

Molecular weight of acetone = 58 lb/lb. mole
Molecular weight of methylene chloride = 85 lb/lb.mole
Railroad tank car diameter = 12 feet
Railroad tank car length = 36 feet
Equivalent diameter (estimated using above data) = 23.5 feet
Paint factor = 1
Railroad tank car diameter adjustment factor = 0.74
Average vapor space height = 6 feet
Average ambient diurnal temperature change = 20.8 F°
Product factor = 1

Substituting all the above data into the equation gives:

High Btu Liquid Railroad Tank Car

L_B = 578.7 lbs/yr of acetone per railroad tank car
= 1425.61 lbs/yr of methylene chloride per railroad tank car

Low Btu Liquid Railroad Tank Car

L_B = 58.44 lbs/yr of acetone per railroad tank car
= 162.9 lbs/yr of methylene chloride per railroad tank car

Railroad Tank Car Transporting Sludges

L_B = 791.49 lbs/yr of acetone per railroad tank car
= 481.4 lbs/yr of methylene chloride per railroad tank car

The above results assume that the railroad tank cars breathe for 8,760 hours per year. Since a railroad tank car is emptied in 2 hours (at 250 gallons per minute), the breathing duration lasts only 2 hours. In addition the emissions of these vapors are controlled by a carbon adsorption system having an efficiency of reduction of 95%. Based on the number of railroad tank cars transporting the organic wastes, and the time taken to empty the railroad tank car contents, the actual breathing losses are estimated to be as follows:

High Btu Liquids Transport

Uncontrolled Emission Rates:

Acetone: 0.0033 lb/hr per railroad tank car
2.68 lb/yr from all railroad tank cars

Methylene chloride: 0.0081 lb/hr per railroad tank car
6.59 lb/yr from all railroad tank cars

Controlled Emission Rates:

Acetone: 0.000165 lb/hr per railroad tank car
0.134 lb/yr from all railroad tank cars

Methylene chloride: 0.000405 lb/hr per railroad tank car
0.3295 lb/yr from all railroad tank cars

Low Btu Liquid Transport

Uncontrolled Emission Rates:

Acetone: 0.0003 lb/hr per railroad tank car
0.54 lb/yr from all railroad tank cars

Methylene chloride: 0.0009 lb/hr per railroad tank car
1.52 lb/yr from all railroad tank cars

Controlled Emission Rates:

Acetone: 0.000015 lb/hr per railroad tank car
0.027 lb/yr from all railroad tank cars

Methylene chloride: 0.000045 lb/hr per railroad tank car
0.076 lb/yr from all railroad tank car

Sludge Transport

Uncontrolled Emission Rates:

Acetone: 0.0045 lb/hr per railroad tank car
12.29 lb/yr from all railroad tank cars

Methylene chloride: 0.0027 lb/hr per railroad tank car
7.47 lb/yr from all railroad tank cars

Controlled Emission Rates:

Acetone:	0.000225 lb/hr per railroad tank car 0.6145 lb/yr from all railroad tank cars
Methylene chloride:	0.000135 lb/hr per railroad tank car 0.3735 lb/yr from all railroad tank cars

For the purposes of reporting the emission rates in Section III-C, the emission rates are classified as follows:

Maximum (lbs/hr)

The maximum emission rate is an hourly controlled emission rate representing the worst case. The worst case situation here is represented by the high Btu liquid unloading operation. Therefore the hourly emission rate of operation is the maximum emission rate. At a given time a maximum of one railroad tank car can unload the organic liquids (high Btu liquids).

Therefore the maximum emission rates of acetone and methylene chloride are:

Acetone:	0.000165 lb/hr
Methylene chloride:	0.000405 lb/hr
Total organics:	0.00057 lb/hr

Actual (tons/yr)

The actual controlled emission rate (tons/yr) is the controlled emission rate on an annual basis. This is estimated based on the amount of the three kinds of wastes unloaded by the railroad tank cars on an annual basis. It is the sum of the controlled emission rates of acetone and methylene chloride during the unloading of all the three kind of organic wastes.

The actual emission rates of acetone and methylene chloride are as follows:

Acetone: 0.134 + 0.027 + 0.6145 = 0.7755 lbs/yr
(0.00039 tons/yr)

Methylene chloride: 0.3295 + 0.076 + 0.3735 = 0.779 lb/yr
(0.00039 tons/yr)

Potential emission rate (lbs/yr)

The potential emission rate is the total uncontrolled emission rate of methylene chloride and acetone from the railroad tank car unloading operation. This is estimated as follows:

Acetone: 2.68 + 0.54 + 12.29 = 15.51 lbs/yr (0.0078 tons/yr)

Methylene chloride: 6.59 + 1.52 + 7.47 = 15.58 lb/yr
(0.0078 tons/yr)

Section V - Items 4, 5

The air pollution control device employed to control the breathing losses from the rail cars will be a single unit carbon adsorber, consisting of one 55-gallon canister containing 200 pounds of carbon. The carbon has an adsorptive capacity of approximately 20% by weight, and one canister will be capable of removing 40 pounds of organic vapor before saturation. The carbon canister will be capable of controlling the maximum emissions of organic compounds at greater than 95% efficiency.

Replacement time for the carbon canister

There is no inflow to the tail cars during the unloading operation, and working losses (from the tank to which the organic liquid from the rail cars is transferred) will be vented to the incinerator or organic liquid storage and handling carbon adsorption system. Therefore the only losses from the rail cars will be breathing losses. The uncontrolled breathing losses from one rail car unloading high Btu liquids were estimated to be:

Acetone:	0.0033 lb/hr
Methylene chloride:	0.0081 lb/hr
Total Organics:	0.0114 lb/hr

The carbon adsorption system will control the organic vapor emissions by at least 95%. Therefore the controlled emission rate of total organics will be:

0.0114 * (1-0.95) = 0.00057 lb/hr

The rate of absorption of the vapors will be:

0.0114 - 0.00057 = 0.01083 lb/hr

The time required to replace the carbon canister is estimated as follows:

$$\frac{\text{40 pounds organic vapor for saturation}}{\text{carbon canister}} \times \frac{\text{hr}}{\text{0.01083 lbs organic vapor removed}}$$

= 3,693 hours ≈ 154 days

```
EMISSIONS DUE TO BREATHING FROM TANK TRUCKS AND RAIL CARS

VEHICLE: RAIL CAR                    RAIL CAR CAPACITY:            30000 GALLONS
                                     RAIL CAR DIAMETER:               12 FEET
                                     RAIL CAR LENGTH:                 36 FEET


ESTIMATED TRANSPORT OF HIGH BTU LIQUIDS BY RAIL CARS:            607833 GALLONS PER YEAR
ESTIMATED TRANSPORT OF LOW BTU LIQUIDS BY RAIL CARS:            1223333 GALLONS PER YEAR
ESTIMATED TRANSPORT OF SLUDGES BY RAIL CARS:                    2040000 GALLONS PER YEAR

ASSUMING A RAIL CAR CAPACITY OF 30000 GALLONS:

# OF RAIL CARS NEEDED TO TRANSPORT HIGH BTU LIQUIDS =                 20
# OF RAIL CARS NEEDED TO TRANSPORT LOW BTU LIQUIDS =                  41
# OF RAIL CARS NEEDED TO TRANSPORT SLUDGES =                          68

EACH RAIL CAR TAKES 2 HOURS TO UNLOAD, AT A RATE OF 250 GPM

# OF HOURS ALL THE RAIL CARS WILL BE BREATHING, PER YEAR =           258

CASE II

MATERIAL TRANSPORTED:      HIGH BTU LIQUIDS

PARTIAL PRESSURE OF ACETONE:           1.668 PSIA
PARTIAL PRESSURE OF MECL2:             3.168 PSIA

MOLECULAR WEIGHT OF ACETONE:              58 POUNDS PER POUND MOLE
MOLECULAR WEIGHT FOR MECL2:               85 POUNDS PER POUND MOLE

PAINT FACTOR:                                    1
EQUIVALENT DIAMETER OF THE RAIL CAR:          23.5 FEET
TANK DIAMETER CORRECTION FACTOR:              0.95
AVERAGE VAPOR SPACE HEIGHT:                      3 FEET
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE:   20.8 DEG F
PRODUCT FACTOR:                                  1


BREATHING LOSSES (USING AP-42 EQUATION):       578.70 POUNDS PER YEAR OF ACETONE PER RAIL CAR
                                     AND      1425.61 POUNDS PER YEAR OF MECL2 PER RAIL CAR

THESE YEARLY EMISSION RATES ASSUME CONTINUOUS BREATHING FOR 8760 HOURS A YEAR.
THEREFORE, CORRECTION HAS TO BE MADE FOR THE ACTUAL TIME ALL THE RAIL CARS TRANSPORTING HIGH BTU LIQUIDS BREATH.
THIS TIME IS:           41 HOURS (BASED ON 20 RAIL CARS UNLOADING FOR 2 HOURS EACH)

THEREFORE THE ACTUAL BREATHING LOSSES ARE:       2.68 POUNDS PER YEAR OF ACETONE
                                     AND         6.59 POUNDS PER YEAR OF MECL2

                                     OR,       0.0033 POUNDS PER HOUR OF ACETONE PER RAIL CAR
                                               0.0081 POUNDS PER HOUR OF MECL2 PER RAIL CAR
```

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EMISSIONS DUE TO BREATHING FROM TANK TRUCKS AND RAIL CARS

VEHICLE: RAIL CAR               RAIL CAR CAPACITY:          30000 GALLONS
                                RAIL CAR DIAMETER:             12 FEET
                                RAIL CAR LENGTH:               36 FEET


ESTIMATED TRANSPORT OF HIGH BTU LIQUIDS BY RAIL CARS:      607833 GALLONS PER YEAR
ESTIMATED TRANSPORT OF LOW BTU LIQUIDS BY RAIL CARS:      1223333 GALLONS PER YEAR
ESTIMATED TRANSPORT OF SLUDGES BY RAIL CARS:              2040000 GALLONS PER YEAR

ASSUMING A RAIL CAR CAPACITY OF 30000 GALLONS:

# OF RAIL CARS NEEDED TO TRANSPORT HIGH BTU LIQUIDS =            20
# OF RAIL CARS NEEDED TO TRANSPORT LOW BTU LIQUIDS =             41
# OF RAIL CARS NEEDED TO TRANSPORT SLUDGES =                     68

EACH RAIL CAR TAKES 2 HOURS TO UNLOAD, AT A RATE OF 250 GPM

# OF HOURS ALL THE RAIL CARS WILL BE BREATHING, PER YEAR =      258

CASE II

MATERIAL TRANSPORTED:      LOW BTU LIQUIDS

PARTIAL PRESSURE OF ACETONE:          0.0643 PSIA
PARTIAL PRESSURE OF MECL2:            0.1644 PSIA

MOLECULAR WEIGHT OF ACETONE:              58 POUNDS PER POUND MOLE
MOLECULAR WEIGHT FOR MECL2:               85 POUNDS PER POUND MOLE

PAINT FACTOR:                                 1
EQUIVALENT DIAMETER OF THE RAIL CAR:       23.5 FEET
TANK DIAMETER CORRECTION FACTOR:           0.95
AVERAGE VAPOR SPACE HEIGHT:                   3 FEET
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE: 20.8 DEG F
PRODUCT FACTOR:                               1


BREATHING LOSSES (USING AP-42 EQUATION):       58.44 POUNDS PER YEAR OF ACETONE PER RAIL CAR
                                AND           162.90 POUNDS PER YEAR OF MECL2 PER RAIL CAR

THESE YEARLY EMISSION RATES ASSUME CONTINUOUS BREATHING FOR 8760 HOURS A YEAR.
THEREFORE, CORRECTION HAS TO BE MADE FOR THE ACTUAL TIME ALL THE RAIL CARS TRANSPORTING LOW BTU LIQUIDS BREATH.
THIS TIME IS:           82 HOURS (BASED ON 41 RAIL CARS UNLOADING FOR 2 HOURS EACH)

THEREFORE THE ACTUAL BREATHING LOSSES ARE:      0.54 POUNDS PER YEAR OF ACETONE
                                AND             1.52 POUNDS PER YEAR OF MECL2

                                OR,           0.0003 POUNDS PER HOUR OF ACETONE PER RAIL CAR
                                              0.0009 POUNDS PER HOUR OF MECL2 PER RAIL CAR
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EMISSIONS DUE TO BREATHING FROM TANK TRUCKS AND RAIL CARS

VEHICLE: RAIL CAR                   RAIL CAR CAPACITY:           30000 GALLONS
                                    RAIL CAR DIAMETER:              12 FEET
                                    RAIL CAR LENGTH:                36 FEET


ESTIMATED TRANSPORT OF HIGH BTU LIQUIDS BY RAIL CARS:           607833 GALLONS PER YEAR
ESTIMATED TRANSPORT OF LOW BTU LIQUIDS BY RAIL CARS:           1223333 GALLONS PER YEAR
ESTIMATED TRANSPORT OF SLUDGES BY RAIL CARS:                   2040000 GALLONS PER YEAR

ASSUMING A RAIL CAR CAPACITY OF 30000 GALLONS:

# OF RAIL CARS NEEDED TO TRANSPORT HIGH BTU LIQUIDS =              20
# OF RAIL CARS NEEDED TO TRANSPORT LOW BTU LIQUIDS =               41
# OF RAIL CARS NEEDED TO TRANSPORT SLUDGES =                       68

EACH RAIL CAR TAKES 2 HOURS TO UNLOAD, AT A RATE OF 250 GPM

# OF HOURS ALL THE RAIL CARS WILL BE BREATHING, PER YEAR =        258

CASE II

MATERIAL TRANSPORTED:      SLUDGES

PARTIAL PRESSURE OF ACETONE:          2.479 PSIA
PARTIAL PRESSURE OF MECL2:            0.775 PSIA

MOLECULAR WEIGHT OF ACETONE:             58 POUNDS PER POUND MOLE
MOLECULAR WEIGHT FOR MECL2:              85 POUNDS PER POUND MOLE

PAINT FACTOR:                                     1
EQUIVALENT DIAMETER OF THE RAIL CAR:           23.5 FEET
TANK DIAMETER CORRECTION FACTOR:               0.95
AVERAGE VAPOR SPACE HEIGHT:                       3 FEET
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE:    20.8 DEG F
PRODUCT FACTOR:                                   1


BREATHING LOSSES (USING AP-42 EQUATION):     791.49 POUNDS PER YEAR OF ACETONE PER RAIL CAR
                                    AND      481.40 POUNDS PER YEAR OF MECL2 PER RAIL CAR

THESE YEARLY EMISSION RATES ASSUME CONTINUOUS BREATHING FOR 8760 HOURS A YEAR.
THEREFORE, CORRECTION HAS TO BE MADE FOR THE ACTUAL TIME ALL THE RAIL CARS TRANSPORTING SLUDGES BREATH.
THIS TIME IS:          136 HOURS (BASED ON 68 RAIL CARS UNLOADING FOR 2 HOURS EACH)

THEREFORE THE ACTUAL BREATHING LOSSES ARE:      12.29 POUNDS PER YEAR OF ACETONE
                                    AND          7.47 POUNDS PER YEAR OF MECL2

                                    OR,      0.0045 POUNDS PER HOUR OF ACETONE PER RAIL CAR
                                             0.0027 POUNDS PER HOUR OF MECL2 PER RAIL CAR
```

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-5

AIR PERMIT APPLICATION
FOR
ORGANIC LIQUID STORAGE TANKS

DEPARTMENT OF ENVIRONMENTAL REGULATION

Best Available Copy

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Organic Liquid Storage Tanks ☒ New[1] ☐ Existing[1]

APPLICATION TYPE: ☒ Construction ☒ Operation ☐ Modification

COMPANY NAME: Florida First Processing, Inc. **COUNTY:** Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Organic Liquid & Sludge Waste Storage/Handling tanks T-09 through T-20

SOURCE LOCATION: Street west side of Fort Green Rd., 3/4 miles south of County Road 630 City Polk

UTM: East 405 North 3066500m

Latitude 27° 43' 15"N Longitude 81° 57' 45"W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, I

I certify that the statements made in this application for a construction & operation permit are true, correct and complete to the best of my knowledge and belief. Further I agree to maintain and operate the pollution control source and pollution contro facilities in such a manner as to comply with the provision of Chapter 403, Florid Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferab and I will promptly notify the department upon sale or legal transfer of the permitte establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project hav been designed/examined by me and found to be in conformity with modern engineerin principles applicable to the treatment and disposal of pollutants characterized in th permit application. There is reasonable assurance, in my professional judgment, tha

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[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit applicaton covers 12 organic liquid & sludge waste storage and handling tanks T-09 through T-20. These tanks handle/store "hazardous organic wastes." The normal capacities range from 2000 gals to 20,000 gals (actually 19,500 gallons - see calculations). The emissions from these tanks are vented into the hazardous waste incinerator where emmissions will be combusted and controlled to an extent of 99.99%. When the incinerator is not operating, the emissions will be vented through 2 carbon adsorption canisters having a control efficiency of 95%. All storage tanks are vertical fixed roof tanks.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/treatment systems is over $5,000,00. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr _____ ; if seasonal, describe: __________

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? _____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____

   c. If yes, list non-attainment pollutants. _____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? _____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

F-4: In general, new source performance standards (NSPS) Subpart Kb applies for storage tanks having a capacity equal to or greater than 40 cubic meters (10,558.7 gals) used to store volatile organic liquids (VOL). Also for tanks having a capacity equal to or greater than 75 cubic meters (19797.6 gallons) there are specific requirements. In this case, tanks T-10 through T-15 will be subject to Subpart Kb of NSPS. These tanks have actual capacities of 19,458.7 gallons and the only requirement they have to meet is that specified by paragraph (2) under §60.1166. FFPI will require to maintain permanent records showing the dimensions of the tanks and an analysis showing the capacities of the tanks.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Please see addendum to the permit application.

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Please see addendum for a more detailed description.

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Methylene Chloride	124.6	0.525	124.6 lb/hr maximum during filling	124.6 lb/hr maximum during filling	113,316	56.68	

---

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

The emission rate reported above is the combined emission rate from all the 12 tanks.

All tanks will be painted white.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A
Please see addendum to the Permit Application.

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (This is not a process. It is a material transfer operation.)
2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

(All emission rates reported below are the sum of the emission rates for all tanks)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Acetone	14.34	0.0568	14.34 *	14.34 *	22,317	11.158	
Methylene chloride	27.89	0.1478	27.89 *	27.89 *	21,617	10.809	
Total VOC	42.23	0.2046	42.23 *	42.23 *	43,934	21.967	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V. Item 3).

* Since there are no specific allowable emission rates, the calculated rates are reported.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Hazardous Waste Incinerator	VOC	99.99%	N/A	Manufacturer's Data
Carbon Adsorption Canisters	VOC	95%	N/A	Manufacturer's Data

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

There are no wastes generated except for the spent carbon adsorption beds. These will not be regenerated, instead, they will be burned in the incinerator.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 200 ft. Stack Diameter: 5.5 ft.

Gas Flow Rate: 68,555 ACFM 27,682 DSCFM Gas Exit Temperature: 365 °F.

Water Vapor Content: 36.91% by volume % Velocity: 48.1 FPS

(These dimensions are for the incinerator stack)

SECTION IV: INCINERATOR INFORMATION

N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ________ Design Capacity (lbs/hr) ________

Approximate Number of Hours of Operation per day ____ day/wk ____ wks/yr. ________

Manufacturer ________

Date Constructed ________ Model No. ________

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ________ ft. Stack Diamter: ________ Stack Temp. ________

Gas Flow Rate: ________ ACFM ________ DSCFM* Velocity: ________ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ________

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

Brief description of operating characteristics of control devices: ______________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS*

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

*Please see addendum.

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:
b. Operating Principles:

c. Efficiency:[1]
d. Capital Cost:

e. Useful Life:
f. Operating Cost:

g. Energy:[2]
h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:
b. Operating Principles:

c. Efficiency:[1]
d. Capital Costs:

e. Useful Life:
f. Operating Cost:

g. Energy:[2]
h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:
2. Efficiency:[1]

3. Capital Cost:
4. Useful Life:

5. Operating Cost:
6. Energy:[2]

7. Maintenance Cost:
8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:
(4) State:

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[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

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[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. ____________ no. sites ____________ TSP ____________ ( ) SO2* ____________ Wind spd/dir

Period of Monitoring ______ / ______ / ______ to ______ / ______ / ______
month day year month day year

Other data recorded ____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)______________________________

3. Upper air (mixing height) data obtained from (location)______________________________

4. Stability wind rose (STAR) data obtained from (location)______________________________

C. Computer Models Used

1. ______________________________ Modified? If yes, attach description.

2. ______________________________ Modified? If yes, attach description.

3. ______________________________ Modified? If yes, attach description.

4. ______________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	______________________________	grams/sec
SO^2	______________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO THE PERMIT APPLICATION FOR ORGANIC LIQUID STORAGE TANKS

Section II - A

The Organic Tank Farm will consist of 12 fixed roof tanks as follows:

Tank No.	Tank Description	Construction Material	Capacity (gallons)
T-09	Containerized Waste Receiving Tank	Carbon Steel	2,000
T-10 to T-12	Low Btu Waste Holding Tanks	Carbon Steel	19,500[1]
T-13 to T-15	High Btu Waste Holding Tanks	Carbon Steel	19,500[1]
T-16	Sludge Holding Tank	Carbon Steel	19,500[1]
T-17	Sludge Feed Tank	Carbon Steel	8,000
T-18	Low Btu Mix/Feed Tank	Carbon Steel	19,000[1]
T-19 & T-20	High Btu Mix/Feed Tanks	Carbon Steel	19,000[1]

The engineering drawings showing the dimensions of these tanks are attached.

Section II - F (4)

Subpart Kb of the New Source Performance Standards (NSPS) specify standards of performance for volatile organic liquid (VOL) storage vessels for which construction, reconstruction, or modification commenced after July 23, 1984. These standards apply for storage tanks having a capacity equal to or greater than 40 cubic meters (10,558 gallons).

§ 60.110b through § 60.117b specify various compliance requirements under Subpart Kb for storage tanks having a capacity greater than 75 cubic meters (19,798 gallons) and are used for storing VOL. Since the individual capacity of each of the tanks T-10 through T-16, and tanks T-18 through T-20 is 19,458.7 gallons, most of these standards do not apply. The only standards that apply are those specified in paragraphs (a) and (b) of § 60.116b. These are requirements for recordkeeping to monitor the operations at the facility. The owner/operator is required to keep permanent records showing the dimension

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[1] 20,000 gallons is the nominal capacity. The actual capacity of each of the tanks T-10 through T-16, and tanks T-18 through T-20 is 19,458.7 gallons as per the tank sketch and the calculations provided by the manufacturer.

of the storage vessels and an analysis showing the capacity of the storage vessels.

The attached engineering drawings for tanks T-10 through T-16 and tanks T-18 through T-20 satisfy the NSPS requirements discussed above. FFPI will maintain these records permanently and they will be available for inspection by Florida DER upon request.

Section III - C

Section C of the Part B permit application provides a detailed description of the wastes accepted by FFPI for disposal. The wastes stored in the tanks will be multicomponent mixtures of various compatible organics. It is difficult to describe a typical composition of such mixtures. Based on the heating values of the different types of wastes, the incinerator designer has defined "typical" compositions (by weight) of these wastes as follows (detailed description is provided in Section C of the RCRA Part B permit application):

High Btu liquids:

Acetone	37% (45.1% by mole, ignoring ash)
Methylene chloride	56% (46.6% by mole, ignoring ash)
Water	2%
Ash	5%

Low Btu liquids:

Acetone	5% (1.74% by mole, ignoring ash)
Methylene chloride	8% (1.89% by mole, ignoring ash)
Water	86%
Ash	1%

Sludges:

Acetone	60% (67% by mole, ignoring ash)
Methylene chloride	15% (11.4% by mole, ignoring ash)
Water	6%
Ash	19%

The throughputs of the three types of the waste are estimated to be:

High Btu liquids	3,647 tons/yr
Low Btu liquids	7,344 tons/yr
Sludges	14,688 tons/yr

Based on an average density of 10 lbs/gal for the high and low Btu liquids, and 12 lbs/gal for the sludge, the throughputs are:

High Btu liquids	729,400 gallons/yr
Low Btu liquids	1,468,000 gallons/yr
Sludges	2,448,000 gallons/yr

The method described in Section 4.3.2.1 of the EPA Document Compilation of Air Pollutant Emission Factors, AP-42, Fourth Edition, September 1985 was used for estimating the breathing and working losses of methylene chloride from each of the tanks.

The vent line of each of these tanks will be connected to a common header pipe which will route the vapors to the hazardous waste incinerator with the combustion air. If the incinerator is not in operation, the vapors will be routed through an emission control system consisting of two-stage mechanical chilling unit followed by a modular carbon canister before being released into the atmosphere. The carbon canister system will consist of four 55 gallon canisters, of which two are in service (in series) and two are backup units. The incinerator and the carbon adsorption system are guaranteed to reduce the emissions by 99.99% and 95% respectively. It is projected that the incinerator and the carbon adsorption system will operate for 6,840 hours and 1,560 hours a year respectively.

Volatile organic compounds (VOC) are emitted from the storage tanks, during the following stages of operations involving loading into the tanks, breathing of the tanks, and unloading from the tanks:

1. Unloading of the organic wastes from tank trucks and rail cars into the storage tanks;
2. Standing storage (or breathing) losses from the storage tanks; and
3. Working losses during the unloading of the storage tanks.

The emissions during each of these three steps have been estimated as follows:

Maximum emission estimates of the total volatile organics during the unloading of the organic liquids from the tank trucks and railroad cars are presented as follows::

Pollutant	Controlled Emissions Maximum (lbs/hr)	Actual (tons/yr)	Uncontrolled (Potential) Emissions (lbs/hr)	(tons/yr)
Total volatile Organics	19.44	0.0886	18,920	9.46

Maximum emission estimates of total volatile organic carbons (VOC) from each of the tanks are presented as follows:

	Estimated Emissions		Potential Emissions	
Tank No.	Maximum (lbs/hr)	Actual (tons/yr)	(lbs/hr)	(tons/yr)
T-09	0.6588	0.00099	215	0.1075
T-10 - T-12	0.7911	0.00304	660	0.3297[2]
T-13 - T-15	19.7652	0.03015	6,553	3.2764[2]
T-16	3.7738	0.01913	4,109	2.054
T-17	3.7738	0.04225	9,031	4.515
T-18	0.2637	0.00098	213	0.1066
T-19 & T-20	13.177	0.0195	4,233	2.117[3]
Total	42.203	0.11604	25,014	12.5065

Section V - Items 2, 3

As mentioned earlier, the air pollutant emission rates were estimated using the EPA Document Compilation of Air Pollutant Emission Factors, AP-42, Fourth Edition, September 1985. Summary sheets of the results of all the calculations are enclosed at the end of this addendum.

The volatile organic compounds emitted during each of the three steps identified above are acetone, and methylene chloride. For the purpose of estimating the emission rates of these pollutants, the worst case scenario is identified as follows:

Since the High Btu Liquid has the highest percent of volatile organic compounds, the unloading of High Btu Liquids from the tank trucks and the railroad cars has the potential to emit these compounds at higher rates. At the proposed FFPI facility, a maximum of two tank trucks and one railroad car can be unloaded simultaneously. For the worst case scenario, it is therefore assumed that two tank trucks and one railroad car, all carrying High Btu

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[2] The emission rates reported are the combined emission rates for all the three tanks.

[3] The emission rates reported are the combined emission rates for the two tanks.

Liquids unload into the storage tanks simultaneously.

The emission rates of acetone and methylene chloride from unloading tank trucks and railroad cars are estimated as follows:

$L_L = 12.46*(S*P*M/T)$

where, L_L = unloading loss (lb/10^3 gal of liquid unloaded into the receiving container)
M = Molecular weight of vapors, lb/lb.mole
P = True vapor pressure of liquid unloading, psia
T = Bulk temperature of liquids unloaded, °R
S = Saturation factor (dimensionless)

The losses computed using the equation can be converted to lbs/hr, and lbs/yr by multiplying L_L by the appropriate unloading rate (thousands of gallons per hour or year).

The tank trucks are assumed to have a volume of 6,000 gallons each, and the railroad car's capacity is assumed to be 30,000 gallons. The unloading time for a tank truck and a railroad car will be 24 minutes, and 2 hours respectively, based on an unloading rate of 250 gallons per minute.

The volatile organic compounds emitted due to the unloading will consist of acetone, and methylene chloride. Since the material transferred is a mixture, the partial pressures of acetone and methylene chloride were computed (ignoring the ash content - which makes it even more conservative) using Raoult's law as follows:

Partial pressure of a component in the mixture

= mole fraction of the component * vapor pressure of the component

Partial pressure of acetone in the High Btu Liquid mixture:

mole fraction of acetone * vapor pressure of acetone

= $0.451 * \overset{70^\circ F}{3.7}$ psia (Table $4.3\text{-}\overset{7}{\cancel{1}}$, AP-42) = 1.668 psia

Partial Pressure of methylene chloride in the High Btu Liquid mixture:

= $0.466 * \overset{70^\circ F}{6.8}$ psia (Table $4.3\text{-}\overset{7}{\cancel{1}}$, AP-42) = 3.668 psia

Other data:

Molecular weight of acetone = 58 lb/lb.mole
Molecular weight of methylene chloride = 85 lb/lb. mole
T = 528°R (460+68)
S = 1 (implies that the displaced air from the vessel into which the high Btu liquid is being unloaded is saturated with acetone and methylene chloride)

Substituting all the above data for **high Btu liquids** into the equation gives:

L_L = 2.283 lbs acetone/10^3 unloaded into the tank, and
6.355 lbs methylene chloride/10^3 unloaded into the tank

At an unloading rate of 250 gallons per minute[4] (or, 15,000 gallons per hour), the uncontrolled emission rates of acetone and methylene chloride are:

Acetone: 34.245 lbs/hr
Methylene chloride: 95.325 lbs/hr

Total Organics: 129.57 lbs/hr

The incineration system, when it is active, will be used to destroy these vapors. During other times, an emission control system consisting of two stage mechanical chilling unit followed by carbon adsorption will be used for the control of these emissions. These systems have destruction efficiencies of 99.99% and 95% respectively.

The controlled emission rates of acetone and methylene chloride when the incineration system is active are estimated to be:

Acetone: $34.245 * (1-0.9999) = 0.003424$ lbs/hr
Methylene chloride: $95.325 * (1-0.9999) = 0.009532$ lbs/hr

Total Organics: 0.012956 lbs/hr ≈ 0.013 lbs/hr

The controlled emission rates of acetone and methylene chloride when the carbon adsorption system is active are estimated to be:

Acetone: $34.245 * (1-0.95) = 1.71$ lbs/hr
Methylene chloride: $95.325 * (1-0.95) = 4.77$ lbs/hr

Total Organics: 6.48 lbs/hr

The incineration system is expected to operate for 6,840 hours per year, and the carbon adsorption system for 1,560 hours a year. Assuming that the high Btu liquids are transported at a uniform rate each year, then the annual controlled emissions of acetone and methylene chloride can be estimated. The annual emission rates of acetone and methylene chloride due to the unloading of high Btu liquids are estimated based on 729,400 gallons of high Btu liquids transported into the facility. The uncontrolled annual emission rates are:

Acetone: 1665.23 lbs/yr
Methylene chloride: 4635.05 lbs/yr

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[4] The filling rate of 250 GPM is based on the rating of the centrifugal pump servicing the tank. This information was provided by IWES.

Using the incineration system, the annual controlled emissions of acetone and methylene chloride will be:

Acetone: 1665.23 * (6840/8400) * (1-0.9999) = 0.1356 lbs/yr
Methylene chloride: 4635.05 * (6840/8400) * (1-0.9999) = 0.3774 lb/yr

Using the carbon adsorption system, the annual controlled emissions of acetone and methylene chloride will be:

Acetone: 1665.23 * (1560/8400) * (1-0.95) = 15.46 lbs/yr
Methylene chloride: 4635.05 * (1560/8400) * (1-0.95) = 43.04 lbs/yr

Similarly, when the **low Btu liquids** and **sludges** are unloaded into their storage tanks, the total annual controlled emission rates of acetone and methylene chloride (based on the total amount of low Btu liquids and sludges transported) are estimated to be:

Low Btu Liquids Unloading:

Acetone: 1.2105 lbs/yr
Methylene chloride: 3.5408 lbs/yr

Total Organics: 4.75 lbs/yr

Sludge Unloading:

Acetone: 77.806 lbs/yr
Methylene chloride: 35.65 lbs/yr

Total Organics: 113.46 lbs/yr

Standing storage and working losses of volatile organic compounds (composed of acetone and methylene chloride) are estimated using the following equations:

Standing Storage losses (or, breathing losses):

$$L_B = 0.0226*M*((P/14.7-P)^{0.68})*(D^{1.73})*(H^{0.51})*(\Delta T^{0.5})*F_P*C*K_C$$

where,
L_B = Breathing losses of substance in the tank (lb/yr)
M = Molecular weight of substance in the tank (lb/lb mole)
P = True vapor pressure of the substance in tank (psia)
D = Diameter of the tank (ft)
H = Height of vapor space in the tank (ft)
ΔT = Average ambient diurnal temperature change (F°)
F_P = Paint factor (dimensionless)
C = Tank diameter adjustment factor (dimensionless)
K_C = Product factor (dimensionless)

Working losses:

$L_W = 0.024*M*P*K_N*K_C$

where,
L_W = Working losses of substance (lb/10^3 gal throughput)
M = Molecular weight of substance (lb/lb mole)
P = True vapor pressure of substance (psia)
K_N = Turnover factor (dimensionless)
K_C = Product factor (dimensionless)

The working losses computed using this equation can be converted to lbs/hr, and lbs/yr by multiplying L_W by the filling rate (thousands of gallons per hour) and the annual throughput (thousands of gallons per year) respectively.

A sample calculation for the emissions from tank T-10 is shown. Tank T-10 low Btu liquids. Therefore, the partial pressures of acetone and methylene chloride based on their composition in the liquid should be determined. This is done based on Raoult's law as follows:

Partial pressure of exerted by a component in the mixture

= mole fraction of the component * vapor pressure of the component

Partial pressure of acetone:

mole fraction of acetone * vapor pressure of acetone

= 0.0174 * 3.7 psia (Table 4.3-1, AP-42) = 0.0644 psia

Partial pressure of methylene chloride:

mole fraction of methylene chloride * vapor pressure of methylene chloride

= 0.0189 * 6.8 psia (Table 4.3-1, AP-42) = 0.1285 psia

Other data:

Molecular weight of acetone = 58 lbs/lb mole
Molecular weight of methylene chloride = 85 lbs/lb mole
K_C for acetone and methylene chloride = 1.0 (for both equations)

For the tank (Tank T-10):

D = 12 feet
H = 14.5 feet (assume tank is 50% full)
C = 0.63 (Figure 4.3-4, AP-42)
F_P = 1.0 (Table 4.3-2, AP-42)
K_N = 1.0 (Figure 4.3-7, AP-42)
Filling rate = 250 GPM (15,000 Gallons Per Hour)

Annual Throughput[5] = 367,000 gallons when incinerator is used and, ΔT is 20.8°F based on The Weather Almanac.

Substituting all the above data in the two equations gives:

L_B = 27.06 lbs/yr (0.0032 lbs/hr) of acetone
63.69 lbs/yr (0.0076 lbs/hr) of methylene chloride

Total VOC breathing losses = 90.74 lbs/yr (0.0108 lbs/hr)

L_W = 0.0896 lbs acetone/10^3 gallon throughput
0.262 lbs methylene chloride/10^3 gallon throughput

Total VOC working losses are:

0.3516 lbs/10^3 gallon throughput

Total VOC hourly working losses are computed as follows:

0.3516 lbs/10^3 gal throughput * 15,000 gal/hr = 5.274 lbs/hr

The total VOC annual working losses (without control) are:

0.3516 lbs/10^3 gal throughput * 367,000 gal/yr = 129.04 lbs/yr

The incineration system, when it is active, will be used to destroy these vapors. During other times, carbon adsorption system will be used for the control of these emissions. These systems have destruction efficiencies of 99.99% and 95% respectively.

The controlled hourly breathing and working losses of total volatile organics when the incineration system is active are estimated to be:

Total Organics: (0.0108+5.274) * (1-0.9999) = 0.0005284 lbs/hr

The controlled hourly breathing and working losses of total volatile organics when the carbon adsorption system is active are estimated to be:

Total Organics: (0.0108+5.274) * (1-0.95) = 0.2642 lbs/hr

Using the incineration system, the annual controlled emissions of total volatile organics will be:

Total Organics: (90.74+129.05) * (6840/8400) * (1-0.9999) = 0.0179 lb/yr

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[5] The annual throughput of the low Btu liquids is 1,468,000 gallons. This is assumed to be equally divided between the 4 tanks T-10 through T-12, and T-18. Therefore, the annual throughput in each of the tanks will be 367,000 gallons.

Using the carbon adsorption system, the annual controlled emissions of total volatile compounds will be:

Total Organics: (90.74+129.05) * (1560/8400) * (1-0.95) = 2.041 lbs/yr

The emission rates of total organics (working and breathing losses) reported in the table above, were estimated using these equations. The various parameters used for the calculations are listed in Exhibit A-5-1.

For the purposes of reporting the emission rates in Section III-C, the emissions rates are classified as follows:

Maximum (lbs/hr)

The maximum (controlled) VOC emission rate is obtained when the organic vapors generated due to the breathing of all the storage tanks and those generated during unloading of all the storage tanks are vented through the carbon adsorption system. The total organic emission rate for this scenario was earlier estimated to be as follows:

Acetone: 14.34 lbs/hr/vehicle
Methylene chloride: 27.9 lbs/hr/vehicle

Total Organics: 42.24 lb/hr

The assumption made here is that all the storage tanks will be unloaded at the same time, and therefore this represents the worst case

Actual (tons/yr)

The actual controlled emission rate (tons/yr) is obtained by adding the total controlled breathing and working losses (tons/yr) from all tanks and the emission rate of the total organics during the unloading of the organic liquid wastes into the storage tanks from tank trucks and railroad cars.

Total controlled breathing losses = 0.02592 tons/yr

Total controlled working losses = 0.09012 lbs/yr

Total controlled losses during
unloading from tank trucks and railroad cars = 0.0886 tons/yr

Total actual controlled emission rate = 0.20464 tons/yr

Potential emission rate (lbs/yr)

The potential emission rate is the total uncontrolled emission rate from all the storage tanks and the uncontrolled losses during unloading of the

EXHIBIT A-5-1

PARAMETERS FOR ESTIMATING BREATHING AND WORKING LOSSES FROM TANKS T-09 THROUGH T-20

	Tank Designation											
Parameter	T-09	T-10	T-11	T-12	T-13	T-14	T-15	T-16	T-17	T-18	T-19	T-20
Tank Capacity (gal)	2,000	19,459	19,459	19,459	19,459	19,459	19,459	19,459	8,000	19,459	19,459	19,459
Tank Diameter (ft)	6	12	12	12	12	12	12	12	9	12	12	12
Tank Height (ft)	13	29	29	29	29	29	29	29	22	25	25	25
Tank Contents	HBL[6]	LBL	LBL	LBL	HBL	HBL	HBL	SLUDGE	SLUDGE	LBL	HBL	HBL
Potential volatile organic compound(s) emitted	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$	Acetone $MeCl_2$
Molecular weight of Pollutant 1	58	58	58	58	58	58	58	58	58	58	58	58
Molecular weight of Pollutant 2	85	85	85	85	85	85	85	85	85	85	85	85
Partial pressure[7] (psia) of Pollutant 1	1.668	0.0643	0.0643	0.0643	1.668	1.668	1.668	2.479	2.479	0.0643	1.668	1.668
Partial pressure[7] (psia) of Pollutant 2	3.168	0.1285	0.1285	0.1285	3.168	3.168	3.168	0.775	0.775	0.1285	3.168	3.168
Paint Factor (F_P)	1	1	1	1	1	1	1	1	1	1	1	1
Adjustment factor for small diameter (C)	0.3	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.47	0.63	0.63	0.63
Product factor (K_C) for Breathing Losses	1	1	1	1	1	1	1	1	1	1	1	1
Product factor (K_C) for Working Losses	1	1	1	1	1	1	1	1	1	1	1	1
Turnover factor (K_N)	1	1	1	1	1	1	1	1	1	1	1	1
Filling Rate (GPM)	25	250	250	250	250	250	250	250	250	250	250	250
Annual Throughput (gallons per year)	14,400	367,000	367,000	367,000	143,000	143,000	143,000	699,425	1,748,575	367,000	367,000	367,000
Average Ambient Diurnal Temperature Change (°F)	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8

HBL = High Btu Liquid LBL = Low Btu Liquid $MeCl_2$ = Methylene chloride

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[6] This tank receives containerized wastes. For the purposes of making conservative estimates of emission rates, it is assumed that these wastes are the same as high Btu liquids.

[7] The partial pressures were estimated using Raoult's Law.

organic liquids from the tank trucks and railroad cars into the storage tanks. The potential emission rate is obtained by adding the uncontrolled breathing and working losses (lbs/yr) and the losses during the unloading operation.

Uncontrolled breathing losses = 5,772 lbs/yr

Uncontrolled working losses = 19,242 lbs/yr

Uncontrolled losses due to
unloading from tank trucks and rail cars = 18,920 lbs/yr

Total uncontrolled emission rate = 43,934 lbs/yr (21.967 tons/yr)

Section V - Items 4, 5

The air pollution control devices consist of the hazardous waste incinerator and carbon adsorption system.

The hazardous waste incinerator consists of a primary and secondary chamber operating at 1400°F and 1800°F respectively and is capable of destroying organics by an extent of 99.99%. The design details are explained in the air permit application (Section L) for the hazardous incinerator, as well as in Section D which describes the overall process.

The carbon adsorption system will consist of a two-stage mechanical chilling unit and a modular carbon canister system consisting of four 55-gallon canisters, of which two are in service (in series) and two are backup units. The first stage of the mechanical chiller will cool the vent gases from the organic liquid storage and handling units to 35°F, which will remove water as well as the heavier fraction of the organic vapors. The second stage chiller will further cool the gases to -5°F, removing a major fraction of the remaining organics. The total removal efficiency of the two stage chiller will be approximately 90%. The chilled gases are vented to the modular carbon canister system consisting of four 55-gallon carbon canisters each containing approximately 200 pounds of carbon. The carbon has an absorptive capacity of approximately 20% by weight, and each carbon canister will be capable of removing 40 pounds of organic vapor before saturation. The maximum loading of organic vapors to the carbon adsorption system will occur during organic liquid unloading operations as described in the "addendum to the air permit application for the organic liquid storage tanks". The combined system is guaranteed to control the organic emissions at greater than 95% efficiency. The carbon beds are not regenerated for reuse. Instead, they will be burned in the incinerator.

Replacement time for carbon canisters

The time required for replacement of carbon canisters during tank truck unloading and regular operations is estimated as follows:

Tank truck/rail car unloading:

As described above, the worst case emissions occur when two tank trucks and one rail car can unload high Btu liquids simultaneously. The worst case (uncontrolled) emission rates of volatile organic compounds are:

Acetone:	34.2 lb/hr/vehicle
Methylene chloride:	95.4 lb/hr/vehicle
Total:	129.6 lb/hr/vehicle

The emissions of volatile organics venting into the carbon adsorbers enter at a rate of 388.8 lb/hr (3 x 129.6). The chillers condense 90% of these emissions. Therefore, these emissions enter the carbon canisters arranged in series at a rate of 38.88 lb/hr. Based on a combined organic vapor removal efficiency for the chiller and the carbon canisters, the emission rate of the organic vapors from the carbon adsorption stack would be 19.44 lb/hr. In other words, the carbon canisters will remove organic vapors at a rate of 19.44 (38.88-19.44) lb/hr. Each carbon canister has an adsorptive capacity of 20 percent by weight, each carbon canister can hold 40 pounds of organic vapors before saturation. The two carbon canisters together contain 400 pounds of carbon. Therefore, the two canisters together can hold 80 pounds of organic vapors before they become saturated.

The time required to replace the carbon canisters is estimated as follows:

$$\frac{\text{80 pounds organic vapors for saturation}}{\text{carbon canisters}} \times \frac{\text{hr}}{\text{19.44 lbs organic vapors removed}}$$

$$= \quad 4.12 \text{ hours}$$

Since the simultaneous unloading of two tank trucks and one rail car can be completed within 2 hours, the unloading can be done without interruption assuming new carbon canisters are used at the beginning of the unloading.

Regular operations

The carbon adsorption system will also be used to control emissions of organic resulting from breathing of the storage tanks, and vapors generated during the tank unloading. Assuming that all the tanks are unloaded simultaneously, the total uncontrolled breathing and working losses from all the tanks is estimated to be:

Acetone:	286.73 lb/hr
Methylene chloride:	557.9 lb/hr
Total Organics:	844.63 lb/hr

When the incinerator is not active, these emissions will be controlled by the carbon adsorption system. The chillers will condense 90% of these emissions. Therefore, these emissions enter the carbon canisters arranged in series at a rate of 84.46 lb/hr. Based on a combined organic vapor removal efficiency for the chiller and the carbon canisters, the emission rate of the organic vapors from the carbon adsorption stack would be 42.23 lb/hr. In other words, the carbon canisters will remove organic vapors at a rate of 42.23 (84.46-42.23) lb/hr. Each carbon canister has an adsorptive capacity of 20 percent by weight, each carbon canister can hold 40 pounds of organic vapors before saturation. The two carbon canisters together contain 400 pounds of carbon. Therefore, the two canisters together can hold 80 pounds of organic vapors before they become saturated.

The time required to replace the carbon canisters is estimated as follows:

$$\frac{\text{80 pounds organic vapors for saturation}}{\text{carbon canisters}} \times \frac{\text{hr}}{\text{42.23 lbs organic vapors removed}}$$

$$= \quad 1.89 \text{ hours} \approx 2 \text{ hours}$$

In reality, all the storage tanks will not be emptied simultaneously leading to high emission rates of organic vapors, and therefore the replacement time estimated above is very conservative.

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EMISSIONS OF VOLATILE ORGANICS DUE TO UNLOADING ORGANIC LIQUID WASTES FROM TANK TRUCKS AND RAIL CARS INTO THE ORGANIC LIQUID STORAGE TANKS

NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:            6840
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:        1560

EMISSION CONTROL EFFICIENCY: INCINERATOR:       0.9999
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:     0.95

MATERIAL TRANSPORTED:      HBL            AMOUNT TRANSPORTED PER YEAR BY TANK TRUCK (GALLONS):          121567
                                          AMOUNT TRANSPORTEO PER YEAR BY RAIL CAR (GALLONS):            607833
        KEY:     HBL = HIGH BTU LIQUIDS   TOTAL AMOUNT OF MATERIAL TRANSPORTED PER YEAR (GALLONS):      729400
                 LBL = LOW BTU LIQUIDS    UNLOADING RATE (GPM):                                            250

TEMPERATURE OF THE CONTENTS OF THE TANK TRUCK OR RAIL CAR:            68 DEG F

NUMBER OF TANK TRUCKS TRANSPORTING  HBL      PER YEAR:                20
NUMBER OF RAIL CARS TRANSPORTING    HBL      PER YEAR:                20

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POLLUTANT          MOLECULAR WEIGHT  PARTIAL PRESSURE              EMISSION RATE WITHOUT CONTROL                 EMISSION RATE WITH CONTROL (FOR ALL VEHICLES)
                                         (PSIA)             LBS/HR          LBS/YR           TONS/YR        WITH INCINERATOR         WITH CARBON ADSORBER
                                                            PER VEHICLE     TOTAL            TOTAL          LBS/HR   LBS/YR          LBS/HR   LBS/YR
---------------------------------------------------------------------------------------------------------------------------------------------------

ACETONE                   58          1.668                     34.25        1665.23            0.83        0.003424 0.135597          1.71     15.46
MECL2                     85          3.168                     95.32        4635.05            2.32        0.009531 0.377425          4.77     43.04

TOTAL                                                          129.56        6300.27            3.15           0.01     0.51           6.48     58.50
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EMISSIONS OF VOLATILE ORGANICS DUE TO UNLOADING ORGANIC LIQUID WASTES FROM TANK TRUCKS AND RAIL CARS INTO THE ORGANIC LIQUID STORAGE TANKS

NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR: 6840
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR: 1560

EMISSION CONTROL EFFICIENCY: INCINERATOR: 0.9999
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER: 0.95

MATERIAL TRANSPORTED: LBL

KEY: HBL = HIGH BTU LIQUIDS
LBL = LOW BTU LIQUIDS

AMOUNT TRANSPORTED PER YEAR BY TANK TRUCK (GALLONS): 244667
AMOUNT TRANSPORTED PER YEAR BY RAIL CAR (GALLONS): 1223333
TOTAL AMOUNT OF MATERIAL TRANSPORTED PER YEAR (GALLONS): 1468000
UNLOADING RATE (GPM): 250

TEMPERATURE OF THE CONTENTS OF THE TANK TRUCK OR RAIL CAR: 68 DEG F

NUMBER OF TANK TRUCKS TRANSPORTING LBL PER YEAR: 41
NUMBER OF RAIL CARS TRANSPORTING LBL PER YEAR: 41

POLLUTANT	MOLECULAR WEIGHT	PARTIAL PRESSURE (PSIA)	EMISSION RATE WITHOUT CONTROL			EMISSION RATE WITH CONTROL (FOR ALL VEHICLES)			
			LBS/HR PER VEHICLE	LBS/YR TOTAL	TONS/YR TOTAL	WITH INCINERATOR		WITH CARBON ADSORBER	
						LBS/HR	LBS/YR	LBS/HR	LBS/YR
ACETONE	58	0.0643	1.32	129.20	0.06	0.000132	0.010520	0.07	1.20
MECL2	85	0.1285	3.87	378.38	0.19	0.000386	0.030811	0.19	3.51
TOTAL			5.19	507.58	0.25	0.00	0.04	0.26	4.71

EMISSIONS OF VOLATILE ORGANICS DUE TO UNLOADING ORGANIC LIQUID WASTES FROM TANK TRUCKS AND RAIL CARS INTO THE ORGANIC LIQUID STORAGE TANKS

NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR: 6840
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR: 1560

EMISSION CONTROL EFFICIENCY: INCINERATOR: 0.9999
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER: 0.95

MATERIAL TRANSPORTED: SLUDGES

AMOUNT TRANSPORTED PER YEAR BY TANK TRUCK (GALLONS): 408000
AMOUNT TRANSPORTED PER YEAR BY RAIL CAR (GALLONS): 2040000
TOTAL AMOUNT OF MATERIAL TRANSPORTED PER YEAR (GALLONS): 2448000
UNLOADING RATE (GPM): 250

KEY: HBL = HIGH BTU LIQUIDS
LBL = LOW BTU LIQUIDS

TEMPERATURE OF THE CONTENTS OF THE TANK TRUCK OR RAIL CAR: 68 DEG F

NUMBER OF TANK TRUCKS TRANSPORTING SLUDGES PER YEAR: 68
NUMBER OF RAIL CARS TRANSPORTING SLUDGES PER YEAR: 68

POLLUTANT	MOLECULAR WEIGHT	PARTIAL PRESSURE	EMISSION RATE WITHOUT CONTROL			EMISSION RATE WITH CONTROL (FOR ALL VEHICLES)			
		(PSIA)	LBS/HR	LBS/YR	TONS/YR	WITH INCINERATOR		WITH CARBON ADSORBER	
			PER VEHICLE	TOTAL	TOTAL	LBS/HR	LBS/YR	LBS/HR	LBS/YR
ACETONE	58	2.479	50.90	8306.16	4.15	0.005089	0.676358	2.54	77.13
MECL2	85	0.775	23.32	3805.54	1.90	0.002331	0.309879	1.17	35.34
TOTAL			74.21	12111.69	6.06	0.01	0.99	3.71	112.47

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EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION:       T-09

TANK CAPACITY (GALLONS):    2,000                                              PAINT FACTOR (DIMENSIONLESS):                                          1
TANK DIAMETER (FEET):             6                                            ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):          0.3
TANK HEIGHT (FEET):              13                                            PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):                   1
                                                                               TURNOVER FACTOR (DIMENSIONLESS):                                       1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:              6840     PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):                     1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:          1560     FILLING RATE (GALLONS PER MINUTE):                                    25
EMISSION CONTROL EFFICIENCY: INCINERATOR:                           0.9999     ANNUAL THROUGHPUT (GALLONS PER YEAR):                              14400
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:                         0.95     AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):                 20.8

TYPE OF MATERIAL STORED:    CW             KEY: HBL = HIGH BTU LIQUID
                                                LBL = LOW BTU LIQUID
                                                CW  = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)
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POLLUTANTS   MOLECULAR   PARTIAL PRESSURE    *******  BREATHING LOSSES (LBS/YEAR)       ******        *******************      WORKING LOSSES    ****************************
             WEIGHT      (PSIA)              WITHOUT       WITH           WITH                        WITHOUT  WITHOUT         WITH INCINERATOR          WITH CARBON ADSORBER
                                             CONTROL       INCINERATOR    CARBON ADSORBER             CONTROL  CONTROL         (LBS/HR) (LBS/YR)         (LBS/HR)  (LBS/YR)
                                                                                                      (LBS/HR)  (LBS/YR)
--------------------------------------------------------------------------------------------------------------------------------------------------------------

ACETONE            58      1.668                25.55        0.0020         0.2275                       3.48    33.43      0.000348   0.0027            0.1741    0.3105
MECL2              85      3.168                62.94        0.0049         0.5604                       9.69    93.06      0.000969   0.0076            0.4847    0.8642

TOTAL                                           88.49        0.0069         0.7879                      13.18   126.50      0.001318   0.0103            0.6588    1.1746
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EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION:       T-10

TANK CAPACITY (GALLONS):    19,459                                        PAINT FACTOR (DIMENSIONLESS):                                        1
TANK DIAMETER (FEET):              12                                     ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):       0.63
TANK HEIGHT (FEET):                29                                     PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):                 1
                                                                          TURNOVER FACTOR (DIMENSIONLESS):                                     1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:           6840   PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):                   1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:       1560   FILLING RATE (GALLONS PER MINUTE):                                 250
EMISSION CONTROL EFFICIENCY: INCINERATOR:                        0.9999   ANNUAL THROUGHPUT (GALLONS PER YEAR):                           367000
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:                      0.95   AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):               20.8

TYPE OF MATERIAL STORED:    LBL             KEY: HBL = HIGH BTU LIQUID
                                                 LBL = LOW BTU LIQUID
                                                 CW  = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)
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POLLUTANTS    MOLECULAR   PARTIAL PRESSURE     *******  BREATHING LOSSES (LBS/YEAR)     ******      *******************     WORKING LOSSES   ***************************
              WEIGHT      (PSIA)               WITHOUT       WITH          WITH                      WITHOUT  WITHOUT       WITH INCINERATOR         WITH CARBON ADSORBER
                                               CONTROL       INCINERATOR   CARBON ADSORBER           CONTROL  CONTROL       (LBS/HR)  (LBS/YR)       (LBS/HR)  (LBS/YR)
                                                                                                     (LBS/HR)  (LBS/YR)
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ACETONE            58      0.0643                27.06        0.0021          0.2409                 1.34     32.85     0.000134   0.0027          0.0671    0.3050
MECL2              85      0.1285                63.69        0.0050          0.5671                 3.93     96.21     0.000393   0.0078          0.1966    0.8933

TOTAL                                            90.74        0.0071          0.8080                 5.27    129.05     0.000527   0.0105          0.2637    1.1984
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EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION:        T-11

TANK CAPACITY (GALLONS):     19,459                                            PAINT FACTOR (DIMENSIONLESS):                                              1
TANK DIAMETER (FEET):            12                                            ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):             0.63
TANK HEIGHT (FEET):              29                                            PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):                       1
                                                                               TURNOVER FACTOR (DIMENSIONLESS):                                           1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:              6840     PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):                         1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:          1560     FILLING RATE (GALLONS PER MINUTE):                                       250
EMISSION CONTROL EFFICIENCY: INCINERATOR:                           0.9999     ANNUAL THROUGHPUT (GALLONS PER YEAR):                                 367000
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:                         0.95     AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):                     20.8

TYPE OF MATERIAL STORED:    LBL              KEY: HBL = HIGH BTU LIQUID
                                                  LBL = LOW BTU LIQUID
                                                  CW  = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)
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POLLUTANTS   MOLECULAR   PARTIAL PRESSURE     *******  BREATHING LOSSES (LBS/YEAR)       ******     *******************     WORKING LOSSES    ***************************
             WEIGHT      (PSIA)               WITHOUT     WITH            WITH                     WITHOUT  WITHOUT      WITH INCINERATOR          WITH CARBON ADSORBER
                                              CONTROL     INCINERATOR     CARBON ADSORBER          CONTROL  CONTROL      (LBS/HR)  (LBS/YR)         (LBS/HR)  (LBS/YR)
                                                                                                   (LBS/HR)  (LBS/YR)
------------------------------------------------------------------------------------------------------------------------------------------------------------

ACETONE             58     0.0643               27.06       0.0021          0.2409                   1.34     32.85     0.000134   0.0027           0.0671    0.3050
MECL2               85     0.1285               63.69       0.0050          0.5671                   3.93     96.21     0.000393   0.0078           0.1966    0.8933

TOTAL                                           90.74       0.0071          0.8080                   5.27    129.05     0.000527   0.0105           0.2637    1.1984
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EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION:        T-12

TANK CAPACITY (GALLONS):     19,459                                                PAINT FACTOR (DIMENSIONLESS):                                          1
TANK DIAMETER (FEET):            12                                                ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):         0.63
TANK HEIGHT (FEET):              29                                                PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):                   1
                                                                                   TURNOVER FACTOR (DIMENSIONLESS):                                       1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:                 6840      PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):                     1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:             1560      FILLING RATE (GALLONS PER MINUTE):                                   250
EMISSION CONTROL EFFICIENCY: INCINERATOR:                              0.9999      ANNUAL THROUGHPUT (GALLONS PER YEAR):                             367000
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:                            0.95      AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):                 20.8

TYPE OF MATERIAL STORED:    LBL             KEY: HBL = HIGH BTU LIQUID
                                                 LBL = LOW BTU LIQUID
                                                 CW  = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)
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POLLUTANTS   MOLECULAR   PARTIAL PRESSURE     *******  BREATHING LOSSES (LBS/YEAR)        ******      *******************    WORKING LOSSES   ****************************
             WEIGHT       (PSIA)              WITHOUT      WITH            WITH                       WITHOUT  WITHOUT       WITH INCINERATOR       WITH CARBON ADSORBER
                                              CONTROL      INCINERATOR     CARBON ADSORBER            CONTROL  CONTROL       (LBS/HR) (LBS/YR)      (LBS/HR)  (LBS/YR)
                                                                                                      (LBS/HR)  (LBS/YR)
------------------------------------------------------------------------------------------------------------------------------------------------------------

ACETONE            58      0.0643               27.06        0.0021          0.2409                     1.34    32.85    0.000134   0.0027        0.0671    0.3050
MECL2              85      0.1285               63.69        0.0050          0.5671                     3.93    96.21    0.000393   0.0078        0.1966    0.8933

TOTAL                                           90.74        0.0071          0.8080                     5.27   129.05    0.000527   0.0105        0.2637    1.1984
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EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION: T-13

TANK CAPACITY (GALLONS):	19,459	PAINT FACTOR (DIMENSIONLESS):	1
TANK DIAMETER (FEET):	12	ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):	0.63
TANK HEIGHT (FEET):	29	PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):	1
		TURNOVER FACTOR (DIMENSIONLESS):	1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:	6840	PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):	1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:	1560	FILLING RATE (GALLONS PER MINUTE):	250
EMISSION CONTROL EFFICIENCY: INCINERATOR:	0.9999	ANNUAL THROUGHPUT (GALLONS PER YEAR):	143000
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:	0.95	AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):	20.8

TYPE OF MATERIAL STORED: HBL

KEY: HBL = HIGH BTU LIQUID
LBL = LOW BTU LIQUID
CW = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)

POLLUTANTS	MOLECULAR WEIGHT	PARTIAL PRESSURE (PSIA)	******* BREATHING LOSSES (LBS/YEAR) ******			****************** WORKING LOSSES **************************					
			WITHOUT CONTROL	WITH INCINERATOR	WITH CARBON ADSORBER	WITHOUT CONTROL (LBS/HR)	WITHOUT CONTROL (LBS/YR)	WITH INCINERATOR (LBS/HR)	WITH INCINERATOR (LBS/YR)	WITH CARBON ADSORBER (LBS/HR)	WITH CARBON ADSORBER (LBS/YR)
ACETONE	58	1.668	267.96	0.0209	2.3860	34.83	332.03	0.003483	0.0270	1.7414	3.0831
MECL2	85	3.168	660.11	0.0515	5.8777	96.94	924.17	0.009694	0.0753	4.8470	8.5816
TOTAL			928.08	0.0725	8.2637	131.77	1256.19	0.013177	0.1023	6.5884	11.6647

EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION: T-14

TANK CAPACITY (GALLONS):	19,459	PAINT FACTOR (DIMENSIONLESS):	1
TANK DIAMETER (FEET):	12	ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):	0.63
TANK HEIGHT (FEET):	29	PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):	1
		TURNOVER FACTOR (DIMENSIONLESS):	1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:	6840	PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):	1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:	1560	FILLING RATE (GALLONS PER MINUTE):	250
EMISSION CONTROL EFFICIENCY: INCINERATOR:	0.9999	ANNUAL THROUGHPUT (GALLONS PER YEAR):	143000
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:	0.95	AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):	20.8

TYPE OF MATERIAL STORED: HBL

KEY: HBL = HIGH BTU LIQUID
LBL = LOW BTU LIQUID
CW = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)

POLLUTANTS	MOLECULAR WEIGHT	PARTIAL PRESSURE (PSIA)	******* BREATHING LOSSES (LBS/YEAR)		******	*******************		WORKING LOSSES	*****************************		
			WITHOUT CONTROL	WITH INCINERATOR	WITH CARBON ADSORBER	WITHOUT CONTROL (LBS/HR)	WITHOUT CONTROL (LBS/YR)	WITH INCINERATOR (LBS/HR)	(LBS/YR)	WITH CARBON ADSORBER (LBS/HR)	(LBS/YR)
ACETONE	58	1.668	267.96	0.0209	2.3860	34.83	332.03	0.003483	0.0270	1.7414	3.0831
MECL2	85	3.168	660.11	0.0515	5.8777	96.94	924.17	0.009694	0.0753	4.8470	8.5816
TOTAL			928.08	0.0725	8.2637	131.77	1256.19	0.013177	0.1023	6.5884	11.6647

EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION: T-15

TANK CAPACITY (GALLONS): 19,459
TANK DIAMETER (FEET): 12
TANK HEIGHT (FEET): 29

NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR: 6840
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR: 1560
EMISSION CONTROL EFFICIENCY: INCINERATOR: 0.9999
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER: 0.95

PAINT FACTOR (DIMENSIONLESS): 1
ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS): 0.63
PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS): 1
TURNOVER FACTOR (DIMENSIONLESS): 1
PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS): 1
FILLING RATE (GALLONS PER MINUTE): 250
ANNUAL THROUGHPUT (GALLONS PER YEAR): 143000
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F): 20.8

TYPE OF MATERIAL STORED: HBL

KEY: HBL = HIGH BTU LIQUID
LBL = LOW BTU LIQUID
CW = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)

POLLUTANTS	MOLECULAR WEIGHT	PARTIAL PRESSURE (PSIA)	******* BREATHING LOSSES (LBS/YEAR) ******			******************		WORKING LOSSES		***************************	
			WITHOUT CONTROL	WITH INCINERATOR	WITH CARBON ADSORBER	WITHOUT CONTROL (LBS/HR)	WITHOUT CONTROL (LBS/YR)	WITH INCINERATOR (LBS/HR)	WITH INCINERATOR (LBS/YR)	WITH CARBON ADSORBER (LBS/HR)	WITH CARBON ADSORBER (LBS/YR)
ACETONE	58	1.668	267.96	0.0209	2.3860	34.83	332.03	0.003483	0.0270	1.7414	3.0831
MECL2	85	3.168	660.11	0.0515	5.8777	96.94	924.17	0.009694	0.0753	4.8470	8.5816
TOTAL			928.08	0.0725	8.2637	131.77	1256.19	0.013177	0.1023	6.5884	11.6647

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EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION:       T-16

TANK CAPACITY (GALLONS):    19,459                                              PAINT FACTOR (DIMENSIONLESS):                                             1
TANK DIAMETER (FEET):           12                                              ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):            0.63
TANK HEIGHT (FEET):             29                                              PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):                      1
                                                                                TURNOVER FACTOR (DIMENSIONLESS):                                          1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:                 6840   PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):                        1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:             1560   FILLING RATE (GALLONS PER MINUTE):                                      250
EMISSION CONTROL EFFICIENCY: INCINERATOR: .                            0.9999   ANNUAL THROUGHPUT (GALLONS PER YEAR):                                699425
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:                            0.95   AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):                    20.8

TYPE OF MATERIAL STORED:    SLUDGE          KEY: HBL = HIGH BTU LIQUID
                                                 LBL = LOW BTU LIQUID
                                                 CW  = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
POLLUTANTS     MOLECULAR    PARTIAL PRESSURE         *******  BREATHING LOSSES (LBS/YEAR)      ******           ******************         WORKING LOSSES   ***************************
               WEIGHT       (PSIA)                   WITHOUT         WITH            WITH                       WITHOUT  WITHOUT           WITH INCINERATOR          WITH CARBON ADSORBER
                                                     CONTROL         INCINERATOR     CARBON ADSORBER            CONTROL  CONTROL           (LBS/HR) (LBS/YR)         (LBS/HR)  (LBS/YR)
                                                                                                                (LBS/HR)  (LBS/YR)
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

ACETONE              58       2.479                   366.49          0.0286           3.2633                    51.76  2413.55           0.005176   0.1965              2.5881   22.4116
MECL2                85       0.775                   222.91          0.0174           1.9848                    23.72  1105.79           0.002371   0.0900              1.1858   10.2681

TOTAL  .                                              589.40          0.0460           5.2481                    75.48  3519.34           0.007548   0.2866              3.7738   32.6796
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
```

EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION: T-17

TANK CAPACITY (GALLONS): 8,000
TANK DIAMETER (FEET): 9
TANK HEIGHT (FEET): 22

NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR: 6840
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR: 1560
EMISSION CONTROL EFFICIENCY: INCINERATOR: 0.9999
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER: 0.95

PAINT FACTOR (DIMENSIONLESS): 1
ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS): 0.47
PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS): 1
TURNOVER FACTOR (DIMENSIONLESS): 1
PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS): 1
FILLING RATE (GALLONS PER MINUTE): 250
ANNUAL THROUGHPUT (GALLONS PER YEAR): 1748575
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F): 20.8

TYPE OF MATERIAL STORED: SLUDGE

KEY: HBL = HIGH BTU LIQUID
LBL = LOW BTU LIQUID
CW = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)

POLLUTANTS	MOLECULAR WEIGHT	PARTIAL PRESSURE (PSIA)	******* BREATHING LOSSES (LBS/YEAR) ******			****************** WORKING LOSSES ***************************					
			WITHOUT CONTROL	WITH INCINERATOR	WITH CARBON ADSORBER	WITHOUT CONTROL (LBS/HR)	WITHOUT CONTROL (LBS/YR)	WITH INCINERATOR (LBS/HR)	WITH INCINERATOR (LBS/YR)	WITH CARBON ADSORBER (LBS/HR)	WITH CARBON ADSORBER (LBS/YR)
ACETONE	58	2.479	144.37	0.0113	1.2855	51.76	6033.93	0.005176	0.4913	2.5881	56.0293
MECL2	85	0.775	87.81	0.0069	0.7819	23.72	2764.50	0.002371	0.2251	1.1858	25.6703
TOTAL			232.19	0.0181	2.0674	75.48	8798.42	0.007548	0.7164	3.7738	81.6996

EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION: T-18

TANK CAPACITY (GALLONS):	19,459	PAINT FACTOR (DIMENSIONLESS):	1
TANK DIAMETER (FEET):	12	ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):	0.63
TANK HEIGHT (FEET):	25	PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):	1
		TURNOVER FACTOR (DIMENSIONLESS):	1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:	6840	PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):	1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:	1560	FILLING RATE (GALLONS PER MINUTE):	250
EMISSION CONTROL EFFICIENCY: INCINERATOR:	0.9999	ANNUAL THROUGHPUT (GALLONS PER YEAR):	367000
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:	0.95	AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):	20.8

TYPE OF MATERIAL STORED: LBL

KEY: HBL = HIGH BTU LIQUID
LBL = LOW BTU LIQUID
CW = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)

POLLUTANTS	MOLECULAR WEIGHT	PARTIAL PRESSURE (PSIA)	******* BREATHING LOSSES (LBS/YEAR) ******			******************** WORKING LOSSES ****************************					
			WITHOUT CONTROL	WITH INCINERATOR	WITH CARBON ADSORBER	WITHOUT CONTROL (LBS/HR)	WITHOUT CONTROL (LBS/YR)	WITH INCINERATOR (LBS/HR)	(LBS/YR)	WITH CARBON ADSORBER (LBS/HR)	(LBS/YR)
ACETONE	58	0.0643	25.09	0.0020	0.2234	1.34	32.85	0.000134	0.0027	0.0671	0.3050
MECL2	85	0.1285	59.04	0.0046	0.5257	3.93	96.21	0.000393	0.0078	0.1966	0.8933
TOTAL			84.13	0.0066	0.7491	5.27	129.05	0.000527	0.0105	0.2637	1.1984

EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION: T-19

TANK CAPACITY (GALLONS): 19,459
TANK DIAMETER (FEET): 12
TANK HEIGHT (FEET): 25

NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR: 6840
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR: 1560
EMISSION CONTROL EFFICIENCY: INCINERATOR: 0.9999
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER: 0.95

PAINT FACTOR (DIMENSIONLESS): 1
ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS): 0.63
PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS): 1
TURNOVER FACTOR (DIMENSIONLESS): 1
PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS): 1
FILLING RATE (GALLONS PER MINUTE): 250
ANNUAL THROUGHPUT (GALLONS PER YEAR): 143000
AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F): 20.8

TYPE OF MATERIAL STORED: HBL

KEY: HBL = HIGH BTU LIQUID
LBL = LOW BTU LIQUID
CW = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)

POLLUTANTS	MOLECULAR WEIGHT	PARTIAL PRESSURE (PSIA)	******* BREATHING LOSSES (LBS/YEAR) ******			****************** WORKING LOSSES ***************************					
			WITHOUT CONTROL	WITH INCINERATOR	WITH CARBON ADSORBER	WITHOUT CONTROL (LBS/HR)	WITHOUT CONTROL (LBS/YR)	WITH INCINERATOR (LBS/HR)	WITH INCINERATOR (LBS/YR)	WITH CARBON ADSORBER (LBS/HR)	WITH CARBON ADSORBER (LBS/YR)
ACETONE	58	1.668	248.43	0.0194	2.2120	34.83	332.03	0.003483	0.0270	1.7414	3.0831
MECL2	85	3.168	611.99	0.0478	5.4492	96.94	924.17	0.009694	0.0753	4.8470	8.5816
TOTAL			860.42	0.0672	7.6613	131.77	1256.19	0.013177	0.1023	6.5884	11.6647

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EMISSIONS FROM STORAGE TANKS

TANK DESIGNATION:       T-20

TANK CAPACITY (GALLONS):    19,459                                                    PAINT FACTOR (DIMENSIONLESS):                                            1
TANK DIAMETER (FEET):             12                                                    ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS (DIMENSIONLESS):           0.63
TANK HEIGHT (FEET):               25                                                    PRODUCT FACTOR FOR BREATHING LOSSES (DIMENSIONLESS):                     1
                                                                                      TURNOVER FACTOR (DIMENSIONLESS):                                         1
NUMBER OF HOURS INCINERATOR WILL BE OPERATING IN A YEAR:                6840          PRODUCT FACTOR FOR WORKING LOSSES (DIMENSIONLESS):                       1
NUMBER OF HOURS CARBON ADSORBER WILL BE OPERATING IN A YEAR:            1560          FILLING RATE (GALLONS PER MINUTE):                                     250
EMISSION CONTROL EFFICIENCY: INCINERATOR:                             0.9999          ANNUAL THROUGHPUT (GALLONS PER YEAR):                               143000
EMISSION CONTROL EFFICIENCY: CARBON ADSORBER:                           0.95          AVERAGE AMBIENT DIURNAL TEMPERATURE CHANGE (DEG F):                   20.8

TYPE OF MATERIAL STORED:    HBL               KEY: HBL = HIGH BTU LIQUID
                                                   LBL = LOW BTU LIQUID
                                                   CW  = CONTAINERIZED WASTE (ASSUME HIGH BTU LIQUIDS - WORST CASE)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
POLLUTANTS     MOLECULAR    PARTIAL PRESSURE        *******  BREATHING LOSSES (LBS/YEAR)       ******            *******************        WORKING LOSSES  ****************************
               WEIGHT       (PSIA)                  WITHOUT         WITH             WITH                        WITHOUT  WITHOUT          WITH INCINERATOR         WITH CARBON ADSORBER
                                                    CONTROL         INCINERATOR      CARBON ADSORBER             CONTROL  CONTROL          (LBS/HR) (LBS/YR)        (LBS/HR)  (LBS/YR)
                                                                                                                 (LBS/HR)  (LBS/YR)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

ACETONE             58       1.668                    248.43         0.0194            2.2120                      34.83     332.03        0.003483   0.0270             1.7414     3.0831
MECL2               85       3.168                    611.99         0.0478            5.4492                      96.94     924.17        0.009694   0.0753             4.8470     8.5816

TOTAL                                                 860.42         0.0672            7.6613                     131.77    1256.19        0.013177   0.1023             6.5884    11.6647
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FLORIDA FIRST PROCESSING, INC.

APPENDIX D-3

TANK DATA SHEETS

Date: 9/29/89
Revision: 1

International Waste Energy Systems

VERTICAL TANK DATA SHEET

Best Available Copy

SPECIFICATION NO. ____

EQUIPMENT NO. T-02

SHEET ____ OF ____

DATE: 29/05/89

REV: C

BY: J.A.O.

CHK'D BY: LDC, JS

PROJECT NAME: FFPI

EQUIPMENT NAME/APPLICATION: DRIED SOLIDS RECYCLE SILO

IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure	psig	ATMOSPHERIC	
Operating Temperature	°F	350°	
~~Liquid~~ Specific Gravity (SOLIDS)		0.8	
Contents Lethal		~~Yes~~ No	
Design Pressure	psig	N/A	
Design Temperature	°F		
VOLUME		1350 cu.ft.	
Hydrostatic Test	psig		
Shell	~~Heads~~ CONE Corr. Allow. in.	1/8"	1/8"
Shell	~~Heads~~ CONE Joint Eff. %	85	85

Code: N/A | Stamp ~~Yes~~ No

Radiograph: SPOT | Stress Relieve:

Type Supports: 8 LEGS

Insulation:

Fireproofing:

Sandblast: | Paint:

Manhole ☒ Hinged ☐ Davited ☐ Other:

Platform Clips: | Ladder Clips: YES | Insul. Rings:

Pipe Supports:

Wind Load: 100 MPH (SBCCI) | Seismic: ZONE (ANSI)

Wt. Empty lb. | Wt. Full of Water lb.

MATERIALS

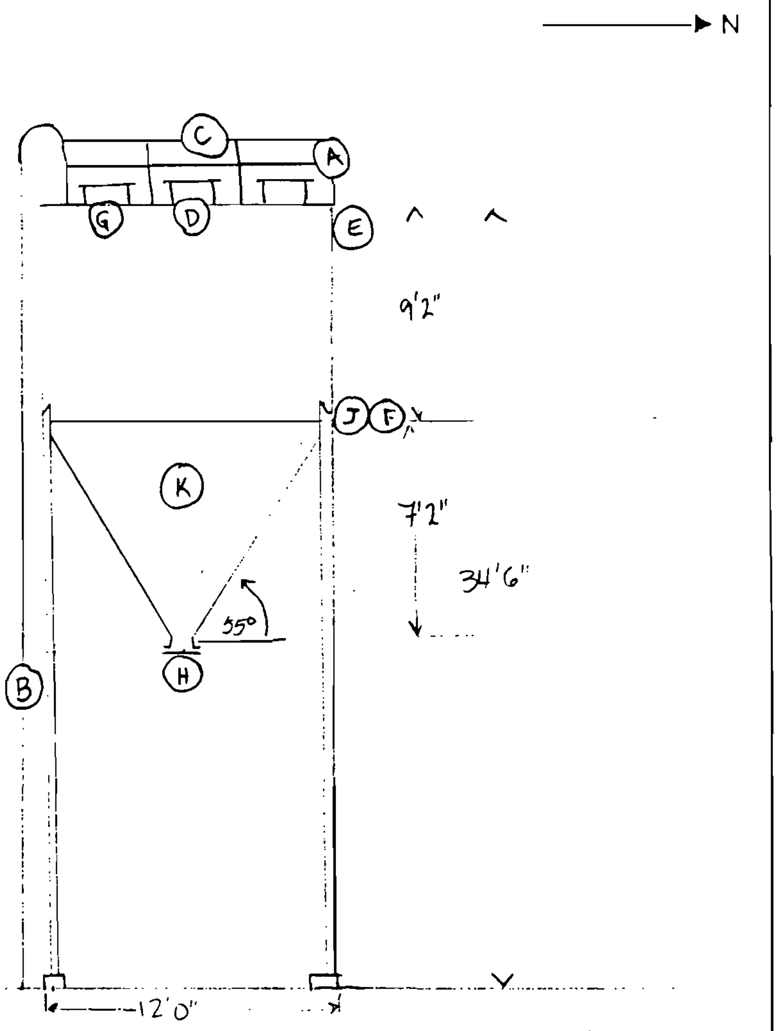
Item	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A-285, GR.C
~~Heads~~ CONE	1/2 in.	CS	A-285, GR.C
Lining	in.	—	
	in.		
	in.		
Nozzle Necks	CS		A-36
Flanges	↓		↓
Coupling			
M.H. Cover			
Supports			
Bolts/Studs			
Nuts	↓		↓
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
MANWAY	A	1	24"			
LADDER	B	1	18"			
RAILING	C		36"			
BAGHOUSE/VENT	D		24"			
LSHH	E		2"			
SPARE	F		2"			
FILL	G		24"			
DISCHARGE	H		24"			
TEMP.	J		2"			
STRIKER PLATE	K		4'-4"			
	L					
	M					
	N					
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



To support bucket conveyor at fill nozzle Ⓓ

To support rotary airlock at discharge nozzle Ⓗ

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IWES 15-0186

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Systems

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SPECIFICATION NO. ____________
EQUIPMENT NO. T-01

DATE: 09/05/89
REV: C
BY: J.A.O.
CHK'D BY: LDC, JS

PROJECT NAME: FFPI
EQUIPMENT NAME/APPLICATION: DRIED SOLIDS STORAGE SILO
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure psig	Atmospheric		
Operating Temperature °F	350°		
~~Liquid~~ Specific Gravity (SOLIDS)	0.8		
Contents Lethal	~~Yes~~ No		
Design Pressure psig	N/A		
Design Temperature °F	400°		
Volume (Capacity) ft^3	5000 ft^3 (37,405 gal)		
L/D Ratio	2.5		
Hydrostatic Test psig			
Shell	~~Heads~~ CONE Corr. Allow. in.	1/8	1/8
Shell	~~Heads~~ CONE Joint Eff. %	85	85
Code: N/A		Stamp ~~Yes~~ No	
Radiograph: SPOT		Stress Relieve:	
Type Supports: 8 LEGS			
Insulation:			
Fireproofing:			
Sandblast:		Paint:	
Manhole ☒ Hinged	☐ Davited	☐ Other:	
Platform Clips:	Ladder Clips: YES	Insul. Rings:	
Pipe Supports:			
Wind Load: 100 MPH (SBCCI)		Seismic: ZONE 1 (ANSI)	
Wt. Empty lb.		Wt. Full of Water lb.	

MATERIALS

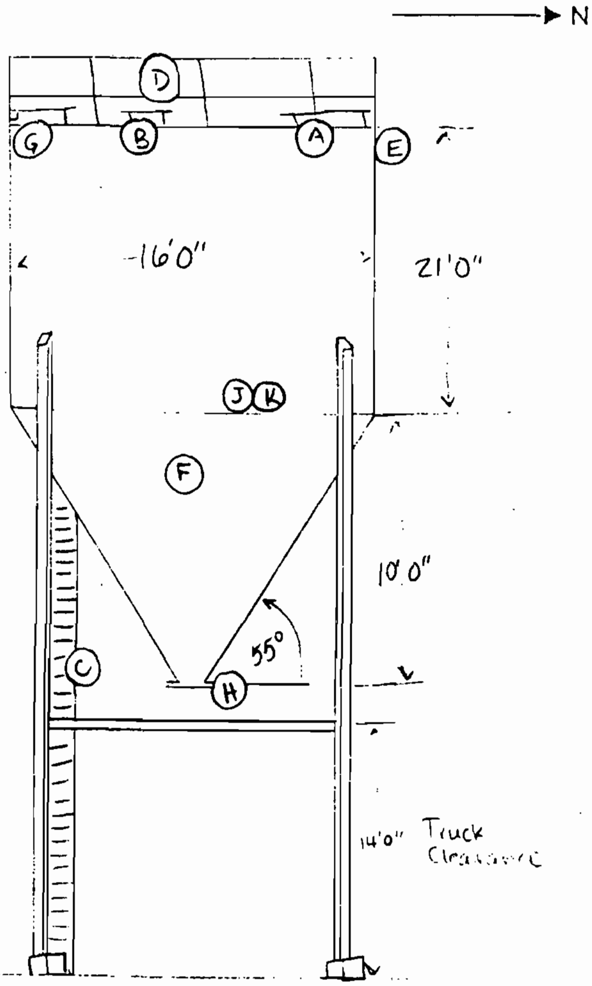
Item	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A-285, GR.C
~~Heads~~ CONE	3/4 in.	CS	A-285, GR.C
Lining	in.		
	in.		
	in.		
Nozzle Necks	CS		A-36
Flanges	CS		
Coupling			
M.H. Cover			
Supports			
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
MANWAY	A	1	24"			
VENT/BAG HOUSE	B	1	24"			
LADDER	C	1	18"			
RAILING	D	1	3/8"			
LSHH	E	1	2"			
LUG STRIKE PLATE	F	2	4"			
FILL	G	1	24"			
DISCHARGE	H	1	24"			
TEMP	J	1	2"			
SPORE	K	1	2"			
	L					
	M					
	N					
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



To support buck conveyor at fill nozzle
To support rotary air lock at discharge nozzle

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Waste Energy
Systems

SPECIFICATION NO. ____________
EQUIPMENT NO. T-07

DATE: 29/05/89
REV: C
BY: LDC
CHK'D BY: PB, JS

[illegible]ECT NAME: FFPI
[illegible]IPMENT NAME/APPLICATION: ALKALINE/CYANIDE WASTE DISSOLVING TANK-INORGANIC WASTE
IWES PROJECT No. 8813 -

DESIGN DATA

Operating Pressure	psig	ATMOSPHERIC	
Operating Temperature	°F	32° to 125°	
Liquid Specific Gravity		1.25	
Contents Lethal		~~Yes~~	No
Design Pressure	psig	N/A	
Design Temperature	°F	180	
DESIGN pH		7-14	
CAPACITY		5000 gal.	
Hydrostatic Test	psig		
Shell	~~Heads~~ HOPPER Corr. Allow. in.	1/8"	1/8"
Shell	~~Heads~~ HOPPER Joint Eff. %	85	85
Code: N/A		Stamp ~~Yes~~	No
Radiograph: SPOT		Stress Relieve:	

Type Supports: 8 LEGS
Insulation:
Fireproofing:
Sandblast: Paint:
Manhole ☐ Hinged ☐ Davited ☐ Other: SEE NOTE
Platform Clips: Ladder Clips: Insul. Rings:
Pipe Supports:
Wind Load: 100 MPH (SBCC I) Seismic: ZONE I (ANSI)
Wt. Empty lb. Wt. Full of Water lb.

MATERIALS

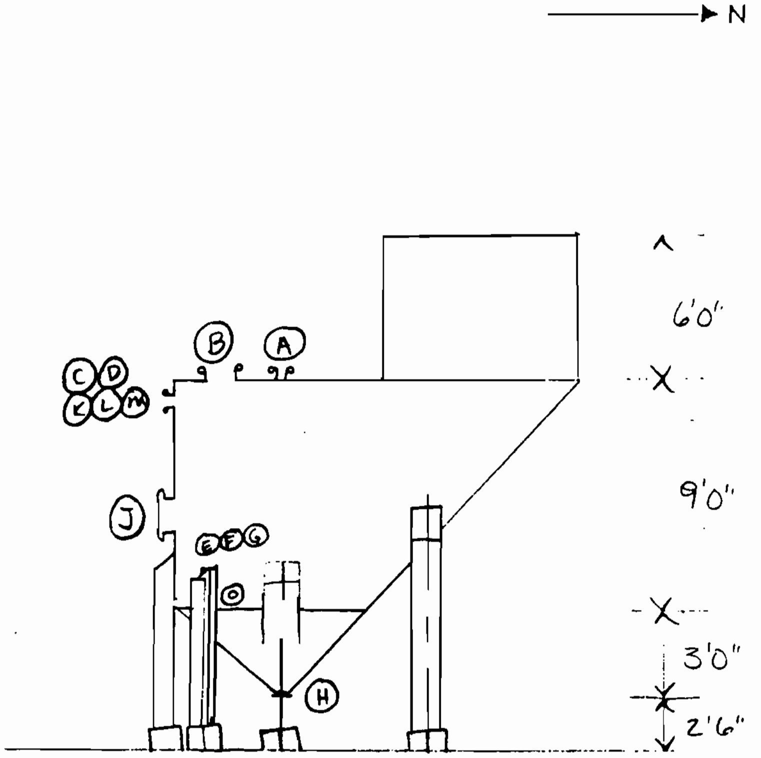
[illegible]em	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A-285, Gr. C
~~Heads~~ (HOPPER)	5/16 in.	CS	A-285, Gr. C
Lining	in.	see note	
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover			
Supports	CS		A36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
TEMPERATURE	E	1	2"			
SPARE	F	1	4"			
SUCTION	G	1	4"			
SUCTION	H	1	4"			
MANWAY	J	1	24"			
WATER	K	1	2"			
[illegible]EAM	L	1	2"			
[illegible]ARE	M	1	4"	↓	↓	↓
	N					
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



NOTE: ALL INTERNAL SURFACES TO BE LINED. LINING TO BE SELECTED DURING DETAILED DESIGN.
TOP MANHOLE HINGED
SIDE MANHOLE DAVITED

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IWES 15-0186

International Waste Energy Systems

SPECIFICATION NO.
EQUIPMENT NO. T-08

DATE: 09/05 '89
REV: C
BY: LDC
CHK'D BY: PB, JS

PROJECT NAME: FFPI
IPMENT NAME/APPLICATION: ACIDIC/CHROMATE WASTE DISSOLVING TANK - INORGANIC WASTE
IWES PROJECT No. 8813 -

DESIGN DATA

Operating Pressure	psig	ATMOSPHERIC	
Operating Temperature	°F	32° to 125°	
Liquid Specific Gravity		1.25	
Contents Lethal		~~Yes~~ No	
Design Pressure	psig	N/A	
Design Temperature	°F	180	
Design pH		0-7	
CAPACITY		5000 gal.	
Hydrostatic Test	psig		
Shell / ~~Heads~~ HOPPER Corr. Allow.	in.	1/8"	1/8"
Shell / ~~Heads~~ HOPPER Joint Eff.	%	85	85
Code: N/A		Stamp ~~Yes~~ No	
Radiograph: SPOT		Stress Relieve:	

Type Supports: 8 LEGS
Insulation:
Fireproofing:
Sandblast: Paint:
Manhole ☐ Hinged ☐ Davited ☐ Other: SEE NOTE
Platform Clips: Ladder Clips: Insul. Rings:
Pipe Supports:
Wind Load: 100 MPH (SBCCI) Seismic: ZONE I (ANSI)
Wt. Empty lb. Wt. Full of Water lb.

MATERIALS

m	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A-285, Gr. C
~~Heads~~ HOPPER	5/16 in.	CS	A-285, Gr. C
Lining	in.	see note	
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover	CS		A36
Supports			
Bolts/Studs			
Nuts			
Gaskets			

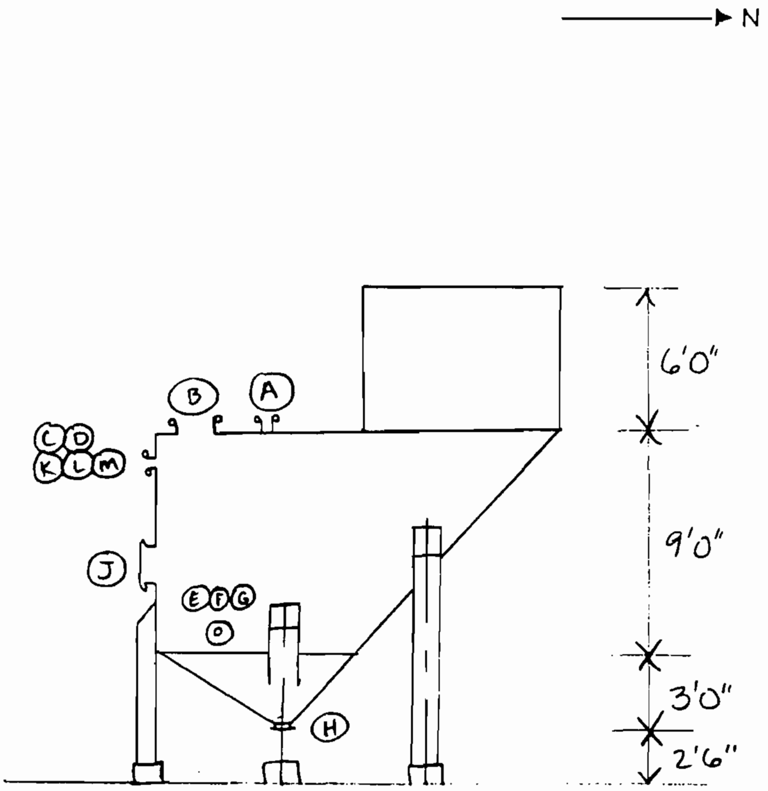
NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
TEMPERATURE	E	1	2"			
SPARE	F	1	4"			
SUCTION	G	1	4"			
SUCTION	H	1	4"			
MANWAY	J	1	24"			
WATER	K	1	2"			
STEAM	L	1	2"			
[illegible]	M	1	4"			
	N	1				
	P					
	Q					
	R					

Nozzle to be Plugged or Blinded

WES 15-0186

TANK SKETCH



NOTE: ALL INTERNAL SURFACES TO BE LINED. LINING TO BE SELECTED DURING DETAILED DESIGN.
TOP MANHOLE HINGED
SIDE MANHOLE DAVITED

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SPECIFICATION NO. ____________
EQUIPMENT NO. T-09

DATE: 09/05/89
REV: C
BY: LDC
CHK'D BY: JAD, JS

PROJECT NAME: FFPI
EQUIPMENT NAME/APPLICATION: DRUMMED PUMPABLE WASTE RECEIVER - ORGANIC WASTE
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure	psig	+4" WC to +18" WC	
Operating Temperature	°F	20 to 120	
Liquid Specific Gravity		1.70	
Contents Lethal		~~Yes~~ No	
Design Pressure	psig	-10" WC to 5 PSIG	
Design Temperature	°F	150°	
CAPACITY		2000 gal	
HEATING		EXTERNAL STEAM COILS	
Hydrostatic Test	psig	15	
Shell / Heads Corr. Allow.	in.	1/8	1/8
Shell / Heads Joint Eff.	%	85	85
Code: API 620		Stamp ~~Yes~~ No	
Radiograph: SPOT		Stress Relieve:	

Type Supports: 4 LEGS
Insulation: YES
Fireproofing:
Sandblast: Paint:
Manhole ☐ Hinged ☒ Davited ☐ Other:
Platform Clips: Ladder Clips: Insul. Rings:
Pipe Supports:
Wind Load: 100 MPH (SBCCI) Seismic: ZONE I (ANSI)
Wt. Empty lb. Wt. Full of Water lb.

MATERIALS

Item	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A-285, Gr. C
Heads	5/16 in.	CS	A-285, Gr. C
Lining	in.		
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover		CS	
Supports		CS	A 36
Bolts/Studs		CS	
Nuts		CS	
Gaskets	TEFLON		

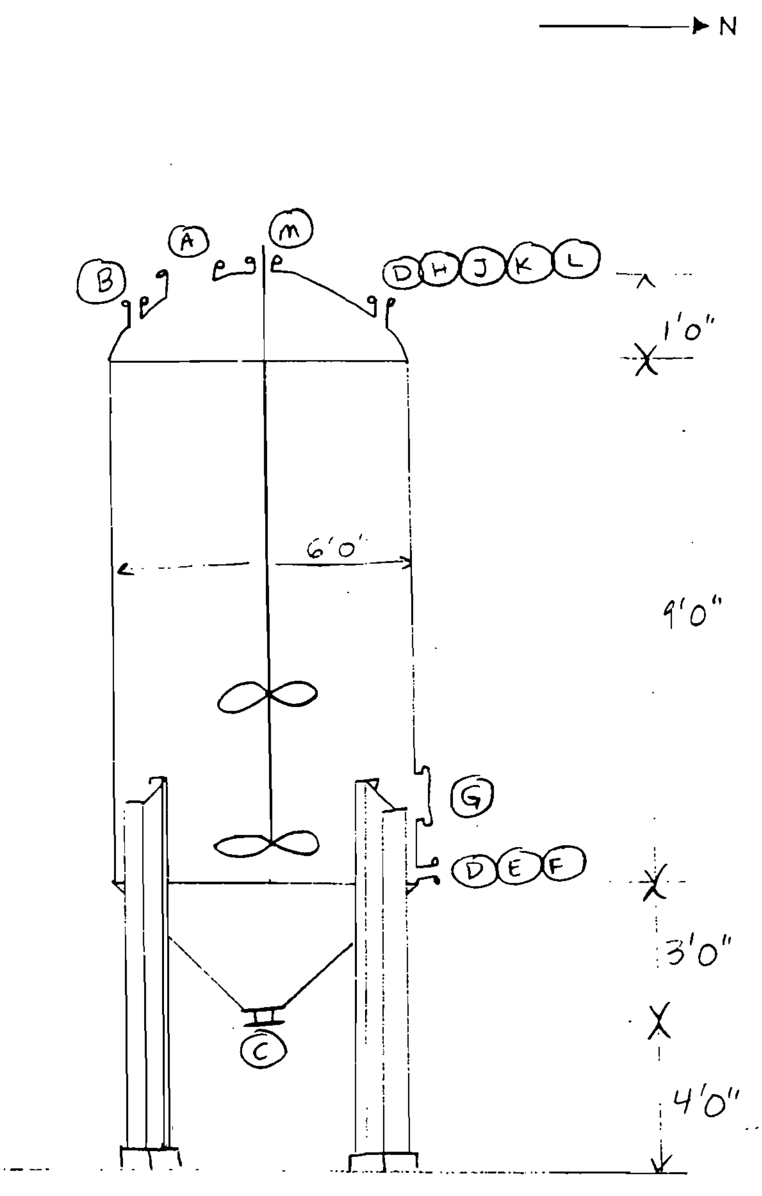
NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
MANWAY/PSV	A	1	24"	150#	RF	FLG
FILL	B	1	2"			
PUMPSUCTION	C	1	4"			
LEVEL TRANSM.	D	2	4"			
TEMPERATURE	E	1	2"			
SPARE	F	1	4"			
MANWAY	G	1	24'			
PRESS. TRANS	H	1	2"			
VENT	J	2	3"			
LSHH	K	1	4"			
SPARE	L	1	4"			
[illegible]ATOR	M	1				
	N					
	P					
	Q					
	R					

·Nozzle to be Plugged or Blinded

WES 15-0186

TANK SKETCH



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Waste Energy
Systems

SPECIFICATION NO. ______
EQUIPMENT NO. T-10, 11, 12, 13, 14, 15

DATE: [illegible]
REV: C
BY: LDC
CHK'D BY: J.A.O., JS

[illegible]ECT NAME: FFPI
[illegible]IPMENT NAME/APPLICATION: ORGANIC RECEIVING / HOLDING TANKS
IWES PROJECT No. 8813 -

DESIGN DATA

Operating Pressure	psig	+4" WC to +18" WC	
Operating Temperature	°F	20° to 120°	
Liquid Specific Gravity		1.25	
Contents Lethal		~~Yes~~ No	
Design Pressure	psig	-10" WC to +5 PSIG	
Design Temperature	°F	150°	
CAPACITY		19,500 GAL	
Hydrostatic Test	psig	15	
Shell / Heads Corr. Allow.	in.	1/8	1/8
Shell / Heads Joint Eff.	%	85	85
Code: API 620		Stamp ~~Yes~~ No	
Radiograph: SPOT		Stress Relieve:	
Type Supports: 4 LEGS			
Insulation: NO			
Fireproofing:			
Sandblast:		Paint:	
Manhole ☐ Hinged ☒ Davited ☐ Other:			
Platform Clips: YES	Ladder Clips: YES	Insul. Rings:	
Pipe Supports:			
Wind Load: 100 MPH (CBCC)		Seismic: ZONE I (ANSI)	
Wt. Empty	lb.	Wt. Full of Water	lb.

MATERIALS

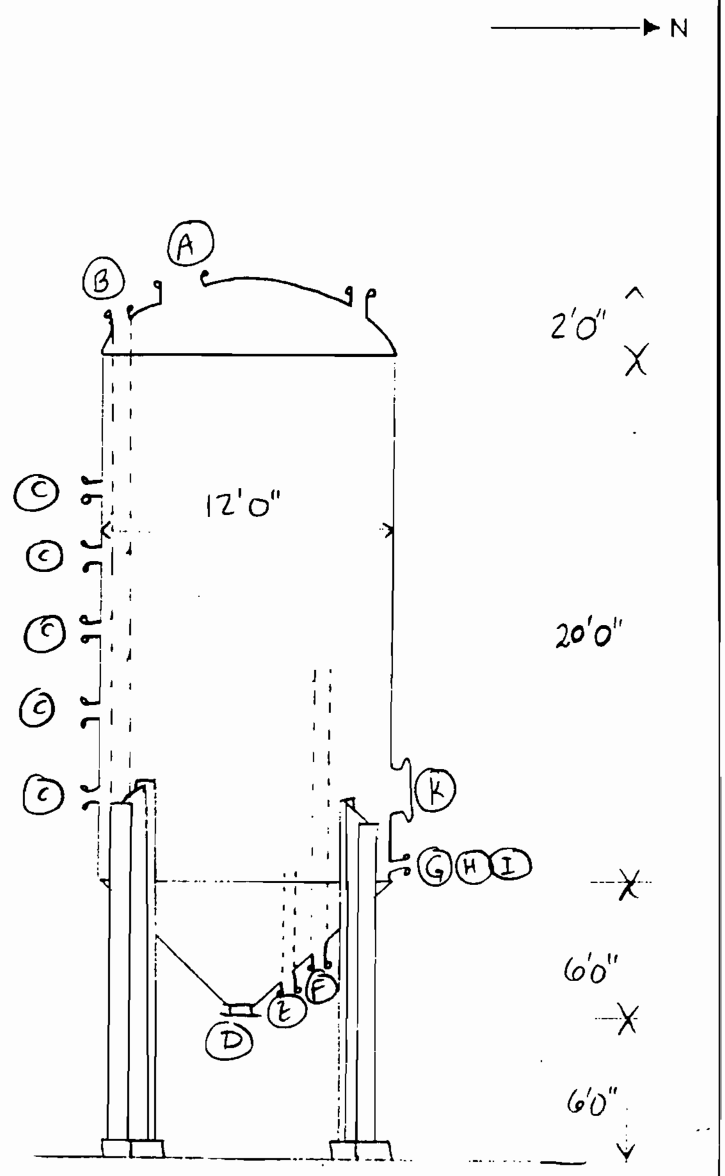
[illegible]em	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A-285, Gr. C
Heads	5/16 in.	CS	A-285, Gr. C
Lining	in.		
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover		CS	
Supports		CS	A36
Bolts/Studs		CS	
Nuts		CS	
Gaskets		TEFLON	

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
MANWAY/PSV HATCH	A	1	24"	150#	RF	FLG
FILL	B	1	4"			
SAMPLE	C	5	1"			
PUMP SUCTION	D	1	6"			
PUMP SUCTION	E	1	4"			
PUMP SUCTION	F	1	4"			
LEVEL TRANS	G	2	4"			
TEMPERATURE	H	1	2"			
SPARE	J	1	4"			
MANWAY	K	1	24"			
PRESSURE TRANS	L	1	2"			
[illegible]NT	M	2	3"			
[illegible]SHH	N	1	4"			
SPARE	P	1	4"	↓	↓	↓
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



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International Waste Energy Systems

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SPECIFICATION NO. ____

EQUIPMENT NO. T-16

DATE: 07/05/89
REV: C
BY: LDC
CHK'D BY: JAD, JS

[illegible]ECT NAME: FFPI
EQUIPMENT NAME/APPLICATION: SLUDGE HOLDING TANK - ORGANIC WASTE
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure	psig	+4" WC to 18" WC	
Operating Temperature	°F	20° to 120°	
Liquid Specific Gravity			
Contents Lethal		~~Yes~~	No
Design Pressure	psig	-10" WC to 5 PSIG	
Design Temperature	°F	150°	
CAPACITY		19,500 gal	
HEATING		External steam coils	
Hydrostatic Test	psig	15	
Shell Heads Corr. Allow.	in.	1/8	1/8
Shell Heads Joint Eff.	%	85	85
Code: API 620		Stamp ~~Yes~~	No
Radiograph: YES		Stress Relieve:	

Type Supports: 4 LEGS
Insulation:
Fireproofing:
Sandblast: Paint:
Manhole ☐ Hinged ☒ Davited ☐ Other:
Platform Clips: YES Ladder Clips: Insul. Rings:
Pipe Supports:
Wind Load: 100 MPH (SBCCI) Seismic: ZONE I (ANSI)
Wt. Empty lb. Wt. Full of Water lb.

MATERIALS

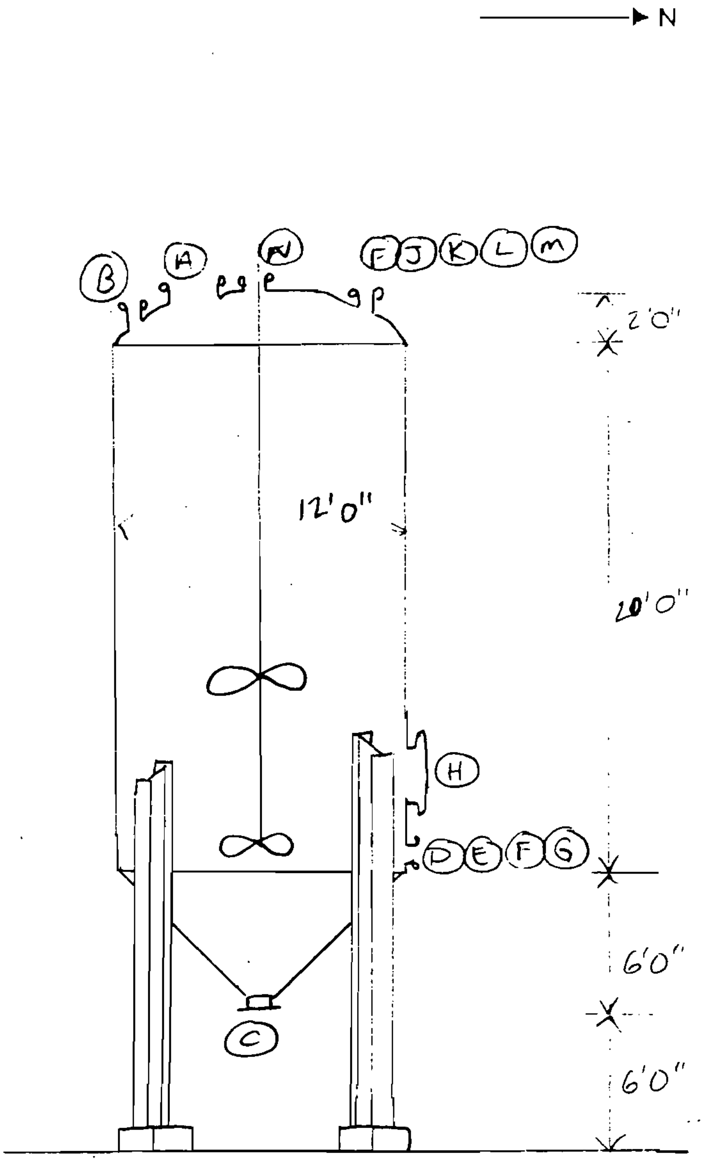
[illegible]tem	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A285, Gr. C
Heads	5/16 in.	CS	A285, Gr. C
Lining	in.		
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover		CS	
Supports		CS	A36
Bolts/Studs		CS	
Nuts		CS	
Gaskets	TEFLON		

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
MANWAY/PSV	A	1	24"	150#	RF	FLG
FILL	B	1	4"			
PUMP SUCTION	C	1	6"			
FEED RECYCLE	D	1	4"			
LEVEL TRANS.	E	2	4"			
TEMPERATURE	F	1	2"			
SPARE	G	1	4"			
MANWAY	H	1	24"			
PRESSURE TR	J	1	2"			
VENT	K	2	3"			
[illegible]H	L	1	4"			
[illegible]RE	M	1	4"	↓	↓	↓
AGITATOR	N	1				
	P					
	Q					
	R					

'Nozzle to be Plugged or Blinded

TANK SKETCH



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IWES 15-0186

International Waste Energy Systems

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SPECIFICATION NO. ______
EQUIPMENT NO. T-17

DATE: 09/05/89
REV: C
BY: LDC
CHK'D BY: JAO, JS

[illegible]ECT NAME: EFPI
EQUIPMENT NAME/APPLICATION: SLUDGE FEED TANK - ORGANIC WASTE
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure	psig	+4" WC to +18" WC
Operating Temperature	°F	20 to 120
Liquid Specific Gravity		1.70
Contents Lethal		~~Yes~~ No
Design Pressure	psig	-10" WC to 5 PSIG
Design Temperature	°F	150°
CAPACITY		8000 gal
HEATING		External Steam Coils
Hydrostatic Test	psig	15

Shell	Heads Corr. Allow.	in.	1/8	1/8
Shell	Heads Joint Eff.	%	85	85

Code: API 620 — Stamp ~~Yes~~ No
Radiograph: SPOT — Stress Relieve:
Type Supports: 6 LEGS
Insulation: YES
Fireproofing:
Sandblast: — Paint:
Manhole ☐ Hinged ☒ Davited ☐ Other:
Platform Clips: YES — Ladder Clips: — Insul. Rings:
Pipe Supports:
Wind Load: 100 mPH (SBCCI) — Seismic: ZONE I (ANSI)
Wt. Empty lb. — Wt. Full of Water lb.

MATERIALS

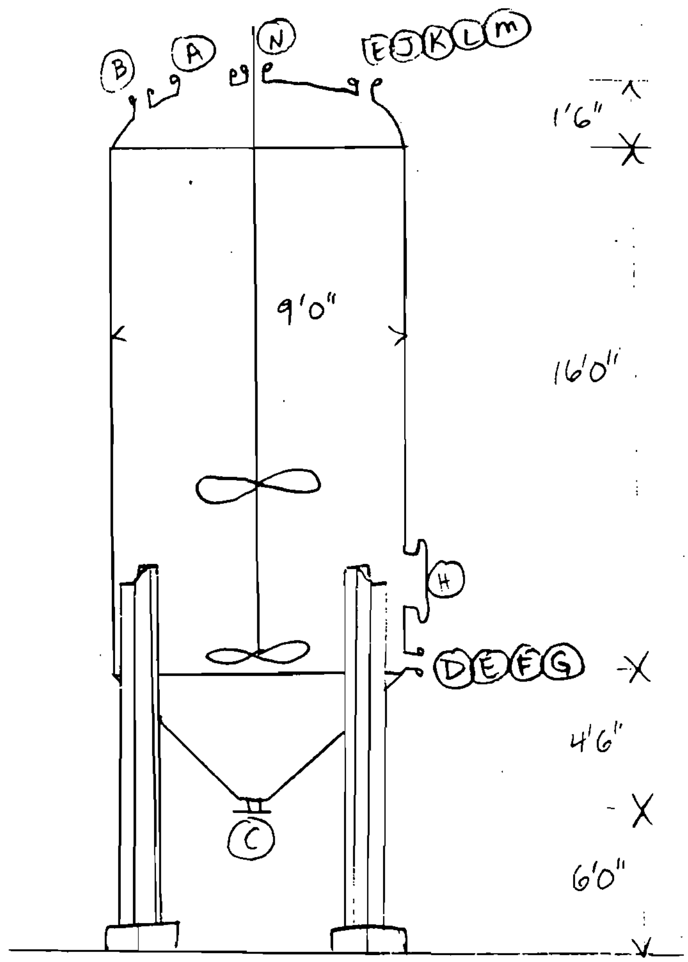
Item	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A 285, Gr. 'C'
Heads	5/16 in.	CS	A 285, Gr. 'C'
Lining	in.		
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover		CS	
Supports		CS	A 36
Bolts/Studs		CS	
Nuts		CS	
Gaskets	TEFLON		

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
MANWAY/ PSV	A	1	24"	150#	RF	FLG
FILL	B	1	4"			
PUMPSUCTION	C	1	6"			
FEED RECYCLE	D	1	4"			
LEVEL TRANS.	E	2	4"			
TEMPERATURE	F	1	2"			
SPARE	G	1	4"			
MANWAY	H	1	24"			
PRESSURE TRAN.	J	1	2"			
VENT	K	2	3"			
[illegible]H	L	1	4"			
[illegible]EE	M	1	4"			
AGITATOR	N	1				
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



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SPECIFICATION NO. ____
EQUIPMENT NO. T-18, 19, 20

DATE: [illegible]
REV: C
BY: LDC
CHK'D BY: J.A.D. , JS

[illegible]JECT NAME: FFPI
[illegible]IPMENT NAME/APPLICATION: HIGH-BTU/LOW-BTU LIQUID FEED TANK - ORGANIC WASTE
IWES PROJECT No. 8813 -

DESIGN DATA

Operating Pressure	psig	+4" WC to +18" WC	
Operating Temperature	°F	20 to 120	
Liquid Specific Gravity		1.25	
Contents Lethal		~~Yes~~ No	
Design Pressure	psig	-10" WC to +5 PSIG	
Design Temperature	°F	150	
CAPACITY		19,500 gal.	
Hydrostatic Test	psig	15	
Shell / Heads Corr. Allow.	in.	1/8	1/8
Shell / Heads Joint Eff.	%	85	85
Code: API 620		Stamp Yes No	
Radiograph: SPOT		Stress Relieve:	

Type Supports: 6 LEGS
Insulation: NO
Fireproofing:
Sandblast: | Paint:
Manhole ☐ Hinged ☒ Davited ☐ Other:
Platform Clips: YES | Ladder Clips: YES | Insul. Rings:
Pipe Supports:
Wind Load: 100 mPH (SBCCI) | Seismic: ZONE I (ANSI)
Wt. Empty lb. | Wt. Full of Water lb.

MATERIALS

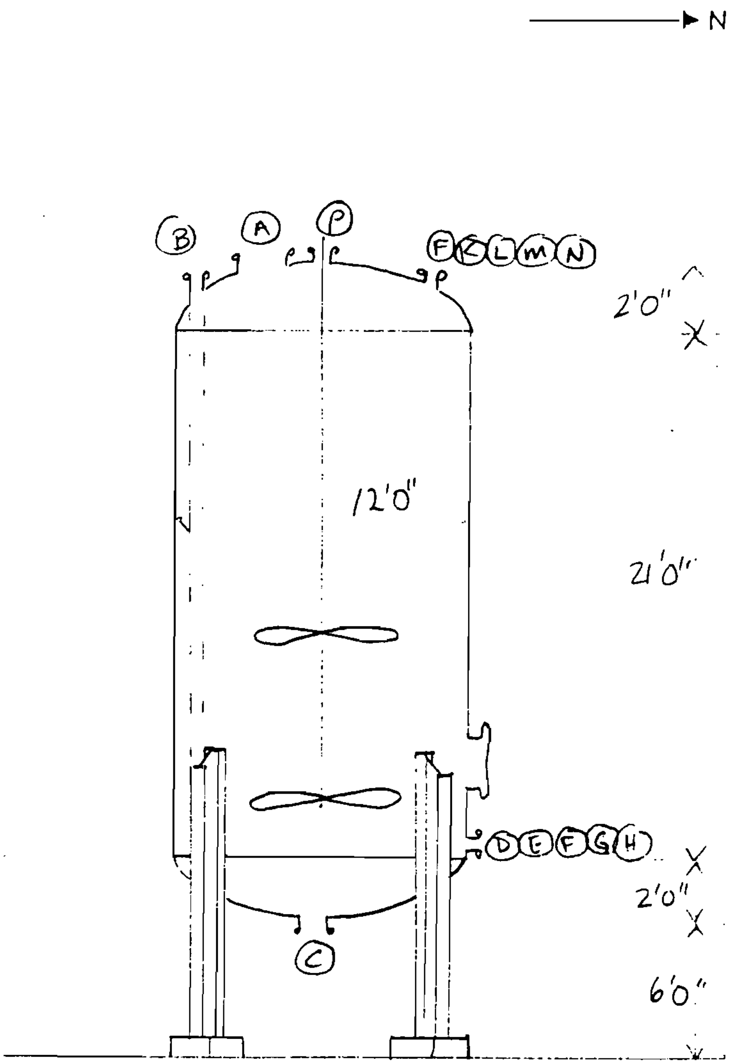
[illegible]em	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A285, Gr.'C'
Heads	5/16 in.	CS	A285, Gr.'C'
Lining	in.		
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover		CS	
Supports		CS	A36
Bolts/Studs		CS	
Nuts		CS	
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
MANWAY/PSV	A	1	24"	150#	RF	FLG
FILL	B	1	4"	|		|
PUMP SUCTION	C	1	6"	|		|
PUMP SUCTION	D	1	2"	|		|
FEED RECYCLE	E	1	2"	|		|
LEVEL TRANS.	F	2	4"	|		|
TEMPERATURE	G	1	2"	|		|
SPARE	H	1	4"	|		|
MANWAY	J	1	24"	|		|
PRESSURE	K	1	2"	|		
VENT	L	2	3"	|	|	
[illegible]H	M	1	4"	|	|	
SPARE	N	1	4"	|		
AGITATOR	P	1		↓	V	V
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



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SPECIFICATION NO. ______
EQUIPMENT NO. T-21

DATE: 09/05/89
REV: C
BY: LDC
CHK'D BY: PB, JS

P[illegible]JECT NAME: FFPI
E[illegible]PMENT NAME/APPLICATION: ALKALINE/CYANIDE DRUM WASTE RECEIVING TANK (INORGANIC WASTE)
IWES PROJECT No. 8813-

DESIGN DATA

Operating Pressure	psig	-0.15 to +0.30
Operating Temperature	°F	32° to 125°
Liquid Specific Gravity		1.25
Contents Lethal		~~Yes~~ No
Design Pressure	psig	-0.30 to +0.45
Design Temperature	°F	180°
Design pH		7-14
Capacity		2000 gal
Hydrostatic Test	psig	
Shell / Heads Corr. Allow.	in.	
Shell / Heads Joint Eff.	%	
Code: NBS-PS 15-69		Stamp ~~Yes~~ No
Radiograph:		Stress Relieve:
Type Supports: 4 LEGS		
Insulation:		
Fireproofing:		
Sandblast:		Paint:
Manhole ☐ Hinged	☐ Davited	☐ Other:
Platform Clips:	Ladder Clips:	Insul. Rings:
Pipe Supports:		
Wind Load: 100 MPH (SBCCI)		Seismic: ZONE I (ANSI)
Wt. Empty lb.		Wt. Full of Water lb.

MATERIALS

[illegible]m	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	1/4 in.	FRP	ASTM D4097-82
Heads	5/16 in.	FRP	ASTM D4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

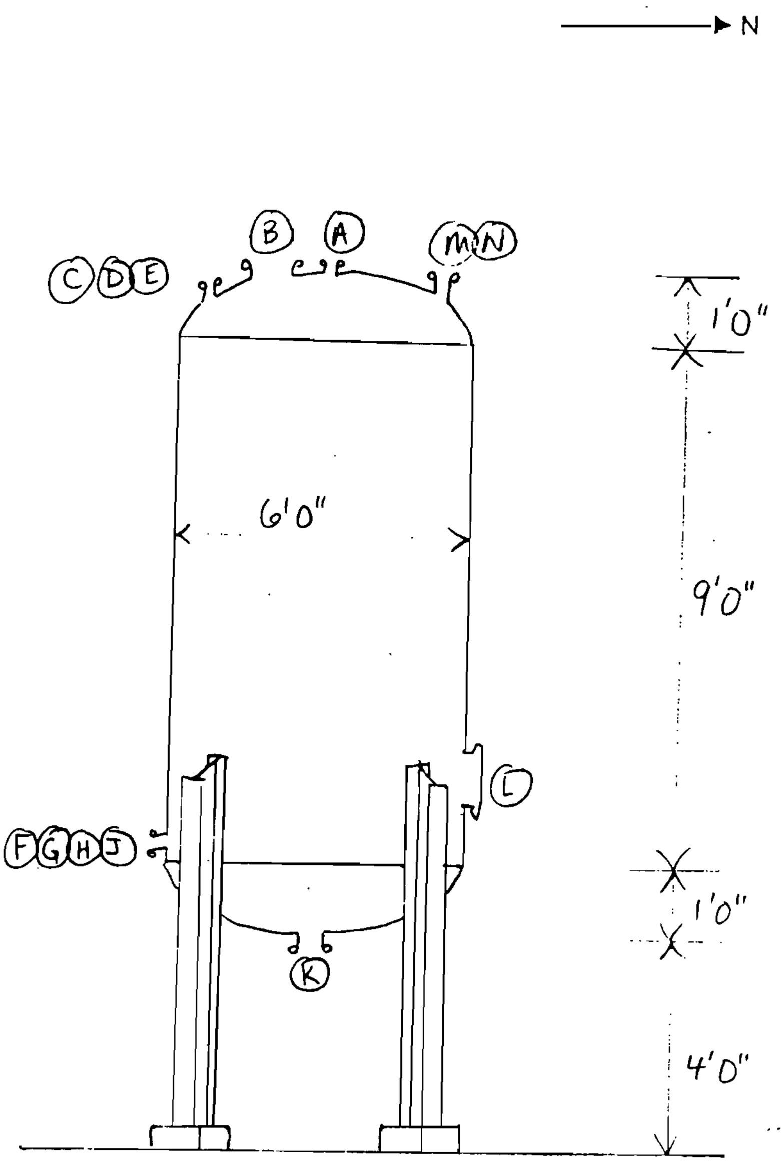
NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG.
MANWAY/PSV	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSM	E	1	1"			
" "	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
PUMPSUCTION	K	1	4"			
MANWAY	L	1	24"			
[illegible]E	M	1	4"			
[illegible]EL	N	1	4"	↓	↓	↓
	P					
	Q					
	R					

Nozzle to be Plugged or Blinded

WES 15-0186

TANK SKETCH



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SPECIFICATION NO.
EQUIPMENT NO. T-22

DATE: 09/06 [illegible]
REV: C
BY: FDC
CHK'D BY: PE, JS

P[illegible]JECT NAME: FFPI
E[illegible]PMENT NAME/APPLICATION: ACIDIC/CHROMATE DRUM WASTE RECEIVING TANK (INORGANIC WASTE)
IWES PROJECT No. 8813 -

DESIGN DATA

Operating Pressure	psig	-0.15 to +0.30
Operating Temperature	°F	32° to 125°
Liquid Specific Gravity		1.25
Contents Lethal		[✓ Yes] No
Design Pressure	psig	-0.30 to +0.45
Design Temperature	°F	180°
DESIGN pH		0-7
CAPACITY		2000 gal
Hydrostatic Test	psig	
Shell / Heads Corr. Allow.	in.	
Shell / Heads Joint Eff.	%	

Code: NBS-PS 15-69
Stamp Yes No
Radiograph:
Stress Relieve:
Type Supports: 4 LEGS
Insulation:
Fireproofing:
Sandblast:
Paint:
Manhole ☐ Hinged ☐ Davited ☐ Other:
Platform Clips:
Ladder Clips:
Insul. Rings:
Pipe Supports:
Wind Load: 100 MPH (SBCCI)
Seismic: ZONE I (ANSI)
Wt. Empty lb.
Wt. Full of Water lb.

MATERIALS

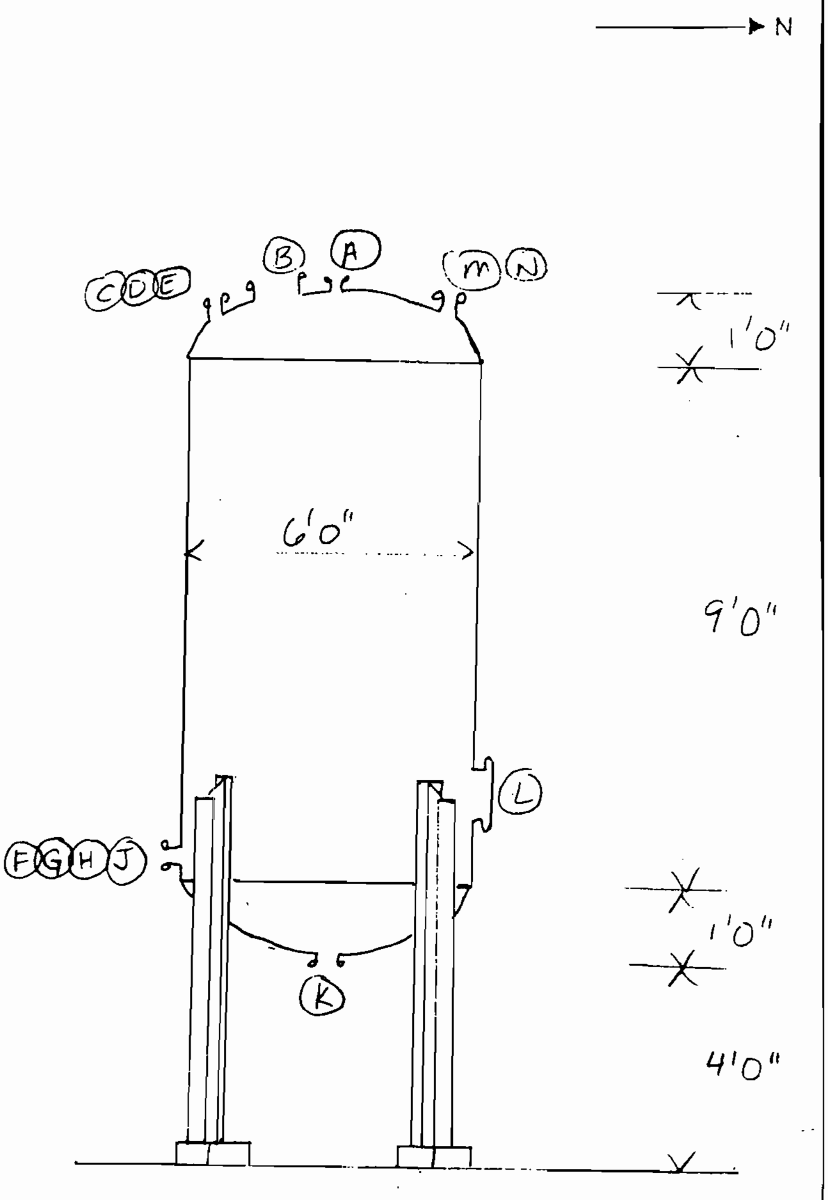
[illegible]m	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	1/4 in.	FRP	ASTM D 4097-82
Heads	5/16 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"	│	│	│
VENT	C	1	6"	│	│	│
LSHH	D	1	2"	│	│	│
LEVEL TRANSM	E	1	1"	│	│	│
- " -	F	1	4"	│	│	│
TEMPERATURE	G	1	2"	│	│	│
SAMPLE POINT	H	1	1"	│	│	│
SPARE	J	1	4"	│	│	│
PUMPSUCTION	K	1	4"	│	│	│
MANWAY	L	1	24"	│	│	│
[illegible]E	M	1	4"	│	│	│
[illegible]LL	N	1	4"	↓	↓	↓
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



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Systems

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SPECIFICATION NO. ______
EQUIPMENT NO. T-23

DATE: 09/26/??
REV: C
BY: LDC
CHK'D BY: PE . J.C

[illegible]JECT NAME: FFPI
[illegible]QUIPMENT NAME/APPLICATION: DISSOLVED ALKALINE/CYANIDE WASTE HOLDING TANK (INORGANIC WASTE)
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure psig	-0.15 to +0.30		
Operating Temperature °F	32° to 125°		
Liquid Specific Gravity	1.25		
Contents Lethal	~~Yes~~ No		
Design Pressure psig	-0.30 to 0.45		
Design Temperature °F	180		
DESIGN pH	0-7		
CAPACITY	8000 gal.		
Hydrostatic Test psig			
Shell / Heads Corr. Allow. in.			
Shell / Heads Joint Eff. %			
Code: NBS-PS 15-69	Stamp	Yes	No
Radiograph:	Stress Relieve:		
Type Supports: 6 LEGS			
Insulation: NO			
Fireproofing:			
Sandblast:	Paint:		
Manhole ☐ Hinged	☐ Davited	☐ Other:	
Platform Clips:	Ladder Clips: YES	Insul. Rings:	
Pipe Supports:			
Wind Load: 100 MPH (SBCCI)	Seismic: ZONE I (ANSI)		
Wt. Empty lb.	Wt. Full of Water lb.		

MATERIALS

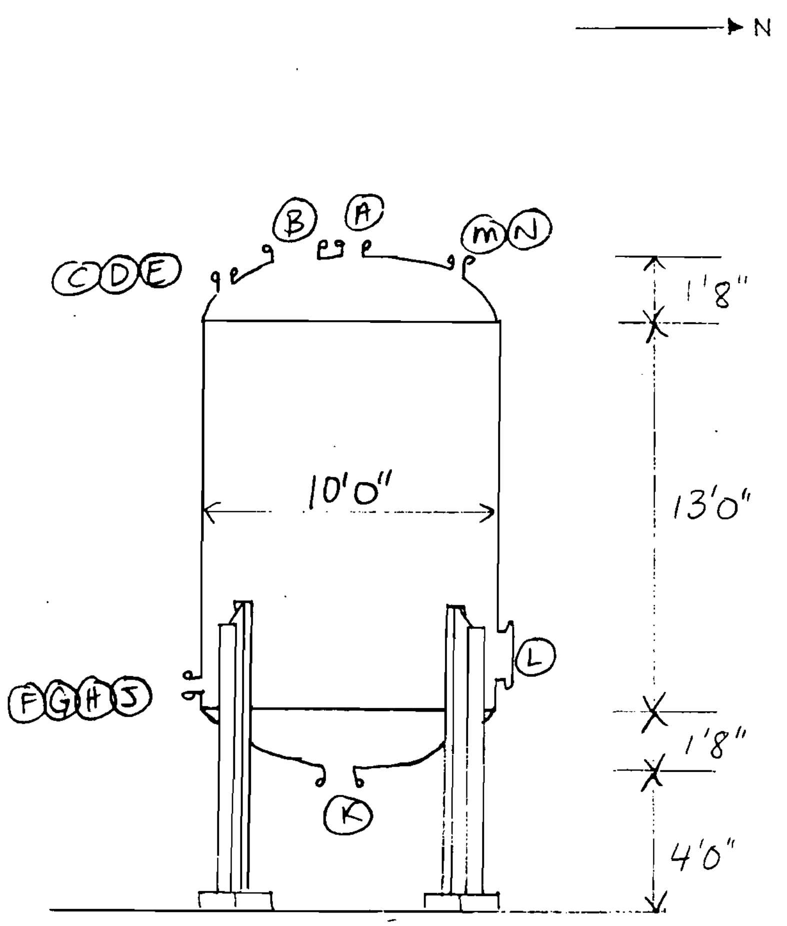
[illegible]tem	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	FRP	ASTM D 4097-82
Heads	3/8 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"	|	|	|
VENT	C	1	6"	|	|	|
LSHH	D	1	2"	|	|	|
LEVEL TRANSM	E	1	1"	|	|	|
-"-	F	1	4"	|	|	|
TEMPERATURE	G	1	2"	|	|	|
SAMPLE POINT	H	1	1"	|	|	|
SPARE	J	1	4"	|	|	|
PUMP SUCTION	K	1	4"	|	|	|
[illegible]WAY	L	1	24"	|	|	|
[illegible]E	M	2	4"	|	|	|
FILL	N	1	4"	↓	↓	↓
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



NOTES: TANK TO BE PROVIDED WITH BAFFLES AND AGITATOR BRIDGE
FRP (POLYESTER) TO BE RESISTANT TOWARDS OXIDIZING ACIDS.

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SPECIFICATION NO. ________
EQUIPMENT NO. T-24

DATE: 09/06/89
REV: C
BY: LDC
CHK'D BY: PB, JS

[illegible]JECT NAME: FFPI
E[illegible]IPMENT NAME/APPLICATION: DISSOLVED ACIDIC/CHROMATE WASTE HOLDING TANK (INORGANIC WASTE)
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure	psig	-0.15 to +0.30	
Operating Temperature	°F	32° to 125°	
Liquid Specific Gravity		1.25	
Contents Lethal		[✓ Yes] No	
Design Pressure	psig	-0.3 to +0.45	
Design Temperature	°F	180	
DESIGN pH		7-14	
CAPACITY		8000 gal.	
Hydrostatic Test	psig		
Shell	Heads Corr. Allow. in.		
Shell	Heads Joint Eff. %		
Code: NBS-PS 15-69		Stamp Yes No	
Radiograph:		Stress Relieve:	
Type Supports: 6 LEGS			
Insulation: NO			
Fireproofing:			
Sandblast:		Paint:	
Manhole ☐ Hinged	☐ Davited	☐ Other:	
Platform Clips:	Ladder Clips: YES	Insul. Rings:	
Pipe Supports:			
Wind Load: 100 MPH (SBCCI)		Seismic: ZONE I (ANSI)	
Wt. Empty lb.		Wt. Full of Water lb.	

MATERIALS

[illegible]tem	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	FRP	ASTM D 4097-82
Heads	3/8 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

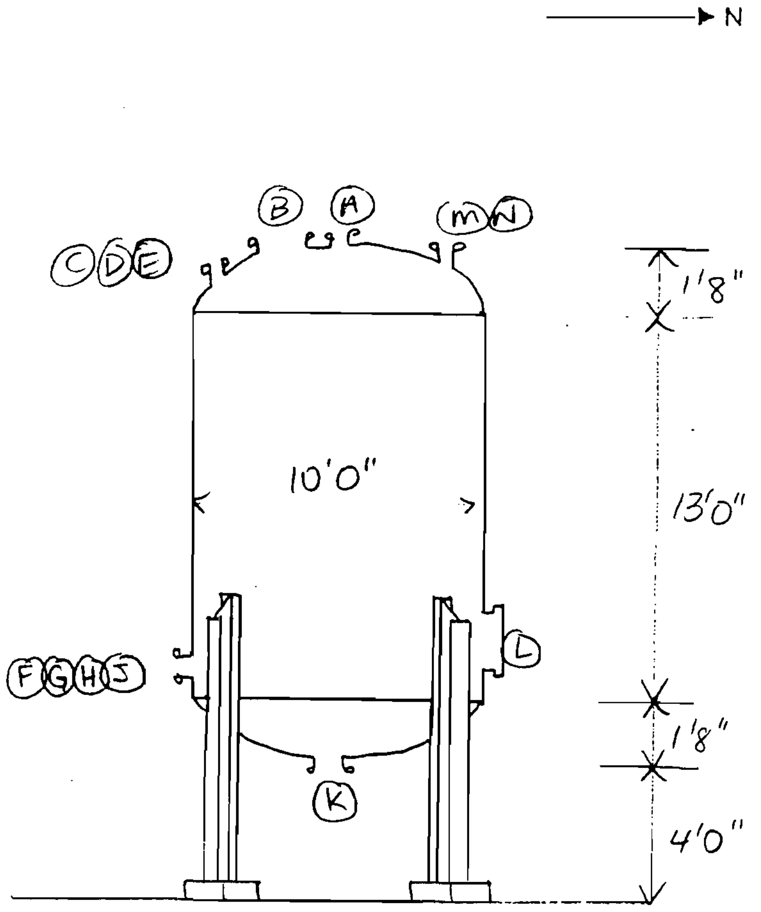
NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSM	E	1	1"			
— " —	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
PUMP SUCTION	K	1	4"			
[illegible]NWAY	L	1	24"			
[illegible]E	M	2	4"			
FILL	N	1	4"	↓	↓	↓
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

IWES 15-0186

TANK SKETCH



NOTE: TANK TO BE PROVIDED WITH BAFFLES AND AGITATOR BRIDGE

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International
Waste Energy
Systems

SPECIFICATION NO. ________
EQUIPMENT NO. T-25, 26, 27, 28, 29, 30

DATE: 04/26/89
REV: C
BY: LDC
CHK'D BY: PB, JS

[illegible]JECT NAME: FFPI
[illegible]IPMENT NAME/APPLICATION: CHROMATE WASTE STORAGE TANK - INORGANIC WASTE
IWES PROJECT No. 8813 -

DESIGN DATA

Operating Pressure	psig	-0.15 to +0.30
Operating Temperature	°F	32° - 125°
Liquid Specific Gravity		1.25
Contents Lethal		[✓ Yes] No
Design Pressure	psig	-0.30 to +0.45
Design Temperature	°F	180
DESIGN pH		0-7
CAPACITY		8000 gal
Hydrostatic Test	psig	
Shell / Heads Corr. Allow.	in.	
Shell / Heads Joint Eff.	%	

Code: NBS-PS 15-69 | Stamp Yes No
Radiograph: | Stress Relieve:
Type Supports: 6 LEGS
Insulation: NO
Fireproofing:
Sandblast: | Paint:
Manhole ☐ Hinged ☐ Davited ☐ Other:
Platform Clips: YES | Ladder Clips: YES | Insul. Rings:
Pipe Supports:
Wind Load: 100 MPH (SBCCI) | Seismic: ZONE I (ANSI)
Wt. Empty lb. | Wt. Full of Water lb.

MATERIALS

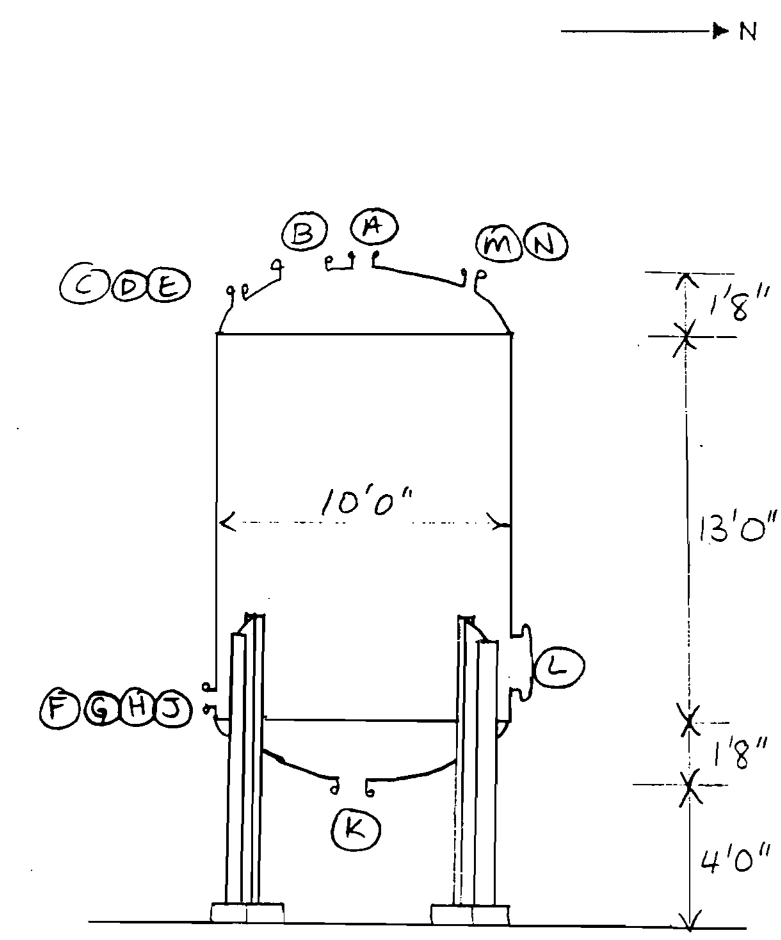
[illegible]em	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	FRP	ASTM D 4097-82
Heads	3/8 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSM	E	1	1"			
- " -	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
PUMP SUCTION	K	1	4"			
MANWAY	L	1	24"			
[illegible]RE	M	2	4"			
[illegible]LL	N	1	4"			
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



NOTES: TANK TO BE PROVIDED WITH BAFFLES AND AGITATOR BRIDGE
FRP (POLYESTER) TO BE RESISTANT TOWARDS OXIDIZING ACIDS

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International Waste Energy Systems

SPECIFICATION NO. ________

EQUIPMENT NO. T-31, 32, 33, 34

DATE: 09/06/89

REV: C

BY: LDC

CHK'D BY: PB, JS

P[illegible]ECT NAME: FFPI

EQUIPMENT NAME/APPLICATION: ACIDIC WASTE STORAGE TANK- INORGANIC WASTE

IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure psig	-0.15 to +0.30		
Operating Temperature °F	32° to 125°		
Liquid Specific Gravity	1.25		
Contents Lethal	~~Yes~~ No		
Design Pressure psig	-0.30 to 0.45		
Design Temperature °F	180°		
DESIGN pH	0-7		
CAPACITY	8000 gal		
Hydrostatic Test psig			
Shell / Heads Corr. Allow. in.			
Shell / Heads Joint Eff. %			
Code: NBS-PS 15-69	Stamp Yes No		
Radiograph:	Stress Relieve:		
Type Supports: 6 LEGS			
Insulation: NO			
Fireproofing:			
Sandblast:	Paint:		
Manhole ☐ Hinged	☐ Davited	☐ Other:	
Platform Clips: YES	Ladder Clips: YES	Insul. Rings:	
Pipe Supports:			
Wind Load: 100 MPH (SBCC)	Seismic: ZONE I		
Wt. Empty lb.	Wt. Full of Water lb.		

MATERIALS

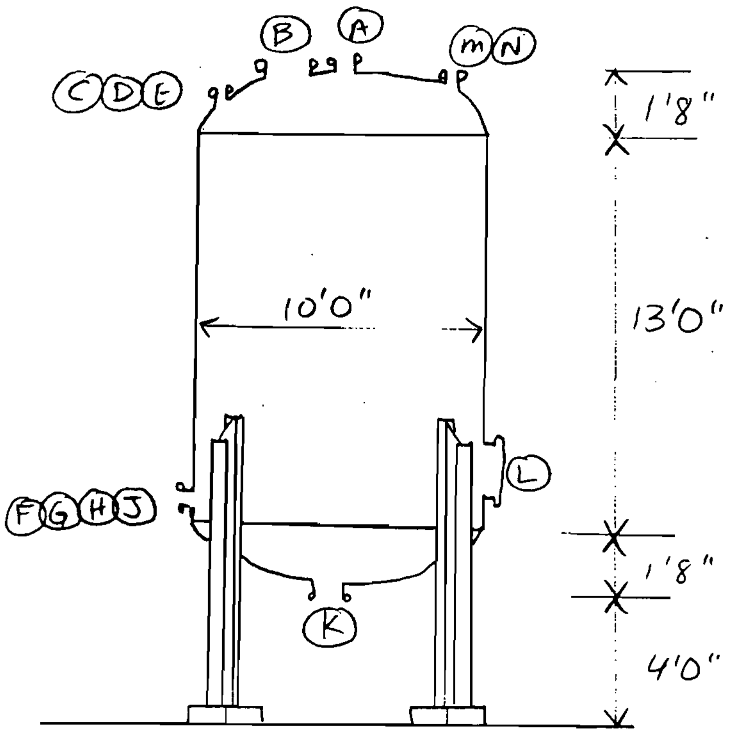
[illegible]em	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	FRP	ASTM D 4097-82
Heads	3/8 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSM	E	1	1"			
-"-	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
PUMP SUCTION	K	1	4"			
[illegible]WAY	L	1	24"			
[illegible]E	M	2	4"			
FILL	N	1	4"	↓	↓	↓
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



NOTES: TANKS TO BE PROVIDED WITH BAFFLES AND AGITATOR BRIDGE

FRP (POLYESTER) TO BE RESISTANT TOWARDS OXIDIZING ACIDS.

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WES 15-0186

International
Waste Energy
Systems

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SPECIFICATION NO. ____
EQUIPMENT NO. T-35, 36

DATE: 09/06/89
REV: C
BY: LDC
CHK'D BY: PB, JS

ROJECT NAME: FFPI
UIPMENT NAME/APPLICATION: ALKALINE WASTE STORAGE TANK- INORGANIC WASTE
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure psig	-0.15 to +0.30		
Operating Temperature °F	32° to 125°		
Liquid Specific Gravity	1.25		
Contents Lethal	~~Yes~~ No		
Design Pressure psig	-0.3 to +0.45		
Design Temperature °F	180°		
DESIGN pH	7-14		
CAPACITY	8000 gal		
Hydrostatic Test psig			
Shell	Heads Corr. Allow. in.		
Shell	Heads Joint Eff. %		
Code: NBS-PS 15-69		Stamp Yes No	
Radiograph:		Stress Relieve:	
Type Supports: 6 LEGS			
Insulation: NO			
Fireproofing:			
Sandblast:		Paint:	
Manhole ☐ Hinged	☐ Davited	☐ Other:	
Platform Clips: YES	Ladder Clips:	Insul. Rings:	
Pipe Supports:			
Wind Load: 100 MPH (SBCCI)		Seismic: ZONE I (ANSI)	
Wt. Empty lb.		Wt. Full of Water lb.	

MATERIALS

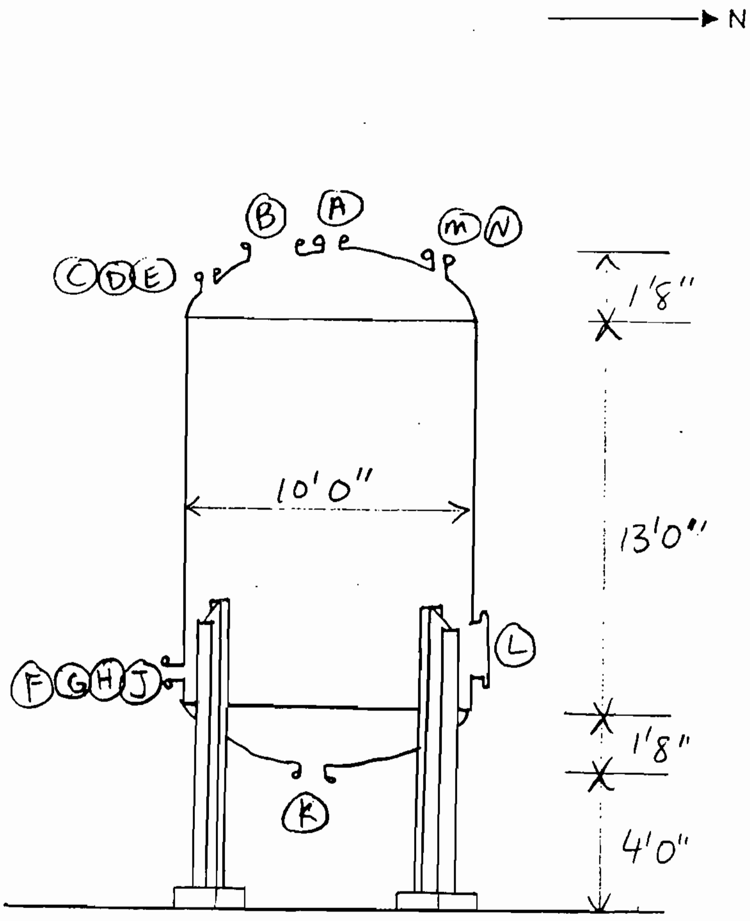
em	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	FRP	ASTM D 4097-82
Heads	3/8 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A 36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"	↓	↓	↓
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSm	E	1	1"			
- " -	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
PUMP SUCTION	K	1	4"			
MANWAY	L	1	24"			
E	M	2	4"			
L	N	1	4"			
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



NOTE: TANK TO BE PROVIDED WITH BAFFLES AND AGITATOR BRIDGE

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SPECIFICATION NO.
EQUIPMENT NO. T-37,38

DATE: 09-06-89
REV: C
BY: LDC
CHK'D BY: PB, JS

[illegible]JECT NAME: FFPI
[illegible]UIPMENT NAME/APPLICATION: CYANIDE WASTE STORAGE TANK-INORGANIC WASTE
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure	psig	-0.15 to +0.30	
Operating Temperature	°F	32° to 125°	
Liquid Specific Gravity		1.25	
Contents Lethal		[✓ Yes] No	
Design Pressure	psig	-0.30 to +0.45	
Design Temperature	°F	180°	
DESIGN pH		7-14	
CAPACITY		8000 gal.	
Hydrostatic Test	psig		
Shell / Heads Corr. Allow.	in.		
Shell / Heads Joint Eff.	%		
Code: NBS-PS 15-69		Stamp Yes No	
Radiograph:		Stress Relieve:	
Type Supports: 6 LEGS			
Insulation: NO			
Fireproofing:			
Sandblast:		Paint:	
Manhole ☐ Hinged ☒ Davited ☐ Other:			
Platform Clips: YES	Ladder Clips: YES	Insul. Rings:	
Pipe Supports:			
Wind Load: 100 MPH (SBCCI)		Seismic: ZONE I (ANSI)	
Wt. Empty	lb.	Wt. Full of Water	lb.

MATERIALS

Item	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	FRP	ASTM D 4097-82
Heads	3/8 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports	CS		A36
Bolts/Studs			
Nuts			
Gaskets			

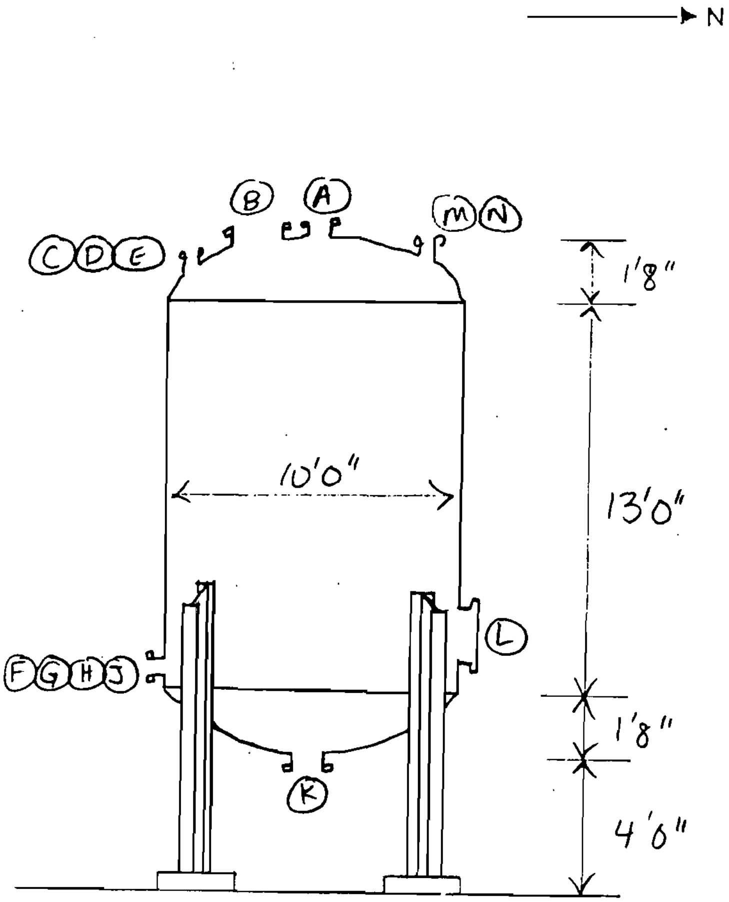
NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY / PSV	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSM.	E	1	1"			
-"-	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
PUMP SUCTION	K	1	4"			
[illegible]ANWAY	L	1	24"			
[illegible]ARE	M	2	4"			
FILL	N	1	4"	↓	↓	↓
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

IWES 15-0186

TANK SKETCH



NOTES: TANK TO BE PROVIDED WITH BAFFLES AND AGITATOR BRIDGE

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SPECIFICATION NO. ______

EQUIPMENT NO. T-44, 45, 46

DATE: 09/06/89

REV: C

BY: LDC

CHK'D BY: PB, JS

[illegible]ECT NAME: FFPI

EQUIPMENT NAME/APPLICATION: MULTIPURPOSE REACTOR - INORGANIC WASTE

IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure	psig	-0.15 to +0.30
Operating Temperature	°F	32° to 125°
Liquid Specific Gravity		1.25
Contents Lethal		~~Yes~~ No
Design Pressure	psig	-0.30 to +0.45
Design Temperature	°F	180°
DESIGN pH, see note		1 to 12
CAPACITY		8000 gal.
Hydrostatic Test	psig	
Shell / Heads Corr. Allow.	in.	
Shell / Heads Joint Eff.	%	

Code: NBS PS 15-69 | Stamp Yes No

Radiograph: | Stress Relieve:

Type Supports: 6 LEGS

Insulation:

Fireproofing:

Sandblast: | Paint:

Manhole ☒ Hinged ☒ Davited ☐ Other:

Platform Clips: YES | Ladder Clips: YES | Insul. Rings:

Pipe Supports:

Wind Load: 100 MPH (SBCCI) | Seismic: ZONE I (ANSI)

Wt. Empty lb. | Wt. Full of Water lb.

MATERIALS

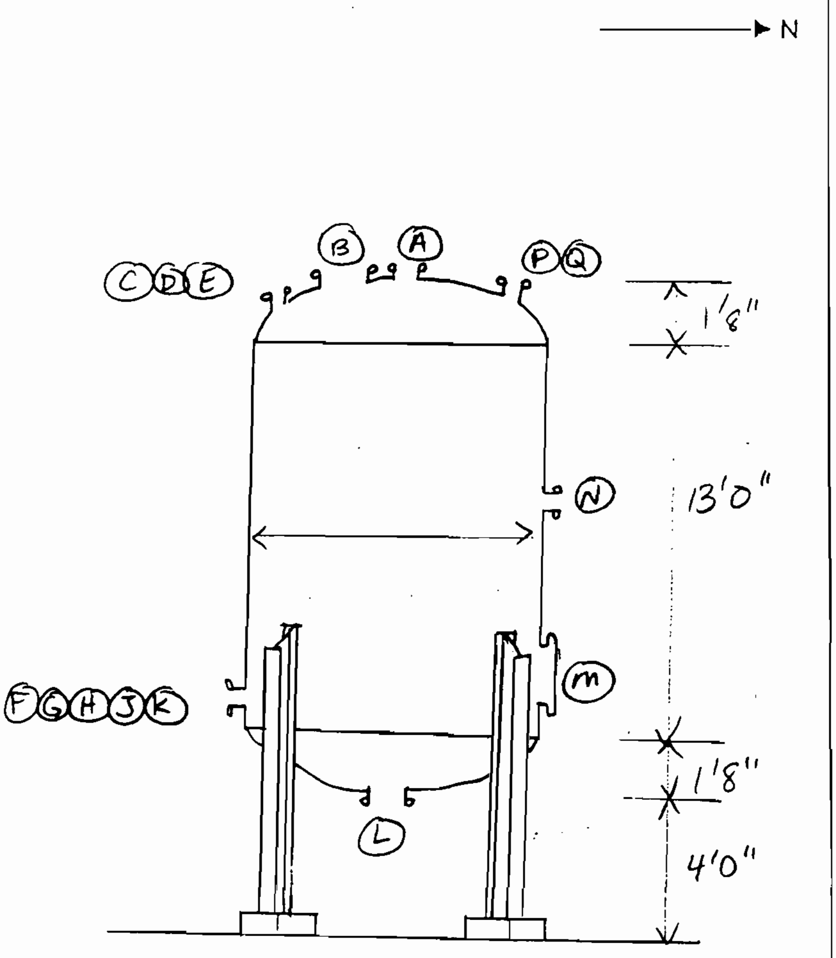
Item	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	FRP	ASTM D 4097-82
Heads	3/8 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSM	E	1	1"			
- " -	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
pH / rH LOOPS	K	4	1"			
[illegible] SUCTION	L	1	6"			
[illegible]NWAY	M	1	24"			
RECYCLE / COOLING	N	1	4"			
SPARE	P	3	4"			
FILL	Q	9	4"			
FILL	R	2	2"	↓	↓	↓

*Nozzle to be Plugged or Blinded

TANK SKETCH



NOTES: TANK TO BE PROVIDED WITH BAFFLES AND AGITATOR BRIDGE. DIPTUBES TO HAVE SIPHON HOLES TO PREVENT BACK SIPHONING. TOP MANWAY TO BE HINGED. SIDE MANWAY TO BE DAVITED. FRP (POLYESTER) TO BE RESISTANT TOWARDS OXIDIZING ACIDS AT LOW pH.

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IWES 15-0186

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SPECIFICATION NO. ____________
EQUIPMENT NO. T-47

DATE: 04/30/87
REV: C
BY: LDC
CHK'D BY: PB, JS

PROJECT NAME: FFPI
[illegible]PMENT NAME/APPLICATION: CYANIDE REACTOR - INORGANIC WASTE
IWES PROJECT No. 8813 -

DESIGN DATA

Operating Pressure	psig	-0.15 to + 0.30
Operating Temperature	°F	32° to 125°
Liquid Specific Gravity		1.25
Contents Lethal		[✓ Yes] No
Design Pressure	psig	-0.30 to +0.45
Design Temperature	°F	180°
DESIGN pH		7-14
CAPACITY		8000 gal
Hydrostatic Test	psig	
Shell / Heads Corr. Allow.	in.	
Shell / Heads Joint Eff.	%	

Code: NBS-PS 15-69 | Stamp Yes No
Radiograph: | Stress Relieve:
Type Supports: 6 LEGS
Insulation: NO
Fireproofing:
Sandblast: | Paint:
Manhole ☒ Hinged ☒ Davited ☐ Other: SEE NOTE
Platform Clips: YES | Ladder Clips: YES | Insul. Rings:
Pipe Supports:
Wind Load: 100 MPH (SBCCI) | Seismic: ZONE I (ANSI)
Wt. Empty lb. | Wt. Full of Water lb.

MATERIALS

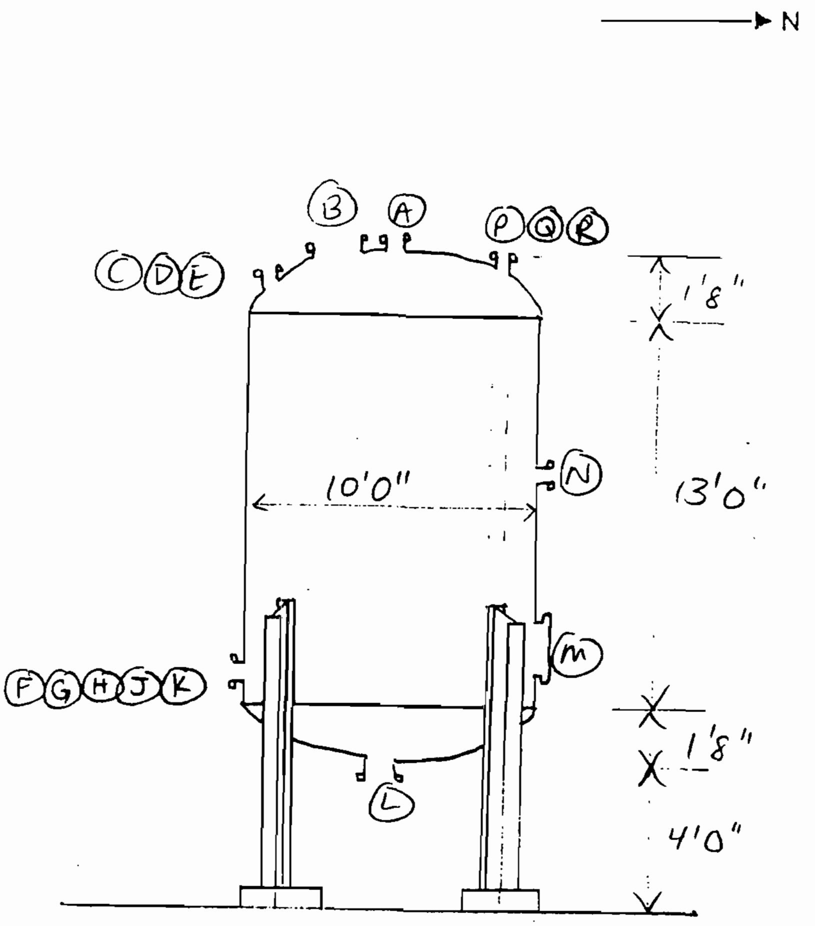
[illegible]m	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	FRP	ASTM D 4097-82
Heads	3/8 in.	FRP	ASTM D 4097-82
Lining	in.		
	in.		
	in.		
Nozzle Necks		FRP	
Flanges		FRP	
Coupling			
M.H. Cover		FRP	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"			
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSM.	E	1	1"			
-"-	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
pH/rH LOOPS	K	4	1"			
PUMP SUCTION	L	1	6"			
[illegible]NWAY	M	1	24"			
K[illegible]LE/COOLING	N	1	4"			
SPARE	P	3	4"			
FILL	Q	5	4"			
FILL	R	3	2"	↓	↓	↓

*Nozzle to be Plugged or Blinded

TANK SKETCH



NOTES: TANK TO BE PROVIDED WITH BAFFLES AND AGITATOR BRIDGE. DIPTUBES TO HAVE SIPHON HOLES TO PREVENT BACK SIPHONING. TOP MANWAY to BE HINGED. SIDE MANWAY to BE DAVITED.

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Dirk M. Miller

Waste Energy Systems

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SPECIFICATION NO.
EQUIPMENT NO. T-48, 49

DATE: [illegible]
REV: C
BY: LDC
CHK'D BY: PB, JS

PROJECT NAME: FFPI
EQUIPMENT NAME/APPLICATION: FILTER FEED TANK - INORGANIC WASTE
IWES PROJECT No. 8813

DESIGN DATA

Operating Pressure	psig	-0.15 to +0.30	
Operating Temperature	°F	32° to 125°	
Liquid Specific Gravity		1.25	
Contents Lethal		[✓ Yes] No	
Design Pressure	psig	-0.30 to +0.45	
Design Temperature	°F	180°	
DESIGN pH		8-12	
CAPACITY		25,000 gal.	
Hydrostatic Test	psig		
Shell / Heads Corr. Allow.	in.	1/8"	1/8"
Shell / Heads Joint Eff.	%	85	85

Code: API 620 | Stamp Yes No
Radiograph: SPOT | Stress Relieve:
Type Supports: 4 LEGS
Insulation:
Fireproofing:
Sandblast: | Paint:
Manhole ☐ Hinged ☒ Davited ☐ Other:
Platform Clips: | Ladder Clips: | Insul. Rings:
Pipe Supports:
Wind Load: 100 MPH (SBCCI) | Seismic: ZONE I (ANSI)
Wt. Empty lb. | Wt. Full of Water lb.

MATERIALS

Item	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A285 Gr. 'C'
Heads	5/16 in.	CS	A285 Gr. 'C'
Lining	in.		
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover		CS	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

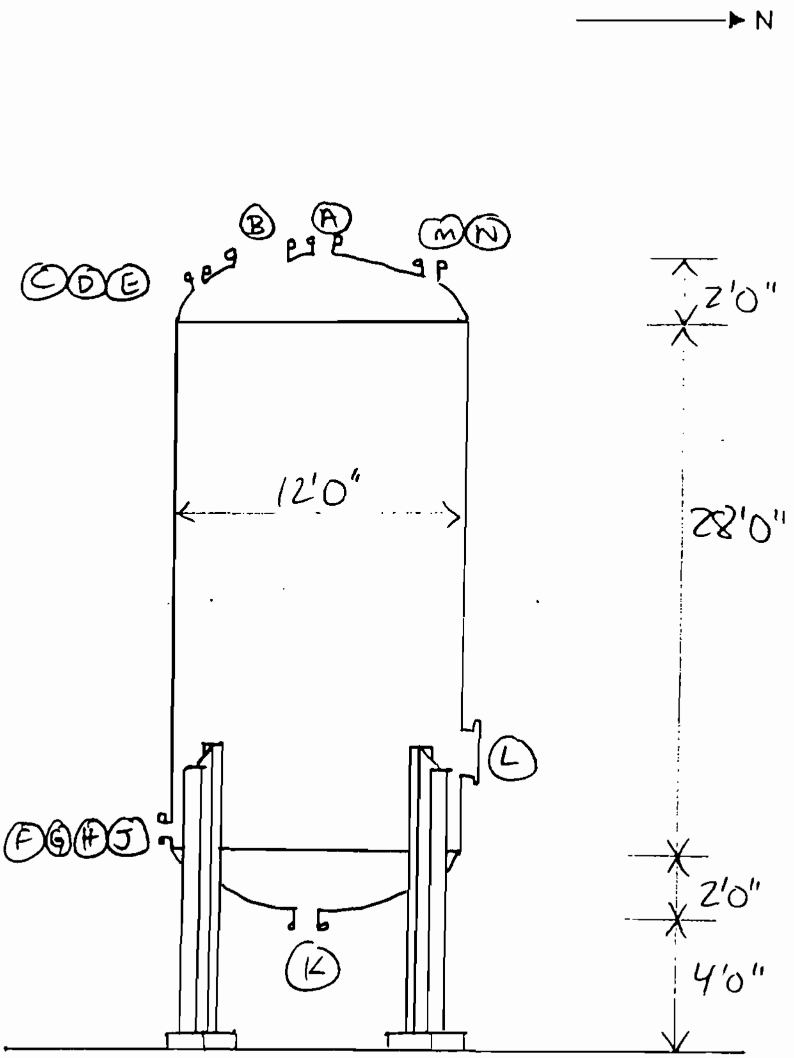
NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
AGITATOR	A	1		150#	RF	FLG
MANWAY/PSV	B	1	24"	↓	↓	↓
VENT	C	1	6"			
LSHH	D	1	2"			
LEVEL TRANSM.	E	1	1"			
-"-	F	1	4"			
TEMPERATURE	G	1	2"			
SAMPLE POINT	H	1	1"			
SPARE	J	1	4"			
PUMP SUCTION	K	1	4"			
MANWAY	L	1	24"			
[illegible]RE	M	1	4"			
[illegible]L	N	2	4"	↓	↓	↓
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

WES 15-0186

TANK SKETCH



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SPECIFICATION NO.

EQUIPMENT NO. T-50, 51

DATE: 09/06/89
REV: C
BY: LDC
CHK'D BY: PB, JS

JECT NAME: FFPI
IPMENT NAME/APPLICATION: FILTRATE HOLDING TANK - INORGANIC WASTE
IWES PROJECT No. 8813-

DESIGN DATA

Operating Pressure psig	-0.15 to +0.30		
Operating Temperature °F	32° to 125°		
Liquid Specific Gravity	1.10		
Contents Lethal	~~Yes~~ No		
Design Pressure psig	-0.30 to +0.45		
Design Temperature °F	180°		
DESIGN pH	8-12		
CAPACITY	8000 gal		
Hydrostatic Test psig			
Shell / Heads Corr. Allow. in.	1/8"	1/8"	
Shell / Heads Joint Eff. %	85	85	
Code: API 620	Stamp ~~Yes~~ No		
Radiograph: SPOT	Stress Relieve:		
Type Supports: 4 LEGS			
Insulation:			
Fireproofing:			
Sandblast:	Paint:		
Manhole ☐ Hinged	☒ Davited	☐ Other:	
Platform Clips:	Ladder Clips:	Insul. Rings:	
Pipe Supports:			
Wind Load: 100 MPH (SBCCI)	Seismic: ZONE 1 (ANSI)		
Wt. Empty lb.	Wt. Full of Water lb.		

MATERIALS

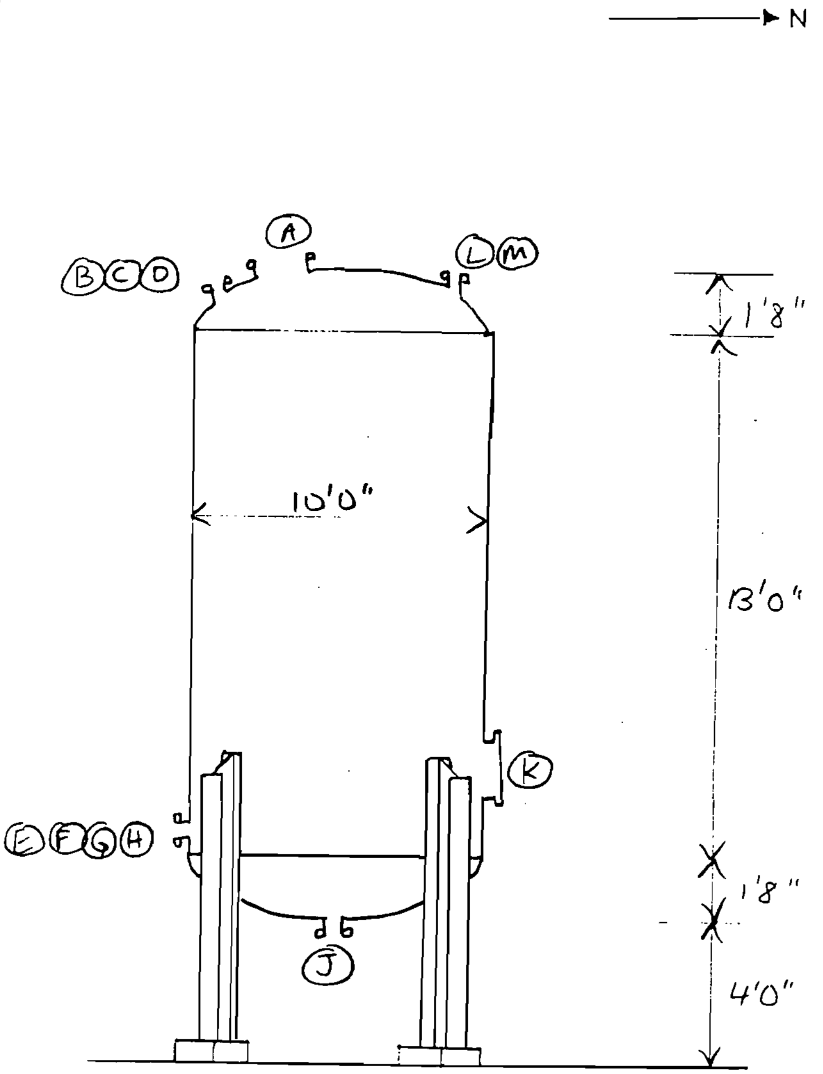
m	Thickness	Mat'l Class	Mat'l-Minimum Quality
Shell	5/16 in.	CS	A285, Gr. 'C'
Heads	5/16 in.	CS	A285, Gr. 'C'
Lining	in.		
	in.		
	in.		
Nozzle Necks		CS	
Flanges		CS	
Coupling			
M.H. Cover		CS	
Supports		CS	A36
Bolts/Studs			
Nuts			
Gaskets			

NOZZLE SCHEDULE

Service	Mark	No.	Size	Rating	Face	Type
MANWAY/PSV	A	1	24"	150#	RF	FLG
VENT	B	1	6"			
LSHH	C	1	2"			
LEVEL TRANSM.	D	1	1"			
-"-	E	1	4"			
TEMPERATURE	F	1	2"			
SAMPLE POINT	G	1	1"			
SPARE	H	1	4"			
PUMP SUCTION	J	1	4"			
MANWAY	K	1	24"			
SPARE	L	1	4"			
	M	1	4"	↓	↓	↓
	N					
	P					
	Q					
	R					

*Nozzle to be Plugged or Blinded

TANK SKETCH



This document has been prepared and is approved by me for inclusion in environmental permit applications only. It is neither approved nor is it to be used for equipment or material procurement, construction or any other purpose.

IWES 15-0186

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-7

AIR PERMIT APPLICATION
FOR
LIME STORAGE SILO

DEPARTMENT OF ENVIRONMENTAL REGULATION

Best Available Copy

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Lime Storage Silo [x] New[1] [ ] Existing[1]

APPLICATION TYPE: [x] Construction [x] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. **COUNTY:** Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Lime Storage Silo

SOURCE LOCATION: Street West side of Fort Green Rd., 3/4 miles south of county Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27 ° 43 ' 15 "N Longitude 81 ° 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed __________________

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (3140389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a 175-ton capacity (3,500 cu. ft.) lime storage silo. Lime is used as a scrubbing medium in the Spray Dryer Aborber (SDA). The particulate emissions from the silo (during transfer) will be vented into a fabric filter having a control efficiency of 99.9%.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/treatment systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr N/A ; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

a. If yes, has "offset" been applied? ________

b. If yes, has "Lowest Achievable Emission Rate" been applied? ________

c. If yes, list non-attainment pollutants. ________

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

a. If yes, for what pollutants? ________

b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

(Please see addendum to the permit application)

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (Please see addendum to the permit application)
2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates	0.077	0.0077	29.83*	29.83*	15,428	7.714	
(PM-10)							

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Based on a transfer rate of 30 tons per hour, Table 610-1 of Fac Rule 17-2.610(1b) sets an allowable particulate emission rate of 29.83 pounds per hour.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Aeropulse 9SB-8	Particulate	99.9%	PM-10	Manufactuers Data
(or equivalent)				

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: ______________________ Percent Ash: ______________________

Density: ______________________ lbs/gal Typical Percent Nitrogen: ______________________

Heat Capacity: ______________________ BTU/lb ______________________ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______________________

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 49 ft. Stack Diameter: 1.5 ft.

Gas Flow Rate: 1,800 ACFM 1,800 DSCFM Gas Exit Temperature: 68 °F.

Water Vapor Content: 0 % Velocity: 15-1 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ______________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

**Please see addendum to permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [x] No NSPS is not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

---

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:
b. Operating Principles:

c. Efficiency:[1]
d. Capital Cost:

e. Useful Life:
f. Operating Cost:

g. Energy:[2]
h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:
b. Operating Principles:

c. Efficiency:[1]
d. Capital Costs:

e. Useful Life:
f. Operating Cost:

g. Energy:[2]
h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:
2. Efficiency:[1]

3. Capital Cost:
4. Useful Life:

5. Operating Cost:
6. Energy:[2]

7. Maintenance Cost:
8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:
(4) State:

---

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. ______ no. sites ______ TSP ______ ( ) SO^{2}* ______ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ______________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)______________________________

3. Upper air (mixing height) data obtained from (location)______________________________

4. Stability wind rose (STAR) data obtained from (location)______________________________

C. Computer Models Used

1. ______________________________ Modified? If yes, attach description.

2. ______________________________ Modified? If yes, attach description.

3. ______________________________ Modified? If yes, attach description.

4. ______________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	______________________________	grams/sec
SO^2	______________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR LIME STORAGE SILO

Section III - A

The Lime Storage Silo has a capacity of 3,500 cubic feet. The dimensions are as follows:

Height: 41 feet
Diameter: 12 feet
Vent Size: 18"
Height of vent above ground: 49 feet
Stack Gas Rate during loading: 1,800 SCFM

The silo will be used to store lime. The particulate emissions, which are assumed to be composed entirely of PM-10, discharged due to transfer of cement will be vented into a fabric filter having a particulate control efficiency of 99.9%.

Section III - B

The silo is not used for processing any materials. It will be used for storage purposes only. The operating parameters are as follows:

Transfer Rate: 30 tons per hour of lime
Total time for material transfer per year: 200 hours

Section III - C

Particulate emissions are discharged during the transfer operations. It is assumed that the entire particulate matter is composed of PM-10. The particulate emissions are controlled by a fabric filter having an efficiency of 99.9% for PM-10.

Section V - Items 2, 3

The particulate emission rate was estimated based on a 2 part article Prescription for Cement Plant Dust Control, Parts 1 and 2, Rock Products, August and September 1970. The concentration (without control) of the particulate matter during the transfer operation was assumed to be 5 grains per dry standard cubic foot. This concentration corresponds to that typically obtained during mechanical transfer with cup elevator.

Based on this concentration, the emission rate without control is estimated as follows:

0.03 × 1800 ÷ 7000 × 60 = 0.46 lbs/hr × 4.2 = 1.68 TPY

(5 grains/dscf)*(1800 dscf/min)*(pound/7000 grains)*(60 minutes/hour)

0.02 × 1800 ÷ 7000 × 60 = 0.3086 ⇒ 0.31 lb/hr; × 4.2 = 1.302 TPY

= 77.14 pounds per hour

Based on the manufacturer's data, the fabric filter has a particulate removal efficiency of 99.9%. The emission rate with control is therefore:

77.14 * (1-0.999) = 0.07714 pounds per hour ≈ 0.077 lb/hr

× 200 ÷ 2000

= 0.0077 ⇒

0.008 TPY

For the purposes of reporting the emission rates in Section III - C, the emission rates are classified as follows:

Maximum Emission Rate (lbs/hour)

The maximum particulate emission is the emission rate with control reported in pounds per hour. This emission rate is 0.077 pounds per hour.

Actual Emission Rate (tons/year)

The actual controlled emission rate (tons/year) is estimated as follows:

(0.077 pounds/hour)*(200 hours of transfer/year)*(ton/2000 pounds)

= 0.0077 tons per year

Potential Emission Rate (pounds per year)

The potential emission rate is the total uncontrolled emission rate from the silo. This is estimated as follows:

(77.14 pounds/hour)*(200 hours of transfer/year)

= 13,428 pounds per year (7.714 tons/year)

Section V - Items 4, 5

The particulate emission control device will be a fabric filter. Based on manufacturer's data, this fabric filter has a particulate removal efficiency of 99.9% for PM-10. The specifications are as follows:

AEROPULSE, Model 9SB-8 (or, equivalent)

No. of filters: 9
Filter Length: 96"
Filter Area: 87 square feet
Pressure Drop: 20 inches water

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-8

AIR PERMIT APPLICATION
FOR
CEMENT STORAGE SILO

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
[illegible]00 BLAIR STONE ROAD
[illegible]LLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Cement Storage Silo [x] New[1] [ ] Existing[1]

APPLICATION TYPE: [x] Construction [x] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Cement Storage Silo

SOURCE LOCATION: Street West side of Fort Green Road; 3/4 miles south of county Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27 ° 43 ' 15 "N Longitude 81 ° 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc.

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-18-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed Dick M. Miller

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a cement storage silo having a capacity of 5,400 cu. ft. The particulate emissions from the silo (during transfer) will be vented into a fabric filter having a control efficiency of 99.9%.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/transfer systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr N/A ; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant?	No
a. If yes, has "offset" been applied?	
b. If yes, has "Lowest Achievable Emission Rate" been applied?	
c. If yes, list non-attainment pollutants.	
2. Does best available control technology (BACT) apply to this source? If yes, ~~see~~ Section VI.	No
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII.	No
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?	No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?	No
H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source?	No

a. If yes, for what pollutants?

b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

(Please see addendum to the permit application)

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (Please see addendum to the permit application)
2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
PM-10	6	0.9	29.83*	29.83*	1,798,200	900	
Particulates (PM-10)							

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Based on a transfer rate of 30 tons per hour, Table 610-1 of Fac Rule 17-2.610(1b) sets an allowable particulate emission rate of 29.83 pounds per hour.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Aeropulse 9SB-8	Particulates	99.9%	PM-10	Manufacturers Data
(or equivalent)				

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: ____________ Percent Ash: ____________

Density: ____________ lbs/gal Typical Percent Nitrogen: ____________

Heat Capacity: ____________ BTU/lb ____________ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ____________

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 43 ft. Stack Diameter: 1.5 ft.

Gas Flow Rate: 2100 ACFM 2100 DSCFM Gas Exit Temperature: 68 °F.

Water Vapor Content: 0 % Velocity: 19.8 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ____ Design Capacity (lbs/hr) ____

Approximate Number of Hours of Operation per day ____ day/wk ____ wks/yr. ____

Manufacturer ____

Date Constructed ____ Model No. ____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ____ ft. Stack Diamter: ____ Stack Temp. ____

Gas Flow Rate: ____ ACFM ____ DSCFM* Velocity: ____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: ☐ Cyclone ☐ Wet Scrubber ☐ Afterburner

☐ Other (specify) ____

Brief description of operating characteristics of control devices: ______________

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

**Please see addendum to permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Costs:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: 2. Efficiency:[1]

3. Capital Cost: 4. Useful Life:

5. Operating Cost: 6. Energy:[2]

7. Maintenance Cost: 8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. ________ no. sites ________ TSP ________ ( ) SO^2* ________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____

month day year month day year

Other data recorded ____________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)____________________

3. Upper air (mixing height) data obtained from (location)____________________

4. Stability wind rose (STAR) data obtained from (location)____________________

C. Computer Models Used

1. ______________________________ Modified? If yes, attach description.

2. ______________________________ Modified? If yes, attach description.

3. ______________________________ Modified? If yes, attach description.

4. ______________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	______________________________	grams/sec
SO^2	______________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR CEMENT STORAGE SILO

Section III - A

The Cement Storage Silo has a capacity of 5,400 cubic feet. The dimensions are as follows:

Height: 50 feet
Diameter: 16 feet
Vent Size: 18"
Height of vent above ground: 58 feet
Stack Gas Rate during loading: 2100 SCFM

The silo will be used to store cement. The particulate emissions, which are assumed to be composed entirely of PM-10, discharged due to transfer of cement will be vented into a fabric filter having a particulate control efficiency of 99.9%.

Section III - B

The silo is not used for processing any materials. It will be used for storage purposes only. The operating parameters are as follows:

Transfer Rate: 30 tons per hour of cement
Total time for material transfer per year: 300 hours

Section III - C

Particulate emissions are discharged during the transfer operations. It is assumed that the entire particulate matter is composed of PM-10. The particulate emissions are controlled by a fabric filter having an efficiency of 99.9% for PM-10.

Section V - Items 2, 3

The particulate emission rate was estimated based on a 2 part article <u>Prescription for Cement Plant Dust Control, Parts 1 and 2, Rock Products, August and September 1970.</u> The concentration (without control) of the particulate matter during the transfer operation was assumed to be 333 grains per dry standard cubic foot. This concentration corresponds to that typically obtained during pneumatic transfer.

Based on this concentration, the emission rate without control is estimated as follows:

0.03 × 2100 × 60 ÷ 7000 = 0.54 lbs/hr ; × 300 ÷ 2000 => 0.081 TPY

(333 grains/dscf)*(2100 dscf/min)*(pound/7000 grains)*(60 minutes/hour)

0.02 × 2100 × 60 ÷ 7000 = 0.36 lb/hr ; × 300 ÷ 2000 => 0.054 TPY

= 5,994 ≈ 6,000 pounds per hour

=> 0.05 TP

Based on the manufacturer's data, the fabric filter has a particulate removal efficiency of 99.9%. The emission rate with control is therefore:

5,994 * (1-0.999) = 5.994 ≈ 6 pounds per hour

For the purposes of reporting the emission rates in Section III - C, the emission rates are classified as follows:

Maximum Emission Rate (lbs/hour)

The maximum particulate emission is the emission rate with control reported in pounds per hour. This emission rate is 6 pounds per hour.

Actual Emission Rate (tons/year)

The actual controlled emission rate (tons/year) is estimated as follows:

(5.994 pounds/hour)*(300 hours of transfer/year)*(ton/2000 pounds)

= 0.899 tons per year

Potential Emission Rate (pounds per year)

The potential emission rate is the total uncontrolled emission rate from the silo. This is estimated as follows:

(5994 pounds/hour)*(300 hours of transfer/year)

= 1,798,200 pounds per year (899.1 tons/year)

Section V - Items 4, 5

The particulate emission control device will be a fabric filter. Based on manufacturer's data, this fabric filter has a particulate removal efficiency of 99.9% for PM-10. The specifications are as follows:

AEROPULSE, Model 9SB-8 (or, equivalent)

No. of filters: 9
Filter Length: 96"
Filter Area: 87 square feet
Pressure Drop: 20 inches water

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-9

AIR PERMIT APPLICATION
FOR
CEMENT DAY SILO

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

Best Available Copy

WIN TOWERS OFFICE BUILDING
600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Cement Day Silo [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [x] Construction [x] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Cement Day Silo

SOURCE LOCATION: Street West Side of Port Green Rd., 3/4 miles south of county Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27 • 43 ' 15 "N Longitude 81 ° 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. **APPLICANT**

I am the undersigned owner or authorized representative* of Florida First Processing, Inc.

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-87 Telephone No. (703)893-3518

B. **PROFESSIONAL ENGINEER REGISTERED IN FLORIDA** (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a Cement Day Silo having a capacity of 1,350 cu. ft. The particulate emissions from the silo (during transfer) will be vented into a fabric filter having a control efficiency of 99.9%.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/transfer systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;
if power plant, hrs/yr N/A ; if seasonal, describe: ____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
   a. If yes, has "offset" been applied? ____
   b. If yes, has "Lowest Achievable Emission Rate" been applied? ____
   c. If yes, list non-attainment pollutants. ____
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ____
   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

(Please see addendum to the permit application)

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (Please see Addendum to the permit application)
2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates (PM-10)	2	0.9	14.99*	14.99*	1,800,000	900	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Based on a transfer rate of 10 tons per hour, Table 610-1 of Fac Rule 17-2.610(1b) sets an allowable particulate emission rate of 14.99 pounds per hour.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Aeropulse 9SB-8	Particulate	99.9%	PM-10	Manufacturers Data
(or equivalent)				

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: ____________________ Percent Ash: ____________________

Density: ____________________ lbs/gal Typical Percent Nitrogen: ____________________

Heat Capacity: ____________________ BTU/lb ____________________ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ____________________

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 43 ft. Stack Diameter: 1.5 ft.

Gas Flow Rate: 700 ACFM 700 DSCFM Gas Exit Temperature: 68 °F.

Water Vapor Content: 0 % Velocity: 6.6 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: ☐ Cyclone ☐ Wet Scrubber ☐ Afterburner

☐ Other (specify) ______

Brief description of operating characteristics of control devices: ______

______

______

______

______

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

______

______

______

______

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

** Please see addendum to the permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

☐ Yes ☒ No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

☐ Yes ☒ No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

---

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Costs:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: 2. Efficiency:[1]

3. Capital Cost: 4. Useful Life:

5. Operating Cost: 6. Energy:[2]

7. Maintenance Cost: 8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to this source.

1. __________ no. sites __________ TSP __________ ( ) SO^{2}* __________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____

month day year month day year

Other data recorded ______________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. ______ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)______________________________

3. Upper air (mixing height) data obtained from (location)______________________________

4. Stability wind rose (STAR) data obtained from (location)______________________________

C. Computer Models Used

1. ______________________________ Modified? If yes, attach description.

2. ______________________________ Modified? If yes, attach description.

3. ______________________________ Modified? If yes, attach description.

4. ______________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	______________________________	grams/sec
SO^2	______________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR CEMENT DAY SILO

Section III - A

The Cement Day Silo has a capacity of 1,350 cubic feet. The dimensions are as follows:

Height: 35 feet
Diameter: 12 feet
Vent Size: 18"
Height of vent above ground: 43 feet
Stack Gas Rate during loading: 700 SCFM

The silo will be used to store cement. The particulate emissions, which are assumed to be composed entirely of PM-10, discharged due to transfer of cement will be vented into a fabric filter having a particulate control efficiency of 99.9%.

Section III - B

The silo is not used for processing any materials. It will be used for storage purposes only. The operating parameters are as follows:

Transfer Rate: 10 tons per hour of cement
Total time for material transfer per year: 900 hours

Section III - C

Particulate emissions are discharged during the transfer operations. It is assumed that the entire particulate matter is composed of PM-10. The particulate emissions are controlled by a fabric filter having an efficiency of 99.9% for PM-10.

Section V - Items 2, 3

The particulate emission rate was estimated based on a 2 part article Prescription for Cement Plant Dust Control, Parts 1 and 2, Rock Products, August and September 1970. The concentration (without control) of the particulate matter during the transfer operation was assumed to be 333 grains per dry standard cubic foot. This concentration corresponds to that typically obtained during pneumatic transfer.

Based on this concentration, the emission rate without control is estimated as follows:

0.03 x 700 ÷ 7000 x 60 = 0.18 lb/hr ; x 900 ÷ 2000 => 0.081 TPY

(333 grains/dscf)*(700 dscf/min)*(pound/7000 grains)*(60 minutes/hour)

= 1,998 ≈ 2,000 pounds per hour

0.02 x 700 ÷ 2000 x 60 = 0.12 lb/hr ; x 900 ÷ 2000 => 0.054 TPY

Based on the manufacturer's data, the fabric filter has a particulate removal efficiency of 99.9%. The emission rate with control is therefore:

=> 0.05 TPY

1,998 * (1-0.999) = 1.998 ≈ 2 pounds per hour

For the purposes of reporting the emission rates in Section III - C, the emission rates are classified as follows:

Maximum Emission Rate (lbs/hour)

The maximum particulate emission is the emission rate with control reported in pounds per hour. This emission rate is 2 pounds per hour.

Actual Emission Rate (tons/year)

The actual controlled emission rate (tons/year) is estimated as follows:

(1.998 pounds/hour)*(900 hours of transfer/year)*(ton/2000 pounds)

= 0.899 tons per year

Potential Emission Rate (pounds per year)

The potential emission rate is the total uncontrolled emission rate from the silo. This is estimated as follows:

(1998 pounds/hour)*(900 hours of transfer/year)

= 1,798,200 pounds per year (899.1 tons/year)

Section V - Items 4, 5

The particulate emission control device will be a fabric filter. Based on manufacturer's data, this fabric filter has a particulate removal efficiency of 99.9% for PM-10. The specifications are as follows:

AEROPULSE, Model 9SB-8 (or, equivalent)

No. of filters:	9
Filter Length:	96"
Filter Area:	87 square feet
Pressure Drop:	20 inches water

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-10

AIR PERMIT APPLICATION
FOR
FLYASH STORAGE SILO

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

Best Available Copy

WIN TOWERS OFFICE BUILDING
00 BLAIR STONE ROAD
ALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Flyash Storage Silo [x] New[1] [ ] Existing[1]

APPLICATION TYPE: [x] Construction [x] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Flyash Storage Silo

SOURCE LOCATION: Street West side of Fort Green Rod., 3/4 miles south of county Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27° 43' 15"N Longitude 81° 57' 45"W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed ____________

Dick M. Miller
Name (Please Type)

International Waste Energy Systems
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a 5,400 cu. ft. Flyash Storage Silo. The particulate emissions from the silo (during transfer) will be vented into a fabric filter having a control efficiency of 99.9%.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/treatment systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr N/A ; if seasonal, describe: ______

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? ______

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ______

   c. If yes, list non-attainment pollutants. ______

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deteriorization" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ______

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

(Please see addendum to the permit application)

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (Please see addendum to the permit application)

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates (PM-10)	6.0	0.989	29.83*	29.83*	1,978,020	989	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Based on a transfer rate of 30 tons per hour. Table 610-1 of Fac Rule 17-2.610(1b) sets an allowable particulate emission rate of 29.83 pounds per hour.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Aeropulse 9SB-8	Particulate	99.9%	PM-10	Manufacturers Data
(or equivalent)				

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 58 ft. Stack Diameter: 1.5 ft.

Gas Flow Rate: 2100 ACFM 2100 DSCFM Gas Exit Temperature: 68 °F.

Water Vapor Content: 0 % Velocity: 19.8 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: ☐ Cyclone ☐ Wet Scrubber ☐ Afterburner

☐ Other (specify) ______

Brief description of operating characteristics of control devices: ____________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

**Please see addendum to permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS is not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:
b. Operating Principles:
c. Efficiency:[1]
d. Capital Cost:
e. Useful Life:
f. Operating Cost:
g. Energy:[2]
h. Maintenance Cost:
i. Availability of construction materials and process chemicals:
j. Applicability to manufacturing processes:
k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:
b. Operating Principles:
c. Efficiency:[1]
d. Capital Costs:
e. Useful Life:
f. Operating Cost:
g. Energy:[2]
h. Maintenance Cost:
i. Availability of construction materials and process chemicals:
j. Applicability to manufacturing processes:
k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:
2. Efficiency:[1]
3. Capital Cost:
4. Useful Life:
5. Operating Cost:
6. Energy:[2]
7. Maintenance Cost:
8. Manufacturer:
9. Other locations where employed on similar processes:

a. (1) Company:
(2) Mailing Address:
(3) City:
(4) State:

---

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. ____________ no. sites ____________ TSP ____________( ) SO^{2}* ____________ Wind spd/dir

Period of Monitoring ______/____/______ to ______/____/______
month day year month day year

Other data recorded ____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)______________________________

3. Upper air (mixing height) data obtained from (location)______________________________

4. Stability wind rose (STAR) data obtained from (location)______________________________

C. Computer Models Used

1. ______________________________ Modified? If yes, attach description.

2. ______________________________ Modified? If yes, attach description.

3. ______________________________ Modified? If yes, attach description.

4. ______________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	______________________________	grams/sec
SO^2	______________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description o point source (on NEDS point number), UTM coordinates, stack data, allowable emissions and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Includ assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application o the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR FLYASH STORAGE SILO

Section III - A

The Flyash Storage Silo has a capacity of 5,400 cubic feet. The dimensions are as follows:

Height: 50 feet
Diameter: 16 feet
Vent Size: 18"
Height of vent above ground: 58 feet
Stack Gas Rate during loading: 2100 SCFM

The silo will be used to store flyash. The particulate emissions, which are assumed to be composed entirely of PM-10, discharged due to transfer of flyash will be vented into a fabric filter having a particulate control efficiency of 99.9%.

Section III - B

The silo is not used for processing any materials. It will be used for storage purposes only. The operating parameters are as follows:

Transfer Rate: 30 tons per hour of flyash
Total time for material transfer per year: 330 hours

Section III - C

Particulate emissions are discharged during the transfer operations. It is assumed that the entire particulate matter is composed of PM-10. The particulate emissions are controlled by a fabric filter having an efficiency of 99.9% for PM-10.

Section V - Items 2, 3

The particulate emission rate was estimated based on a 2 part article <u>Prescription for Cement Plant Dust Control, Parts 1 and 2, Rock Products, August and September 1970.</u> The concentration (without control) of the particulate matter during the transfer operation was assumed to be 333 grains per dry standard cubic foot. This concentration corresponds to that typically obtained during pneumatic transfer.

Based on this concentration, the emission rate without control is estimated as follows:

0.03 × 2100 × 60 * 7000 = 0.54 lb/hr, × 330 ÷ 2000 => 0.089 TPY => 0.09

(333 grains/dscf)*(2100 dscf/min)*(pound/7000 grains)*(60 minutes/hour)

0.02 × 2100 × 60 ÷ 7000 = 0.36 lb/hr × 330 ÷ 2000 => 0.059 TPY => 0.06 TPY

= 5,994 ≈ 6,000 pounds per hour

Based on the manufacturer's data, the fabric filter has a particulate removal efficiency of 99.9%. The emission rate with control is therefore:

5,994 * (1-0.999) = 5.994 ≈ 6 pounds per hour

For the purposes of reporting the emission rates in Section III - C, the emission rates are classified as follows:

Maximum Emission Rate (lbs/hour)

The maximum particulate emission is the emission rate with control reported in pounds per hour. This emission rate is 6 pounds per hour.

Actual Emission Rate (tons/year)

The actual controlled emission rate (tons/year) is estimated as follows:

(5.994 pounds/hour)*(330 hours of transfer/year)*(ton/2000 pounds)

= 0.989 tons per year

Potential Emission Rate (pounds per year)

The potential emission rate is the total uncontrolled emission rate from the silo. This is estimated as follows:

(5994 pounds/hour)*(330 hours of transfer/year)

= 1,978,020 pounds per year (989 tons/year)

Section V - Items 4, 5

The particulate emission control device will be a fabric filter. Based on manufacturer's data, this fabric filter has a particulate removal efficiency of 99.9% for PM-10. The specifications are as follows:

AEROPULSE, Model 9SB-8 (or, equivalent)

No. of filters:	9
Filter Length:	96"
Filter Area:	87 square feet
Pressure Drop:	20 inches water

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-11

AIR PERMIT APPLICATION
FOR
FLYASH DAY SILO

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Flyash Day Silo [x] New[1] [ ] Existing[1]

APPLICATION TYPE: [x] Construction [x] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. **COUNTY:** Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Flyash Day Silo

SOURCE LOCATION: Street West side of Fort Green Rd., 3/4 miles south of county Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27 ° 43 ' 15 "N Longitude 81 ° 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a Flyash Day Silo having a capacity of 1,350 cu. ft. The particulate emissions from the silo (during transfer) will be vented into a fabric filter having a control efficiency of 99.9%.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/transfer systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr N/A ; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? ____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ____

   c. If yes, list non-attainment pollutants. ____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A
(Please see addendum to the permit application)

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (Please see addendum to the permit applicati
2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates (PM-10)	2.0	0.989	14.99*	14.99*	1,978,020	989	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Based on a transfer rate of 10 tons per hour, Table 610-1 of Fac Rule 17-2-610(1b) sets an allowable particulate emission rate of 14-99 pounds per hour.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Aeropulse 9SB-8	Particulates	99.9%	PM-10	Manufacturers Data
(or equivalent)				

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: ____________ Percent Ash: ____________

Density: ____________ lbs/gal Typical Percent Nitrogen: ____________

Heat Capacity: ____________ BTU/lb ____________ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ____________

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 43 ft. Stack Diameter: 1.5 ft.

Gas Flow Rate: 700 ACFM 700 DSCFM Gas Exit Temperature: 68 °F.

Water Vapor Content: 0 % Velocity: 6.6 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ____ day/wk ____ wks/yr. ____

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ____ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: ☐ Cyclone ☐ Wet Scrubber ☐ Afterburner

☐ Other (specify) ______

Brief description of operating characteristics of control devices: ____________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

**Please see addendum to permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Costs:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: 2. Efficiency:[1]

3. Capital Cost: 4. Useful Life:

5. Operating Cost: 6. Energy:[2]

7. Maintenance Cost: 8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

---

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. ________ no. sites ________ TSP ________ ( ) SO^{2}* ________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____

month day year month day year

Other data recorded ________________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________________

3. Upper air (mixing height) data obtained from (location)____________________

4. Stability wind rose (STAR) data obtained from (location)___________________

C. Computer Models Used

1. ______________________________ Modified? If yes, attach description.

2. ______________________________ Modified? If yes, attach description.

3. ______________________________ Modified? If yes, attach description.

4. ______________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	______________________	grams/sec
SO^2	______________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR FLYASH DAY SILO

Section III - A

The Flyash Day Silo has a capacity of 1,350 cubic feet. The dimensions are as follows:

Height: 35 feet
Diameter: 12 feet
Vent Size: 18"
Height of vent above ground: 43 feet
Stack Gas Rate during loading: 700 SCFM

The silo will be used to store flyash. The particulate emissions, which are assumed to be composed entirely of PM-10, discharged due to transfer of flyash will be vented into a fabric filter having a particulate control efficiency of 99.9%.

Section III - B

The silo is not used for processing any materials. It will be used for storage purposes only. The operating parameters are as follows:

Transfer Rate: 10 tons per hour of flyash
Total time for material transfer per year: 990 hours

Section III - C

Particulate emissions are discharged during the transfer operations. It is assumed that the entire particulate matter is composed of PM-10. The particulate emissions are controlled by a fabric filter having an efficiency of 99.9% for PM-10.

Section V - Items 2, 3

The particulate emission rate was estimated based on a 2 part article Prescription for Cement Plant Dust Control, Parts 1 and 2, Rock Products, August and September 1970. The concentration (without control) of the particulate matter during the transfer operation was assumed to be 333 grains per dry standard cubic foot. This concentration corresponds to that typically obtained during pneumatic transfer.

Based on this concentration, the emission rate without control is estimated as follows:

0.03 x 700 x 60 ÷ 7000 = 0.18 lbs/hr ; x990 ÷ 2000 => 0.09 TPY

(333 grains/dscf)*(700 dscf/min)*(pound/7000 grains)*(60 minutes/hour)

0.02 x 700 x 60 ÷ 7000 = 0.12 lb/hr ; x990 ÷ 2000 => 0.06 TPY

= 1,998 ≈ 2,000 pounds per hour

0.01 x 700 x 60 ÷ 7000 = 0.06 lb/hr ; x 990 ÷ 2000 => ~~0.03 TPY~~

Based on the manufacturer's data, the fabric filter has a particulate removal efficiency of 99.9%. The emission rate with control is therefore:

1,998 * (1-0.999) = 1.998 ≈ 2 pounds per hour

For the purposes of reporting the emission rates in Section III - C, the emission rates are classified as follows:

Maximum Emission Rate (lbs/hour)

The maximum particulate emission is the emission rate with control reported in pounds per hour. This emission rate is 2 pounds per hour.

Actual Emission Rate (tons/year)

The actual controlled emission rate (tons/year) is estimated as follows:

(1.998 pounds/hour)*(990 hours of transfer/year)*(ton/2000 pounds)

= 0.989 tons per year

Potential Emission Rate (pounds per year)

The potential emission rate is the total uncontrolled emission rate from the silo. This is estimated as follows:

(1998 pounds/hour)*(990 hours of transfer/year)

= 1,978,020 pounds per year (989 tons/year)

Section V - Items 4, 5

The particulate emission control device will be a fabric filter. Based on manufacturer's data, this fabric filter has a particulate removal efficiency of 99.9% for PM-10. The specifications are as follows:

AEROPULSE, Model 9SB-8 (or, equivalent)

No. of filters:	9
Filter Length:	96"
Filter Area:	87 square feet
Pressure Drop:	20 inches water

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-12

AIR PERMIT APPLICATION
FOR
RECYCLE SOLIDS STORAGE SILO

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Recycle Solids Storage Silo [x] New¹ [ ] Existing¹

APPLICATION TYPE: [x] Construction [x] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Recycle Solids Storage Silo

SOURCE LOCATION: Street West side of Fort Green Road; 3/4 miles south of county Road 630 City Polk County

UTM: East 405 North 3066500 m

Latitude 27 • 43 ' 15 "N Longitude 81 • 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: Juan

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed ______________________

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a recycle solids storage silo having a capacity of 1,350 cu. ft. The particulate emissions from the silo (during transfer) will be vented into a fabric filter having a control efficiency of 99.9%.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/transfer systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr N/A ; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? ______

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ______

   c. If yes, list non-attainment pollutants. ______

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ______

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

. Raw Materials and Chemicals Used in your Process, if applicable: N/A
(Please see addendum to the permit application)

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (Please see addendum to the permit application)

2. Product Weight (lbs/hr): N/A

. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates (PM-10)	0.0002	0.00016	12.17*	12.17*	321.4	0.1607	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Based on a transfer rate of 7.17 tons per hour, Table 610-1 of Fac Rule 17-2.610(1b) sets an allowable particulate emission rate of 12.17 pounds per hour.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Aeropulse 9SB-8	Particulates	99.9%	PM-10	Manufacturers Data
(or equivalent)				

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 43 ft. Stack Diameter: 1.5 ft.

Gas Flow Rate: 5 ACFM 5 DSCFM Gas Exit Temperature: 68 °F.

Water Vapor Content: 0 % Velocity: <1 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ____ Design Capacity (lbs/hr) ____

Approximate Number of Hours of Operation per day ____ day/wk ____ wks/yr. ____

Manufacturer ____

Date Constructed ____ Model No. ____

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ____ ft. Stack Diamter: ____ Stack Temp. ____

Gas Flow Rate: ____ ACFM ____ DSCFM* Velocity: ____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ____

Brief description of operating characteristics of control devices: ______

______

______

______

______

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

______

______

______

______

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

**Please see addendum to permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N?A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

☐ Yes ☒ No NSPS is not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

☐ Yes ☒ No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Costs:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: 2. Efficiency:[1]

3. Capital Cost: 4. Useful Life:

5. Operating Cost: 6. Energy:[2]

7. Maintenance Cost: 8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI Facility.

1. ______ no. sites ______ TSP ______ ( ) SO^{2}* ______ Wind spd/dir

Period of Monitoring ____ / ____ / ____ to ____ / ____ / ____
month day year month day year

Other data recorded ______________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. ______ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)______________________________

3. Upper air (mixing height) data obtained from (location)______________________________

4. Stability wind rose (STAR) data obtained from (location)______________________________

C. Computer Models Used

1. ______________________________ Modified? If yes, attach description.

2. ______________________________ Modified? If yes, attach description.

3. ______________________________ Modified? If yes, attach description.

4. ______________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	______________________________ grams/sec
SO^2	______________________________ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR RECYCLE SOLIDS STORAGE SILO

Section III - A

The Recycle Solids Storage Silo has a capacity of 1,350 cubic feet. The dimensions are as follows:

Height: 35 feet
Diameter: 12 feet
Vent Size: 18"
Height of vent above ground: 43 feet
Stack Gas Rate during loading: 5 SCFM

The silo will be used to store recycle solids. The particulate emissions, which are assumed to be composed entirely of PM-10, discharged due to transfer of cement will be vented into a fabric filter having a particulate control efficiency of 99.9%.

Section III - B

The silo is not used for processing any materials. It will be used for storage purposes only. The operating parameters are as follows:

Transfer Rate: 7.17 tons per hour of recycle solids
Total time for material transfer per year: 1500 hours

Section III - C

Particulate emissions are discharged during the transfer operations. It is assumed that the entire particulate matter is composed of PM-10. The particulate emissions are controlled by a fabric filter having an efficiency of 99.9% for PM-10.

Section V - Items 2, 3

The particulate emission rate was estimated based on a 2 part article Prescription for Cement Plant Dust Control, Parts 1 and 2, Rock Products, August and September 1970. The concentration (without control) of the particulate matter during the transfer operation was assumed to be 5 grains per dry standard cubic foot. This concentration corresponds to that typically obtained during mechanical transfer with cup elevator.

Based on this concentration, the emission rate without control is estimated as follows:

0.03 x 5 x 60 ÷ 7000 =

(5 grains/dscf)*(5 dscf/min)*(pound/7000 grains)*(60 minutes/hour)

0.02 x 5 x 60 ÷ 7000 = 0.000857 ⇒ 0.0009 ; x 4.2 = 0.00378 => 0.004 TPY

= 0.214 pounds per hour

Based on the manufacturer's data, the fabric filter has a particulate removal efficiency of 99.9%. The emission rate with control is therefore:

0.214 * (1-0.999) = 0.000214 pounds per hour

=> 0.00021 lb/hr

x 1500 ÷ 2000

= 0.000158

=> 0.0002 TPY

For the purposes of reporting the emission rates in Section III - C, the emission rates are classified as follows:

Maximum Emission Rate (lbs/hour)

The maximum particulate emission is the emission rate with control reported in pounds per hour. This emission rate is 0.000214 pounds per hour.

Actual Emission Rate (tons/year)

The actual controlled emission rate (tons/year) is estimated as follows:

(0.000214 pounds/hour)*(1500 hours of transfer/year)*(ton/2000 pounds)

= 0.00016 tons per year

Potential Emission Rate (pounds per year)

The potential emission rate is the total uncontrolled emission rate from the silo. This is estimated as follows:

(0.214 pounds/hour)*(1500 hours of transfer/year)

= 321.4 pounds per year (0.1607 tons/year)

Section V - Items 4, 5

The particulate emission control device will be a fabric filter. Based on manufacturer's data, this fabric filter has a particulate removal efficiency of 99.9% for PM-10. The specifications are as follows:

AEROPULSE, Model 9SB-8 (or, equivalent)

No. of filters:	9
Filter Length:	96"
Filter Area:	87 square feet
Pressure Drop:	20 inches water

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-13

AIR PERMIT APPLICATION
FOR
DRY SLOIDS STORAGE SILO

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

WIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Dry Solids Storage Silo ☒ New[1] ☐ Existing[1]

APPLICATION TYPE: ☒ Construction ☒ Operation ☐ Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Dry Solids Storage Silo

SOURCE LOCATION: Street West side of Fort Green Road; 3/4 miles south of county Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27 ° 43 ' 15 "N Longitude 81 ° 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc.

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed ______________________

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

lorida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a dry solids storage silo having a capacity of 5,000 cu. ft. The particulate emissions from the silo (during transfer) will be vented into a fabric filter having a control efficiency of 99.9%.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimated cost of the pollution control devices for the incinerator and other material handling/transfer systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr N/A ; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied?

   b. If yes, has "Lowest Achievable Emission Rate" been applied?

   c. If yes, list non-attainment pollutants.

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants?

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

(Please see addendum to the permit application)

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (Please see addendum to the permit application)

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates PM-10	0.0002	0.00061	12.17*	12.17*	1221.4	0.6107	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Based on a transfer rate of 7-17 tons per hour, Table 610-1 of Fac Rule 17-2.610(1b) sets an allowable particulate emission rate of 12-17 pounds per hour.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Aeropulse 9SB-8	Particulates	99.9%	PM-10	Manufacturers Data
(or equivalent)				

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 53 ft. Stack Diameter: 1.5 ft.

Gas Flow Rate: 5 ACFM 5 DSCFM Gas Exit Temperature: 68 °F.

Water Vapor Content: 0 % Velocity: <1 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ____________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

**Please see addendum to permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS is not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy).

[ ] Yes [X] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity* FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to this FFPI facility.

1. ________ no. sites ________ TSP ________ ( ) SO^2* ________ Wind spd/dir

Period of Monitoring ___/___/___ to ___/___/___
month day year month day year

Other data recorded ____________________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________

3. Upper air (mixing height) data obtained from (location)________________________

4. Stability wind rose (STAR) data obtained from (location)________________________

C. Computer Models Used

1. ________________________ Modified? If yes, attach description.

2. ________________________ Modified? If yes, attach description.

3. ________________________ Modified? If yes, attach description.

4. ________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	________________________	grams/sec
SO^2	________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR DRY SOLIDS STORAGE SILO

Section III - A

The Dry Solids Storage Silo has a capacity of 5,000 cubic feet. The dimensions are as follows:

Height: 45 feet
Diameter: 16 feet
Vent Size: 18"
Height of vent above ground: 53 feet
Stack Gas Rate during loading: 5 SCFM

The silo will be used to store dry solids. The particulate emissions, which are assumed to be composed entirely of PM-10, discharged due to transfer of cement will be vented into a fabric filter having a particulate control efficiency of 99.9%.

Section III - B

The silo is not used for processing any materials. It will be used for storage purposes only. The operating parameters are as follows:

Transfer Rate: 7.17 tons per hour of dry solids
Total time for material transfer per year: 5700 hours

Section III - C

Particulate emissions are discharged during the transfer operations. It is assumed that the entire particulate matter is composed of PM-10. The particulate emissions are controlled by a fabric filter having an efficiency of 99.9% for PM-10.

Section V - Items 2, 3

The particulate emission rate was estimated based on a 2 part article Prescription for Cement Plant Dust Control, Parts 1 and 2, Rock Products, August and September 1970. The concentration (without control) of the particulate matter during the transfer operation was assumed to be 5 grains per dry standard cubic foot. This concentration corresponds to that typically obtained during mechanical transfer with cup elevator.

Based on this concentration, the emission rate without control is estimated as follows: $\times 4.2 =$ 0.00546 ⇒ 0.005 TPY

5 x 0.03 x 60 ÷ 7000 = 0.00129 ⇒ 0.0013,

(5 grains/dscf)*(5 dscf/min)*(pound/7000 grains)*(60 minutes/hour)

= 0.214 pounds per hour

Based on the manufacturer's data, the fabric filter has a particulate removal efficiency of 99.9%. The emission rate with control is therefore:

0.214 * (1-0.999) = 0.000214 pounds per hour ⇒ 0.00021 lb/hr

X 5700 ÷ 2000

= 0.000599

⇒ 0.0006 TPY

For the purposes of reporting the emission rates in Section III - C, the emission rates are classified as follows:

Maximum Emission Rate (lbs/hour)

The maximum particulate emission is the emission rate with control reported in pounds per hour. This emission rate is 0.000214 pounds per hour.

Actual Emission Rate (tons/year)

The actual controlled emission rate (tons/year) is estimated as follows:

(0.000214 pounds/hour)*(5700 hours of transfer/year)*(ton/2000 pounds)

= 0.00061 tons per year

Potential Emission Rate (pounds per year)

The potential emission rate is the total uncontrolled emission rate from the silo. This is estimated as follows:

(0.214 pounds/hour)*(5700 hours of transfer/year)

= 1221.4 pounds per year (0.6107 tons/year)

Section V - Items 4, 5

The particulate emission control device will be a fabric filter. Based on manufacturer's data, this fabric filter has a particulate removal efficiency of 99.9% for PM-10. The specifications are as follows:

AEROPULSE, Model 9SB-8 (or, equivalent)

No. of filters: 9
Filter Length: 96"
Filter Area: 87 square feet
Pressure Drop: 20 inches water

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-14

AIR PERMIT APPLICATION
FOR
STEAM BOILER

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Steam Boiler [x] New[1] [ ] Existing[1]

APPLICATION TYPE: [x] Construction [x] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) #2 Fuel Oil Fired Boiler

SOURCE LOCATION: Street West side of Fort Green Road; 3/4 miles south of county Road 630 City Polk County

UTM: East $^{4}05$ North $30_{66}500^{m}$

Latitude 27 • 43 ' 15 "N Longitude 81 • 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a #2 fuel oil fired steam boiler having a maximum gross heat input of 6.2 million Btu per hour.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

N/A

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr N/A ; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant?	No
a. If yes, has "offset" been applied?	
b. If yes, has "Lowest Achievable Emission Rate" been applied?	
c. If yes, list non-attainment pollutants.	
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.	No
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII.	No
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?	No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?	No
H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source?	No

a. If yes, for what pollutants?

b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1) N/A

1. Total Process Input Rate (lbs/hr):

2. Product Weight (lbs/hr):

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2 *	Allowable[3] Emission lbs/hr *	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates	0.0875	0.368	0.0875	0.0875	0.0875	0.368	
SO_2 SO_3	2.174 0.031	9.132 0.129	2.174 0.031	2.174 0.031	2.174 0.031	9.132 0.129	
CO	0.219	0.919	0.219	0.219	0.219	0.919	
NO_X	0.875	3.675	0.875	0.875	0.875	3.675	
VOC	0.024	0.102	0.024	0.102	0.024	0.102	

[1] See Section V, Item 2. [Other Table 500-2 Pollutants - N/A]

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Bact does not apply for fossil fuel firing sources having a gross heat input less than 250 million Btu per hour. Therefore the actual emission rates will be the allowable emission rates.

D. Control Devices: (See Section V, Item 4) N/A

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
#2 Fuel Oil	31.25	43.75	6.2 million Btu/hr

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: 0.35 Percent Ash: 0.5

Density: 8 lbs/gal Typical Percent Nitrogen: 0.2%

Heat Capacity: 17,625 BTU/lb 141,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution):
N/A

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 50 ft. Stack Diameter: 1.3 (16") ft.

Gas Flow Rate: 2200 ACFM at 175°F 2250 at 250°F ACFM 1600 DSCFM Gas Exit Temperature: 175-250 °F.

Water Vapor Content: 4.5% % Velocity: 30 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ________ Design Capacity (lbs/hr) ________

Approximate Number of Hours of Operation per day ____ day/wk ____ wks/yr. ________

Manufacturer ________

Date Constructed ________ Model No. ________

	Volume (ft)³	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ________ ft. Stack Diamter: ________ Stack Temp. ________

Gas Flow Rate: ________ ACFM ________ DSCFM* Velocity: ________ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ________

Brief description of operating characteristics of control devices: ______________________

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

**Please see addendum to permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

☐ Yes ☒ No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

☐ Yes ☒ No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Costs:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: 2. Efficiency:[1]

3. Capital Cost: 4. Useful Life:

5. Operating Cost: 6. Energy:[2]

7. Maintenance Cost: 8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

N/A: PSD is not applicable to the FFPI facility.

A. Company Monitored Data

1. ____________ no. sites ____________ TSP ____________ ( ) SO^2* ____________ Wind spd/dir

Period of Monitoring ______ / ______ / ______ to ______ / ______ / ______
month day year month day year

Other data recorded ____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)__________________________

3. Upper air (mixing height) data obtained from (location)__________________________

4. Stability wind rose (STAR) data obtained from (location)__________________________

C. Computer Models Used

1. __________________________ Modified? If yes, attach description.

2. __________________________ Modified? If yes, attach description.

3. __________________________ Modified? If yes, attach description.

4. __________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	__________________________ grams/sec
SO^2	__________________________ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR STEAM BOILER

Section III - A, B

The steam boiler is a 6.2 million BTU per hour unit. It is an external combustion source, and uses #2 fuel oil as the fuel. It is expected to operate 8,400 hours a year.

The operating characteristics are as follows:

Fuel burned per hour:	43.75 gallons
Flue gas exit temperature:	175 - 250°F
Flue gas flow rate:	2000 ACFM at 175°F
Exit velocity:	30 feet per second
Discharge height:	50 feet

Section III - C

The air contaminants generated due to combustion of #2 fuel oil in the steam boiler and their emission rates were estimated using the emission factors given in the EPA Document Compilation of Air Pollutant Emission Factors, AP-42, Fourth Edition, September 1985. The emission factors for fuel oil combustion were used for estimating the emission rates of the various contaminants.

Section V - Items 2, 3

The air contaminants due to #2 fuel oil combustion consist of: particulate matter, sulfur dioxide, sulfur trioxide, carbon monoxide, nitrogen oxides, and volatile organics. The emission rates of these contaminants based on the AP-42 emission factors (Table 1.3-1, AP-42) are as follows:

Pollutant	Emission Factor (lb/1000 gallons)	Emission Rate lb/hr	tons/yr[1]
Particulate Matter	2	0.0875	0.368
Sulfur dioxide	142S[2]	2.174	9.132
Sulfur trioxide	2S[2]	0.031	0.129
Carbon monoxide	5	0.219	0.919
Nitrogen oxides	20	0.875	3.675
Organic compounds (VOC)	0.556	0.024	0.102

---

[1] The annual emission rates are based on a operating schedule of 8400 hours per year.

[2] S is the percent sulfur in the fuel.

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-15

AIR PERMIT APPLICATION

FOR

BACKUP DIESEL POWERED FIREWATER PUMP

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Backup Diesel Powered Firewater Pump [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [X] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. **COUNTY:** Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Backup Diesel Powered Firewater Pump

SOURCE LOCATION: Street West Side of Fort Green Road; 3/4 Miles South of County Road 630 City Polk County

UTM: East 4 05 North 30 500m 66

Latitude 27 ° 43 ' 15 "N Longitude 81 ° 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-89 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed Dick M. Miller

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a 131 HP backup diesel powered firewater pump. The maximum expected annual hours of operation are 100 hours.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

N/A

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

Maximum Annual Operating Time: 100 Hours

E. Requested permitted equipment operating time: hrs/day – ; days/wk – ; wks/yr – ;

if power plant, hrs/yr – ; if seasonal, describe: –

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? ______

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ______

   c. If yes, list non-attainment pollutants. ______

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ______

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A
2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates	0.147	0.007	0.147	0.147	0.147	0.007	
CO	0.446	0.022	0.446	0.446	0.446	0.022	
VOC	0.164	0.008	0.164	0.164	0.164	0.008	
NOx	2.052	0.103	2.052	2.052	2.052	0.103	
SOx	0.137	0.007	0.137	0.137	0.137	0.007	
Aldehydes	0.031	0.002	0.031	0.031	0.031	0.002	

[1] See Section V, Item 2. [Other Table 500-2 Pollutants - N/A]

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4) N/A

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Diesel	N/A	4.375	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: 0.5% Percent Ash: 0.5%

Density: 8 lbs/gal Typical Percent Nitrogen: 1%

Heat Capacity: 17,625 BTU/lb 141,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution): N/A

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 10 ft. Stack Diameter: 5 inches ft.

Gas Flow Rate: 200 ACFM at 175°F 225 @ 250°F ACFM 1600 DSCFM Gas Exit Temperature: 175-250°F °F.

Water Vapor Content: 5% % Velocity: 30 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ____ day/wk ____ wks/yr. ____

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ____ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ______

______

______

______

______

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

______

______

______

______

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS**

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

** Please see addendum to permit application.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System: 2. Operating Principles:

3. Efficiency:* 4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

---

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. __________ no. sites __________ TSP __________ ( ) SO^{2}* __________ Wind spd/dir

Period of Monitoring ____ / ____ / ____ to ____ / ____ / ____
month day year month day year

Other data recorded ____________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________

3. Upper air (mixing height) data obtained from (location)________________________

4. Stability wind rose (STAR) data obtained from (location)________________________

C. Computer Models Used

1. ________________________ Modified? If yes, attach description.

2. ________________________ Modified? If yes, attach description.

3. ________________________ Modified? If yes, attach description.

4. ________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	________________________	grams/sec
SO^2	________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR BACKUP DIESEL POWERED FIREWATER PUMP

Section III - A, B

The backup diesel firewater pump is a 131 HP unit which will be used to pump firewater during an emergency situation. It is an internal combustion source, and uses diesel as the fuel. Since it is a backup device, the operating schedule is not known. For the purposes of reporting an operating schedule in the permit application, it is estimated that the maximum total annual operating time will be 100 hours.

The operating characteristics are as follows:

Fuel burned per hour:	4.375 gallons
Flue gas exit temperature:	175 - 250°F
Flue gas flow rate:	2000 ACFM at 175°F
Exit velocity:	30 feet per second
Discharge height:	10 feet

Section III - C

The air contaminants generated due to combustion of diesel fuel in the backup diesel firewater pump and their emission rates were estimated using the emission factors given in the EPA Document Compilation of Air Pollutant Emission Factors, AP-42, Fourth Edition, September 1985. The emission factors for gasoline or diesel powered industrial equipment were used for estimating the emission rates of the various contaminants.

Section V - Items 2, 3

The air contaminants due to diesel fuel combustion consist of: particulate matter, carbon monoxide, volatile organics, nitrogen oxides, sulfur oxides, and aldehydes. The emission rates of these contaminants based on the AP-42 emission factors (Table 3.3-1, AP-42) are as follows:

Pollutant	Emission Factor (lb/1000 gallons)	Emission Rate lb/hr	tons/yr[1]
Particulate Matter	33.5	0.147	0.007
Carbon monoxide	102	0.446	0.022
Organic compounds (VOC)	37.5	0.164	0.008
Nitrogen oxides	469	2.052	0.103
Sulfur oxides	31.2	0.137	0.007
Aldehydes	7.04	0.031	0.002

---

[1] The annual emission rates are based on a operating schedule of 100 hours per year.

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-16

AIR PERMIT APPLICATION
FOR
BACKUP DIESEL GENERATOR

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Backup Diesel Generator [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [X] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Backup Diesel Generator

SOURCE LOCATION: Street West Side of Fort Green Road; 3/4 Miles South of County Road 630 City Polk County

UTM: East 405 North 30 66 500m

Latitude 27 ° 43 ' 15 "N Longitude 81 ° 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc.

I certify that the statements made in this application for a Construction & Operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-84 Telephone No. (803) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed Dick M Miller

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers a 785 HP backup diesel generator. The maximum expected annual hours of operation are 100 hours.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Spring/Summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

N/A

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

Maximum Annual Operating Time: 100 Hours

E. Requested permitted equipment operating time: hrs/day - ; days/wk - ; wks/yr - ;

if power plant, hrs/yr ____; if seasonal, describe: ____
N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
   - a. If yes, has "offset" been applied? ____
   - b. If yes, has "Lowest Achievable Emission Rate" been applied? ____
   - c. If yes, list non-attainment pollutants. ____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   - a. If yes, for what pollutants? ____
   - b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates	1.441	0.072	1.441	1.441	1.441	0.072	
CO	4.386	0.219	4.386	4.386	4.386	0.219	
VOC	1.613	0.081	1.613	1.613	1.613	0.081	
NOx	20.167	1.008	20.167	20.167	20.167	1.008	
SOx	1.342	0.067	1.342	1.342	1.342	0.067	
Aldehydes	0.303	0.015	0.303	0.303	0.303	0.015	

[1] See Section V, Item 2.   Other Table 500-2 Pollutants - N/A

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4) N/A

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Diesel	N/A	43 gals	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: 0.5% Percent Ash: 0.5%

Density: 8 lbs/gal Typical Percent Nitrogen: 1%

Heat Capacity: 17,625 BTU/lb 141,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution): N/A

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 10 ft. Stack Diameter: 13 ft.

Gas Flow Rate: 2000 ACFM at 175°F 2250 @ 250°F ACFM ____ DSCFM Gas Exit Temperature: 175-250°f °F.

Water Vapor Content: 5% % Velocity: 30 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ____ Design Capacity (lbs/hr) ____

Approximate Number of Hours of Operation per day ____ day/wk ____ wks/yr. ____

Manufacturer ____

Date Constructed ____ Model No. ____

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ____ ft. Stack Diamter: ____ Stack Temp. ____

Gas Flow Rate: ____ ACFM ____ DSCFM* Velocity: ____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ____

Brief description of operating characteristics of control devices: ____________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

** Please see addendum to permit application

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity* FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Costs:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: 2. Efficiency:[1]

3. Capital Cost: 4. Useful Life:

5. Operating Cost: 6. Energy:[2]

7. Maintenance Cost: 8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

---

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility

1. ________ no. sites ________ TSP ________ ( ) SO2* ________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ________________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)____________________

3. Upper air (mixing height) data obtained from (location)____________________

4. Stability wind rose (STAR) data obtained from (location)____________________

C. Computer Models Used

1. ____________________ Modified? If yes, attach description.

2. ____________________ Modified? If yes, attach description.

3. ____________________ Modified? If yes, attach description.

4. ____________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	____________________	grams/sec
SO^2	____________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR BACKUP DIESEL GENERATOR

Section III - A, B

The backup diesel generator is a 785 HP unit which will be used as a to generate power during an emergency situation. It is an internal combustion source, and uses diesel as the fuel. Since it is a backup device, the operating schedule is not known. For the purposes of reporting an operating schedule in the permit application, it is estimated that the maximum total annual operating time will be 100 hours.

The operating characteristics are as follows:

Fuel burned per hour:	43 gallons
Flue gas exit temperature:	175 - 250°F
Flue gas flow rate:	2000 ACFM at 175°F
Exit velocity:	30 feet per second
Discharge height:	10 feet

Section III - C

The air contaminants generated due to combustion of diesel fuel in the backup diesel generator and their emission rates were estimated using the emission factors given in the EPA Document Compilation of Air Pollutant Emission Factors, AP-42, Fourth Edition, September 1985. The emission factors for gasoline or diesel powered industrial equipment were used for estimating the emission rates of the various contaminants.

Section V - Items 2, 3

The air contaminants due to diesel fuel combustion consist of: particulate matter, carbon monoxide, volatile organics, nitrogen oxides, sulfur oxides, and aldehydes. The emission rates of these contaminants based on the AP-42 emission factors (Table 3.3-1, AP-42) are as follows:

Pollutant	Emission Factor (lb/1000 gallons)	Emission Rate lb/hr	tons/yr[1]
Particulate Matter	33.5	1.441	0.072
Carbon monoxide	102	4.386	0.219
Organic compounds (VOC)	37.5	1.613	0.081
Nitrogen oxides	469	20.167	1.008
Sulfur oxides	31.2	1.342	0.067
Aldehydes	7.04	0.303	0.015

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[1] The annual emission rates are based on a operating schedule of 100 hours per year.

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-17

AIR PERMIT APPLICATION

FOR

#2 FUEL OIL STORAGE TANK

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: #2 Fuel Oil Storage Tank [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [X] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) #2 fuel oil tank (20,000 gallon nominal capacity)

SOURCE LOCATION: Street west side of Fort Green Rd., 3/4 miles south of County Road 630 City Polk County

UTM: East 405 North 3066500m

Latitude 27° 43' 15"N Longitude 81° 57' 45"W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, I

I certify that the statements made in this application for a construction & operation permit are true, correct and complete to the best of my knowledge and belief. Furthe I agree to maintain and operate the pollution control source and pollution contr facilities in such a manner as to comply with the provision of Chapter 403, Flori Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferab and I will promptly notify the department upon sale or legal transfer of the permitt establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-94 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project hav been designed/examined by me and found to be in conformity with modern engineeri principles applicable to the treatment and disposal of pollutants characterized in t permit application. There is reasonable assurance, in my professional judgment, tha

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed Dick M. Miller

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers 1 20,000 gallon (nominal capacity) #2 fuel oil storage tank.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction spring/summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

N/A

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr_____; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant?	No
a. If yes, has "offset" been applied?	
b. If yes, has "Lowest Achievable Emission Rate" been applied?	
c. If yes, list non-attainment pollutants.	
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.	No
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII.	No
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?	No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?	No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

a. If yes, for what pollutants?__________

b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Please see addendum to the permit application

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
#2 fuel oil vapors	0.355	0.0125	0.355*	0.355*	24.91	0.0125	

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

*Since there are no specific allowable emission limits for storage tanks, the calculated emission rates are reported.

D. Control Devices: (See Section V, Item 4) N/A

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: N/A

Percent Ash: N/A

Density: ______ lbs/gal

Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb

______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A

Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack): N/A

Stack Height: ____________ ft. Stack Diameter: ____________ ft.

Gas Flow Rate: ________ ACFM ________ DSCFM Gas Exit Temperature: ____________ °F.

Water Vapor Content: ____________ % Velocity: ____________ FPS

Tank will have a vent approximately 30' above ground.

SECTION IV: INCINERATOR INFORMATION

N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) ____________ Design Capacity (lbs/hr) ____________

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ____________

Date Constructed ____________ Model No. ____________

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ________ ft. Stack Diamter: ____________ Stack Temp. ____________

Gas Flow Rate: ____________ ACFM ____________ DSCFM* Velocity: ____________ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ____________

Brief description of operating characteristics of control devices: ____________________

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS*

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

*Please see addendum.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS are not applicable to this source

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No BACT is not applicable to this source

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:

2. Operating Principles:

3. Efficiency:*

4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

---

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. ________ no. sites ________ TSP ________( ) SO^{2}* ________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ________________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________________

3. Upper air (mixing height) data obtained from (location)________________________

4. Stability wind rose (STAR) data obtained from (location)________________________

C. Computer Models Used

1. ________________________________ Modified? If yes, attach description.

2. ________________________________ Modified? If yes, attach description.

3. ________________________________ Modified? If yes, attach description.

4. ________________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	____________________	grams/sec
SO^2	____________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO THE PERMIT APPLICATION FOR #2 FUEL OIL STORAGE TANK

Section V - Items 2, 3

The air pollutant emission rates were estimated using the EPA Document Compilation of Air Pollutant Emission Factors, AP-42, Third Edition, January 1984.

There are two types of losses from tanks:

1. Breathing losses (or, standing storage losses), and
2. Working losses (due to loading/unloading)

Breathing losses from tanks are estimated using the following equation:

$$L_B = 0.0226*M*((P/14.7-P)^{0.68})*(D^{1.73})*(H^{0.51})*(\Delta T^{0.5})*F_P*C*K_C$$

where,
L_B = Breathing losses of substance in the tank (lb/yr)
M = Molecular weight of substance in the tank (lb/lb mole)
P = True vapor pressure of the substance in tank (psia)
D = Diameter of the tank (ft)
H = Height of vapor space in the tank (ft)
ΔT = Average ambient diurnal temperature change (F°)
F_P = Paint factor (dimensionless)
C = Tank diameter adjustment factor (dimensionless)
K_C = Product factor (dimensionless)

Working losses from tanks are estimated using the following equation:

$$L_W = 0.024*M*P*K_N*K_C$$

where,
L_W = Working losses of substance (lb/10^3 gal throughput)
M = Molecular weight of substance (lb/lb mole)
P = True vapor pressure of substance (psia)
K_N = Turnover factor (dimensionless)
K_C = Product factor (dimensionless)

The working losses computed using this equation can be converted to lbs/hr, and lbs/yr by multiplying L_W by the filling rate (thousands of gallons per hour) and the annual throughput (thousands of gallons per year) respectively.

11-30-89 TR
1/2 @ ok

For #2 Fuel Oil:

M = 130 lbs/lb mole (Table 4.3-1, AP-42)
P = 0.009 psia at 70°F (Table 4.3-1, AP-42)
K_C = 0.65 (for bbreathing losses)
K_C = 0.84 (for working losses)

For the tank (Tank T-10):

D = 12 feet
H = 5.0 feet (assume tank is 80% full)
C = 0.63 (Figure 4.3-4, AP-42)

F_P = 1.4 for tanks not painted white (Table 4.3-2, AP-42)
K_N = 1.0 (Figure 4.3-7, AP-42)
Filling rate = 250 GPM[1] (15,000 Gallons Per Hour)
Annual Throughput[2] = 700,000 gallons
and, ΔT = 20.8°F based on The Weather Almanac

Substituting all the above data in the two equations gives:

L_B = 8.4 lbs/yr (0.00096 lbs/hr)

L_W = 0.0236 lbs/10^3 gallon throughput

Hourly working losses are computed as follows:

0.0236 lbs/10^3 gal throughput * 15,000 gal/hr = 0.354 lb/hr

The annual working losses (without control) are:

0.0236 lbs/10^3 gal throughput * 700,000 gal/yr = 16.51 lbs/yr

There are no air pollution control devices to control the minute vapors of #2 fuel oil generated from the tank.

For the purposes of reporting the emission rates in Section III-C, the emissions rates are classified as follows:

Maximum (lbs/hr) .

The maximum emission rate is obtained when the tank is being filled. This is estimated as follows:

Uncontrolled breathing losses (lbs/hr) = 0.00096

Uncontrolled working losses during filling (lbs/hr) = 0.354

Total uncontrolled losses = 0.00096 + 0.354 = 0.35496 ≈ 0.355 lbs/hr

Actual (tons/yr)

The actual controlled emission rate (tons/yr) is obtained by adding the total uncontrolled breathing and working losses (lbs/yr) and dividing the sum

---

[1] The filling rate of 250 GPM is based on the rating of the centrifugal pump servicing the tank. This information was provided by the manufacturer.

[2] The annual throughput was estimated based on the fact that one burner in the Secondary Combustion Chamber always burns #2 fuel oil. This burner is rated at 13 MM Btu/hr. Based on the number of hours the incineration is in operation per year, this translates to about 665,700 gallons of #2 oil burned per year. For the purposes of this calculation, the annual throughput was rounded off to 700,000 gallons.

by 2,000 to convert from pounds per year to tons per year.

Total uncontrolled breathing losses = 8.4 lbs/yr

Total uncontrolled working losses = 16.51 lbs/yr

Total uncontrolled losses = 24.91 lbs/yr (0.0125 tons/yr)

Potential emission rate (lbs/yr)

The potential emission rate is the total uncontrolled emission rate from the tank. Since there is no air pollution control device this emission rate is the same as the "Actual" emission rate, reported above.

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-18

AIR PERMIT APPLICATION
FOR
STABILIZATION MIXER AND FLYASH/CEMENT WEIGH HOPPER

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Stabilization Mixer & Flyash/Cement Weigh Hopper [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [x] Construction [x] Operation [ ] Modification

COMPANY NAME: Florida First Processing, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Stabilization Mixer & Flyash/ Cement Weigh Hopper

SOURCE LOCATION: Street West side of Fort Green Road; 3/4 miles South of County Road 630 City Polk County

UTM: East $^{4}05$ North $^{30}{}_{66}{}^{500}$m

Latitude 27 ° 43 ' 15 "N Longitude 81 ° 57 ' 45 "W

APPLICANT NAME AND TITLE: Juan J. Gutierrez, President, Florida First Processing, Inc.

APPLICANT ADDRESS: 7926 Jones Branch Drive, Suite 1100, McLean, VA 22102

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida First Processing, Inc.

I certify that the statements made in this application for a construction & operation permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Juan J. Gutierrez, President, FFPI
Name and Title (Please Type)

Date: 9-28-84 Telephone No. (703) 893-3518

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed

Dick M. Miller
Name (Please Type)

International Waste Energy Systems, Inc.
Company Name (Please Type)

2150 Kienlen Avenue, St. Louis, MO 63121
Mailing Address (Please Type)

Florida Registration No. 20927 Date: 9/25/89 Telephone No. (314) 389-7275

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This permit application covers transfer of flyash and cement to weigh hopper by screw conveyor. The particulate emissions generated during transfer will be vented into a fabric filter having a particulate control efficiency of 99.9%.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction spring/summer 1990 Completion of Construction 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The estimate cost of the pollution control devices for the incinerator and other material handling/transfer systems is over $5,000,000. A detailed breakdown of the individual pollution control devices is not applicable at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ;

if power plant, hrs/yr N/A ; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied?

   b. If yes, has "Lowest Achievable Emission Rate" been applied?

   c. If yes, list non-attainment pollutants.

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants?

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A:

(Please see addendum to the permit application)

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A (Please see addendum to permit application)

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates	0.00051	0.00025	23*	23*	509.1	0.2545	
(PM-10)							

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

* Based on a transfer rate of 20 tons per hour, Table 610-1 of F.A.C. Rule 17-2.610(1b) sets an allowable particulate emission rate of 23 pounds per hour.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Aeropulse 9SB-8 (or Equivalent)	Particulates	99.9%	PM-10	Manufacturer's Data

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: N/A Percent Ash: N/A

Density: ________ lbs/gal Typical Percent Nitrogen: ________

Heat Capacity: ________ BTU/lb ________ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ________

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 30 ft. Stack Diameter: 1.5 ft.

Gas Flow Rate: 5 ACFM 5 DSCFM Gas Exit Temperature: 68 °F.

Water Vapor Content: 0 % Velocity: < 1 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste N/A

Total Weight Incinerated (lbs/hr) Design Capacity (lbs/hr)

Approximate Number of Hours of Operation per day day/wk wks/yr.

Manufacturer

Date Constructed Model No.

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ft. Stack Diamter: Stack Temp.

Gas Flow Rate: ACFM DSCFM* Velocity: FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify)

Brief description of operating characteristics of control devices: ____________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

** Please see addendum to permit application

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No NSPS are not applicable to this source.

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No BACT is not applicable to this source.

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity* FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Costs:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: 2. Efficiency:[1]

3. Capital Cost: 4. Useful Life:

5. Operating Cost: 6. Energy:[2]

7. Maintenance Cost: 8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

---

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data N/A: PSD is not applicable to the FFPI facility.

1. ____________no. sites ____________ TSP ____________( ) SO^2* ____________ Wind spd/dir

Period of Monitoring ______/______/______ to ______/______/______
month day year month day year

Other data recorded ____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________

3. Upper air (mixing height) data obtained from (location)________________________

4. Stability wind rose (STAR) data obtained from (location)________________________

C. Computer Models Used

1. ________________________ Modified? If yes, attach description.

2. ________________________ Modified? If yes, attach description.

3. ________________________ Modified? If yes, attach description.

4. ________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	________________________	grams/sec
SO^2	________________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO PERMIT APPLICATION FOR STABILIZATION MIXER & FLYASH/CEMENT WEIGH HOPPER

Section III - A

Flyash and cement (1:1 ratio) will be transferred to weigh hopper by a screw conveyor at a transfer rate of 20 tons per hour. The particulate emissions, which are assumed to be composed entirely of PM-10, discharged due to transfer of flyash and cement will be vented into a fabric filter having a particulate control efficiency of 99.9%.

Section III - B

Processing of materials is not carried out. The only operation that is carried out is material transfer. The operating parameters are as follows:

Transfer Rate: 20 tons per hour of flyash and cement
Total time for material transfer per year: 990 hours

Section III - C

Particulate emissions are discharged during the transfer operations. It is assumed that the entire particulate matter is composed of PM-10. The particulate emissions are controlled by a fabric filter having an efficiency of 99.9% for PM-10.

Section V - Items 2, 3

The particulate emission rate was estimated based on a 2 part article Prescription for Cement Plant Dust Control, Parts 1 and 2, Rock Products, August and September 1970. The concentration (without control) of the particulate matter during the transfer operation was assumed to be 5 grains per dry standard cubic foot. This concentration corresponds to that typically obtained during mechanical transfer with cup elevator.

Based on this concentration, the emission rate without control is estimated as follows:

(5 grains/dscf)*(12 dscf/min)*(pound/7000 grains)*(60 minutes/hour)

0.02 × 12 ÷ 7000 × 60 = 0.002057 => 0.0021 lb/hr

= 0.514 pounds per hour

× 4.2 = 0.0088 => 0.009 TPY

Based on the manufacturer's data, the fabric filter has a particulate removal efficiency of 99.9%. The emission rate with control is therefore:

0.514 * (1-0.999) = 0.000514 pounds per hour => 0.00051)

× 990 ÷ 2000 => 0.00025 TPY

For the purposes of reporting the emission rates in Section III - C, the emission rates are classified as follows:

Maximum Emission Rate (lbs/hour)

The maximum particulate emission is the emission rate with control reported in pounds per hour. This emission rate is 0.000514 pounds per hour.

Actual Emission Rate (tons/year)

The actual controlled emission rate (tons/year) is estimated as follows:

(0.000514 pounds/hour)*(990 hours of transfer/year)*(ton/2000 pounds)

= 0.00025 tons per year

Potential Emission Rate (pounds per year)

The potential emission rate is the total uncontrolled emission rate from the hopper. This is estimated as follows:

(0.514 pounds/hour)*(990 hours of transfer/year)

= 509.1 pounds per year (0.2545 tons/year)

Section V - Items 4, 5

The particulate emission control device will be a fabric filter. Based on manufacturer's data, this fabric filter has a particulate removal efficiency of 99.9% for PM-10. The specifications are as follows:

AEROPULSE, Model 9SB-8 (or, equivalent)

No. of filters:	9
Filter Length:	96"
Filter Area:	87 square feet
Pressure Drop:	20 inches water

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-19

LETTER OF AUTHORIZATION OF REPRESENTATIVE OF FLORIDA FIRST PROCESSING, INC.

The first submission (Revision 0) of the FFPI RCRA Part B and Air Permit Application contained an unsigned Letter of Authorization designating Mr. Juan Gutierrez as the authorized representative of FFPI. This was submitted in conjunction with the "Statements by Applicant and Engineer" contained in DER Form 17-1.202(1). This Letter of Authorization was inadvertently included in the first submission. Mr. Juan Gutierrez is the President and Owner of FFPI. According to the Statement contained in DER Form 17-1.202(1), a Letter of Authorization is not required for completion of the Statement if the Applicant is the Owner of the facility. The Letter of Authorization has therefore been removed from this submission (Revision 1) of the Application.

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-20

CALCULATIONS OF FAC TABLE 500-2 POLLUTANT EMISSIONS FROM PROPOSED INCINERATOR

INCINERATOR EMISSIONS CALCULATIONS

Introduction

Table L-5-1 (Section L) presents a summary of the maximum estimated hourly and annual emissions of the pollutants listed in FAC Table 500-2. These estimates are based on a total incinerator waste feed rate of 16,550 pounds per hour, and an exhaust gas rate of 68,555 acfm at 365°F (27,682 dscfm at 68°F). The annual operating hours are estimated be 8,400. Sample calculations for the emission rates of selected pollutants are presented in the following sections.

Emission rate of Sulfur dioxide

It is estimated that the maximum sulfur content in the waste fed to the incinerator will be 1%. The uncontrolled emission rate of SO_2 will therefore be:

(16,550 lb waste/hr) * (1 lb sulfur/100 lb waste) * (2 lbs SO_2/1 lb sulfur)

= 331 lb/hr

The spray dryer absorber (SDA) is estimated to have reduce the SO_2 emissions by an extent of 90%. The controlled emission rate therefore will be:

331 * (1-0.90) = 33.1 lb/hr

Emission Rate of Particulates

It is assumed that the entire particulate matter will be composed on PM-10. The particulate emission rate will not exceed 0.08 gr/dscf corrected to 7% O_2. Based on this, the actual particulate concentration in the stack gases can be estimated as follows:

$C_{7\%O2}$ = C*(20.9 - 7.0)/(20.9 - Actual O_2 content in exhaust)

where, $C_{7\%O2}$ = particulate concentration corrected to 7% O_2

C = Actual particulate concentration

The oxygen content in the stack gases is estimated to be 4.581% by volume. Therefore the actual concentration of particulates will be:

0.08 gr/dscf * (20.9 - 4.581)/(20.9 - 7.0)

= 0.0939 gr/dscf

The hourly emission rate of particulates in pounds per hour is estimated to be:

(0.0939 gr/dscf) * (lb/7,000 gr) * (27,682 dcfm) * (60 min/hr)

= 22.29 lb/hr

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-21

CALCULATION OF INCINERATOR STACK EMISSIONS RESULTING FROM USE OF INORGANIC WASTE TREATMENT SYSTEM FILTRATE AS SDA MAKEUP WATER

Filtrate from the inorganic waste treatment system will be used as makeup water in the incinerator spray dryer absorber. The emissions from the SDA resulting from the use of the filtrate has been calculated, based on the maximum concentration of regulated pollutants in the filtrate, and a total filtrate feed rate to the SDA of 25,000 liters/hr. The maximum concentration of pollutants listed in FAC Table 500-2, carcinogenic and noncarcinogenic metals, and other pollutants in the filtrate are shown in Table 1, based on the treatment system design. Emissions from the use of the filtrate in the spray dryer absorber, based on these maximum concentrations are included in Table 2. The removal efficiencies of the spray dryer absorber and fabric filter for metals and acid gases fed to the SDA with the filtrate feed will be the same as the removal efficiencies for these substances fed to the SDA with the exhaust gas from the SCC. The removal efficiency for water-soluble organic compounds (phenols) has been assumed to be zero.

For example, the maximum concentration of lead in the filtrate will be 5.0 mg/liter. At a total filtrate feed rate of 25,000 liters per hour, this concentration corresponds to a total lead feed rate of:

(5.0 mg/l)/((1000 mg/gm)x(453.6 gm/lb)) x 25,000 l/hr = 0.2755 lb/hr

At the EPA assumed control effieicieny of 95 percent, this corresponds to a total lead emission rate resulting from the filtrate feed of:

0.275 lb/hr x (1-.95) = 0.0138 lb/hr or 0.0579 tons per year

This is added to the total lead feed rate resulting from the waste feed to the incinerator rotary kiln and secondary combustion chamber of 23.17 lb/hr corresponding to 0.14 percent lead in the total waste feed of 16,550 lb/hr.

The total emission rate of lead resulting from the waste feed is 1.16 lb/hr at the EPA assumed control efficiency of 95 percent. The total lead feed rate to the incinerator system is therefore 23.4 lb/hr, and total emission rate is 1.17 lb/hr or 4.92 tons per year. Emissions calculations for the incinerator are further discussed in Section L of the Application

The use of filtrate as makeup water to the spray dryer absorber will increase the total feed rate of solid material to the SDA by approximately 20 percent from that if fresh water were to be used. The total feed rate of solid materials to the SDA, including fresh lime slurry, recycled lime slurry and solids, and inorganic waste treatment system filtrate, is approximately 12,000 lb/hr, of which 2,000 lb/hr is the result of the filtrate feed. The increased loading of solid material will not affect the total particulate emissions from the incinerator stack. Emissions from the spray dryer absorber and fabric filter will be no greater than 0.08 gr/dscf corrected to 7 percent O_2 in the exhaust gas, in accordance with RCRA regulations.

Table 2 illustrates that the increased emissions of organic compounds, metals, and other compounds through the incinerator stack resulting from the use of such liquid wastes in the spray dryer absorber represent only a small percentage of the total incinerator stack emissions. Spreadsheets used in calculating the effect of filtrate use on incinerator stack emissions are reproduced in Table 3. Table 3 also shows the calculation of fugitive volatile organic compound emissions from the treatment system.

TABLE 1

MAXIMUM CONCENTRATIONS OF POLLUTANTS IN INORGANIC WASTE TREATMENT FILTRATE

POLLUTANT		MAXIMUM CONCENTRATION (mg/l)
TABLE 500-2 POLLUTANTS		
SULFUR DIOXIDE	(SO_2)	NOT DETECTABLE
NITROGEN OXIDES	(NO_x)	NOT DETECTABLE
CARBON MONOXIDE	(CO)	NOT DETECTABLE
ORGANIC COMPOUNDS	(VOC)[1]	1.0
PARTICULATE	(PM-10)	80.0
REDUCED SULFUR	(as H_2S)	0.5
SULFURIC ACID MIST	(as SO_4)	NOT DETECTABLE
TOTAL FLUORIDES	(as F^-)	10.0
VINYL CHLORIDE		NOT DETECTABLE
LEAD	(Pb)	5.0
MERCURY	(Hg)	3.0
ASBESTOS		NOT DETECTABLE
BERYLLIUM	(Be)	0.02
CARCINOGENIC AND NONCARCINOGENIC METALS		
ARSENIC	(As)	4.0
BERYLLIUM	(Be)	0.02
CADMIUM	(Cd)	0.05
CHROMIUM	(Cr^{+6})	0.2
ANTIMONY	(Sb)	5.0
BARIUM	(Ba)	5.0
LEAD	(Pb)	3.0
MERCURY	(Hg)	3.0
SILVER	(Ag)	5.0
THALLIUM	(Tl)	5.0
OTHER POLLUTANTS		
HYDROGEN CYANIDE	(as CN^-)	0.5
HYDROGEN CHLORIDE	(as Cl^-)	0.5
PHOSPHATE	(as P)	10.0
AMMONIA	(as N)	25.0
PHENOL		1.0

---

[1] Based on a total soluble VOC concentration (as phenol) of 5.5 mg/l in the waste feed to the inorganic waste treatment system, a total inorganic waste feed rate of 10,000 lb/hr, and a total filtrate generation rate of 25,000 l/hr. Calculations are presented in Appendix __ of the Air Permit Application.

TABLE 2

EMISSIONS OF POLLUTANTS RESULTING FROM THE USE OF INORGANIC WASTE TREATMENT SYSTEM FILTRATE IN THE INCINERATOR SPRAY DRYER ABSORBER

		EMISSIONS RESULTING FROM USE OF TREATMENT SYSTEM FILTRATE IN SDA[2]		TOTAL EMISSIONS FROM FFPI INCINERATOR STACK[3]	
POLLUTANT		lb/hr	tons/yr	lb/hr	tons/yr
TABLE 500-2 POLLUTANTS					
SULFUR DIOXIDE	(SO_2)	NOT DETECTABLE		33.1	138.9
NITROGEN OXIDES	(NO_x)	NOT DETECTABLE		22.79	95.72
CARBON MONOXIDE	(CO)	NOT DETECTABLE		12.06	50.66
ORGANIC COMPOUNDS	(VOC)	0.055	0.230	1.66	6.95
PARTICULATE	(PM-10)	included in total		22.29	93.60
REDUCED SULFUR	(as H_2S)	0.0293	0.123	0.0293	0.123
SULFURIC ACID MIST	(as SO_4)	NOT DETECTABLE		1.65	6.94
TOTAL FLUORIDES	(as HF)	0.0508	0.244	1.22	5.11
VINYL CHLORIDE		NOT DETECTABLE		0.0166	0.0695
LEAD	(Pb)	0.0138	0.0579	1.17	4.92
MERCURY	(Hg)	0.0000165	0.0000695	0.828	3.48
ASBESTOS		NOT DETECTABLE		NOT DETECTABLE	
BERYLLIUM	(Be)	0.00000276	0.0000116	0.00331	0.014
CARCINOGENIC AND NONCARCINOGENIC METALS					
ARSENIC	(As)	0.0110	0.0463	0.0938	0.394
BERYLLIUM	(Be)	0.00000276	0.0000116	0.00331	0.014
CADMIUM	(Cd)	0.000138	0.000579	0.166	0.696
CHROMIUM	(Cr^{+6})	0.00011	0.000463	0.0498	0.209
ANTIMONY	(Sb)	0.0138	0.0579	2.50	10.5
BARIUM	(Ba)	0.00276	0.0116	0.499	2.10
LEAD	(Pb)	0.0138	0.0579	1.17	4.92
MERCURY	(Hg)	0.0000165	0.0000695	0.828	3.48
SILVER	(Ag)	0.0000551	0.000232	0.497	2.09
THALLIUM	(Tl)	0.000276	0.00116	0.828	3.48

---

[2] Emission calculations are based on the maximum concentration of each listed compound in the filtrate feed, and a total filtrate feed rate to the SDA of 25,000 liters/hr.

[3] Total incinerator emissions are based on a total waste feed rate of 16,550 lb/hr and a maximum exhaust gas rate of 68,555 acfm at a stack temperature if 365 degrees F.

TABLE 2 (continued)

EMISSIONS OF POLLUTANTS RESULTING FROM THE USE OF INORGANIC WASTE TREATMENT SYSTEM FILTRATE IN THE INCINERATOR SPRAY DRYER ABSORBER

		EMISSIONS RESULTING FROM USE OF TREATMENT SYSTEM FILTRATE IN SDA[4]		TOTAL EMISSIONS FROM FFPI INCINERATOR STACK[5]	
POLLUTANT		lb/hr	tons/yr	lb/hr	tons/yr
OTHER POLLUTANTS					
HYDROGEN CYANIDE	(as HCN)	0.0138	0.0579	0.0138	0.0579
HYDROGEN CHLORIDE	(as HCl)	0.000283	0.00119	12.4	51.9
AMMONIA	(as N)	0.0335	0.141	0.0335	0.141
PHENOL		0.0551	0.232	0.0551	0.232
PHOSPHORUS	(as $P_{20}5$)	0.130	0.548	0.130	0.548

---

[4] Emission calculations are based on the maximum concentration of each listed compound in the filtrate feed, and a total filtrate feed rate to the SDA of 25,000 liters/hr.

[5] Total incinerator emissions are based on a total waste feed rate of 16,550 lb/hr and a maximum exhaust gas rate of 68,555 acfm at a stack temperature if 365 degrees F.

TABLE 3

IMPACT OF USE OF INORGANIC TREATMENT SYSTEM FILTRATE ON INCINERATOR STACK EMISSIONS

TABLE 500-2 POLLUTANTS		TOTAL CONSTITUENT EMISSIONS FROM SDA (pounds/hour)	TOTAL CONSTITUENT EMISSIONS FROM SDA (tons per year)
SULFUR DIOXIDE	S02	not detectable	not detectable
NITROGEN OXIDES	NOX	not detectable	not detectable
CARBON MONOXIDE	CO	not detectable	not detectable
ORGANIC COMPOUNDS	VOC^	5.51E-02	2.32E-01
FUGITIVE ORGANICS	VOC	1.00E-01	4.20E-01
PARTICULATE ^^	PM-10	not detectable	not detectable
REDUCED SULFUR (as H2S)		2.93E-02	1.23E-01
SULFURIC ACID MIST		not detectable	not detectable
TOTAL FLUORIDES (as HF)		5.80E-02	2.44E-01
VINYL CHLORIDE		not detectable	not detectable
LEAD	Pb	1.38E-02	5.79E-02
MERCURY	Hg	1.65E-05	6.95E-05
ASBESTOS		not detectable	not detectable
BERYLLIUM	Be	2.76E-06	1.16E-05

^^ PARTICULATE IS ASSUMED TO BE ENTIRELY COMPOSED OF PM-10

^ ORGANIC COMPOUND EMISSIONS CALCULATED AS TOTAL PHENOLS AND DO NOT INCLUDE FUGITIVE EMISSIONS

OTHER POLLUTANTS		TOTAL CONSTITUENT EMISSIONS FROM SDA (pounds/hour)	TOTAL CONSTITUENT EMISSIONS FROM SDA (tons per year)
AMMONIA	NH3	3.35E-02	1.41E-01
CHLORINE	HCl	2.83E-04	1.19E-03
CYANIDE	HCN	1.38E-02	5.79E-02
PHENOL		5.51E-02	2.32E-01
PHOSPHATE	P205	1.30E-01	5.48E-01

MAXIMUM COMPOSITION OF FILTRATE			TOTAL CONSTITUENT INPUT RATE TO SDA (grams/hour)*	TOTAL CONSTITUENT INPUT RATE TO SDA (pounds/hour)	MINIMUM CONTROL EFFICIENCY of SDA (percent)	TOTAL CONSTITUENT EMISSIONS FROM SDA (pounds/hour)	TOTAL CONSTITUENT EMISSIONS FROM SDA (tons per year)
INORGANIC COMPOUNDS							
AMMONIA	total N	25.00 mg/l	625	1.38E+00	98.00%	3.35E-02 as NH3	1.41E-01 as NH3
CHLORIINE	as HCl	0.50 mg/l	12.5	2.76E-02	99.00%	2.83E-04 as HCl	1.19E-03 as HCl
CYANIDE	total CN-	0.50 mg/l	12.5	2.76E-02	50.00%	1.38E-02 as HCN	5.79E-02 as HCN
FLUORINE	total F-	10.00 mg/l	250	5.51E-01	90.00%	5.80E-02 as HF	2.44E-01 as HF
PHOSPHATE	total P	10.00 mg/l	250	5.51E-01	90.00%	1.30E-01 as P205	5.48E-01 as P205
REDUCED S	total H2S	0.50 mg/l	12.5	2.76E-02	0.00%	2.93E-02 as H2S	1.23E-01 as H2S

MAXIMUM COMPOSITION OF WASTE FEED TO INORGANIC WASTE TREATMENT PLANT		MAXIMUM CONTENT OF FILTRATE**	TOTAL CONSTITUENT INPUT RATE TO SDA (grams/hour)*	TOTAL CONSTITUENT INPUT RATE TO SDA (pounds/hour)	MINIMUM CONTROL EFFICIENCY OF SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA (pounds/hour)	TOTAL CONSTITUENT EMISSIONS FROM SDA (tons per year)
ORGANIC COMPOUNDS							
fugitive VOCs	10 mg/l	1.82 mg/l	4.54E+01	1.00E-01	0.00%	1.00E-01 as total C	4.20E-01 as total C
total phenol compounds	NA mg/l	1.00 mg/l	2.50E+01	5.51E-02	0.00%	5.51E-02 as phenol	2.32E-01 as phenol

** BASED ON TOTAL INOGANIC WASTE FEED RATE OF 10000 LB/HR EQ TO 4539.26 L/HR

TABLE 3 (continued)

IMPACT OF USE OF INORGANIC TREATMENT SYSTEM FILTRATE ON INCINERATOR STACK EMISSIONS

MAXIMUM COMPOSITION OF FILTRATE			TOTAL CONSTITUENT INPUT TO SDA FROM FILTRATE RECYCLE	TOTAL CONSTITUENT INPUT TO SDA FROM FILTRATE RECYCLE	MINIMUM CONTROL EFFICIENCY of SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA
ARSENIC	As	4.00 mg/l	100 g/hr	2.20E-01 lb/hr	95.00%	1.10E-02 lb/hr	4.63E-02 tpy
BERYLLIUM	Be	0.0050 mg/l	0.125 g/hr	2.76E-04 lb/hr	99.00%	2.76E-06 lb/hr	1.16E-05 tpy
CADMIUM	Cd	0.05 mg/l	1.25 g/hr	2.76E-03 lb/hr	95.00%	1.38E-04 lb/hr	5.79E-04 tpy
CHROMIUM	100%Cr+6	0.20 mg/l	5 g/hr	1.10E-02 lb/hr	99.00%	1.10E-04 lb/hr	4.63E-04 tpy
CHROMIUM	tot Cr	0.20 mg/l	5 g/hr	1.10E-02 lb/hr	99.00%	1.10E-04 lb/hr	4.63E-04 tpy
ANTIMONY	Sb	5.00 mg/l	125 g/hr	2.76E-01 lb/hr	95.00%	1.38E-02 lb/hr	5.79E-02 tpy
BARIUM	Ba	5.00 mg/l	125 g/hr	2.76E-01 lb/hr	99.00%	2.76E-03 lb/hr	1.16E-02 tpy
LEAD	Pb	5.00 mg/l	125 g/hr	2.76E-01 lb/hr	95.00%	1.38E-02 lb/hr	5.79E-02 tpy
MERCURY	Hg	3.00 ug/l	0.075 g/hr	1.65E-04 lb/hr	90.00%	1.65E-05 lb/hr	6.95E-05 tpy
SILVER	Ag	0.10 mg/l	2.5 g/hr	5.51E-03 lb/hr	99.00%	5.51E-05 lb/hr	2.32E-04 tpy
THALLIUM	Tl	0.10 mg/l	2.5 g/hr	5.51E-03 lb/hr	95.00%	2.76E-04 lb/hr	1.16E-03 tpy

* BASED ON TOTAL FILTRATE GENERATION RATE OF 25000 l/hr

CARCINOGENIC METALS	TOTAL CONSTITUENT EMISSIONS FROM FILTRATE RECYCLE	TOTAL CONSTITUENT EMISSIONS FROM FILTRATE RECYCLE
ARSENIC	1.10E-02 lb/hr	4.63E-02 tons/yr
BERYLLIUM	2.76E-06 lb/hr	1.16E-05 tons/yr
CADMIUM	1.38E-04 lb/hr	5.79E-04 tons/yr
CHROMIUM	1.10E-04 lb/hr	4.63E-04 tons/yr

NON-CARCINOGENIC METALS	TOTAL CONSTITUENT EMISSIONS FROM FILTRATE RECYCLE	TOTAL CONSTITUENT EMISSIONS FROM FILTRATE RECYCLE
ANTIMONY	1.38E-02 lb/hr	5.79E-02 tons/yr
BARIUM	2.76E-03 lb/hr	1.16E-02 tons/yr
LEAD	1.38E-02 lb/hr	5.79E-02 tons/yr
MERCURY	1.65E-05 lb/hr	6.95E-05 tons/yr
SILVER	5.51E-05 lb/hr	2.32E-04 tons/yr
THALLIUM	2.76E-04 lb/hr	1.16E-03 tons/yr

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-22

CALCULATION OF INCINERATOR METALS EMISSIONS, FEED RATES, AND TIER III LIMITS UNDER DRAFT STANDARDS FOR METAL EMISSONS FROM HAZARDOUS WASTE INCINERATORS

TRIAL BURN TESTS TWO AND THREE

CALCULATION OF METALS EMISSIONS FROM INCINERATOR SDA FROM WASTE AND FILTRATE FEEDS - TRIAL BURN TESTS 2 AND 3

CARCINOGENIC METALS	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA
ARSENIC	9.38E-02 lb/hr	1.18E-02 g/s	36.14 g/day	0.394 tons/yr
BERYLLIUM	3.31E-03 lb/hr	4.18E-04 g/s		0.014 tons/yr
CADMIUM	1.66E-01 lb/hr	2.09E-02 g/s		0.696 tons/yr
CHROMIUM	4.98E-02 lb/hr	6.28E-03 g/s		0.209 tons/yr

NON-CARCINOGENIC METALS	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	
ANTIMONY	2.50E+00 lb/hr	3.15E-01 g/s	9027.45 g/day	10.484 tons/yr
BARIUM	4.99E-01 lb/hr	6.30E-02 g/s		2.097 tons/yr
LEAD	1.17E+00 lb/hr	1.48E-01 g/s		4.924 tons/yr
MERCURY	8.28E-01 lb/hr	1.04E-01 g/s		3.476 tons/yr
SILVER	4.97E-01 lb/hr	6.27E-02 g/s		2.086 tons/yr
THALLIUM	8.28E-01 lb/hr	1.05E-01 g/s		3.477 tons/yr

MAXIMUM WASTE FEED COMPOSITION CARCINOGENIC METALS		maximum wt. percent	TOTAL CONSTITUENT INPUT TO KILN/SCC FROM WASTE FEED	TOTAL CONSTITUENT INPUT TO SDA FROM FILTRATE RECYCLE	TOTAL CONSTITUENT INPUT RATE TO SOA	MINIMUM CONTROL EFFICIENCY of SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA
ARSENIC	As	0.010%	1.66E+00 lb/hr	2.20E-01 lb/hr	1.88E+00 lb/hr	95.00%	9.38E-02 lb/hr	1.18E-02 g/s
BERYLLIUM	Be	0.002%	3.31E-01 lb/hr	2.76E-04 lb/hr	3.31E-01 lb/hr	99.00%	3.31E-03 lb/hr	4.18E-04 g/s
CADMIUM	Cd	0.020%	3.31E+00 lb/hr	2.76E-03 lb/hr	3.31E+00 lb/hr	95.00%	1.66E-01 lb/hr	2.09E-02 g/s
CHROMIUM	tot. Cr	0.030%	4.96E+00 lb/hr	1.10E-02 lb/hr	4.98E+00 lb/hr	99.00%	4.98E-02 lb/hr	6.28E-03 g/s
CHROMIUM	100% Cr+6	0.030%	4.96E+00 lb/hr	1.10E-02 lb/hr	4.98E+00 lb/hr	99.00%	4.98E-02 lb/hr	6.28E-03 g/s
NONCARCINOGENIC METALS		maximum wt. percent						
ANTIMONY	Sb	0.300%	4.96E+01 lb/hr	2.76E-01 lb/hr	4.99E+01 lb/hr	95.00%	2.50E+00 lb/hr	3.15E-01 g/s
BARIUM	Ba	0.300%	4.96E+01 lb/hr	2.76E-01 lb/hr	4.99E+01 lb/hr	99.00%	4.99E-01 lb/hr	6.30E-02 g/s
LEAD	Pb	0.140%	2.32E+01 lb/hr	2.76E-01 lb/hr	2.34E+01 lb/hr	95.00%	1.17E+00 lb/hr	1.48E-01 g/s
MERCURY	Hg	0.050%	8.28E+00 lb/hr	1.65E-04 lb/hr	8.28E+00 lb/hr	90.00%	8.28E-01 lb/hr	1.04E-01 g/s
SILVER	Ag	0.300%	4.96E+01 lb/hr	5.51E-03 lb/hr	4.97E+01 lb/hr	99.00%	4.97E-01 lb/hr	6.27E-02 g/s
THALLIUM	Tl	0.100%	1.66E+01 lb/hr	5.51E-03 lb/hr	1.66E+01 lb/hr	95.00%	8.28E-01 lb/hr	1.05E-01 g/s

BASED ON TOTAL WASTE FEED RATE TO KILN AND SCC OF 16550 lb/hr
BASED ON MODELED ANNUAL UNIT DISPERSION FACTOR OF 0.0605 ug/m3/g/s
BASED ON MODELED 24 HOUR UNIT DISPERSION FACTOR OF 0.5840 ug/m3/g/s
BASED ON TOTAL ANNUAL OPERATION OF INCINERATOR FOR 8400 hr/yr

UNIT RISK FACTORS FOR CARCINOGENIC METALS		CALCULATED RISK FROM EMISSIONS
ARSENIC	4.30E-03 m3/ug	3.08E-06
BERYLLIUM	2.40E-03 m3/ug	6.07E-08
CADMIUM	1.80E-03 m3/ug	2.28E-06
CHROMIUM	1.20E-02 m3/ug	4.56E-06
TOTAL RISK FROM EMISSIONS OF CARCINOGENIC METALS		9.98E-06

REFERENCE AIR CONCENTRATIONS FOR NON-CARCINOGENIC METALS		MAXIMUM MODELED CONCENTRATIONS	RATIO OF REFERENCE TO MODELED CONCENTRATION
ANTIMONY	0.30 ug/m3	1.84E-01 ug/m3	6.14E-01
BARIUM	50.00 ug/m3	3.68E-02 ug/m3	7.36E-04
LEAD	0.09 ug/m3	8.64E-02 ug/m3	9.60E-01
MERCURY	0.30 ug/m3	6.10E-02 ug/m3	2.03E-01
SILVER	3.00 ug/m3	3.66E-02 ug/m3	1.22E-02
THALLIUM	0.30 ug/m3	6.10E-02 ug/m3	2.03E-01

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-23

CALCULATION OF INCINERATOR METALS EMISSIONS, FEED RATES, AND TIER III LIMITS UNDER DRAFT STANDARDS FOR METAL EMISSIONS FROM HAZARDOUS WASTE INCINERATORS

TRIAL BURN TEST FOUR

CALCULATION OF METALS EMISSIONS FROM INCINERATOR SDA FROM WASTE AND FILTRATE FEEDS - TRIAL BURN TEST 4

CARCINOGENIC METALS	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA
ARSENIC	7.06E-02 lb/hr	8.92E-03 g/s		0.297 tons/yr
BERYLLIUM	3.31E-03 lb/hr	4.18E-04 g/s	36.14 g/day	0.014 tons/yr
CADMIUM	9.94E-02 lb/hr	1.25E-02 g/s		0.417 tons/yr
CHROMIUM	6.63E-02 lb/hr	8.37E-03 g/s		0.279 tons/yr

NON-CARCINOGENIC METALS	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	
ANTIMONY	9.99E-01 lb/hr	1.26E-01 g/s		4.194 tons/yr
BARIUM	4.99E-01 lb/hr	6.30E-02 g/s		2.097 tons/yr
LEAD	1.16E+00 lb/hr	1.47E-01 g/s		4.889 tons/yr
MERCURY	8.28E-01 lb/hr	1.04E-01 g/s	9027.45 g/day	3.476 tons/yr
SILVER	4.97E-01 lb/hr	6.27E-02 g/s		2.086 tons/yr
THALLIUM	3.31E-01 lb/hr	4.18E-02 g/s		1.391 tons/yr

MAXIMUM WASTE FEED COMPOSITION CARCINOGENIC METALS		maximum wt. percent	TOTAL CONSTITUENT INPUT TO KILN/SCC FROM WASTE FEED	TOTAL CONSTITUENT INPUT TO SDA FROM FILTRATE RECYCLE	TOTAL CONSTITUENT INPUT RATE TO SDA	MINIMUM CONTROL EFFICIENCY of SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA	TOTAL CONSTITUENT EMISSIONS FROM SDA
ARSENIC	As	0.020%	3.31E+00 lb/hr	2.20E-01 lb/hr	3.53E+00 lb/hr	98.00%	7.06E-02 lb/hr	8.92E-03 g/s
BERYLLIUM	Be	0.002%	3.31E-01 lb/hr	2.76E-04 lb/hr	3.31E-01 lb/hr	99.00%	3.31E-03 lb/hr	4.18E-04 g/s
CADMIUM	Cd	0.030%	4.96E+00 lb/hr	2.76E-03 lb/hr	4.97E+00 lb/hr	98.00%	9.94E-02 lb/hr	1.25E-02 g/s
CHROMIUM	tot. Cr	0.040%	6.62E+00 lb/hr	1.10E-02 lb/hr	6.63E+00 lb/hr	99.00%	6.63E-02 lb/hr	8.37E-03 g/s
CHROMIUM	100% Cr+6	0.040%	6.62E+00 lb/hr	1.10E-02 lb/hr	6.63E+00 lb/hr	99.00%	6.63E-02 lb/hr	8.37E-03 g/s
NONCARCINOGENIC METALS		maximum wt. percent						
ANTIMONY	Sb	0.300%	4.96E+01 lb/hr	2.76E-01 lb/hr	4.99E+01 lb/hr	98.00%	9.99E-01 lb/hr	1.26E-01 g/s
BARIUM	Ba	0.300%	4.96E+01 lb/hr	2.76E-01 lb/hr	4.99E+01 lb/hr	99.00%	4.99E-01 lb/hr	6.30E-02 g/s
LEAD	Pb	0.350%	5.79E+01 lb/hr	2.76E-01 lb/hr	5.82E+01 lb/hr	98.00%	1.16E+00 lb/hr	1.47E-01 g/s
MERCURY	Hg	0.050%	8.28E+00 lb/hr	1.65E-04 lb/hr	8.28E+00 lb/hr	90.00%	8.28E-01 lb/hr	1.04E-01 g/s
SILVER	Ag	0.300%	4.96E+01 lb/hr	5.51E-03 lb/hr	4.97E+01 lb/hr	99.00%	4.97E-01 lb/hr	6.27E-02 g/s
THALLIUM	Tl	0.100%	1.66E+01 lb/hr	5.51E-03 lb/hr	1.66E+01 lb/hr	98.00%	3.31E-01 lb/hr	4.18E-02 g/s

BASED ON TOTAL WASTE FEED RATE TO KILN AND SCC OF	16550 lb/hr
BASED ON MODELED ANNUAL UNIT DISPERSION FACTOR OF	0.0605 ug/m3/g/s
BASED ON MODELED 24 HOUR UNIT DISPERSION FACTOR OF	0.5840 ug/m3/g/s
BASED ON TOTAL ANNUAL OPERATION OF INCINERATOR FOR	8400 hr/yr

UNIT RISK FACTORS FOR CARCINOGENIC METALS		CALCULATED RISK FROM EMISSIONS
ARSENIC	4.30E-03 m3/ug	2.32E-06
BERYLLIUM	2.40E-03 m3/ug	6.07E-08
CADMIUM	1.80E-03 m3/ug	1.37E-06
CHROMIUM	1.20E-02 m3/ug	6.08E-06
TOTAL RISK FROM EMISSIONS OF CARCINOGENIC METALS		9.82E-06

REFERENCE AIR CONCENTRATIONS FOR NON-CARCINOGENIC METALS		MAXIMUM MODELED CONCENTRATIONS	RATIO OF REFERENCE TO MODELED CONCENTRATION
ANTIMONY	0.30 ug/m3	7.36E-02 ug/m3	2.45E-01
BARIUM	50.00 ug/m3	3.68E-02 ug/m3	7.36E-04
LEAD	0.09 ug/m3	8.58E-02 ug/m3	9.54E-01
MERCURY	0.30 ug/m3	6.10E-02 ug/m3	2.03E-01
SILVER	3.00 ug/m3	3.66E-02 ug/m3	1.22E-02
THALLIUM	0.30 ug/m3	2.44E-02 ug/m3	8.14E-02

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APPENDIX L-24

LITERATURE DATA FOR INCINERATOR EMISSIONS AND WASTE CHARACTERIZATION DATA USED IN SUPPORT OF INCINERATION DESIGN EMISSIONS CALCULATIONS

3rd International Symposium on Operating European
Hazardous Waste Incineration Facilities, Odense, Denmark
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Paper
The Risks of Dioxins and Other Pollutants Emitted from Hazardous Waste Incineration Facilities

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Abstract

The fact that dioxins and dibenzofurans are routinely detected in the emissions from incineration facilities is of considerable public and scientific interest in evaluating the health risks posed by these facilities. This paper looks at the emission rates of polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF), and other pollutants from US and European incineration facilities; discusses how offsite concentrations are determined; and evaluates the risks of these pollutants relative to other hazardous constituents in the stack emissions. The paper also examines what is currently understood about the human health effects of these substances and describes the current assumptions and limitations in evaluating these risks.

A. Introduction

Although hazardous waste incineration facilities are often perceived as posing an unacceptable risk to public health, very few comprehensive health risk assessments have been performed of major facilities. This article represents the latest in a series of reports summarizing the state of knowledge about the health effects of hazardous waste incineration facilities. Past articles have focused on methodologies for assessing these risks (19), emissions of metals from US and European hazardous waste incineration facilities (17), and a comprehensive health risk assessment of a major hazardous waste incineration facility based on actual emissions data (18). In this article, the contribution of PCDD and PCDF to the overall risk posed by these facilities is discussed in the context of what is known about the risks posed by such facilities.

A health risk assessment of a hazardous waste incineration facility involves the assessment of:

o Sources of Exposure (Characterization of Emissions)
o Pathways of Exposure (Inhalation, Ingestion, etc.)
o Receptors (Humans, Environment, etc.)

TABLE 1

CONCENTRATION OF METALS IN HAZARDOUS WASTE INCINERATION STACK EMISSIONS

(mg/m^3)

	HIM	EHWF #2	NYBORG	SCA	ROLLINS
Ag	<0.03		0.001	0.026 - 0.059	0.006 - 0.02
Al	<0.5			0.015 - 0.840	≤0.2 - ≤0.5
As	<0.03	<0.01		0.158 - 0.250	<0.02
Be	<0.02	<<0.01		0.0021 - 0.0084	
Bi	<0.1				
Cd	0.06	<0.01	0.00445	0.0052 - 0.0095	0.1 - 0.4
Co	<0.03	<0.01			≤0.03
Cr	0.14	0.12 - 0.16	0.002	0.02 - 0.197	0.01 - 0.04
Cu	0.13	0.11 - 0.47	0.015	0.441 - 2.116	0.2 - 8
Fe	0.78	2.75 - 6.43	0.035	4.500 - 21.000	2 - 6
Hg	0.06	<0.01	0.157	0.011 - 0.016	
Mg	<0.5			0.260 - 7.100	≤0.3
Mo	<0.05		0.0015	0.042 - 5.100	0.04 - 2
Ni	<0.06	0.08 - 0.17	0.0015	0.156 - 0.532	0.02 - 0.06
Pb	0.68	0.06 - 0.14	0.13019	0.362 - 1.062	3
Sb	<0.3	<0.01 - 0.01	0.001	0.0058 - 0.015	
Se	<0.03			0.0031 - 0.012	<0.04
Sn	0.56		0.003	0.054 - 3.000	0.1 - 0.7
Ti	<0.03		0.01		0.01 - 0.3
Tl	<0.06	<<0.01		0.003 - <0.0081	
U	<0.02				<0.05
V	<0.03	<0.01	0.0005		≤0.007 - ≤0.01
W	<0.03				<0.05
Zn	0.71	0.14 - 0.62	0.08	0.758 - 2.341	≤1 - ≤2
Zr	<0.03				
Partic.	10	30.0 - 84.0	5	918 - 2,543	53

References: 17, 33

"<"	indicates below detection level; "<<" indicates far below detection.
HIM:	HIM Biebesheim, Germany.
EHWF2:	European Hazardous Waste Facility #2. Unpublished data. Range of measurements taken over two four-day monitoring periods.
NYBORG:	Kommunekemi, Denmark. Analysis of particulates by proton-induced X-ray emission.
SCA:	SCA. Chicago. Range of 4 average results of trial burns. Conducted August 21-31, 1985 and analyzed by ICAP.
ROLLINS:	Deer Park, Texas. Survey for trace metals in stack samples by POFS. Range of two test results.

TABLE 2

CONCENTRATIONS OF DIOXINS AND FURANS IN HAZARDOUS WASTE INCINERATION STACK EMISSIONS (ng/m^3)

	NOTE 1 Nyborg Denmark N=2	SAKAB Sweden N=4	SAKAB Sweden N=5	KEMA NORD Sweden N=?	BAYER Germany N=?	HIM BIEB. Germany N=5	EHWF #1* Europe N=?	Misc. U.S. Facilities N=10	ROLLINS Texas N=1	ENSCO Arkansas N=1	DOW Michigan N=?
PCDD			14 (SD 16)		0.188**		18.3***				
TCDD	5 - 5.7	3.4 - 216	2 (SD 1.3)		<0.005	0.30 - 0.57	2.3	ND - 2.5 ($\bar{X}$ = 0.56)	0.636	0.177	
PeCDD	5 - 25	2.5 - 79	8 (SD 12)			0.5 - 0.8					
HxCDD	1 - 10	1.7 - 26				0.8 - 1.5					
HpCDD	1 - 15	0.5 - 11				1.1 - 1.7					
OCDD	0.2 - 2	0.07 - 5.8		0.1 - 1	0.42	1.5 - 1.9	3.1				
2,3,7,8 TCDD	0.02 - 0.03	0.08 - 1.5			<0.005	0.02 - 0.03		ND			0.71
PCDF			50 (SD 37)		1.04**		192.0***				
TCDF	40 - 108	42 - 3,060	8 (SD 8.5)		0.12	1.5 - 4.7	36.0		9.923	2.119	
PeCDF	5 - 26	38 - 350	18 (SD 17)			1.7 - 8.9					
HxCDF	4 - 22	10 - 128		1 - 3		9.5 - 13.1					
HpCDF	3 - 23	0.9 - 43		3 - 20		5.9 - 9.7					
OCDF	0.6 - 6	0.2 - 5.8		3 - 400	0.66	1.4 - 5.9	6.0				
2,3,7,8 TCDF	8 - 36	1.7 - 9			0.005	0.09 - 0.37					
REFS:	34	34	25,26	34	4	12	****	57	41,43,58,	43,54,58	****

* EHWF #1: Unpublished data from a European rotary kiln incinerator -- PCB test burn.
** 3-7 chlorine
*** 4-7 chlorine
***** Unpublished data
N = Number of samples taken

NOTE 1: TEST RESULTS FROM DENMARK
FROM A PCB BURN.

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WORKING PAPER

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Subject: HAZARDOUS WASTE STREAM TRACE METAL CONCENTRATIONS AND EMISSIONS

To: Pamela Walker

From: S. Haus, R. Gerstein

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ABSTRACT: This report addresses trace metals released through the incineration of hazardous waste. Thirty-two trace metals for which quantitative standards and guidelines exist have been selected for inclusion in the study. Data are presented on the concentrations of these 32 trace metals in 71 waste streams that are both potentially hazardous and incinerable. Data are also presented on controlled and uncontrolled emissions of these trace metals from hazardous waste incinerators. A screening analysis has been conducted, using these data, to assess whether there is a potential for trace metal emissions, released during hazardous waste incineration, to exceed air quality standards or guidelines. Based on the available data and the assumptions of the screening analysis, trace metals emissions from the incineration of hazardous waste can potentially exceed such standards or guidelines.

TABLE 2

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	PETROLEUM REFINING WASTES						
	DISSOLVED AIR FLOTATION FLOAT	SLOP OIL EMISSIONS SOLIDS	HEAT EXCHANGER CLEANING SLUDGE	LEADED TANK BOTTOMS	CRUDE TANK BOTTOMS	COKE FINES	API SEPARATOR SLUDGES
EPA HAZARDOUS WASTE NUMBER	K048	K049	K050	K052	(i)	(i)	K051
NUMBER OF SITES SAMPLED	5(e)	9(e)	2(e)	2(e)	4(e)	5(e)	12(e)
HEAT CONTENT (kJ/kg)	470-6,300	10,700-27,700	2,200-4,000	8,000-9,200	8,000-37,000	32,600	1,160-25,000
TRACE METALS							
Aluminum (Al)	—(e)	—	—	—	—	—	>10,000
Antimony (Sb)	—	—	—	—	—	—	—
Arsenic (As)	0.5-10.5	2.5-10.5	10.2-11	63-525	5.0-53	0.2-10.0	0.1-32
Barium (Ba)	—	—	—	—	—	—	740
Beryllium (Be)	0.0012-0.25	0.002-0.30	0.05-0.34	0.0025	0.0013-0.25	0.0025-0.5	0.0012-0.24
Cadmium (Cd)	0.0025-0.5	0.025-2	1.0-1.5	4.5-0.1	0.25-0.42	0.015-2.0	0.024-3.0
Chromium (Cr)	28-260	0.1-1,750	310-311	9.0-13.7	1.9-75	0.02-7.5	0.1-6,790
Cobalt (Co)	0.13-67.5	0.1-82.5	0.2-3.0	26.5-71	3.0-37	0.2-9.2	0.1-26.2
Copper (Cu)	0.05-21.3	0.5-420	67-75	110-172	18.5-194	3.3-5.0	2.5-550
Hafnium (Hf)	—	—	—	—	—	—	—
Indium (In)	—	—	—	—	—	—	—
Iron (Fe)	—	—	—	—	—	—	—
Lead (Pb)	2.3-1,250	0.25-500	0.5-155	150-1,420	10.9-338	0.3-2.9	0.25-1,290
Magnesium (Mg)	—	—	—	—	—	—	>5,000
Manganese (Mn)	—	—	—	—	—	—	170
Mercury (Hg)	0.07-0.09	0.005-12.25	0.14-3.6	0.19-0.94	0.07-1.53	0.0004-0.2	0.04-6.2
Molybdenum (Mo)	0.025-2.5	0.25-2.0	1-12	0.5-110	0.25-95	0.1-2.5	0.25-60
Nickel (Ni)	0.025-15	7.5-160	61-170	235-392	12.0-125	350-2,200	0.25-150.4
Platinum (Pt)	—	—	—	—	—	—	—
Potassium (K)	—	—	—	—	—	—	~1,000
Selenium (Se)	0.1-4.2	0.1-8.0	2.4-52	3.1-10.0	0.01-1	0.01-1.6	0.005-7.6
Silver (Ag)	0.0013-2.0	0.013-20.1	0.0007-0.01	0.05-1.7	0.03-1.3	0.01-3.0	0.05-3
Sodium (Na)	—	—	—	—	—	—	—
Tantalum (Ta)	—	—	—	—	—	—	—
Tellurium (Te)	—	—	—	—	—	—	—
Tin (Sn)	—	—	—	—	—	—	18
Titanium (Ti)	—	—	—	—	—	—	540
Tungsten (W)	—	—	—	—	—	—	—
Vanadium (V)	0.05-0.15	0.12-75	0.7-50	1.0-9.0	5-62	400-3,500	1.0-48.5
Yttrium (Y)	—	—	—	—	—	—	—
Zinc (Zn)	10-1,825	60-2,725	91-297	1103-17,000	22.0-425	0.2-20	25-6,396
Zirconium (Zr)	—	—	—	—	—	—	—
REFERENCES	79,80	79,80	79,80	79,80	80	80	71,79,80

TABLE 2 (Continued)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	IGNITABLE SOLVENT WASTES								
	SYNTHETIC RESINS MANUFACTURE	CLEANING/ DEGREASING	PRINTING/INK THINNING AND CLEANING	PAINT AND COATING	CHEMICAL MANUFACTURE	PHARMACEUTICALS MANUFACTURE	HERBICIDE MANUFACTURE	ADHESIVE MANUFACTURE	RESEARCH CENTER
EPA HAZARDOUS WASTE NUMBER	D001$^{(j)}$	D001$^{(j)}$	D001$^{(j)}$	D001$^{(j)}$	D001$^{(j)}$	D001$^{(j)}$	D001$^{(j)}$	D001$^{(j)}$	D001,F002$^{(h)}$
NUMBER OF SITES SAMPLED	NA$^{(b)}$	NA	NA	NA	NA	NA	NA	NA	1
HEAT CONTENT (kJ/kg)	<14,500-<42,900	<30,800-42,900	NA	<14,600-<42,900	<13,600-<42,400	<14,600-<45,200	NA	<23,900-<42,400	NA
TRACE METALS									
Aluminum (Al)	—	—	—	—	—	—	—	—	—
Antimony (Sb)	—	—	—	—	—	—	—	—	—
Arsenic (As)	0.0-3.9	0.1-7.0	0.0-12	0.2-20	0.1-2.0	0.1	0.1	0.1	0.1
Barium (Ba)	—	—	—	—	—	—	—	—	—
Beryllium (Be)	—	—	—	—	—	—	—	—	—
Cadmium (Cd)	0.0-0.7	0.1-9.0	0.0-12	0.1-215.4	0.1-30.5	0.1-0.3	—	0.1	2.5
Chromium (Cr)	0.2-1.3	1.0-342	0.1-120	0.4-3,431	0.6-2,760	0.3-220	0.1	3.0	9.2
Cobalt (Co)	—	—	—	—	—	—	—	—	—
Copper (Cu)	0.1-0.3	1.7-30.4	0.0-3,610	0.3-220	0.4-364	0.6-13.5	0.1	0.3	37.6
Hafnium (Hf)	—	—	—	—	—	—	—	—	—
Indium (In)	—	—	—	—	—	—	—	—	—
Iron (Fe)	—	—	—	—	—	—	—	—	—
Lead (Pb)	0.1-0.7	5.1-2,366	0.2-770	0.5-6,617	0.75-14,000	0.1-192	0.1	35.0	3.3
Magnesium (Mg)	—	—	—	—	—	—	—	—	—
Manganese (Mn)	—	—	—	—	—	—	—	—	—
Mercury (Hg)	—	0.0-0.1	0.0-1.0	0.1-1.0	0.0-0.1	0.1	1.0	—	—
Molybdenum (Mo)	—	—	—	—	—	—	—	—	—
Nickel (Ni)	0.1	2.9-32	0.1-12.6	0.1-37.4	0.1-4.3	0.4-2,090	0.1	1.5	1.5
Platinum (Pt)	—	—	—	—	—	—	—	—	—
Potassium (K)	—	—	—	—	—	—	—	—	—
Selenium (Se)	—	—	—	—	—	0.1	—	—	—
Silver (Ag)	—	—	—	—	—	—	—	—	—
Sodium (Na)	—	—	—	—	—	—	—	—	—
Tantalum (Ta)	—	—	—	—	—	—	—	—	—
Tellurium (Te)	—	—	—	—	—	—	—	—	—
Tin (Sn)	—	—	—	—	—	—	—	—	—
Titanium (Ti)	—	—	—	—	—	—	—	—	—
Tungsten (W)	—	—	—	—	—	—	—	—	—
Vanadium (V)	—	—	—	—	—	—	—	—	—
Yttrium (Y)	—	—	—	—	—	—	—	—	—
Zinc (Zn)	1.1-5.2	17.-17,500	0.1-110,000	0.5-1,032	0.1-5,130	0.9-10.5	0.8	51.3	29.6
Zirconium (Zr)	—	—	—	—	—	—	—	—	—
REFERENCES	40	40	40	40	40	40	40	40	40

TABLE 2 (Continued)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	CHLORINATED SOLVENT WASTES						UNKNOWN SOLVENT WASTE	
	FOOD PREPARATION	PRINTING INK CLEANING	CLEANING/ DEGREASING	PLASTICS, RUBBER AND SYNTHETICS MANUFACTURE	PHARMACEUTICALS MANUFACTURE	PAINT AND COATINGS	MACHINERY MANUFACTURING	ELECTRONIC COMPONENTS MANUFACTURING
EPA HAZARDOUS WASTE NUMBER	F002$^{(b)}$	F002$^{(b)}$	F001	F002$^{(b)}$	F002$^{(b)}$	F002	F001-F005$^{(b)}$	F001-F005$^{(b)}$
NUMBER OF SITES SAMPLED	NA	NA	NA	NA	NA	NA	1	5$^{(a)}$
HEAT CONTENT (kJ/kg)	<3,100-<7,300	<8,300-<19,100	<500-<27,600	<3,100-<5,300	<1,000-<19,100	~5,250	~9,300	~9,300
TRACE METALS								
Aluminum (Al)	—	—	—	—	—	—	—	—
Antimony (Sb)	—	—	—	—	—	—	—	—
Arsenic (As)	0.1-0.2	0.2	0.0-3.3	0.1	0.1	0.1-1.9	—	—
Barium (Ba)	—	—	—	—	—	—	—	—
Beryllium (Be)	—	—	—	—	—	—	—	—
Cadmium (Cd)	0.1-0.3	2.7	0.0-1.2	0.1	0.1-1.0	1.9-2.0	0.5	<0.02-0.05
Chromium (Cr)	0.3	379	0.0-22.6	0.2-2.7	0.1	0.0-150	0.01	<0.02-0.1
Cobalt (Co)	—	—	—	—	—	—	—	—
Copper (Cu)	0.1-0.2	151	0.0-76.1	0.6-1.4	0.2-200	0.2-2,970	2.0	<0.03-1.2
Hafnium (Hf)	—	—	—	—	—	—	—	—
Indium (In)	—	—	—	—	—	—	—	—
Iron (Fe)	—	—	—	—	—	—	6	<0.1-190
Lead (Pb)	0.1-1.6	2,482	0.0-125	0.1-1.0	0.1	1.0-165	11	0.3-125
Magnesium (Mg)	—	—	—	—	—	—	—	—
Manganese (Mn)	—	—	—	—	—	—	—	—
Mercury (Hg)	0.1	—	0.0-1.0	—	0.1	—	—	—
Molybdenum (Mo)	—	—	—	—	—	—	—	—
Nickel (Ni)	0.2-0.6	6	0.1-30.2	0.8	0.2-1.0	0.2-1,020	—	<0.04-2
Platinum (Pt)	—	—	—	—	—	—	—	—
Potassium (K)	—	—	—	—	—	—	—	—
Selenium (Se)	—	—	—	—	—	—	—	—
Silver (Ag)	—	—	—	—	—	—	—	—
Sodium (Na)	—	—	—	—	—	—	—	—
Tantalum (Ta)	—	—	—	—	—	—	—	—
Tellurium (Te)	—	—	—	—	—	—	—	—
Tin (Sn)	—	—	—	—	—	—	—	—
Titanium (Ti)	—	—	—	—	—	—	—	—
Tungsten (W)	—	—	—	—	—	—	—	—
Vanadium (V)	—	—	—	—	—	—	—	—
Yttrium (Y)	—	—	—	—	—	—	—	—
Zinc (Zn)	1.2	13.0	0.2-452	1.1-17.4	1.0-2.5	0.7-3,440	2	1-455
Zirconium (Zr)	—	—	—	—	—	—	—	—
REFERENCES	48	48	48	48	48	48	81	81,82

TABLE 2 (Continued)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	PAINT MANUFACTURING WASTES							
	PAINT MANUFACTURE SLUDGES AND RESIDUES	PAINT AND PIGMENT PRODUCTION WET SOLIDS	PAINT FORMULATION WASTEWATER TREATMENT SLUDGES	PAINT MANUFACTURING WASTE	UNKNOWN PAINT WASTE	WATER-BASED PAINT WITH SOLVENTS - SLUDGES AND RESIDUES	LATEX PAINT SLUDGES AND RESIDUES	SOLVENT CLEANING WASTE AND STILL BOTTOMS
EPA HAZARDOUS WASTE NUMBER	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
NUMBER OF SITES SAMPLED	NA	NA	39	NA	1	NA	NA	3
HEAT CONTENT (kJ/kg)	NA	NA	3,600	25,600	31,670	NA	NA	32,300
TRACE METALS								
Aluminum (Al)	——	——	50-3,000	——	——	——	——	——
Antimony (Sb)	——	——	0.01-13	——	<20	——	——	——
Arsenic (As)	0.1-0.5	——	<0.025-2	——	<31	0-20	0-5.2	——
Barium (Ba)	——	——	0.072-50	——	196	——	——	——
Beryllium (Be)	——	——	0.002-3.0	——	<1.0	——	——	——
Cadmium (Cd)	0.2-8.0	——	0.008-16.7	——	<5.0	0.1-26.1	0-93	——
Chromium (Cr)	11.5-1,100	0-625	0.05-90	——	1,020	0-20,000	0-11,312	20-7,000
Cobalt (Co)	——	——	0.05-15.6	——	——	——	——	——
Copper (Cu)	3.1-272	0-200	0.22-60	——	——	0-7,817	0-1,700	——
Hafnium (Hf)	——	——	——	——	——	——	——	——
Indium (In)	——	——	——	——	——	——	——	——
Iron (Fe)	——	——	22.6-8,000	——	——	——	——	——
Lead (Pb)	30.0-5,630	0-275	0.1-60	84	4,650	0-17,393	0-12,534	113-3,000
Magnesium (Mg)	——	——	0.001-1.5	——	——	——	——	——
Manganese (Mn)	——	——	0.3-50	——	——	——	——	——
Mercury (Hg)	0.1-1.6	0-596	0.005-220	0.17	<22	0-37	0-1	——
Molybdenum (Mo)	——	——	0.05-15	——	——	——	——	——
Nickel (Ni)	0.5-12.1	0-137	0.02-200	——	<61	0-1,600	0-1,077	——
Platinum (Pt)	——	——	——	——	——	——	——	——
Potassium (K)	——	——	——	——	——	——	——	——
Selenium (Se)	——	——	<0.008-2	——	<470	——	——	——
Silver (Ag)	——	——	<0.002-0.1	——	<2.6	——	——	——
Sodium (Na)	——	——	——	——	——	——	——	——
Tantalum (Ta)	——	——	——	——	——	——	——	——
Tellurium (Te)	——	——	——	——	——	——	——	——
Tin (Sn)	——	——	0.2-14.5	——	——	——	——	——
Titanium (Ti)	——	——	1-230	——	——	——	——	——
Tungsten (W)	——	——	——	——	——	——	——	——
Vanadium (V)	——	——	0.06-11.5	——	——	——	——	——
Yttrium (Y)	——	——	<0.045-0.6	——	——	——	——	——
Zinc (Zn)	21.0-1,290	——	0.6-2,000	——	——	0-2,759	0-8,500	——
Zirconium (Zr)	——	——	——	——	——	——	——	——
REFERENCES	40	40	82,84	38	45	40	40	82

TABLE 2 (Continued)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	INK MANUFACTURING AND USE			SEWAGE SLUDGE	WASTE OILS			
	PRINTING INK FORMULATION WASHES AND SLUDGES	INK MANUFACTURING WASTE	PRINTING SOLVENT SLUDGE		CRANKCASE OIL	INDUSTRIAL OILS	UNKNOWN OILS	ALL
EPA HAZARDOUS WASTE NUMBER	K086	(i)	(i)	(g)	(i)	(i)	(i)	(i)
NUMBER OF SITES SAMPLED	1	NA	NA	31[e]	68[d]	70[d]	181[d]	319[d]
HEAT CONTENT (kJ/kg)	NA	27,900	NA	12,000-23,000	43,000	43,000	43,000	43,000
TRACE METALS								
Aluminum (Al)	209-417	—	—	4,400-52,000	<1-800	1-2,000	5.0-370	<1-2,000
Antimony (Sb)	<0.03-0.13	—	—	2.6-300	—	—	—	—
Arsenic (As)	0.12	—	0.0	0.3-50	—	—	—	—
Barium (Ba)	0.3-14	—	—	ND[b]-4,500	2-3,906	0-0.550	0-1,630	0-3,906
Beryllium (Be)	0.015-0.024	—	—	ND-15	0.05-6	0.01-7	0.02-0.22	0.01-7
Cadmium (Cd)	4.2-20	—	0.1	ND-500	0.6-4	0-21	0.3-36	0-36
Chromium (Cr)	17.1-39.1	—	14.3	30-14,000	0.33-50	0.1-520	0.7-537	0.1-537
Cobalt (Co)	1.4-5.4	—	—	ND-800	0.04-0.16	—	0.06-2.6	0.04-2.6
Copper (Cu)	10.3-26	—	756	45-16,000	4-90.0	0-1160	1-540	0-1,160
Hafnium (Hf)	—	—	—	1-11	—	—	—	—
Indium (In)	—	—	—	0.07-3.7	—	—	—	—
Iron (Fe)	106-142	—	—	8,700-170,000	10-2,401	1-10,000	6-34,000	1-34,000
Lead (Pb)	422-777	1.2	62.9	80-26,000	19-21,676	0-3,500	1-21,700	0-21,700
Magnesium (Mg)	0.47-0.74	—	—	2,000-10,000	3-1,600	0-1,000	0.4-531	0-1,600
Manganese (Mn)	1.0-1.5	—	—	32-8,800	0-200	0-250	2-60	0-250
Mercury (Hg)	0.005-0.013	<0.005	0.10	0.6-43	—	—	—	—
Molybdenum (Mo)	0.72-3.7	—	—	1.2-40	1.4-0.7	0-19	1.1-50	0-50
Nickel (Ni)	0.6-0.74	—	93.7	ND-2,000	0-7	0-300	0.49-627	0-627
Platinum (Pt)	—	—	—	0.05-0.6	—	—	—	—
Potassium (K)	—	—	—	2,700-39,000	—	—	—	—
Selenium (Se)	—	—	—	1.7-100	—	—	—	—
Silver (Ag)	0.002	—	—	ND-960	0-1	0-30	—	0-30
Sodium (Na)	—	—	—	740-15,400	0-660	0-400	10-1,300	0-1,300
Tantalum (Ta)	—	—	—	0.1-1.2	—	—	—	—
Tellurium (Te)	—	—	—	0.05-1.5	—	—	—	—
Tin (Sn)	1.1-2.1	—	—	111-3,000	0-20.0	0-140	<0.03-100	0-140
Titanium (Ti)	3.7-5.0	—	—	1,000-11,000	<0.01-5	0-110	<0.1-33	0-110
Tungsten (W)	—	—	—	0.9-100	—	—	—	—
Vanadium (V)	0.72-1.4	—	—	ND-2,100	0-210	0-25	0-140	0-210
Yttrium (Y)	0.05-0.064	—	—	0.8-10	—	—	—	—
Zinc (Zn)	22.3-25.0	—	15.7	51-20,400	80-2,500	0.7-5,000	3-2,100	0.7-5,000
Zirconium (Zr)	—	—	—	5.4-92	—	—	—	—
REFERENCES	85	38	40	24,27,42,43,44, 57,58,59,62,64, 66,67,68,77	70,86	70,86	70,86	70,86

TABLE 2 (Continued)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	WASTES FROM PAINTING OPERATIONS						
	FABRICATED METAL PRODUCTS	ELECTRIC AND ELECTRONIC EQUIPMENT	MACHINERY MANUFACTURING	TRANSPORTATION EQUIPMENT	METAL PAINTING SLUDGES AND RESIDUES	OIL-BASED PAINTS WITH SOLVENTS SLUDGES AND RESIDUES	PAINT STRIPPING AND CLEANING SLUDGES AND RESIDUES
EPA HAZARDOUS WASTE NUMBER	(1)	(1)	(1)	(1)	(1)	(1)	(1)
NUMBER OF SITES SAMPLED	6(a)	2(a)	3(a)	3	NA	NA	NA
HEAT CONTENT (kJ/kg)	NA	NA	NA	NA	NA	NA	NA
TRACE METALS							
Aluminum (Al)	—	—	—	—	—	—	—
Antimony (Sb)	—	—	—	—	—	—	—
Arsenic (As)	—	—	—	—	0.20	0-4.3	0-17
Barium (Ba)	—	—	—	—	—	—	—
Beryllium (Be)	—	—	—	—	—	—	—
Cadmium (Cd)	10,400	<0.02-<0.1	1.5	—	0.1-95	0.1-15	0-60
Chromium (Cr)	214-2,900	41-390	140-150	1,500-8,370	0-20,000	0-9,850	1.2-10,000
Cobalt (Co)	—	—	—	—	—	—	—
Copper (Cu)	—	5-37	45,300	—	0-7,017	0.1-79	0-272
Hafnium (Hf)	—	—	—	—	—	—	—
Indium (In)	—	—	—	—	—	—	—
Iron (Fe)	—	10-360	253,100	—	—	—	—
Lead (Pb)	449-130,000	170-502	150-2,275	8,370-5,820	0-17,393	0-34,200	0-24,000
Magnesium (Mg)	—	—	—	—	—	—	—
Manganese (Mn)	—	—	—	—	—	—	—
Mercury (Hg)	—	—	—	—	0-37	—	0-1.6
Molybdenum (Mo)	—	—	—	—	—	—	—
Nickel (Ni)	—	4	—	—	0-1,620	1.2-37	0-8,650
Platinum (Pt)	—	—	—	—	—	—	—
Potassium (K)	—	—	—	—	—	—	—
Selenium (Se)	—	—	—	—	—	—	—
Silver (Ag)	—	—	—	—	—	—	—
Sodium (Na)	—	—	—	—	—	—	—
Tantalum (Ta)	—	—	—	—	—	—	—
Tellurium (Te)	—	—	—	—	—	—	—
Tin (Sn)	—	—	—	—	—	—	—
Titanium (Ti)	—	—	—	—	—	—	—
Tungsten (W)	—	—	—	—	—	—	—
Vanadium (V)	—	—	—	—	—	—	—
Yttrium (Y)	—	—	—	—	—	—	—
Zinc (Zn)	—	0.6-1,996	7,600	—	0-15,900	9.7-15,900	0-5,700
Zirconium (Zr)	—	—	—	—	—	—	—
REFERENCES	82	81,82	81,82	82	40	40	40

TABLE 2 (Continued)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	RUBBER MANUFACTURING WASTE		AQUEOUS WASTES					
	RUBBER WASTE	POLYSTYRENE TAR	COKE PLANT AQUEOUS WASTE	AQUEOUS WASTE CONTAINING METHYL METHACRYLATE	AQUEOUS WASTE CONTAINING PHENOL	ETHYLENE MANUFACTURING AQUEOUS WASTE	HEXACHLOROCYCLOPENTADIENE MANUFACTURING AQUEOUS WASTE	UNKNOWN AQUEOUS WASTE
EPA HAZARDOUS WASTE NUMBER	(i)	(i)	(i)	(i)	(i)	D001$^{(h)}$	D001$^{(h)}$	NA
NUMBER OF SITES SAMPLED	1	1	1	1	1	1	1	2$^{(a)}$
HEAT CONTENT (kJ/kg)	~22,800	37,200	<230	<6,300	<6,300	42,300	10,200	1,500-4,370
TRACE METALS								
Aluminum (Al)	1,500	32	0.47	160-315	86	—	—	<10
Antimony (Sb)	—(e)	—	0.01	2	0.08	—	—	<20
Arsenic (As)	—	—	0.11	0.04	0.03	0.01	0.01	1.3-6.2
Barium (Ba)	42	0.25	0.02	35	1	0.01	0.04	<1
Beryllium (Be)	—	—	NGTB$^{(b)}$	0.01	0.01	—	—	<1
Cadmium (Cd)	—	—	21	0.5	—	—	—	0.09-2.7
Chromium (Cr)	130	0.1*	0.20	38	4	0.01	12	—
Cobalt (Co)	5.3	0.01	0.02	0.04	0.01	—	0.04	—
Copper (Cu)	11	0.54	1.3	19	4	0.04	1.9	—
Hafnium (Hf)	—	—	—	—	—	—	—	—
Indium (In)	—	—	—	—	—	—	—	—
Iron (Fe)	~2,000	31	—	—	—	—	—	—
Lead (Pb)	62	0.11	0.04	160-315	3	0.02	0.01	<10
Magnesium (Mg)	440	13	4.3	75	40	—	—	—
Manganese (Mn)	30	0.37	0.02	10	3	0.1	0.33	—
Mercury (Hg)	—	—	—	0.3	0.1	0.07	0.01	<10
Molybdenum (Mo)	12	—	—	2	4	—	—	—
Nickel (Ni)	160	0.03	0.04	2	1	—	—	<0.8-2.2
Platinum (Pt)	—	—	—	4	16	—	—	—
Potassium (K)	710	1.4	7.1	2	75	—	—	—
Selenium (Se)	—	—	0.02	<0.01	0.06	—	0.01	<100
Silver (Ag)	—	—	—	0.4	0.1	—	—	<1
Sodium (Na)	760	32	—	—	—	—	—	—
Tantalum (Ta)	—	—	—	—	—	—	—	—
Tellurium (Te)	—	—	—	—	—	—	—	—
Tin (Sn)	—	—	0.01	—	6	—	—	—
Titanium (Ti)	66	0.16	0.70	—	15	—	—	—
Tungsten (W)	—	—	—	0.1	—	—	—	—
Vanadium (V)	—	—	—	0.2	5	—	<0.01	—
Yttrium (Y)	—	—	0.01	—	0.1	—	—	—
Zinc (Zn)	53	1.7	4.3	26	6	—	—	—
Zirconium (Zr)	—	—	0.03	0.4	4	—	—	—
REFERENCES	71	71	72	74	74	75	75	45

TABLE 2 (Continued)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	UNKNOWN ORGANIC WASTE	UNKNOWN SOLID WASTE	UNKNOWN FILTER CAKE	BCB COKE	IRON COKE	UNKNOWN DRUM WASTE	ANILINE MANUFACTURING WASTE	METHYL METHACRYLATE WASTE	PVC MANUFACTURING WASTE
EPA HAZARDOUS WASTE NUMBER	NA	NA	NA	NA	NA	NA	NA	(1)	(1)
NUMBER OF SITES SAMPLED	4$^{(a)}$	1	1	1	1	1	1	NA	1
HEAT CONTENT (kJ/kg)	19,900-34,040	760	8,390	20,150	16,520	21,550	33,340	25,600	6,300
TRACE METALS									
Aluminum (Al)	—	—	—	—	—	—	—	—	10
Antimony (Sb)	<12-276	<24	<13	<12	<12	<3	<2	—	—
Arsenic (As)	<24	<23	<24	<24	<24	<3.5	11	—	0.06
Barium (Ba)	6.5-1,260	71	113	<3.6	<3.6	5.4	<0.24	—	5
Beryllium (Be)	<1.8	1.1	<1.8	<1.8	<1.8	<0.15	<0.5	—	—
Cadmium (Cd)	<5-130	<2	165	<5.0	<5.0	<0.54	<0.84	—	—
Chromium (Cr)	5.2-466	14	235	<5.2	<5.2	105	250	—	25
Cobalt (Co)	—	—	—	—	—	—	—	—	—
Copper (Cu)	—	—	—	—	—	—	—	—	13
Hafnium (Hf)	—	—	—	—	—	—	—	—	—
Indium (In)	—	—	—	—	—	—	—	—	—
Iron (Fe)	—	—	—	—	—	—	1,300	—	—
Lead (Pb)	<19-1,910	<23	1,040	<19	<19	13	1	29,000	0.0
Magnesium (Mg)	—	—	—	—	—	—	—	—	—
Manganese (Mn)	—	—	—	—	—	—	34	—	—
Mercury (Hg)	<50	<50	<22	<22	<22	<3	4	<0.5	—
Molybdenum (Mo)	—	—	—	—	—	—	4	—	0.8
Nickel (Ni)	<4-67	14	6,550	262	105	723	170	—	0
Platinum (Pt)	—	—	—	—	—	—	—	—	—
Potassium (K)	—	—	—	—	—	—	—	—	13
Selenium (Se)	<470	<220	<495	<470	<470	<20	10	—	0.6
Silver (Ag)	<2.6	<1	<2.6	<2.6	<2.6	<0.03	<0.45	—	—
Sodium (Na)	—	—	—	—	—	—	71	—	—
Tantalum (Ta)	—	—	—	—	—	—	—	—	—
Tellurium (Te)	—	—	—	—	—	—	—	—	—
Tin (Sn)	—	—	—	—	—	—	—	—	—
Titanium (Ti)	—	—	—	—	—	—	—	—	4
Tungsten (W)	—	—	—	—	—	—	—	—	—
Vanadium (V)	—	—	—	—	—	—	—	—	0.6
Yttrium (Y)	—	—	—	—	—	—	—	—	—
Zinc (Zn)	—	—	—	—	—	—	—	—	16
Zirconium (Zr)	—	—	—	—	—	—	—	—	—
REFERENCES	45	45	45	45	45	45	45	30	73

TABLE 2 (Continued)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

WASTE STREAM	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	MIXTURE OF WASTES CONTAINING PESTICIDES	AMIBEN HERBICIDE MANUFACTURING WASTE	MIXTURE OF WASTES WITH HIGH CHLORINE CONTENT	LEATHER TANNING WASTE FINISHES
EPA HAZARDOUS WASTE NUMBER	D001	D001	D003	D004	K033-K043(h)	(i)	K085, K105(h)	NA
NUMBER OF SITES SAMPLED	1	1	1	1	30(a)	1	15(c)	9
HEAT CONTENT (kJ/kg)	32,600	11,600	42,000	NA	NA	230	NA	NA
TRACE METALS								
Aluminum (Al)	14,000	---	---	---	---	0.39	---	---
Antimony (Sb)	---	---	---	---	3.8-31	---	7-43	---
Arsenic (As)	---	---	---	100,000	6.8	0.26	5.6	---
Barium (Ba)	8,000	---	---	---	69.5	NCTB(b)	120	---
Beryllium (Be)	---	---	---	---	0.04	---	<0.08	---
Cadmium (Cd)	---	---	---	---	15.3	0.03	3.4	---
Chromium (Cr)	---	---	---	---	186	0.26	244	<4-5,200
Cobalt (Co)	---	---	---	---	---	0.86	---	---
Copper (Cu)	---	---	---	---	---	0.28	---	---
Hafnium (Hf)	---	---	---	---	---	---	---	---
Indium (In)	---	---	---	---	---	---	---	---
Iron (Fe)	---	---	---	---	---	31.9	---	---
Lead (Pb)	---	---	---	---	1,422	0.13	785	<10-17,000
Magnesium (Mg)	---	---	300,000	---	---	33	---	---
Manganese (Mn)	---	---	---	---	---	0.46	---	---
Mercury (Hg)	---	---	---	---	1.7	---	2.3	---
Molybdenum (Mo)	---	---	---	---	---	---	---	---
Nickel (Ni)	---	---	---	---	12.1	---	13.8	---
Platinum (Pt)	---	---	---	---	---	---	---	---
Potassium (K)	---	100,000	---	---	---	NC(b)	---	---
Selenium (Se)	---	---	---	---	5.1	0.04	3.1	---
Silver (Ag)	---	---	---	---	0.28	---	0.15	---
Sodium (Na)	---	110,000	---	---	---	---	---	---
Tantalum (Ta)	---	---	---	---	---	---	---	---
Tellurium (Te)	---	---	---	---	2.6	---	1.9	---
Tin (Sn)	---	---	---	---	---	---	---	---
Titanium (Ti)	---	---	---	---	---	2.9	---	---
Tungsten (W)	---	---	---	---	---	---	---	---
Vanadium (V)	---	---	---	---	---	0.87	---	---
Yttrium (Y)	---	---	---	---	---	---	---	---
Zinc (Zn)	---	---	---	---	---	0.59	---	ND(b)-1,400
Zirconium (Zr)	6,000	---	---	---	---	---	---	---
REFERENCES	87	87	87	87	78	72	78	83

TABLE 2 (Concluded)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)

<u>FOOTNOTES FOR TABLE 2</u>

(a) Not all trace metals were analyzed at all sites.
(b) NA - Not available.
MC - Major component.
NGTB - Not greater than background.
ND - Not detected.
(c) Multiple samples of several waste streams at an offsite incinerator.
(d) Actual number of samples.
(e) Data not reported.
(f) Mixture of industrial and municipal sludge.
(g) No one EPA Hazardous Waste Number applies. Range of concentrations is likely to encompass many of the sludges listed as hazardous wastes.
(h) EPA Hazardous Waste Number not specified. Estimate of what the EPA Hazardous Waste Number might be.
(i) EPA Hazardous Waste Number not specified. Not determinable as to whether all such waste streams are hazardous; some of the waste streams are expected to be hazardous.
(j) May also include EPA Hazardous Waste Number F003 and F005.

TABLE 3

AVERAGE TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)(a)

WASTE STREAM	PETROLEUM REFINING						
	DISSOLVED AIR FLOTATION FLOAT(k)	SLOP OIL EMISSIONS SOLIDS(k)	HEAT EXCHANGER CLEANING SLUDGE(h)	LEADED TANK BOTTOMS(k)	CRUDE TANK BOTTOMS(k)	COKE FINES(h)	API SEPARATOR SLUDGES(k)
EPA HAZARDOUS WASTE NUMBER	K048	K049	K050	K052	(j)	(j)	K051
NUMBER OF SITES SAMPLED	5(b)	9(b)	2(b)	2(b)	2(b)	5(b)	12(b)
HEAT CONTENT (kJ/kg)	3,600	20,300	3,500	8,800	20,600	32,600	8,700
TRACE METALS							
Aluminum (Al)	—(f)	—	—	—	—	—	>10,000.
Antimony (Sb)	—	—	—	—	—	—	—
Arsenic (As)	2.1	7.4	10.6	294.	21.1	2.0	6.2
Barium (Ba)	—	—	—	—	—	—	740.
Beryllium (Be)	0.0025	0.0025	0.20	0.0025	0.0025	0.005	—
Cadmium (Cd)	0.005	0.19	1.3	6.3	0.31	1.0	0.42
Chromium (Cr)	140.	525.	311.	11.4	19.4	0.02	420.
Cobalt (Co)	2.0	10.	1.6	49.	14.0	4.0	9.3
Copper (Cu)	7.0	40.	71.	141.	65.4	4.0	410.
Hafnium (Hf)	—	—	—	—	—	—	—
Indium (In)	—	—	—	—	—	—	—
Iron (Fe)	—	—	—	—	—	—	—
Lead (Pb)	7.5	20.1	78.	790.	10.9	—	210.
Magnesium (Mg)	—	—	—	—	—	—	>5,000.
Manganese (Mn)	—	—	—	—	—	—	170.
Mercury (Hg)	0.27	0.59	1.9	0.57	0.40	0.04	0.4
Molybdenum (Mo)	0.05	5.	6.5	59.	6.3	0.1	5.
Nickel (Ni)	0.025	50.	116.	314.	16.2	500.	50.
Platinum (Pt)	—	—	—	—	—	—	—
Potassium (K)	—	—	—	—	—	—	~1,000.
Selenium (Se)	2.0	1.0	27.1	6.95	0.3	0.01	0.01
Silver (Ag)	0.25	0.4	0.005	0.88	0.19	0.01	0.45
Sodium (Na)	—	—	—	—	—	—	—
Tantalum (Ta)	—	—	—	—	—	—	—
Tellurium (Te)	—	—	—	—	—	—	—
Tin (Sn)	—	—	—	—	—	—	18.
Titanium (Ti)	—	—	—	—	—	—	340.
Tungsten (W)	—	—	—	—	—	—	—
Vanadium (V)	0.05	25.	25.	5.4	17.4	455.	92.
Yttrium (Y)	—	—	—	—	—	—	—
Zinc (Zn)	85.	250.	194.	—	145.	14.	~1,000.
Zirconium (Zr)	—	—	—	—	—	—	22.
REFERENCES	79,80	79,80	79,80	79,80	80	80	71,79,80

TABLE 3 (Continued)

AVERAGE TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)[a]

WASTE STREAM	PAINT FORMULATION WASTEWATER TREATMENT SLUDGES	MIXTURE OF WASTES CONTAINING PESTICIDES	MIXTURE OF WASTES WITH HIGH CHLORINE CONTENT	SEWAGE SLUDGE[g]	WASTE OILS			
					CRANKCASE OIL	INDUSTRIAL OIL	UNKNOWN OIL	ALL
EPA HAZARDOUS WASTE NUMBER	(j)	K033-K043[f]	K085,K105[f]	(h)	(j)	(j)	(j)	(j)
NUMBER OF SITES SAMPLED	39[b]	30[b]	15[d]	31[b]	60[e]	79[e]	181[e]	319[e]
HEAT CONTENT (kJ/kg)	3,600	NA[c]	NA	12,000-23,000	43,000	43,000	43,000	43,000
TRACE METALS								
Aluminum (Al)	867.	—	—	20,400.	13.9	60.9	64.0	43.9
Antimony (Sb)	1.6	26.0	39.1	42.	—	—	—	—
Arsenic (As)	0.80	6.0	4.9	300.	—	—	—	—
Barium (Ba)	9.0	86.0	121.	1,230.	321.	59.	123.	107.
Beryllium (Be)	0.19	< 0.08	< 0.08	7.6	1.0	5.	0.06	1.4
Cadmium (Cd)	0.84	15.33	3.4	178.	1.7	3.6	2.2	2.9
Chromium (Cr)	7.1	106.	244.	1,650.	10.	8.	20.	10.
Cobalt (Co)	2.1	—	—	37.	0.14	—	0.09	0.56
Copper (Cu)	7.1	—	—	1,800.	31.6	52.6	45.1	43.0
Hafnium (Hf)	—	—	—	2.4	—	—	—	—
Indium (In)	—	—	—	0.3	—	—	—	—
Iron (Fe)	886.	—	—	35,000.	230.	516.	1,271.	505.
Lead (Pb)	10.0	1,422.	785.	2,150.	5,560.	206.	550.	1,527.
Magnesium (Mg)	0.16	—	—	6,900.	362.	40.6	107.	221.
Manganese (Mn)	7.3	—	—	800.	5.7	20.1	13.0	14.2
Mercury (Hg)	15.1	1.0	2.3	620.	—	—	—	—
Molybdenum (Mo)	1.7	—	—	14.	4.9	2.0	10.1	5.0
Nickel (Ni)	<10.4	12.0	13.0	320.	1.4	13.7	36.0	16.1
Platinum (Pt)	—	—	—	0.3	—	—	—	—
Potassium (K)	—	—	—	12,100.	—	—	—	—
Selenium (Se)	< 0.55	4.9	3.1	3.0	—	—	—	—
Silver (Ag)	< 0.02	0.20	0.2	74.	0.21	1.1	6.4	1.1
Sodium (Na)	0.50	—	—	4,150.	100.	45.6	221.	119.
Tantalum (Ta)	—	—	—	0.4	—	—	—	—
Tellurium (Te)	—	2.4	1.9	200.	—	—	—	—
Tin (Sn)	2.6	—	—	670.	6.5	12.4	10.7	11.7
Titanium (Ti)	30.4	—	—	2,300.	1.4	6.2	5.3	5.2
Tungsten (W)	—	—	—	19.	—	—	—	—
Vanadium (V)	0.09	—	—	—	0.73	5.5	31.3	9.6
Yttrium (Y)	< 0.21	—	—	3.0	—	—	—	—
Zinc (Zn)	231.	—	—	3,400.	9.2	220.	555.	5.6
Zirconium (Zr)	—	—	—	49.	—	—	—	—
REFERENCES	82,84	70	70	24,27,42,43,44 57,58,59,62,64 66,67,68,77	70,86	70,86	70,86	70,86

TABLE 3 (Concluded)

AVERAGE TRACE METAL CONCENTRATIONS IN SELECTED HAZARDOUS WASTE STREAMS THAT ARE POTENTIALLY INCINERABLE (mg/kg)(a)

FOOTNOTES FOR TABLE 3:

(a) Average values are presented only for those wastes included in Table 2 that were sampled at more than one site. See Table 2 for trace metal concentrations of wastes sampled at only one site and for additional wastes for which average trace metal concentrations cannot be determined based on available data.
(b) Not all trace metals were analyzed at all sites.
(c) NA--Not available.
(d) Multiple samples of several waste streams at an offsite incinerator.
(e) Actual number of samples.
(f) Data not reported.
(g) Mixture of industrial and municipal sludge.
(h) No one EPA hazardous waste number applies. Range of concentrations is likely to encompass many of the sludges listed as hazardous wastes.
(i) EPA hazardous waste number not specified. Estimate of what the EPA hazardous waste number might be.
(j) EPA hazardous waste number not specified. Not determinable as to whether all such waste streams are hazardous; some of the waste streams are expected to be hazardous.
(k) Median value, not average value.

TABLE 4

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED WASTES AND FUELS (mg/kg)

FUEL/WASTE	HAZARDOUS WASTE(a)	SEWAGE SLUDGE	COAL	FUEL OIL(h)	MUNICIPAL SOLID WASTE	REFUSE-DERIVED FUEL	WOOD
NUMBER OF SITES SAMPLED(b)	(d)	30	166	>20	9	2	1
HEAT CONTENT(c) (kJ/kg)	470-45,200	12,000-23,000	23,400-33,400	40,000-44,000	10,500(e)	11,500-16,000(f)	19,000
ASH CONTENT(c) (%)	NA(g)	31-60	4.1-25	0.01- 0.2	6.5(e)	17-36	2.0
TRACE METALS							
Aluminum (Al)	<1-14,000	4,400-52,000	4,300-31,000	0.3-19	5,400-20,000	14,000	>19
Antimony (Sb)	0.01-276	2.6-300	0.1-0.9	<0.01- 0.4(j)	0.4-660	<1(i)-25	2.0
Arsenic (As)	0.0-100,000	0.3-50	0.3-120	< 0.01-2.0	<0.2-400	<3(i)	20
Barium (Ba)	0.01-8,000	ND-4,500	5-1,600	0.3-3.4	20-450	850	50
Beryllium (Be)	0.001-7	ND-<15	0.2-4	<0.002-0.2	< 2	<1.2	0.1
Cadmium (Cd)	0.0-10,400	ND-580	0.1-65	< 0.1-5	<0.3-70	6.4-13.0	0.1
Chromium (Cr)	0.0-20,000	30-14,000	2.4-60	0.09-2.2	6.1-100	34-280	>100
Cobalt (Co)	0.01-83	ND-800	0.6-33	0.008-2.2	0.6-17	NR	17
Copper (Cu)	0.0-45,300	45-16,000	3.1-44	0.1-79	14-900	250-370	15
Hafnium (Hf)	NR(g)	1-11	0.1-2.2	0.003(j)	<0.10	NR	0.2
Indium (In)	NR	0.07-3.7	0.01-0.6	0.005-0.3(j)	NR	NR	NR
Iron (Fe)	<0.1-253,000	8,700-170,000	3,000-41,000	< 1-<51	305-5,400	16,000	>100
Lead (Pb)	0.0-130,000	80-26,000	0.7-220	< 0.2-8	12-1,500	466-610	3.3
Magnesium (Mg)	0.001-300,000	2,000-10,000	100-3,900	<0.4-650	410-4,300	NR	100
Manganese (Mn)	0.02-250	32-8,000	1.4-220	<0.01-27	15-400	190	200
Mercury (Hg)	0.0-220	0.6-43	0.02-1.6	0.001-0.3	<0.1-3.1	4.0	0.2
Molybdenum (Mo)	0.02-120	1.2-40	0.1-30	<0.01-2.9	0.0-30	NR	0.7
Nickel (Ni)	0.0-6,550	ND-2,000	1.5-60	< 1-142(j)	3.4-90	14	19
Platinum (Pt)	4(i)-6(i)	0.05-0.6	0.3(h)	0.02(j)	<0.1-<10	NR	>0.02
Potassium (K)	1.4-100,000	2,700-39,300	400-6,000	1.9-82	840-2,000	3,000	>100
Selenium (Se)	0.005-52	1.7-100	0.4-8.1	0.02-4.2	0.1	<1-8	0.7
Silver (Ag)	0.0007-20	ND-960	0.01-0.08	0.0002-1	0.1-16	3.2	0.1
Sodium (Na)	ND-110,000	740-15,400	300-6,000	<1-280	890-7,400	NR	>50
Tantalum (Ta)	NR	0.1-1.2	0.04-1.1	0.04(j)	< 4	NR	≤0.06
Tellurium (Te)	1.9-2.6	0.05-1.5	0.7(h)	0.1(j)	NR	NR	0.02
Tin (Sn)	0.01-140	111-3,000	0.1-51	<0.01-6.2(j)	1.1-95	27	1.1
Titanium (Ti)	<0.01-540	1,000-11,000	200-1,600	0.3-2.0	900-2,000	500-1,000	>100
Tungsten (W)	0.1	0.9-100	0.04-4.2	0.004(j)	< 30	NR	0.1
Vanadium (V)	<0.01-3,500	ND-2,100	4.0-90	1.0-300	5-70	17-150	12
Yttrium (Y)	0.01-0.6	0.0-10	0.8(h)	0.002(j)	0.35	NR	1.9
Zinc (Zn)	0.1-17,500	51-28,400	0.3-5,300	0.06-6.1	42-2,500	597-760	45
Zirconium (Zr)	0.03-6,000	5.4-92	8-170	<0.05-0.2(j)	1-70	NR	7
REFERENCES	38,45,48,70,71, 72,73,74,75,77, 78,79,80,81,82, 83,84,85,86,87	24,27,42,43,44, 57,58,59,62,64, 66,67,68,77	6,92	9,13,15,18, 34,91,93	20,21,25,37, 47,51,56,92	7, 10	46

TABLE 4 (Concluded)

RANGE OF TRACE METAL CONCENTRATIONS IN SELECTED WASTES AND FUELS (mg/kg)

(a) Range of trace metal concentration of all hazardous waste included in Table 2, except sewage sludge which is listed separately.
(b) Not all trace metals were analyzed at all sites.
(c) Moisture-free value, except where noted.
(d) Data is based on 67 different waste streams at over 100 different sites, plus 319 samples of three waste oil streams from an unknown number of sites.
(e) Average value based on 23 sites. Ash is "as fired" for the combustible portion of the waste.
(f) Heat content as fired.
(g) NA--Not available; ND--Not detected; NR- Not reported.
(h) Mean value for eastern and western bituminous coal.
(i) Data is reported to be suspect.
(j) The upper limit is an average value of an unknown number of samples for which the range is not available.
(k) Type of fuel oil is not specified by the references.

DISTRIBUTION OF TOTAL AND HEXAVALENT CHROMIUM IN EMISSIONS AND DISCHARGES FROM LIQUID INJECTION INCINERATION

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ABSTRACT

A brief series of pilot-scale incineration tests was conducted in the EPA Combustion Research Facility's liquid injection incineration system (LIS) to determine the fate of chromium in the waste fed to the incinerator in terms of the distribution of chromium between flue gas and incinerator residuals and the fraction of chromium in each discharge as hexavalent chromium (Cr(+6)). In two of the tests performed, chromium was fed to the LIS in a methanol base. In a third test to evaluate possible effects of feed chlorine content, chlorobenzene and carbon tetrachloride were added to the feed to bring feed chlorine content to about 20 percent. Test results indicate that roughly 80 percent of the total chromium fed in a chlorine-free feed exited the incinerator's scrubber in the flue gas; the remaining about 20 percent is discharged in the scrubber blowdown. The flue gas proportion of total chromium decreased to about 65 percent with the high chlorine content feed. Most of the flue gas total chromium was in the particulate (80 to 95 percent at the scrubber exit) phase relative to the vapor phase regardless of feed chlorine content. Apparently 14 to 18 percent of the scrubber exit flue gas particulate and the scrubber blowdown chromium was Cr(+6). However, feed Cr(+6) proportions were in this range even for feeds prepared with trivalent chromium only. Thus the significance of this latter observation is unclear.

INTRODUCTION

EPA's Office of Solid Waste is currently considering the regulation of hazardous constituent trace metal emissions from hazardous waste incinerators. Chromium is one of these hazardous constituent trace metals. Of the two common forms of chromium in chromium-containing compounds, trivalent chromium (Cr(+3)) and hexavalent chromium (Cr(+6)), the hexavalent form is the much more toxic. In the absence of data showing which form of chromium is emitted from an incinerator, risk assessments have generally assumed that the entire amount emitted is in the hexavalent form. This assumption has resulted in specifying rather conservative allowable emission levels in the regulatory development process.

To supply data to support a more reasonable regulatory posture, EPA's Combustion Research Facility was asked to perform a brief series of tests specifically aimed at determining the relative fractions of the two forms of chromium present in the emissions from a hazardous waste incinerator. The specific objectives of the tests were to:

- Determine the fate of chromium fed to an incinerator in terms of the distribution of chromium between flue gas and scrubber blowdown discharges, and whether this distribution is affected by the valence state of chromium fed or the chlorine content of the feed.
- Determine the distribution of flue gas chromium between condensed (particulate) and vapor phases, and whether this distribution is affected by the valence state of chromium fed or the chlorine content of the feed.
- Determine the fraction of chromium existing as hexavalent chromium in the flue gas particulate and vapor phases and in the scrubber

blowdown, and whether these fractions are affected by the valence state of chromium fed or the chlorine content of the feed.

A secondary objective of the tests was to extend the data base on volatile product of incomplete combustion (PIC) emissions from hazardous waste incinerators.

TEST PROGRAM

Three tests were performed in this program in which chromium compounds were added to methanol to simulate a hazardous waste. In one test, chlorobenzene and carbon tetrachloride were added to the test mixture to bring its chlorine content up to 21.3 percent.

All tests were performed in the liquid injection incinerator system (LIS) at the CRF. Figure 1 shows a schematic of this system. As shown, it consists of a fired primary combustion chamber followed by an unfired secondary chamber. Incineration flue gas from the system passes through a primary air pollution control system (APCS) consisting of a packed column scrubber followed by an ionizing wet scrubber (IWS). From this primary APCS, flue gas next passes through a secondary APCS consisting of a carbon bed absorber followed by a HEPA filter. This secondary system is designed to ensure complete removal of particulate and vapor phase organic constituents from the flue gas before discharging it to the atmosphere. For these tests the IWS was not in operation.

Test Liquid Feed Mixture

As noted above, the test feed liquids for the tests were methanol-based synthetic waste mixtures. For one test, carbon tetrachloride and chlorobenzene were added to methanol to achieve a high chlorine content synthetic waste. The mixtures were then spiked selectively with either chromium trioxide (CrO_3, hexavalent chromium) or chromium trinitrate hydrate

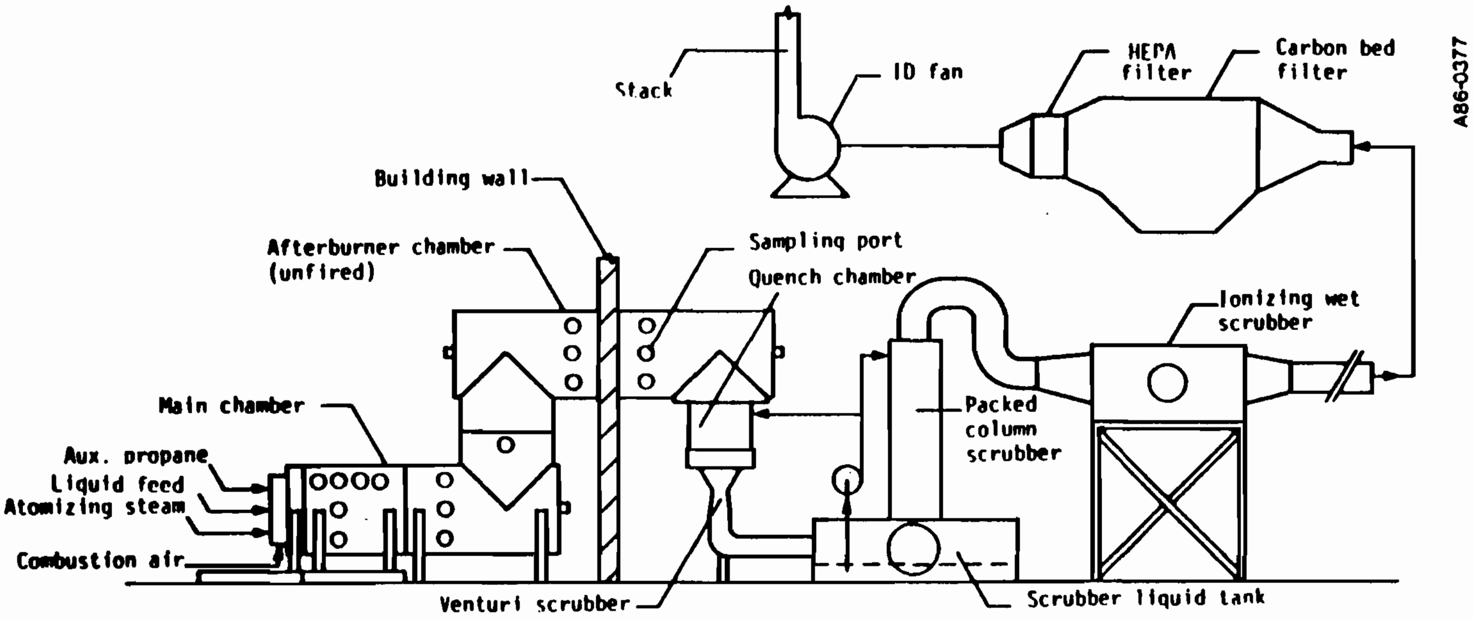

Figure 1. Simplified schematic of the EPA CRF liquid injection incinerator system.

($Cr(NO_3)_3.9H_2O$, trivalent chromium). Table 1 lists the feed composition as determined by blend proportions and by analysis.

For test 1, methanol was spiked with chromium trioxide (Cr(+6)) to 10-ppm chromium. Analysis found total chromium to be 5.3 ppm and only 0.4 ppm as Cr(+6). For tests 2 and 3, chromium trinitrate hydrate (Cr(+3)) was added to the methanol-based liquids to give 40-ppm chromium. Analysis of the test-2 and -3 feed batches found about 17 and 27 ppm total chromium, of which 1 and 6 ppm were hexavalent chromium, respectively.

Three points are suggested by the above data. The first is that the analyzed total chromium content of all feed mixtures prepared were roughly half the blended concentrations. This suggests that the added chromium compounds partially precipitated out of solution or adhered to liquid feed system surfaces. For this reason, the analyzed concentrations are used in all data evaluations.

The second point is that, although hexavalent chromium was added to the feed mixture for test 1, feed analysis showed that the resultant chromium was largely in the trivalent state. This strongly suggests that the hexavalent chromium reacted with the feed liquid and became reduced to trivalent chromium. In retrospect, this seems logical. Hexavalent chromium is a relatively strong oxidizing agent and methanol oxidizes readily to formaldehyde, which oxidizes even more readily to formic acid. Thus the reduction of hexavalent chromium to trivalent when placed in methanol might be expected, and apparently occurred.

The third point is that apparently regardless of the form of chromium added to the feed liquid, of the order of 10 percent (6 percent for test 2, 8 percent for test 1, and 22 percent for test 3) of the total chromium is

TABLE 1. TEST LIQUID FEED COMPOSITION

Parameter	Test number Test date	1 3-3-87	2 3-4-87	5 3-5-87
Calculated composition[a]				
Methanol (%)		100	100	53.8
Carbon tetrachloride (%)		--	--	24.2
Chlorobenzene (%)		--	--	21.9
Cr(+3) (ppm)		--	40.0	40.0
Cr(+6) (ppm)		10.1	--	--
Ultimate analysis (%)				
C		37.5	37.5	36.1
H		12.5	12.5	7.7
O		50.0	50.0	26.1
Cl		--	--	29.3
Heating value, MJ/kg (Btu/lb)		22.67 (9,766)	22.67 (9,766)	18.58 (8,005)
Analyzed composition				
Carbon tetrachloride (%)		--	--	22.0
Chlorobenzene (%)		--	--	23.4
Total Cr (ppm)		5.3	17.0	27.0
Cr(+6) (ppm)		0.4	0.9	6.0
Ultimate analysis (%)				
C		34.1	37.5	37.9
H		11.9	12.0	8.5
O		54.0	50.5	32.3
Cl		--	--	21.3
Heating value, MJ/kg (Btu/lb)		22.67 (9,766)	22.66 (9,763)	18.59 (8,011)

[a] Based on blend proportions.

measured as hexavalent chromium. This suggests that either an equilibriuim is reached with roughly 10 to 20 percent of the total chromium added being in the hexavalent form, or that the hexavalent chromium analysis method does respond to trivalent chromium, although at an order of magnitude less sensitivity.

Test Conditions

Since the test program sought only to investigate the effects of the form of chromium fed and the feed chlorine content on chromium emissions, incinerator operation was maintained at identical conditions for the three tests performed. Table 2 summarizes the average operating conditions of these tests.

The sampling matrix to be employed for each test consisted of:

- Obtaining a composite sample of the feed mixture
- Obtaining a composite sample of the scrubber blowdown water
- Sampling the flue gas at the secondary combustion chamber exit and the ionizing wet scrubber (IWS) exit for chromium emissions (particulate matter only at the stack) using Method 5 (M5) modified to enhance chromium collection
- Sampling the flue gas at the ionizing wet scrubber exit for volatile organic hazardous constituents using the volatile organic sampling train (VOST)
- Measuring flue gas O_2, CO_2, and CO at the secondary combustion chamber exit and in the stack using continuous emission analyzers
- Sampling the flue gas at the ionizing wet scrubber discharge and at the stack for particulate emissions using M5

TABLE 2. AVERAGE TEST INCINERATOR OPERATING CONDITIONS

Test no.	Test date	Waste feed rate, kg/hr (lb/hr)	Secondary chamber flue gas O_2, percent dry	Primary chamber temperature, °C (°F)	Chromium feedrate, g/hr	
					Total Cr	Cr(+6)
1	3-3-87	46 (101)	7.5	1,288 (2,350)	0.24	0.018
2	3-4-87	45 (99)	7.7	1,264 (2,307)	0.76	0.041
3	3-5-87	47 (105)	6.7	1,231 (2,248)	1.27	0.28

The laboratory analysis procedures used to characterize the samples collected by the above methods included:

- Analyzing all blowdown water and M5 train samples (filter and impinger solutions) for total Cr and Cr(+6)
- Analyzing the composite feed sample from test 3 for carbon tetrachloride and chlorobenzene and all composite feed samples for total Cr and Cr(+6)
- Subjecting one composite feed sample per formulation to ultimate analysis (C, H, O, Cl, and heating value)
- Analyzing all VOST samples for the 23 volatile organic compounds visible to the FID and routinely determined at the CRF (see Table 3)

TABLE 3. VOLATILE ORGANIC COMPOUNDS ROUTINELY ANALYZED BY GC/FID AT THE CRF

Methylene chloride
1,1-Dichloroethylene
1,1-Dichloroethane
t-1,2-Dichloroethylene
Chloroform
1,2-Dichloroethane
1,1,1-Trichloroethane
Carbon tetrachloride
Bromodichloromethane
1,2-Dichloropropane
t-1,3-Dichloropropylene
Trichloroethylene
Benzene
1,1,2-Trichloroethane
Hexane
Bromoform
Tetrachloroethylene + Tetrachloroethane
Toluene
Chlorobenzene
Ethyl benzene
1,3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene

RESULTS

Chromium Discharge Distributions

Discharge distributions for chromium in the following paragraphs are discussed in terms of the flowrate of the chromium measured in the secondary combustor exit flue gas, the IWS exit flue gas, and scrubber blowdown discharge expressed as a fraction of the inlet chromium feedrate. Table 4 summarizes the fractions of the total chromium feed found in the secondary combustor exit flue gas, the IWS exit flue gas, and the scrubber blowdown water. As shown in the table, between 46 and 71 percent of the total chromium fed to the incinerator was measured in the secondary combustion chamber exit flue gas. Thus, mass balance closure was within a factor of about 2 at this location. This result compares quite favorably with past experience. This past experience has shown that mass balance closure for trace elements fed to combustion devices within a factor of 3 has generally been the best achievable.

Between 71 and 116 percent of the total chromium fed could be accounted for in the two scrubber discharge streams. For tests 1 and 2, 78 and

TABLE 4. TOTAL CHROMIUM DISCHARGE DISTRIBUTIONS

Test no.	Feed chlorine content, %	Primary combustor temperature, °C (°F)	Secondary combustor exit O_2, %	Total chromium discharge distribution, percent of feedrate			
				Secondary combustor exit	Scrubber discharge streams		
					IWS exit flue gas	Blowdown	Total
1	0	1,288 (2,350)	7.5	46	88	25	113
2	0	1,264 (2,307)	7.7	71	89	27	116
3	21.3	1,231 (2,248)	6.7	51	47	24	71

77 percent, respectively, of the total chromium measured was found in the flue gas discharge of the scrubber, suggesting that the scrubber collection efficiency for chromium for these two tests was only about 20 percent.

For test 3, in which the chlorine content of the feed liquid was increased to about 20 percent, a significantly lower fraction of scrubber discharge total chromium (66 percent) was found in the flue gas. Apparent scrubber collection efficiency of total chromium increased to about 35 percent. This is consistent with expectations. With higher feed chlorine content, the opportunity for chromium to be in the form of soluble chromium chlorides over insoluble chromium oxides would exist, and scrubber collection efficiency would be expected to be increased.

Table 5 gives the distribution of total chromium between the particulate phase (probe wash plus filter catch) and the vapor phase (impinger catches) at the two flue gas stream locations sampled. As shown, the bulk of the total chromium measured at both locations was in the condensed, particulate phase.

TABLE 5. CHROMIUM FLUE GAS DISTRIBUTIONS

				Total chromium distribution between particulate and vapor phase in the flue gas, %			
				Secondary combustor exit		IWS discharge	
Test no.	Feed chlorine content, %	Primary combustor temperature, °C (°F)	Secondary combustor exit O_2, %	Particulate	Vapor	Particulate	Vapor
1	0	1,288 (2,350)	7.5	97	3	82	18
2	0	1,264 (2,307)	7.7	99.5	0.5	95	5
3	21.3	1,231 (2,248)	6.7	75	25	95	5

Between 75 and 99.5 percent of the total chromium was measured in the particulate phase at the secondary combustor exit; a similar 82 to 95 percent was in the particulate phase in the scrubber discharge flue gas.

Table 6 gives the fraction of total chromium which was measured as hexavalent chromium in the flue gas streams sampled, and in the scrubber blowdown. Only data for the flue gas particulate phase samples are given; no impinger solution contained detectable hexavalent chromium. The data in Table 6 show that less than 10 percent of the particulate chromium was measured as Cr(+6) at the secondary combustor exit. Between 14 and 18 percent of the particulate Cr at the IWS exit was measured as Cr(+6). Between less than about 10 and 20 percent of the Cr in the scrubber blowdown was measured as Cr(+6).

TABLE 6. FRACTION OF TOTAL CHROMIUM MEASURED AS HEXAVALENT CHROMIUM IN INCINERATOR DISCHARGE STREAMS

				Fraction of total chromium measured as hexavalent chromium, %		
Test no.	Feed chlorine content, %	Primary combustor temperature, °C (°F)	Secondary combustor exit O_2, %	Secondary combustor exit flue gas particulate	IWS discharge flue gas particulate	Scrubber blowdown
1	0	1,288 (2,350)	7.5	<10	14	<13
2	0	1,264 (2,307)	7.7	2.4	18	18
3	21.3	1,231 (2,248)	6.7	0.8	18	12

Recall from above that the Cr content of feed samples was measured to consist of the order of 10 percent Cr(+6). It seems more than circumstantial that, in the majority of samples of all matrices analyzed (feed, flue gas particulate, and blowdown liquor) if Cr(+6) was present at above method detection limits, it was present at about 10 to 20 percent of the total Cr measured in the samples. All these data seem to suggest one of two occurrences noted above. Either an equilibrium distribution of Cr(+3) and Cr(+6) was established in each feed in which about 10 to 20 percent of the feed total Cr was present as Cr(+6), and that this distribution was roughly preserved through the incineration process and the wet scrubber (including scrubber blowdown); or that the method used to measure Cr(+6) is sensitive to total Cr as well, with a response factor an order of magnitude below that for Cr(+6).

Flue Gas Organic Compound Emissions

Table 7 summarizes results from the volatile organic hazardous constituent measurements in the IWS exit flue gas. Those constituents present in the flue gas above method detection limits ranging from 0.6 to 2.9 µg/dscm are listed.

The compounds noted in Table 7 are commonly measured products of incomplete combustion (PICs) in incinerator flue gas. The measured concentrations in these tests, in the nominally 1 to 10 µg/dscm range, are also the commonly measured levels at which these compounds are seen.

In tests 1 and 2, the feed contained no chlorinated compounds. Still the presence of the chlorinated PICs in the flue gas should not be surprising. A hysteresis effect has been noted in several chlorinated hazardous constituent thermal destruction test programs in which emissions of chlorinated PICs continues long after feed of chlorinated constituents to the thermal destruction device has been stopped. The tests immediately preceding these in the LIS involved feeding highly chlorinated synthetic waste feeds. Thus, the continuing emissions of low levels of the chlorinated PICs in Table 7 during tests 1 and 2 should come as no surprise.

In test 3, the feed mixture contained about 22 percent chlorobenzene and 24 percent carbon tetrachloride. Indeed, the IWS exit flue gas concentrations for both these compounds increased by a factor of 3 to 10 in test 3 over tests 1 and 2. Flue gas chloroform levels also increased significantly for test 3, although 1,2-dichloroethane levels decreased. Emission levels of the other chlorinated PICs were relatively invariant for all three tests.

In test 3, chlorobenzene and carbon tetrachloride would be considered principal organic hazardous constituents (POHCs) if the test feed were a

TABLE 7. IWS EXIT VOLATILE ORGANIC CONSTITUENT FLUE GAS CONCENTRATIONS

Test no.	1[a]	2[a]	3[b]	
Feed chlorine concentration, %	0	0	21.3	
Primary combustor temperature, °C (°F)	1,288 (2,350)	1,264 (2,307)	1,231 (2,248)	
Secondary combustor exit O_2, %	7.5	7.7	6.7	
	Volatile organic constituent flue gas concentration (µg/dscm)[c]			Detection limit (µg/dscm)
Methylene chloride	7.0	5.2	4.6	2.9
Chloroform	3.5	1.8	27.4	1.0
1,2-Dichloroethane	3.8	11.8	ND	1.2
1,1,1-Trichloroethane	0.6	0.8	1.3	0.6
Carbon tetrachloride	2.2	1.4	13.3	0.6
Trichloroethylene	0.5	ND	1.0	0.6
Benzene	11.3	1.3	1.6	0.6
1,1,2-Trichloroethane	1.6	1.6	3.8	1.6
Hexane	0.7	1.2	3.6	0.6
Toluene	3.6	2.3	1.7	1.2
Chlorobenzene	0.9	ND	3.0	0.6

[a] Average of 3 trap pairs.
[b] Average of 2 trap pairs.
[c] ND: Not detected at detection limit noted.

hazardous waste. The emission levels noted in Table 7 for these two compounds, combined with the test flue gas flowrate and respective feedrates, correspond to 99.99997 percent chlorobenzene destruction and removal efficiency (DRE) and 99.99986 percent carbon tetrachloride DRE.

CONCLUSIONS

Test conclusions in terms of the test program objectives include:

- Between 46 and 71 percent of the chromium fed to the incinerator could be measured in the flue gas at the incinerator secondary combustor exit. Between 71 and 116 percent of the chromium fed to the incinerator could be measured in one of the two discharge streams from the flue gas scrubber (flue gas and blowdown). Thus, total chromium mass balance closure was within about a factor of 2 at the secondary combustor exit, and within a factor of 30 percent in the scrubber discharges. This experience is well within the bounds of trace metal mass balance closure results from past studies of trace metal discharges from combustion sources.
- Roughly 80 percent of the total chromium measured in scrubber discharges was in the flue gas for the tests with no feed chlorine, implying a scrubber chromium collection efficiency of about 20 percent. With feed chlorine content increased to about 20 percent, the fraction of chromium in the scrubber discharge flue gas was decreased to about 65 percent of the total measured in the flue gas and blowdown, implying an increased scrubber collection efficiency of about 35 percent. This might be expected if the increased chlorine content gave rise to increased formation of more soluble chromium chlorides over more insoluble chromium oxides.

- Most of the flue gas chromium existed in the condensed (particulate) phase and both the secondary combustor exit and the scrubber exit, with between 75 and 99.5 percent of the flue gas chromium measured being in the solid phase particulate. This distribution was apparently unaffected by feed chlorine content.
- Apparently less than 10 percent of the flue gas particulate chromium was as Cr(+6) at the secondary combustor exit. Apparently 10 to 20 percent of the scrubber blowdown and the scrubber discharge flue gas particulate Cr was as Cr(+6). Cr(+6) was not detected in any flue gas vapor phase sample, although this would be expected given the low total chromium contents (near detection limit) of these samples. The apparent fraction of flue gas particulate and scrubber blowdown chromium measured as Cr(+6) was unaffected by feed chlorine content.
- Several commonly measured chlorinated C_1, and C_2 hydrocarbons, benzene, toluene, and hexane were present in the scrubber discharge flue gas at levels in the about 1 to 10 µg/dscm range for all tests. Chlorobenzene, carbon tetrachloride, and chloroform levels were increased for the test with chlorobenzene and carbon tetrachloride present in the feed, although 1,2-dichloroethane levels were decreased for this test.
- Chlorobenzene DRE was greater tha 99.9999 percent and carbon tetrachloride DRE greater than 99.999 percent as measured at the scrubber discharge for the test with these constituents present in the feed.

The conclusion concerning the fraction of total chromium present as Cr(+6) was qualified as being apparent. In all three feed samples analyzed, Cr(+6) was measured as being present at between 6 and about 20 percent of the total chromium. This is the same range as the fraction of total chromium measured as Cr(+6) in scrubber discharge flue gas particulate and scrubber blowdown samples. This suggests that either an equilibrium distribution of Cr(+3) and Cr(+6) is established in the feed liquids in which Cr(+6) exists as of the order of 10 percent of the total Cr, and that this distribution is preserved through the incinerator, the scrubber, and in the scrubber blowdown. Alternatively, the analytical method used to determine Cr(+6) may be sensitive to total Cr with a response factor for total Cr of an order of magnitude lower.

Data quality objectives (DQO) for measurement precision and accuracy were not fully met for all measurement parameters. The major objective not met was for spike recovery of compounds from VOST traps. Outlying recoveries were generally low, in the 20 percent range. This implies that volatile organic compound levels reported, and detection limits for those reported not detected, may be low by up to a factor of 5. However, only order of magnitude conclusions regarding volatile organic compound levels in flue gas were stated. Failure to meet this DQO affects these statements in minor fashion.

United States
Environmental Protection
Agency

Office of Solid Waste
Washington DC 20460
April 1989

Hazardous Waste Incineration

EPA

GUIDANCE ON PIC CONTROLS FOR HAZARDOUS WASTE INCINERATORS

VOLUME V OF THE HAZARDOUS WASTE INCINERATION GUIDANCE SERIES

TABLE E-2

INCINERATOR CO/THC/DATA FROM RESEARCH TESTS

SITE ID	RUN NO.	O2 (PERCENT)	AVERAGE CO (ppm DRY)* (AS MEASURED)	AVERAGE CO (ppm DRY)* (ppm 7% O2)	AVERAGE THC (ppm DRY)* (AS MEASURED)	AVERAGE THC (ppm DRY)* (@ 7%O2)	HIGHEST RECORDED VALUES (ppm DRY @7%O2) CO	HIGHEST RECORDED VALUES (ppm DRY @7%O2) THC
Plant B	1	11.8	14.8	22.5	< 1	1.5	34.2	1.5
	2	10.3	< 1.0	1.3	< 1	1.3	1.3	1.3
	3	10.7	6.9	9.4	< 1	1.4	14.5	2.6
	4	14.3	7.2	15.0	< 1	2.1	17.6	2.3
	5	10.1	4,300	5,523	341	438	6,935.8	671.7
	Average	11.4	866	1,114	69	89	-	-
Ross	1	10.4	4.8	6.3	< 1	1.3	9.8	1.3
	2	10.8	9.1	12.5	0.9	1.2	21.3	3.2
	3	10.7	4.7	6.4	1.0	1.4	11.8	3.1
	Average	10.6	6.2	8.4	1.0	1.3	-	-
Upjohn	1	8.1	10.5	11.4	8.9	9.6	7.3	7.9
	2	8.3	11.2	12.3	6.0	6.6	7.6	6.0
	3	8.4	9.9	11.0	3.9	4.3	6.7	4.1
	Average	8.3	10.5	11.6	6.3	6.9	-	-
Zapata	1	8.2	1,275	1,394	71.0	77.7	1,717.2	235.2
	2	12.0	22.2	34.5	1.9	3.0	612.9	63.6
	3	11.8	7.5	11.4	< 1	1.5	13.4	1.5
	4	11.9	8.8	13.5	< 1	1.5	28.2	4.5
	Average	11.0	328.4	363.5	19.7	20.9	-	-
A. Cyanamid	1	10.3	6.7	8.8	< 1	1.3	40.2	2.1
	2	12.4	19.3	31.4	< 1	1.6	60.7	4.2
	3	-	-	-	-	-	-	-
	4	12.7	13.8	23.3	< 1	1.7	43.0	1.7
	5	13.0	14.3	25.0	< 1	1.8	45.0	1.9
	Average	12.1	13.5	22.1	1.0	1.6	-	-

TABLE E-2
(CONCLUDED)

INCINERATOR CO/THC/DATA FROM RESEARCH TESTS

SITE ID	RUN NO.	02 (PERCENT)	AVERAGE CO (ppm DRY)* (AS MEASURED)	AVERAGE CO (ppm DRY)* (ppm 7% 02)	AVERAGE THC (ppm DRY)* (AS MEASURED)	AVERAGE THC (ppm DRY)* (@ 7%02)	HIGHEST RECORDED VALUES (ppm DRY @7%02) CO	HIGHEST RECORDED VALUES (ppm DRY @7%02) THC
Mitchell	1	9.4	1.4	1.7	< 1	1.2	6.1	1.3
	2	10.5	1.8	2.4	< 1	1.3	4.1	1.4
	3	9.9	< 1	1.2	0.6	0.7	16.3	2.3
	Average	9.9	1.4	1.8	0.9	1.1	-	-
DuPont	1	9.2	666	790	75.9	90.1	1,364.4	166.1
	2	9.6	422	518	47.6	58.5	1,854.4	105.4
	3	10.3	624	816	58.1	76.0	1,975.7	112.9
	Average	9.7	571	708	60.5	74.8	-	-
TWI	1	12.4	4.3	7.0	2.5	4.1	107.9	4.7
	2	13.0	0.9	1.6	1.9	3.3	24.2	3.7
	3	13.2	1.2	2.2	1.7	3.1	4.1	3.9
	4	15.6	0.6	1.6	0.8	2.1	5.2	5.4
	Average	13.6	1.8	3.1	1.7	3.1	-	-
DOW	1	10.1	1	1.3	2.5	3.3	110.5	11.6
	2	11.1	NA	NA	2.3	3.2	-	11.2
	3	11.5	1	1.5	2.1	3.0	3.7	14.7
	4	11.2	10	14	2.9	4.2	1,028.6	230.0
	Average	11.0	4.0	5.6	2.5	3.4	-	-

Sources: MRI "Performance Evaluation of Full-Scale Hazardous Waste Incinerators. Volume 2. Incinerators Performance Results," EPA-600/2-84-181b, PB85-129518, Nov. 1984.
MRI "Total Mass Emissions from a Hazardous Waste Incinerator," MRI Project No. 8671-L(1), May 1987.

* All THC data are measured propane with the exception of DOW Site where THC was measured as methane. Heated extraction system and heated THC monitor was used. The THC data for this Site was converted to propane using the following equation:

THC (propane) = THC (methane)/3 (to account for the FID response factor)

85-72.8

COMPARISON OF METALS EMISSIONS DATA FROM HAZARDOUS WASTE INCINERATION FACILITIES

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Detroit, Michigan June 16-21, 1985

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I. INTRODUCTION

Although hazardous waste incineration facilities are often perceived as posing a potentially great public health threat, very little is actually known about the health effects of stack emissions from such facilities on offsite populations. Past assessments have focused on the emission of toxic chlorinated organics, particularly polychlorinated biphenyls (PCB), dioxins (PCDD), and furans (PCDF). Results of these assessments have generally shown low levels of risk due to hazardous organic emissions.

In contrast to the several studies of organic emissions, few data on metals emissions exist and are generally limited to municipal solid waste incinerators and power plants. Current regulations require incinerators to achieve a 99.99% destruction and removal efficiency (DRE) for organic emissions, while metal emissions are only indirectly controlled by a standard limiting particulate emissions to 180 mg/m^3 and ambient air quality standards for lead and beryllium. As a result, incineration facilities are not generally monitored for metal emissions. Even less data exist on the concentration of metals in waste feed.

Focus of Research

A study was done to estimate the magnitude and nature of health risks posed by a hazardous waste incineration facility to the population surrounding the facility. This assessment was based on actual emissions data from a large hazardous waste incineration facility in West Germany and a U.S. population hypothetically exposed to these emissions from different stack heights. Although the assessment focused on the risks of metals in the stack emissions, the risks of PCB's were also evaluated to show their risks relative to those of the metals.

This paper presents a summary of the monitoring data that were used as a basis for the exposure studies and subsequent health risk assessment. Combustion and destruction efficiency data are also presented as well as the initial results of experiments to optimize the scrubber unit. The German facility emissions are compared to ambient air concentrations and to emissions from other US and European incineration facilities. Results of the health risk assessment are presented in other reports. (1)

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European vs. US Hazardous Waste Incineration Facilities

The efficacy of European hazardous waste incineration technology vs. US facilities is an ongoing debate. Facility comparisons are difficult due to a lack of monitoring data and comparable facilities as well as differences in languages, regulatory structures, monitoring methods, waste feed, and operating experience. It is clear, however, that the Europeans, and particularly the West Germans, have a well-established history of successful operating experience based on over a quarter century of rotary kiln incineration practice, supported by more stringent emissions standards. (References 2-9) The German facility analyzed in this study was found to emit an average of 10 mg/m^3 of particulate matter, well within its permit limit of 75 mg/m3.

In contrast, recent USEPA performance testing of full-scale hazardous waste incineration facilities in the United States showed that half the facilities tested did not meet the 180 mg/m^3 federal emission standard for particulate matter.(10) One of the major U.S. commercial facilities exceeded this standard by 178%-778% (320-1,400 mg/m^3) during trial burns, which was corrected to 50 and 72 mg/m^3 in a subsequent trial burn at approximately half the waste feed rate of the original runs. (11)

II. BIEBESHEIM MONITORING PROGRAM

In an effort to assess the need for incineration technology transfer, over the past three years the German Ministry for Research and Technology and the U.S. Environmental Protection Agency have jointly sponsored a comprehensive program to sample and analyze emissions at a large hazardous waste incineration facility in Biebesheim, West Germany. This state-of-the-art facility has been operated by Hessische Industriemüll GmbH (HIM) since 1982 and is required by law to accept all "incinerable" waste generated in the State of Hessen.

The monitoring program was initially intended to demonstrate the functional efficiency of the facility with regard to environmental impacts and energy conservation, and to determine the optimal operating conditions of the facility. Additional tests were later requested by the USEPA to determine the destruction and removal efficiencies (DRE's) of selected organics; as European emission regulations are not based on the DRE standard, no such tests had been planned. The program was supervised by the German federal environmental authorities (Umweltbundesamt) and conducted by NUKEM GmbH based in Hanau.

The HIM Biebesheim emissions data are of particular interest because measurements were taken during normal facility operations, rather than being taken during a trial burn with spiked samples or simply estimated as is usually done. As a result, these facility monitoring data better reflect what might be expected to be emitted during normal daily operations than could be estimated from non-routine operating conditions and thus allow more accurate health risk estimates. The following section summarizes Biebesheim facility and emissions data as reported in (12).

Overview of the Biebesheim Facility

The Biebesheim facility features two separate incineration lines which operate completely independent of each other (see Figure 1). This was designed to

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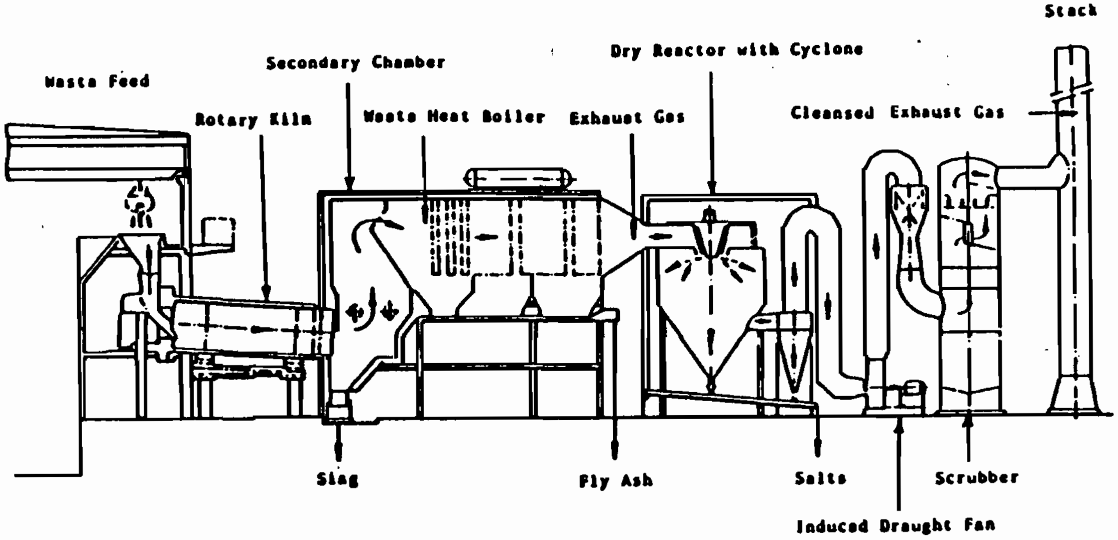

Figure 1. Process schematic of the Biebesheim facility.

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achieve the highest operational efficiency possible as well as to help minimize unit down-time and maintenance time and reduce operational disturbances. Each process line features feed devices, a rotary kiln, secondary combustion chamber, waste heat boiler, exhaust gas scrubbing system, and a stack.

A wide variety of solid, semi-solid, and liquid (even aqueous) wastes can be readily incinerated at the facility, including up to 50,000 tons a year of organic wastes and 10,000 tons a year of organically contaminated liquids. The amount of exhaust gas is at most 100,000 m^3/hour on a continuous basis, with a short-term overload capacity of 130,000 m^3/hour.

The capacity is 17.5 MW for each process line, or a total of 35 MW for the facility, with a short-term overload capacity of 45 MW. The facility was designed for an average heating value of 18,000 kJ/kg. Throughput varies with heat value of the waste.

The hazardous wastes are fed directly to the kiln or to the secondary chamber through a variety of feed devices according to the consistency of the waste. There the wastes are incinerated at temperatures of $1,100^\circ$ to over $1,300^\circ$ C. The slag containing incombustible residues is discharged as a liquid from the secondary chamber to an ash quench where they become solidified. The slag, ashes, and salts are transported to a secure landfill facility for disposal.

The exhaust gases flow through the secondary chamber at temperatures of 950°-+$1,200^\circ$ C to the waste heat boiler, where they are cooled to temperatures of 220-280° C in the process of waste heat recovery. The excess energy is used to heat the boiler water to steam, thereby conserving facility energy use.

Some particulate matter is removed as fly ash from the waste heat boiler. From there the exhaust gases travel to the dry reactor (also called spray dryer) which represents the first and most important stage of scrubbing exhaust gases. This dry reactor achieves the high scrubbing efficiency of a wet scrubber in removing aerosols without generating the usual large quantity of scrubber waste water which would require further treatment. In the dry reactor, the gaseous emissions are cooled from 250° C to 160° C by being sprayed with a brine wash solution recirculated from the scrubber, thereby evaporating the water. The salts contained in the solution crystallize out and are removed. The dry residues (particulates and salts) are removed in the cyclone solids separator.

Condensation on the very small particles and subsequent particle agglomeration is achieved by passing the exhaust gas through the reactor at low temperatures. The relatively low temperatures of the gases before reaching the quencher also prevent excessive regeneration of suspended particulate matter.

Removal of HCl, HF, SO_2, and fine particulate matter and aerosols takes place in the three-stage scrubber system. In the first stage the exhaust gases are further cooled from 160° C to 65° C by spraying them with scrubber water in the quencher, simultaneously removing HCl and HF. Any remaining HCl or HF is removed in the second stage. In the third stage (ring jets), particulates, SO_2, and aerosols which are present in the form of fine mists are removed.

The scrubber water from all three stages becomes a brine wash which is recirculated to the dry reactor where it is vaporized. After the moisture has been removed by a mist separator, the cleansed exhaust gases are released through the stack to the atmosphere at temperatures of 60-70^{0} C without being reheated.

The degree of gas scrubbing that can be achieved depends on the amount of energy required. The ring-jet at the Biebesheim facility is an optimized Venturi scrubber. Most of the required energy is lost to a pressure drop between the entry and exit points in the scrubber tower partition fitted with ring-jets. The scrubber water spray jets consume additional energy.

Sampling Locations

Seventeen monitoring points were established over the entire incineration process from waste feed through stack emissions. Sampling procedures were selected which would produce data that could be compared with the results of similar EPA sampling procedures as much as possible.

The first measuring period was designed to produce a complete materials and mass balance. In addition to the usual variety of waste feed, the following special types of wastes were also incinerated during Monitoring Period I:

Day 1: Drums with high Cl, P, and and S content; drums of paint sludge.
Day 2: Drums of paint sludge with high lead content.
Day 3: Drums containing capacitors with PCB's.
Day 4: Drums with high Cl, P, and S content.

Modifications were made to the scrubber system for monitoring period II, as described in section IV.

III. RESULTS

Particle Size

About 90% of the dry particulate in the stack gas was found to have an aerodynamic diameter of less than 1.0 µm, and about 63% was less than 0.4 µm. This shows that the exhaust gas scrubbing system achieves very high removal efficiencies of particulates and aerosols. Modifications to the gas scrubbing system in Monitoring Period II resulted in even greater removal efficiencies.

About 94% of the dry lead and zinc salts and about 92% of the dry sodium salts were smaller than 0.7 µm, which explained the higher concentrations in the particulate matter and in the stack gas. Lower emission values were achieved in the second monitoring period after modifying the exhaust gas scrubbing system to accumulate more particulates and salts, and by lowering the scrubber water concentrations of salts in the drip tube and in the scrubber ring jets.

Material and Mass Balance

The material and mass balance of selected elements concluded the following:

- 90% of chromium, copper, iron, and nickel are retained in the slag.
- Lead, cadmium, and chlorine are primarily removed in the cyclone solids separator.

- Zinc, tin, and sulfur were removed in approximately equal parts in the slag and in the solids separator.

Combustion Efficiency

The incinerator's combustion efficiency was determined to be greater than 99.99%. This is attributable to the large amounts of excess air used during facility operations. A combustion efficiency of 99.6% was still achieved even when the induced draught fan failed on the first day causing a short-term peak value of 180 ppm CO and a minimum value of 50,000 ppm CO_2.

Destruction Efficiency

Over 99.999% destruction efficiency was consistently measured for five organic waste feed constituents (PCB's, diamines, methylene chloride, p-toluenesulfonic acid, and ring-chlorinated benzoyl chloride). Burning a mixture of various PCB-contaminated wastes also easily resulted in a destruction efficiency of 99.999% at a feed rate of 400 kg/hr.

Comparison with Other Emissions Data

Comparison with Permit Limits

The following table compares the average values in mg/m^3 of those substances with emission limit values as established in the facility operating permit vs. the limits established in the German air pollution laws. Permit limits correspond to limits contained in the proposed revision to the air quality law of December 1983. (7) The new proposed limit for particulates is 50 mg/m^3. More complete Monitoring Period I data are given in Appendix A.

Table I. Facility emission values vs. permitted and legal limits.

Pollutant	Legal Limit	Permit Limit	Mon. Period I	Mon. Period II
Chloride	100	100	15	10
Fluoride	5	5	0.25	0.6
SO_2	—	200	60	100
CO	50	100	10	77
C_{org}	50	50	5	5
Particulate	150	75	55	10
Part. Class I[a]	20	5	3.5	1.5
Part. Class II	50	15	10	2

[a] Class I particulates include As, Be, Cd, Cr, Hg, Ni, Pb, Se, Tl, U, V
Class II particulates include Ag, Co, Sb, Zn

In Monitoring Period I, lead was the only permit limit that was exceeded with an average value of 3 mg/m^3 instead of <1 mg/m^3. Spraying additional steam into the scrubber to further treat the exhaust gases succeeded in keeping lead levels below 1 mg/m^3 in Monitoring Period II. This modification also reduced the amount of zinc in the scrubbed exhaust gases by a factor of 10, and the degree of particulate removal improved from 90% to better than 97%.

The following table shows the average emission values for selected metals, showing the effect of modifying the scrubber system in the second measurement period as discussed in Section IV.

Table II. Average emission values (mg/m^3).

Pollutant	Mon. Period I	Mon. Period II
Arsenic	<0.03	<0.03
Beryllium	<0.02	<0.02
Cadmium	0.05	0.06
Chromium	0.06	0.14
Cobalt	<0.03	<0.03
Copper	0.50	0.13
Lead	3.00	0.68
Mercury	0.10	0.05
Nickel	0.06	<0.06
Zinc	7.10	0.70

Contribution of Emissions to Ambient Air Quality

As shown in Table III, Continuous Exposure Limit (CEL) values developed for the health risk assessment (Column A) were compared to the maximum offsite ground-level air concentrations (GLAC) of each pollutant (Column B) as estimated by the Inhalation Exposure Methodology. All maximum ground-level concentrations were less than two percent of the corresponding "acceptable" CEL value (Column C).

CEL values were also compared with ambient air levels in the Newark area (Column D). (13) Here the hypothetical facility emissions are shown to represent as much as 22% of the existing ambient levels of beryllium and 15% of selenium in the Newark area, and less than 8% of all other metals (Column E).

Column F adds the facility emissions to the existing ambient levels to determine the combined health impact (Column G). Copper, lead, and vanadium are found to exceed CEL values due to existing high levels of these pollutants in the Newark area, with less than 1% contribution from the hypothetical facility for these pollutants.

Comparison with Other Sources of Emissions

Emissions data were obtained from several large incineration facilities in Europe and the United States. Table IV gives an overview of facility data for the HIM Biebesheim facility (HIM), European Hazardous Waste facility #2 (EHW2), United States Hazardous Waste Facilities #1-#4 (USHW1-USHW4), and the proposed United States Resource Recovery Facility #1 (USRR1). HIM monitoring data pertain to only one of two process lines at the facility. All hazardous waste facilities feature at least one rotary kiln.

Table

Ag
Al
As
Be
Bi
Cd
Co
Cr
Cu
Fe
Hg
Mg
Mo
Ni
Pb
Sb
Se
Sn
Ti
Tl
U
V
W
Zn
PCB

Facility

HIM

EHW2

USHW1

USHW2

USHW3

USHW4

USRR1

Table III. Comparison of emissions with CEL'S and ambient concentrations. (ng/m^3)

	A	B	C	D	E	F	G
	CEL	MAX.GLAC	MAX AS % OF CEL	AMBIENT CONC.	MAX AS % OF AMB.	TOTAL CONC. (MAX + AMB)	TOTAL AS % OF CEL
Ag	330	<0.15	<0.05%				
Al	3,330	<2.61	<0.08%				
As	660	<0.15	<0.02%	10	<1.5%	<10.15	<1.5%
Be	6.6	<0.11	<1.67%	0.5	<22.0%	<0.61	<9.2%
Bi	331,200	<0.37	<0.0001%				
Cd	170	0.30	0.18%	15	2.0%	15.30	9.0%
Co	330	<0.15	<0.05%	1.9	<7.9%	<2.05	<1.2%
Cr	1,700	0.75	0.04%	16	4.7%	16.75	0.98%
Cu	66	0.75	1.14%	130	0.6%	130.75	198.0%
Fe	16,560	3.73	0.02%	1,228	0.3%	1,231.73	7.4%
Hg	170	0.30	0.18%	7	4.3%	7.30	4.3%
Mg	33,120	<2.61	<0.008%				
Mo	1,660	<0.26	<0.02%	7.8	<3.3%	<8.06	<0.5%
Ni	33	<0.30	<0.91%	18	<1.7%	<18.30	<55.5%
Pb	500	3.36	0.67%	550	0.6%	553.30	110.7%
Sb	1,660	<1.49	<0.09%				
Se	66	<0.15	<0.23%	1	<15.0%	<15.15	<23.0%
Sn	6,600	2.98	0.05%				
Ti	16,560	<0.15	<0.0009%	15.7	<1.0%	<15.85	<0.1%
Tl	33	<0.30	<0.91%				
U	66	<0.11	<0.17%	0.2	<55.0%	<0.31	<0.47%
V	17	<0.15	<0.88%	39	<0.4%	<39.15	<230.3%
W	330	<0.15	0.05%				
Zn	16,560	3.73	0.02%	252	1.5%	255.73	1.5%
PCB	170	<0.0003	<0.0002%				

Table IV. Facility data.

Facility	Waste Feed Type	Waste Feed Rate (kg/hour)	Stack Height (m)	References
HIM	Hazardous PCB	5,424 400	75^a	8,12,14
EHW2	Hazardous	3,500	60	15
USHW1	PCB	5,160	25	11,16
USHW2	PCB	$1,106^b$	30	17,18,19,20,21
USHW3	PCB	288	56	18,20,21
USHW4	Hazardous	5,880	23	10
USRR1	Municipal	93,750	88	22

NOTES TO TABLE IV

a Although the HIM stack height is 75m, a height of 33m was assumed for the air dispersion modeling to be more consistent with US stack heights.

b The waste feed rates for the non-PCB trial burns were 360 kg/hour solid hazardous waste and 2,300 liters/hour waste oil. (17)

Tables V and VI summarize the available data on rate of metals emissions in mg/sec and concentrations of metals in mg/m^3 stack gas. Rate of PCB emissions are also given for PCB trial burns at USHW2 and USHW3 in Table VI. As indicated by the waste feed rates in Table IV, USHW2 and USHW3 are considerably smaller and USRR1 is much larger than the other facilities under study (HIM, EHW2, and USHW1).

However, these emissions data cannot be used to evaluate facility operating efficiency without knowing more about the metal content in the waste feed at each facility. These data are extremely limited. With regard to lead, USHW1 emits up to one hundred times more lead than the HIM facility but has only ten times greater lead concentration in its waste feed. (11,12)

Table V. Concentration of metals in incinerator stack emissions (mg/m^3)

	HIM	EHW2	USHW1	USHW2
Ag	<0.03		<0.0018 - 0.036	0.006 - 0.02
Al	<0.5		0.13 - 11	≤0.2 - ≤0.5
As	<0.03	<0.01	ND	<0.02
Be	<0.02	<<0.01	<0.001 - 0.001	
Bi	<0.1			
Cd	0.06	<0.01	0.009 - 0.03	0.1 - 0.4
Co	<0.03	<0.01	0.03 - 0.17	<0.03
Cr	0.14	0.12 - 0.16	0.2 - 0.7	0.01 - 0.04
Cu	0.13	0.11 - 0.47	0.16 - 0.77	0.2 - 8
Fe	0.78	2.75 - 6.43	2.6 - 12	2 - 6
Hg	0.06	<0.01		
Mg	<0.5		0.1 - 0.6	<0.3
Mo	<0.05		0.02 - 0.1	0.04 - 2
Ni	<0.06	0.08 - 0.17	0.07 - 0.5	0.02 - 0.06
Pb	0.68	0.06 - 0.14	12 - 65	3
Sb	<0.3	<0.01 - 0.01	<0.03 - 0.1	
Se	<0.03			<0.04
Sn	0.56		0.3 - 1.4	0.1 - 0.7
Ti	<0.03		0.07 - 0.9	0.01 - 0.3
Tl	<0.06	<<0.01	<0.07 - 0.1	
U	<0.02			<0.05
V	<0.03	<0.01		≤0.007 - ≤0.01
W	<0.03			<0.05
Zn	0.71	0.14 - 0.62	2.4 - 10	≤1 - ≤2
Zr	<0.03			
Partic.	10	30.0 - 84.0	320-1400	53

NOTES FOR TABLE V

"<" indicates below detection level

HIM: *Averages of monitoring period II where available, otherwise monitoring period I data.* (12)

EHW2: Range of measurements taken over two four-day monitoring periods. (15)

USHW1: Range of 6 average results of two two-hour M5 trial burn tests. (11)

USHW2: Survey for trace metals in stack samples by ICPOES. Range of two test results. (17)

Table VI. Rate of emissions (mg/sec).

	HIM	EHW2	USHW1	USHW2	USHW3	USHW4	USRR1
Ag	<0.4		<0.03-<0.5			0.02-0.1	
Al	<7.0		1.8-150				
As	<0.4	0.03	ND			0.4	0.5
Be	<0.3	<0.003	<0.02-0.2			<0.0005	0.1
Bi	<1.0						
Cd	0.8	0.01-0.02	0.1-0.5			1.2-1.5	13.6
Co	<0.4	0.05-0.07	0.4-3				
Cr	2.0	1.1-1.7	3-10			2.5-3.5	3.7
Cu	2.0	1.4-4.7	2-14				8.2
Fe	10.0	28.1-70.0	38-180				
Hg	0.8	0.03-0.09				<0.07-<0.7	16.7
Mg	<7.0		1.4-9				
Mo	<0.7		0.3-2				
Ni	<0.8	0.8-1.7	1-7.8			0.3-0.8	0.9
Pb	9.0	0.6-1.4	170-990			106.7-121.7	255.
Sb	<4.0	0.1	<0.5-1.5			1.1-20	10.8
Se	<0.4					<0.8	0.5
Sn	8.0		5-26				
Ti	<0.4		1-13				
Tl	<0.8	0.006	<1-2			0.2	
U	<0.3						
V	<0.4	0.01-0.04					
W	<0.4						
Zn	10.0	1.1-6.4	36-165				635.
Zr	<0.4						
PCB	<0.008	ND	0.02-0.3	0.03	0.02		3.3
PARTIC.	100	336-879	3,611-25,556	4,926	18,813	1,367	7,500

USRR1: Predicted annual emissions assuming a control efficiency for a 0.03 grains/dscf release rate. (22)

IV. MODIFICATIONS TO SCRUBBER UNIT

Although the particulate emissions were consistently below the permit limit of 75 mg/m^3 during the first monitoring period, a second series of stack measurements were taken following various changes to the exhaust gas scrubbing system to determine whether lower emission values could be achieved. As described in (12), these changes involved:

- Additional spraying with water or steam in the scrubber tower in the area after the drip tube, which resulted in additional agglomeration of fine particles.
- Reduction in pH values in the first (<2) and second (<6.5) scrubber stages through controlled addition of $Ca(OH)_2$ and NaOH according to the concentration of HCl and SO_2 in the exhaust gas.

97-99.5% removal efficiency and emission values of 5-30 mg/m^3 could be achieved after the scrubbing system was optimized in this second measurement period.

An improvement in particulate removal was also thought to be possible with an increase in the specific energy consumption in the scrubber. In order to confirm this theory, CIBA-Geigy (manufacturer of the gas scrubbing system) conducted an experiment which involved increasing the pressure at the ring jets from 480 to 750 Torr. This resulted in a 37% decrease in particulate matter, from 30 mg/m^3 to 19.3 mg/m^3. Correspondingly lower emission values were also achieved for lead, copper, zinc, and tin. Increasing the pressure at the ring jets was not tried as the objective had been achieved of optimizing the aerosol (and therefore heavy metal) removal with a minimum of energy expenditure. The main focus of optimization efforts was therefore to treat the gas so as to increase the size of particles before aerosol separation.

Initial Results of Experiments to Optimize Scrubber System

Four different operating conditions were tried over the course of 11 days to evaluate the above methods. The four conditions were different combinations of spraying additional steam or water and adding $Ca(OH)_2$.

Table VII. Concentration of particulate matter under different operating conditions (mg/m^3).

Operating Condition	Duration (h)	Exhaust Gas	Stack Gas	% Removal
A. + steam/- $Ca(OH)_2$	18.3	1,828	9.0	99.5
B. + steam/+ $Ca(OH)_2$	6.0	468	14.0	97.0
C. + water/- $Ca(OH)_2$	17.4	1,483	15.5	99.0
D. + water/+ $Ca(OH)_2$	23.3	797	24.9	96.9

The stack gas measurements clearly show that significantly higher particulate removal values were achieved by spraying additional water into the scrubber tower, vs. the 90-94% removal achieved without additional water in the first monitoring period. Highest removal (99.5%) was achieved with the addition of steam and without additional $Ca(OH)_2$ (experimental condition A above).

With regard to concentrations of hazardous constituents, no firm conclusions could be reached about the results of the above experiments until concentrations of these substances in the exhaust gas had been evaluated. It could only be said that permitted emission limits were not exceeded under operating conditions A, B, and C, and that the levels of lead and zinc in particular were reduced significantly from the first monitoring period (Table II).

As a result of these experiments, the above operational and structural changes were made a permanent feature of normal operating conditions. These changes are to be followed by a third measurement period to test the efficiency of the modified system.

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FLORIDA FIRST PROCESSING, INC.

APPENDIX L-25

CALCULATION OF FUGITIVE VOC EMISSIONS FROM FFPI FACILITY

FLORIDA FIRST PROCESSING INC.
SPILL CALCULATIONS AND CONTRIBUTION TO THE TOTAL VOC EMISSIONS

BASIS: VIA EPA GUIDANCE FOR ESTIMATING THE SPILLAGE FROM A TANKER TRUCK, A CONSERVATIVE APPROACH IS TO ASSUME I POUND OF LIQUID IS SPILLED FOR EVERY 100,000 POUNDS HANDLED. IN ADDITION IT IS ALSO ASSUMED THAT 50% OF THE ORGANIC CONTENT OF THE SPILL IS VOLATILIZED BEFORE CLEANUP. THIS ASSUMPTION WILL BE USED IN CALCULATING SPILLAGE FROM THE LOW, HI AND SLUDGE TANKER TRUCKS.

FOR CONTAINERIZED WASTE SPILLAGE EPA GUIDANCE GIVES A CONSERVATIVE ESTIMATE OF 1 POUND OF SPILLAGE DUE TO CONTAINER RUPTURE OR DAMAGE PER EVERY 10,000 POUNDS OF WASTE HANDLED. AGAIN, 50% OF THE ORGANIC CONTENT IS ASSUMED TO VOLATILIZE BEFORE CLEANUP. THIS ASSUMPTION WILL BE USED FOR THE DRUMMED SOLIDS AND BULK SOLIDS GOING TO THE KILN.

ASSUMPTIONS:

1. TOTAL THROUGHPUT FOR EACH OF THE STREAMS WAS BASED ON THE ESTIMATED TONS/YR VALUES AS GIVEN IN THE PROCESS DESIGN CRITERIA; THESE VALUES ARE AS FOLLOWS:

DRUMMED SOLIDS	8,665 tons/yr
BULK SOLIDS	5,661 tons/yr
SLLUDGES	14,688 tons/yr
LOW-BTU LIQUIDS	7,344 tons/yr
HI-BTU LIQUIDS	3,647 tons/yr
TOTAL	40,005 tons/yr

2. ESTIMATED COMPOSITIONS OF THE FIVE STREAMS WERE COMPILED BY BLENDING ACETONE AND METHYLENE CHLORIDE IN SPECIFIC VOLUMES TO AS CLOSELY AS POSSIBLE SIMULATE THE HIGH HEATING VALUE OF THE WASTE STREAMS AS GIVEN IN THE PROCESS DESIGN CRITERIA. THIS METHOD WAS USED FOR THE LOW-BTU, HI-BTU AND SLUDGE STREAMS AND IS DETAILED IN THE ATTACHED FUGITIVE EMISSIONS WASTE PROFILES. FOR THE CASE OF THE BULK SOLIDS AND DRUMMED SOLIDS AN ADDITIONAL COMPONENT , TOLUENE , WAS ADDED TO ACETONE WITH NO METHYLENE CHLORIDE INTRO- TO AGAIN SIMULATE THE HIGH HEATING VALUE OF THESE STREAMS AND IS DETAILED IN THE FUGITIVE EMISSIONS WASTE PROFILES. IN ALL INSTANCES THE ORIGINAL WATER AND ASH PERCENTAGES WERE MAINTAINED TO WITHIN 10% OF THE VALUES GIVEN IN THE PROCESS DESIGN CRITERIA.

LOW-BTU LIQUID SPILLAGE

(1 lb/100,0001b)*(7,344 tons/yr)*(2000 lb/ton)* 0.5(% organics volatilized) = 73.4 lb/yr

HI-BTU LIQUID SPILLAGE

(1 lb/100,0001b)*(3,647 tons/yr)*(2000 lb/ton)* 0.5(% organics volatilized) = 36.5 lb/yr

SLUDGE SPILLAGE

(1 lb/100,0001b)*(14,688 tons/yr)*(2000 lb/ton)* 0.5(% organics volatilized) = 146.9 lb/yr

BULK SOLIDS SPILLAGE

(1 lb/10,0001b)*(5,661 tons/yr)*(2000 lb/ton)* 0.5(% organics volatilized) = 566.1 lb/yr

DRUMMED SOLIDS SPILLAGE

(1 lb/10,0001b)*(8,665 tons/yr)*(2000 lb/ton)* 0.5(% organics volatilized) = 866.5 lb/yr

FLORIDA FIRST PROCESSING INC.

FUGITIVE EMISSIONS
WASTE PROFILES

Rev. 1 6/14/89

COMPONENT (wt. %)	HI-BTU LIQUID TO KILN/SCC	SLUDGES TO KILN	LOW-BTU LIQUID TO KILN	DRUMMED SOLIDS TO KILN	BULK SOLIDS TO KILN	CCl4	C2Cl4	ClBz C6H5Cl	SiCl4	Toluene C6H5CH3	CH3OH	Glycol CH2OHCH2OH	Phenol C6H5OH	Tricloret C2H3Cl3	Benzene C6H6	MEK CH3COC2H5	Acetone CH3COCH3	Acetonitrile CH3CN	Methylene Chloride CH3Cl	WATER	ASH
CARBON	36.34	40.77	5.08	31.17	9.74	7.79	14.46	64.00		91.30	37.50	38.71	77.00	18.00	92.00	67.00	62.00	59.00	23.80		
SILICON	0.00	0.00	0.00	0.00	0.00				16.47												
HYDROGEN	7.07	6.90	0.99	4.74	1.48			4.44		8.70	12.50	9.68	6.00	2.00	8.00	11.00	10.00	7.00	6.00		
NITROGEN	0.00	0.00	0.00	0.00	0.00													34.00			
OXYGEN	10.42	16.80	1.46	12.10	3.78						50.00	51.61	17.00	80.00		22.00	28.00				
CHLORINE	39.17	10.53	5.48	0.00	0.00	92.21	85.54	31.56	83.53										70.20		
SULFUR	0.00	0.00	0.00	0.00	0.00																
WATER	2.00	6.00	86.00	12.00	9.00																
ASH	5.00	19.00	1.00	40.00	76.00																
	------	------	------	------	------																
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
HHV, BTU/LB	8193.30	8827.50	1145.30	6599.52	2062.35	432	2,142	11,450	300	18,240	9,758	8,178	14004.00	3582.00	18054.00	14526.00	13250.00	13266.00	5850.00		

====================================

WASTE, LB/HR	500	5,100	6,650
POHC, LB/HR			

WASTE STREAM	PERCENTAGE OF COMPONENTS				
1. HI-BTU LIQUID TO KILN/SCC		0.37	0.56	0.02	0.05
2. SLUDGE		0.60	0.15	0.06	0.19
3. LOW-BTU		0.05	0.08	0.86	0.01
4. DRUMMED SOLIDS	0.05	0.43		0.12	0.40
5. BULK SOLIDS	0.02	0.14		0.09	0.76

FUGITIVE EMISSIONS SUMMARY FOR FLORIDA FIRST PROCESSING INC.

VOC EMISSIONS BREAKDOWN

FUGITIVE NUMBER (See Leak Source Calc. Sheets.)	WORST CASE MATERIAL EMITTED	TOTAL EMISSIONS lb/yr	NON-VOLATILES lb/yr	ACETONE lb/yr	METHYLENE CHLORIDE lb/yr	FUEL OIL lb/yr
1	HI-BTU	616.80	43.18	228.22	345.41	
2	HI-BTU	868.80	60.82	321.46	486.53	
3	HI-BTU	966.20	67.63	357.49	541.07	
4	HI-BTU	1009.90	70.69	373.66	565.54	
5	FUEL OIL	231.50				231.5
6	HI-BTU	153.80	10.77	56.91	86.13	
7	SLUDGE	693.60	173.40	416.16	104.04	
8	HI-BTU	621.10	43.48	229.81	347.82	
9	HI-BTU	663.80	46.47	245.61	371.73	
10	HI-BTU	85.40	5.98	31.60	47.82	
11	HI-BTU	85.40	5.98	31.60	47.82	
12	HI-BTU	85.40	5.98	31.60	47.82	
13	HI-BTU	85.40	5.98	31.60	47.82	
14	HI-BTU	85.40	5.98	31.60	47.82	
15	HI-BTU	85.40	5.98	31.60	47.82	
16/17	HI-BTU	203.40	14.24	75.26	113.90	
18/19	HI-BTU	203.40	14.24	75.26	113.90	
20/21	HI-BTU	203.40	14.24	75.26	113.90	
22/23	HI-BTU	203.40	14.24	75.26	113.90	
24/25	HI-BTU	203.40	14.24	75.26	113.90	
26/27	HI-BTU	203.40	14.24	75.26	113.90	
28	HI-BTU	637.90	44.65	236.02	357.22	
29	SLUDGE	432.20	108.05	259.32	64.83	
30	SLUDGE	101.50	25.38	60.90	15.23	
31	SLUDGE	44.80	11.20	26.88	6.72	
32	SLUDGE	44.80	11.20	26.88	6.72	
33	SLUDGE	101.50	25.38	60.90	15.23	
34	LOW-BTU	89.80	78.13	4.49	7.18	
35	HI-BTU	89.80	6.29	33.23	50.29	
36	HI-BTU	89.80	6.29	33.23	50.29	
37	LOW-BTU	4413.60	3839.83	220.68	353.09	
38	LOW-BTU	609.10	529.92	30.46	48.73	
39	HI-BTU	3401.30	238.09	1258.48	1904.73	
40	HI-BTU	609.10	42.64	225.37	341.10	
41	HI-BTU	609.10	42.64	225.37	341.10	
42	LOW-BTU	564.50	491.12	28.23	45.16	
43	HI-BTU	590.40	41.33	218.45	330.62	
44	FUEL OIL	1145.40				1145.4
45	LOW-BTU	1530.70	1331.71	76.54	122.46	
		22663.60 lbs/yr	7511.54 lbs/yr	5895.85 lbs/yr	7879.31 lbs/yr	1376.90 lbs/yr
		or	or	or	or	or
		11.33 tons/yr	3.76 tons/yr	2.95 tons/yr	3.94 tons/yr	0.69 tons/yr

FUGITIVE EMISSIONS DUE TO SPILLS

	TOTAL (lb/yr)	TOLUENE lb/yr	ACETONE lb/yr	METHLYLENE CHLORIDE lb/yr	NON VOLATILES lb/yr
1. LOW-BTU LIQUID	73.40	0.00	3.67	5.87	63.86
2. HI-BTU LIQUID	36.50	0.00	13.50	20.44	2.55
3. SLUDGE	146.90	0.00	88.14	22.04	36.73
4. BULK SOLIDS	566.10	11.32	79.25	0.00	475.52
5. DRUMMED SOLIDS	866.50	43.33	372.59	0.00	450.58
TOTAL SPILLAGE	1689.40 lb/yr or 0.84 ton/yr	54.65 lb/yr or 0.03 ton/yr	557.16 lb/yr or 0.28 ton/yr	48.35 lb/yr or 0.02 ton/yr	1029.24 lb/yr or 0.51 ton/yr

TOTAL FUGITIVES

TOTAL	TOLUENE	ACETONE	METHLYLENE CHLORIDE	NON VOLATILES	FUEL OIL
24353.00 lb/yr or 12.18 ton/yr	54.65 lb/yr or 0.03 ton/yr	6453.01 lb/yr or 3.23 ton/yr	7927.66 lb/yr or 3.96 ton/yr	8540.78 lb/yr or 4.27 ton/yr	1376.90 lb/yr or 0.69 ton/yr

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM PUMP (P-01) TANK TRUCK UNLOADING TO WASTE STORAGE HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 1

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	6	0.016	0.096	0.0038	0.0228
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	10	0.0018	0.018	0.00013	0.0013
OTHER	2	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.257 lbs/hr		0.0501 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			616.8 lbs/yr		360.72 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASIS IS THAT LINES WILL ONLY BE FILLED 8 HRS / DAY FOR UNLOADING AT A MAXIMUM

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM PUMP (P-02) TANK TRUCK UNLOADING TO WASTE STORAGE HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 2

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	12	0.016	0.192	0.0038	0.0456
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	15	0.0018	0.027	0.00013	0.00195
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.362 lbs/hr		0.07355 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			868.8 lbs/yr		529.56 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASIS IS THAT LINES WILL ONLY BE FILLED 8 HRS / DAY FOR UNLOADING AT A MAXIMUM

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM PUMP (P-04) TANK TRUCK UNLOADING / DIRECT BURN TO KILN/SCC

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 3

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	37	0.016	0.592	0.0038	0.1406
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	39	0.0018	0.0702	0.00013	0.00507
OTHER	2	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.8052 lbs/hr		0.17167 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			966.24 lbs/yr		1236.024 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASIS IS THAT LINES WILL ONLY BE FILLED 4 HRS/DAY FOR UNLOADING DIRECT BURN

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM PUMP (P-06) TO THE PUMPABLE WASTE STORAGE HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 4

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	15	0.016	0.24	0.0038	0.057
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	21	0.0018	0.0378	0.00013	0.00273
OTHER	2	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.4208 lbs/hr		0.08573 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			1009.92 lbs/yr		617.256 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM PUMP (P-05) TO FUEL OIL STORAGE TANK

SERVICE : LIGHT ___ HEAVY _X_ GAS ___

FUGITIVE EMISSION ID # : 5

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.047	0.047	0.03	0.03
VALVES	4	0.00051	0.00204	0.00051	0.00204
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	8	0.0018	0.0144	0.00013	0.00104
OTHER	2	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.09644 lbs/hr		0.03308 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			231.456 lbs/yr		238.176 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASIS OF UNLOADING 8 HRS/DAY MAXIMUM OR 2400 HRS/YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: DIRECT BURN RECIRCULATION LINE FROM KILN/SCC TO TRUCK UNLOADING

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 6

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	7	0.016	0.112	0.0038	0.0266
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	9	0.0018	0.0162	0.00013	0.00117
OTHER	2	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.1282 lbs/hr		0.02777 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			153.84 lbs/yr		193.944 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASIS IS THAT LINES WILL ONLY BE FILLED 4 HRS/DAY FOR UNLOADING DIRECT BURN AND THEREFORE THE MAXIMUM FLOW BACK THRU THE RECIRCULATION LINE IS 4 HRS ALSO

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM SLUDGE PUMP (P-79) TO THE PUMPABLE WASTE STORAGE HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 7

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	8	0.016	0.128	0.0038	0.0304
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	10	0.0018	0.018	0.00013	0.0013
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.289 lbs/hr		0.0577 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			693.6 lbs/yr		415.44 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM PUMP (P-07) TO THE DRUMMED PUMPABLE WASTE STORAGE RECIEVER (T-03)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 8

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	6	0.016	0.096	0.0038	0.0228
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	11	0.0018	0.0198	0.00013	0.00143
OTHER	2	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.2588 lbs/hr		0.05023 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			621.12 lbs/yr		361.656 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM DRUMMED PUMPABLE WASTE STORAGE RECIEVER (T-09) TO PUMPABLE WASTE STORAGE FEED HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 9

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	7	0.016	0.112	0.0038	0.0266
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	12	0.0018	0.0216	0.00013	0.00156
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.2766 lbs/hr		0.05416 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			663.84 lbs/yr		389.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE LIQUID WASTE FEED HEADER TO RECEIVING/HOLDING TANK (T-10)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 10

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0356 lbs/hr		0.00786 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			85.44 lbs/yr		56.592 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE LIQUID WASTE FEED HEADER TO RECEIVING/HOLDING TANK (T-11)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 11

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0356 lbs/hr		0.00786 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			85.44 lbs/yr		56.592 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE LIQUID WASTE FEED HEADER TO RECEIVING/HOLDING TANK (T-12)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 12

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.038	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0356 lbs/hr		0.00786 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			85.44 lbs/yr		56.592 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE LIQUID WASTE FEED HEADER TO RECEIVING/HOLDING TANK (T-13)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 13

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0356 lbs/hr		0.00786 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			85.44 lbs/yr		56.592 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE LIQUID WASTE FEED HEADER TO RECEIVING/HOLDING TANK (T-14)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 14

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0356 lbs/hr		0.00786 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			85.44 lbs/yr		56.592 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE LIQUID WASTE FEED HEADER TO RECEIVING/HOLDING TANK (T-15)

SERVICE : LIGHT _X_ HEAVY __ GAS __

FUGITIVE EMISSION ID # : 15

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0356 lbs/hr		0.00786 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			85.44 lbs/yr		56.592 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM RECEIVING/HOLDING TANK (T-10) , SIDE OR BOTTOM DRAW , TO THE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 16/17

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			203.04 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM RECEIVING/HOLDING TANK (T-11) , SIDE OR BOTTOM DRAW , TO THE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY __ GAS __

FUGITIVE EMISSION ID # : 18/19

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			203.04 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM RECEIVING/HOLDING TANK (T-12) , SIDE OR BOTTOM DRAW , TO THE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 20/21

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			203.04 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM RECEIVING/HOLDING TANK (T-13) , SIDE OR BOTTOM DRAW , TO THE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 22/23

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			203.04 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM RECEIVING/HOLDING TANK (T-14) , SIDE OR BOTTOM DRAW , TO THE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 24/25

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			203.04 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM RECEIVING/HOLDING TANK (T-15), SIDE OR BOTTOM DRAW, TO THE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 26/27

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			203.04 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM EITHER PUMP P-09, P-10 OR P-11 ; TO THE PUMPABLE WASTE STORAGE HEADER.

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 28

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	7	0.016	0.112	0.0038	0.0266
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	6	0.0018	0.0108	0.00013	0.00078
OTHER	1	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.2658 lbs/hr		0.05338 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			637.92 lbs/yr		384.336 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE UNLOADING WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM PUMP P-16 TO THE KILN (SLUDGE TO THE KILN)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID #: 29

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	12	0.016	0.192	0.0038	0.0456
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	14	0.0018	0.0252	0.00013	0.00182
OTHER	2	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.3602 lbs/hr		0.07342 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			432.24 lbs/yr		528.624 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE SLUDGE FEED TO THE KILN WILL TAKE PLACE FOR 12 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 3600 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE SLUDGE HOLDING TANK (T-16) TO THE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 30

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			101.52 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE SLUDGE FEED WILL TAKE PLACE FOR 12 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 3600 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE WASTE STORAGE FEED HEADER TO THE SLUDGE FEED TANK (T-17)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 31

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	3	0.0018	0.0054	0.00013	0.00039
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0374 lbs/hr		0.00799 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			44.88 lbs/yr		57.528 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE SLUDGE FEED WILL TAKE PLACE FOR 12 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 3600 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE WASTE STORAGE FEED HEADER TO THE SLUDGE HOLDING TANK (T-16)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 32

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	3	0.0018	0.0054	0.00013	0.00039
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0374 lbs/hr		0.00799 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			44.88 lbs/yr		57.528 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI) .

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE SLUDGE FEED WILL TAKE PLACE FOR 12 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 3600 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM THE SLUDGE FEED TANK (T-17) TO THE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 33

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			101.52 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE SLUDGE FEED WILL TAKE PLACE FOR 12 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 3600 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: PUMPABLE WASTE STORAGE FEED HEADER TO THE LOW-BTU LIQUID FEED TANK (T-10)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 34

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	3	0.0018	0.0054	0.00013	0.00039
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0374 lbs/hr		0.00799 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			89.76 lbs/yr		57.528 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE SLUDGE FEED WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: PUMPABLE WASTE STORAGE FEED HEADER TO THE HIGH-BTU LIQUID FEED TANK (T-19)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 35

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	3	0.0018	0.0054	0.00013	0.00039
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0374 lbs/hr		0.00799 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			89.76 lbs/yr		57.528 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE SLUDGE FEED WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: PUMPABLE WASTE STORAGE FEED HEADER TO THE HIGH-BTU LIQUID FEED TANK (T-20)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 36

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	2	0.016	0.032	0.0038	0.0076
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	3	0.0018	0.0054	0.00013	0.00039
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0374 lbs/hr		0.00799 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			89.76 lbs/yr		57.528 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE SLUDGE FEED WILL TAKE PLACE FOR 8 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 2400 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM LOW BTU LIQUID FEED TANK (T-18) SIDE DRAW OFF TO KILN/SCC

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 37

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	26	0.016	0.416	0.0038	0.0988
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	30	0.0018	0.054	0.00013	0.0039
OTHER	4	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.613 lbs/hr		0.1287 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			4413.6 lbs/yr		926.64 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE LOW-BTU FEED WILL TAKE PLACE FOR 24 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 7200 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM LOW BTU LIQUID FEED TANK (T-10) BOTTOM DRAW OFF TO WASTE STORAGE EMPTYING HEADER

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 38

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	4	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			609.12 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE LOW-BTU FEED WILL TAKE PLACE FOR 24 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 7200 HRS/ YR

LEAK SOURCE CALCULATION SHEET

OESCRIPTION OF SOURCE: FROM HIGH BTU LIQUIO FEED TANK (T-19 OR T-20) SIDE ORAW OFF TO KILN/SCC

SERVICE : LIGHT _X_ HEAVY __ GAS __

FUGITIVE EMISSION ID # : 39

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	18	0.016	0.288	0.0038	0.0684
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	23	0.0018	0.0414	0.00013	0.00299
OTHER	4	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.4724 lbs/hr		0.09739 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			3401.28 lbs/yr		701.208 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE HIGH-BTU FEED WILL TAKE PLACE FOR 24 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 7200 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM HIGH BTU LIQUID FEED TANK (T-19) TO THE EMPTYING HEADERS

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 40

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			609.12 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE HIGH-BTU FEED WILL TAKE PLACE FOR 24 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 7200 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM HIGH BTU LIQUID FEED TANK (T-20) TO THE EMPTYING HEADERS

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 41

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	2	0.0018	0.0036	0.00013	0.00026
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0846 lbs/hr		0.01166 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			609.12 lbs/yr		83.952 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE HIGH-BTU FEED WILL TAKE PLACE FOR 24 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 7200 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: LOW-BTU LIQUID RECIRCULATION FROM KILN TO LOW-BTU LIQUID FEED TANK (T-18)

SERVICE : LIGHT _X_ , HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 42

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	4	0.016	0.064	0.0038	0.0152
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	8	0.0018	0.0144	0.00013	0.00104
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.0784 lbs/hr		0.01624 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			564.48 lbs/yr		116.928 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE LOW-BTU FEED WILL TAKE PLACE FOR 24 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 7200 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: HIGH-BTU LIQUID RECIRCULATION FROM KILN TO HIGH-BTU LIQUID FEED TANK (T-19 OR T-20)

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 43

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	0	0.11	0	0.026	0
VALVES	4	0.016	0.064	0.0038	0.0152
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	0	0.033	0	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	10	0.0018	0.018	0.00013	0.0013
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.082 lbs/hr		0.0165 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			590.4 lbs/yr		118.8 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE HIGH-BTU FEED WILL TAKE PLACE FOR 24 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 7200 HRS/ YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: FROM FUEL OIL STORAGE TANK TO THE KILN/SCC

SERVICE : LIGHT ___ HEAVY _X_ GAS ___

FUGITIVE EMISSION ID # : 44

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.047	0.047	0.03	0.03
VALVES	28	0.00051	0.01428	0.00051	0.01428
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	36	0.0018	0.0648	0.00013	0.00468
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.15908 lbs/hr		0.04896 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			1145.376 lbs/yr		352.512 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASIS OF FEEDING FUEL OIL TO EITHER THE KILN OR THE SCC 24 HRS/DAY FOR THE MAXIMUM ON STREAM TIME OR 7200 HRS/YR

LEAK SOURCE CALCULATION SHEET

DESCRIPTION OF SOURCE: ASH QUENCH LIQUID TO FILTER FEED TANKS

SERVICE : LIGHT _X_ HEAVY ___ GAS ___

FUGITIVE EMISSION ID # : 45

SOURCE CATEGORY	NUMBER OF SOURCE COMPONENTS	LEAKING EMISSION FACTOR (lb/hr)	LEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)	NONLEAKING EMISSION FACTOR (lb/hr)	NONLEAKING TOTAL LEAK FROM SOURCE CATEGORY (lb/hr)
PUMPS	1	0.11	0.11	0.026	0.026
VALVES	3	0.016	0.048	0.0038	0.0114
SAFETY/RELIEF VALVES	0	0.23	0	0.098	0
OPEN-ENDED LINES	0	0.0037	0	0.0033	0
SAMPLING CONNECTIONS	1	0.033	0.033	0	0
COMPRESSORS	0	0.5	0	0.2	0
FLANGES	12	0.0018	0.0216	0.00013	0.00156
OTHER	0	0	0	0	0
TOTAL LEAKAGE ON HOURLY BASIS			0.2126 lbs/hr		0.03896 lbs/hr
TOTAL ANNUAL LEAKAGE FROM SOURCE			1530.72 lbs/yr		280.512 lbs/yr

BASED ON THE AVERAGE FUGITIVE EMISSION FACTORS FOR THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY (SOCMI)

LIGHT LIQUIDS HAVE A VAPOR PRESSURE GREATER THAN 0.1 PSIA AT 100 F .

BASED ON THE ASSUMPTION THAT THE ASH QUENCH WILL TAKE PLACE FOR 24 HRS/DAY FOR THE ENTIRE ONSTREAM TIME OR 7200 HRS/ YR

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-26

CALCULATION OF FUGITIVE PARTICULATE EMISSIONS FROM FFPI FACILITY

FLORIDA FIRST PROCESSING INC.
PARTICULATE EMISSIONS
SUMMARY
08/04/89

FUGITIVE SOURCE ID	OPERATION	PM-10 RELEASE	TSP RELEASE
ORGANIC BULK SOLIDS UNLOADING	BATCH	0.84 lb/yr	1.7 lb/yr
DRIED SOLIDS LOADOUT	CONTINUOUS	31.3 lb/yr	65.14 lb/yr
ASH SOLIDS LOADOUT	CONTINUOUS	12.16 lb/yr	25.3 lb/yr
INORGANIC FILTERCAKE LOADOUT	BATCH	0.53 lb/yr	1.08 lb/yr
INORGANIC BULK SOLIDS UNLOADING	BATCH	0.15 lb/yr	0.3 lb/yr
STABILIZATION AREA BULK SOLIDS UNLOADING	BATCH	63.54 lb/yr	128.84 lb/yr
TOTAL FUGITIVE SOURCE EMISSIONS		108.52 lb/yr	222.36 lb/yr

FLORIDA FIRST PROCESSING INC.
PARTICULATE EMISSIONS CALCULATIONS
8/3/89
PM 10 & TSP FUGITIVE EMISSIONS

The quantity of particulate emissions generated by a batch drop operation , per ton of material transferred is given by the following empirical relationship as given in EPA's AP-42 :

$$E = k\,(0.0018)\ \frac{(s/5) * (U/5) * (H/5)}{(M/2)^{2} * (Y/6)^{0.33}}\qquad (\text{lb/ton})$$

Where: E = emission factor
k = particle size multipler (dimensionless)
s = material silt content (%)
U = mean wind speed, (mph)
H = drop height, (ft)
M = material moisture content (%)
Y = dumping device capacity (yd3)

For the PM 10 calculation k = 0.36 , while the TSP calculation uses k = 0.73

The quantity of particulate emissions generated by a batch drop operation , per ton of material transferred is given by the following empirical relationship as given in EPA's AP-42 :

$$E = k\,(0.0018)\ \frac{(s/5) * (U/5) * (H/5)}{(M/2)^{2}}\qquad (\text{lb/ton})$$

Where: E = emission factor
k = particle size multipler (dimensionless)
s = material silt content (%)
U = mean wind speed, (mph)
H = drop height, (ft)
M = material moisture content (%)

For the PM 10 calculation k = 0.37 , while the TSP calculation uses k = 0.77

ORGANIC AREA

BULK SOLIDS UNLOADING (Estimated at 5661 tons/yr)

BATCH OPERATIONS PM 10
k = 0.36
s = 100
U = 8.5
H = 6
M = 20
Y = 35

E = 0.000147 lb/ton 0.836326 lb/yr

BATCH OPERATIONS TSP
k = 0.73
s = 100
U = 8.5
H = 6
M = 20
Y = 35

E = 0.000299 lb/ton 1.695883 lb/yr

DRIED SOLIDS LOADOUT (Estimated at 8640 tons/yr)

CONTINUOUS OPERATIONS PM 10
k = 0.37
s = 100
U = 8.5
H = 10
M = 5
Y = 0

E = 0.003623 lb/ton 31.30306 lb/yr

CONTINUOUS OPERATIONS TSP
k = 0.77
s = 100
U = 8.5
H = 10
M = 5
Y = 0

E = 0.007539 lb/ton 65.14421 lb/yr

ASH SOLIDS LOADOUT (Estimated at 37,440 tons/yr based on maximum solids loading of 10,400 lb/hr in Trial Burn #1)

CONTINUOUS OPERATIONS PM 10
k = 0.37
s = 100
U = 8.5
H = 10
M = 16.7
Y = 0

E = 0.000324 lb/ton 12.15950 lb/yr

CONTINUOUS OPERATIONS TSP
k = 0.77
s = 100
U = 8.5
H = 10
M = 16.7
Y = 0

E = 0.000675 lb/ton 25.30492 lb/yr

INORGANIC AREA

FILTERCAKE LOADOUT (Estimated at 15,000 tons/yr)

BATCH OPERATIONS PM 10
k = 0.36
s = 100
U = 8.5
H = 13
M = 60
Y = 35

E = 0.000035 lb/ton 0.533486 lb/yr

BATCH OPERATIONS TSP
k = 0.73
s = 100
U = 8.5
H = 13
M = 60
Y = 35

E = 0.000072 lb/ton 1.081792 lb/yr

BULK SOLIDS INORGANIC UNLOADING (Estimated at 1490 tons/yr)

BATCH OPERATIONS PM 10			BATCH OPERATIONS TSP		
k =	0.36		k =	0.73	
s =	100		s =	100	
U =	8.5		U =	8.5	
H =	1		H =	1	
M =	10		M =	10	
Y =	35		Y =	35	
E =	0.000098 lb/ton	0.146749 lb/yr	E =	0.000199 lb/ton	0.297576 lb/yr

STABILIZATION AREA

BULK SOLIDS UNLOADING TO STABILIZATION (DRIED SOLIDS AND ASH LOADOUT)

(Dried Solids and Ash Loadout as given above, estimated at 46,080 tons/yr)

BATCH OPERATIONS PM 10			BATCH OPERATIONS TSP		
k =	0.36		k =	0.73	
s =	100		s =	100	
U =	8.5		U =	8.5	
H =	14		H =	14	
M =	10		M =	10	
Y =	35		Y =	35	
E =	0.001378 lb/ton	63.53775 lb/yr	E =	0.002796 lb/ton	128.8404 lb/yr

Total PM 10 Fugitive Emission	108.5168 lb/yr	Total TSP Fugitive Emission	222.3648 lb/yr

FLORIDA FIRST PROCESSING, INC.

APPENDIX L- 27

DISPERSION MODELING PROTOCOL SUBMITTED BY ICF KAISER ENGINEERS TO FLORIDA STATE DER

AND

RESPONSE FROM FLORIDA STATE DER

9300 Lee Highway
Fairfax, Virginia
22031-1207

703/934-3000

ICF TECHNOLOGY INCORPORATED

April 26, 1989

Mr. Tom Rogers
Florida State Dept. of Environmental Regulation
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400
(904)488-1344

Subject: Atmospheric Dispersion Modeling Protocol for the FFPI Rotary Kiln Hazardous Waste Incinerator located in Polk County, Florida

Dear Mr. Rogers:

I am writing to you in reference to our telephone conversation of April 21, 1989.

I am enclosing a protocol (see Attachment) for the atmospheric dispersion modeling analysis for the subject facility based on our earlier discussions. I would like to confirm that we are mutually in agreement that if the steps of the analysis conform with the standard EPA guidelines, it would be acceptable for the Florida Dept. of Environmental Regulation. The proposed protocol is based on various EPA guidance documents on the subject of atmospheric dispersion analysis.

We look forward to receiving your approval on the protocol. If you need any further information, or any clarifications, please let me know. You may reach me at (703)934-3677. My Fax number is (703)934-9740.

Sincerely,

Ramesh S. Kalagnanam, P.E.
Senior Associate

Attachment

cc: Liane Hetherington, ICF Kaiser, Fairfax, VA
Robert Lanza, ICF Kaiser, Fairfax, VA
Ted Leigh, WAPORA, McLean, VA

MODELING PROTOCOL
FOR THE FFPI ROTARY KILN HAZARDOUS WASTE INCINERATOR

To accomplish a technically sound impact analysis consistent with the EPA guidelines on atmospheric dispersion analysis, ICF Kaiser Engineers proposes the following procedure:

I IMPACT ANALYSIS FOR NORMAL OPERATING MODE:

1.0 Short and Long Term Impacts:

1.1 GEP stack height analysis.

In this case, since the stack height is 200 feet and the only nearby structure is 30 feet high, GEP stack height analysis is not required.

1.2 Screening for short term concentrations.

Proposed Model: ISCST in conjunction with meteorological data recorded at Tampa airport for the year 1986.

Receptor locations will be selected as follows:

- Use the PTPLU-2 model to screen for short term impacts. For each stability category, identify the distance to the highest concentration listed in the PTPLU-2 output.
- Select the smallest of these distances as the first receptor distance. The next eight receptors will be placed at locations determined by multiplying the first receptor distance by the constants: 1.3, 1.7, 2.3, 3.0, 3.9, 5.2, 6.8, and 9.0. The tenth receptor will be placed at a location based on sound engineering judgement upon reviewing the topographic map of the region.
- Use the polar coordinate system and place 10 rings of receptors whose radii correspond to the distances determined in the step above. The rings will be spaced 10 degrees apart. This will give 360 receptors around the stack.

This method of determining the receptor locations is in compliance with the methodology defined in "Regional Workshops on Air Quality Modeling: A Summary Report, April 1981, pp. 12-13, EPA-450/4-82-015"

Run the ISCST model in conjunction with the actual meteorological data for Tampa recorded for the year 1986 and obtain the short term impacts. The averaging period for the short term impacts will be determined for different pollutants based on the applicable standards.

1.3 Screening for long term concentrations.

Proposed Models: ISCST in conjunction with meteorological data recorded at Tampa airport for the year 1986.

ISCLT in conjunction with meteorological data recorded at Tampa airport for the 5-year period 1983 through 1987.

- The N-day average option will be used during the ISCST run described in section 1.2 to obtain annual average concentrations.
- In addition, the ISCLT model will be used in conjunction with the 5-year meteorological data recorded at Tampa airport during the period 1983 through 1987. This will provide a comparison for the results obtained from the ISCST model. Also using the 5 year data serves to "smooth" the effects of any unusual weather patterns observed during a certain year and will give results which are not biased towards any extremes.

This procedure is in compliance with the guidelines set forth in "Guidelines on Air Quality Models (Revised), July 1986, Chapter 9, p 12, EPA-450/2-78-027R"

If the annual concentrations obtained from the ISCLT model is lower than those predicted by the ISCST model, it is reasonable to use the concentration predicted by ISCLT for further steps of the impact analyses.

II IMPACT ANALYSIS FOR AIR POLLUTION CONTROL BYPASS MODE:

Upon identifying the events leading to the air pollution control bypass mode (release through the emergency vent stack), the frequency of these events, and the emission rates of the different contaminants, we will model the impacts due to these emissions using the EPA INPUFF model. The operation in the air pollution bypass mode typically lasts for a duration between 5-10 minutes, based on description of similar units. Therefore obtaining 1-hour average concentrations of the various pollutants would be sufficient for analyzing the impacts due to the releases through the emergency vent stack.

III MISCELLANEOUS

Based on the population method, the source operation is determined to be located in a rural region. Therefore, rural dispersion coefficients will be used throughout the analysis.

Also, during the analysis, we will identify discrete receptors such as the closest residence, day care center, or a school and analyze the impacts at these locations.

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor   Dale Twachtmann, Secretary   John Shearer, Assistant Secretary

May 3, 1989

Mr. Ramesh S. Kalagnanam
ICF Technology Inc.
9300 Lee Highway
Fairfax, Virginia 22031-1207

Subject: Atmospheric Dispersion Modeling Protocol for the FFPI Rotary Kiln Hazardous Waste Incinerator Located in Polk County, Florida

Dear Mr. Kalagnanam:

I have reviewed your modeling protocol for the subject facility and suggest the following changes and additions.

Section 1.1 GEP stack height analysis

A GEP stack height analysis should be submitted. That is, the dimensions of nearby structures should be shown along with the appropriate calculations to show the calculated GEP height. If the stack is to be built at a height greater than or equal to the calculated GEP height, then no downwash analysis is required.

Section 1.2 Screening for short-term concentrations

The short-term modeling should be run for a five-year meteorological data set (1982-1986). I believe I originally told you that a one year data set would be sufficient; however, due to the hazardous nature of your effluent the longer record would be more appropriate.

Section 1.3 Screening for long-term concentrations

The ISCLT model, if used, should be run for each year separately.

In general, you should follow the procedures set forth in the EPA's Guidelines on Air Quality Models (Revised), July 1986, with Supplement A for all modeling submitted to the Department. The use of the INPUFF model for emergency vent releases will be evaluated and accepted based on its applicability for the particular dispersion situation. There is insufficient information in the protocol to say whether that model is appropriate. Sufficient information should be provided in the application to verify the use of any particular model for the dispersion situation it's used for.

If you have any questions, please call me at (904) 488-1344.

Sincerely,

Thomas Rogers
Meteorologist,
Division of Air Resources
Management

cc: Larry George
Barry Andrews

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-28

RESULTS OF INCINERATION STACK EMISSIONS MODELING USING PTPLU-2 MODEL

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1                     PTPLU-2.0  (DATED 86196)
                      AN AIR QUALITY DISPERSION MODEL IN
                      SECTION 3. NON-GUIDELINE MODELS.
                      IN UNAMAP (VERSION 6) JUL 86
                      SOURCE: FILE 21 ON UNAMAP MAGNETIC TAPE FROM NTIS.

                      IBM-PC VERSION 1.20
                      (C) COPYRIGHT 1986, TRINITY CONSULTANTS, INC.
                      SERIAL NUMBER 5959 SOLD TO ICF TECHNOLOGY, INC.
                      RUN BEGAN ON 09-12-89 AT 09:01:45

                                           >>>INPUT PARAMETERS<<<
 *** TITLE***  FFPI ROTARY KILN INCINERATOR STACK

 ***OPTIONS***                    ***METEOROLOGY***                                 ***SOURCE***
 IF = 1, USE OPTION               AMBIENT AIR TEMPERATURE =   293.00 (K)            EMISSION RATE =     1.00 (G/SEC)
 IF = 0, IGNORE OPTION            MIXING HEIGHT           =  5000.00 (M)            STACK HEIGHT  =    60.96 (M)
 IOPT(1) = 0 (GRAD PLUME RISE)    ANEMOMETER HEIGHT       =    10.00 (M)            EXIT TEMP.    =   458.15 (K)
 IOPT(2) = 1 (STACK DOWNWASH)     WIND PROFILE EXPONENTS  = A: .07, B: .07, C: .10  EXIT VELOCITY =    14.66 (M/SEC)
 IOPT(3) = 1 (BUOY. INDUCED DISP.)                          D: .15, E: .35, F: .55  STACK DIAM.   =     1.68 (M)
 IDFLT   = 1 (1 = USE DEFAULT, 0 = NOT USE DEFAULT)
 MUOR    = 2 (1 = URBAN, 2 = RURAL)
0***RECEPTOR HEIGHT*** =      .00 (M)

                                          >>>CALCULATED PARAMETERS<<<
 VOLUMETRIC FLOW =    32.50 (M**3/SEC)          BUOYANCY FLUX PARAMETER =    36.56 (M**4/SEC**3)


 FFPI ROTARY KILN INCINERATOR STACK
0                     ****WINDS CONSTANT WITH HEIGHT****        ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT        WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
              (M/SEC)    (UG/CU M)      (KM)          (M)             (M/SEC)    (UG/CU M)      (KM)          (M)
     1           .50         1.84       1.131       698.1(2)            .57         1.96       1.068       622.4(2)
     1           .80         2.28        .920       459.2(2)            .91         2.39        .872       411.9(2)
     1          1.00         2.47        .838       379.5(2)           1.13         2.57        .797       341.7(2)
     1          1.50         2.74        .716       273.3(2)           1.70         2.80        .684       248.1(2)
     1          2.00         2.85        .646       220.2(2)           2.27         2.87        .620       201.3(2)
     1          2.50         2.87        .601       188.4              2.84         2.87        .578       173.2
     1          3.00         2.86        .568       167.2              3.40         2.83        .548       154.5
0                     ****WINDS CONSTANT WITH HEIGHT****        ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT        WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
              (M/SEC)    (UG/CU M)      (KM)          (M)             (M/SEC)    (UG/CU M)      (KM)          (M)
     2           .50          .91       3.893       698.1(2)            .57          .99       3.506       622.4(2)
     2           .80         1.22       2.662       459.2(2)            .91         1.31       2.413       411.9(2)
     2          1.00         1.38       2.242       379.5(2)           1.13         1.47       2.041       341.7(2)
     2          1.50         1.67       1.673       273.3(2)           1.70         1.75       1.535       248.1(2)
     2          2.00         1.85       1.382       220.2(2)           2.27         1.92       1.277       201.3(2)
     2          2.50         1.97       1.204       188.4              2.84         2.02       1.119       173.2
     2          3.00         2.04       1.085       167.2              3.40         2.07       1.013       154.5
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     2          4.00         2.09         .933        140.6              4.54        2.09         .878        131.1
     2          5.00         2.08         .840        124.7              5.67        2.05         .795        117.1
0                   ****WINDS CONSTANT WITH HEIGHT****          ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT          WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
               (M/SEC)   (UG/CU M)      (KM)          (M)               (M/SEC)   (UG/CU M)      (KM)          (M)
     3          2.00         1.48        2.612        220.2(2)           2.40        1.59        2.287        193.9
     3          2.50         1.61        2.220        188.4              3.00        1.70        1.963        167.3
     3          3.00         1.70        1.961        167.2              3.59        1.77        1.748        149.6
     3          4.00         1.79        1.640        140.6              4.79        1.81        1.482        127.4
     3          5.00         1.82        1.448        124.7              5.99        1.80        1.322        114.1
     3          7.00         1.77        1.230        106.5              8.39        1.71        1.140         98.9
     3         10.00         1.63        1.065         92.7             11.98        1.55         .992         86.6
     3         12.00         1.55         .991         86.6             14.38        1.46         .930         81.5
     3         15.00         1.44         .917         80.4             17.97        1.33         .869         76.4
1
0                   ****WINDS CONSTANT WITH HEIGHT****          ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT          WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
               (M/SEC)   (UG/CU M)      (KM)          (M)               (M/SEC)   (UG/CU M)      (KM)          (M)
     4           .50          .13       57.291        698.1(2)            .66         .19       36.251        546.8(2)
     4           .80          .25       28.950        459.2(2)           1.05         .34       19.710        364.6(2)
     4          1.00          .32       21.060        379.5(2)           1.31         .43       14.590        303.9(2)
     4          1.50          .49       12.271        273.3(2)           1.97         .62        9.270        222.9(2)
     4          2.00          .62        9.100        220.2(2)           2.62         .75        6.842        182.4
     4          2.50          .73        7.183        188.4              3.28         .84        5.512        158.1
     4          3.00          .81        5.993        167.2              3.93         .91        4.680        141.9
     4          4.00          .92        4.617        140.6              5.25         .99        3.708        121.7
     4          5.00          .98        3.848        124.7              6.56        1.02        3.162        109.5
     4          7.00         1.02        3.028        106.5              9.18        1.00        2.675         95.7
     4         10.00          .99        2.556         92.7             13.11         .96        2.209         84.0
     4         12.00          .97        2.310         86.6             15.74         .91        2.029         79.3
     4         15.00          .92        2.072         80.4             19.67         .84        1.853         74.6
     4         20.00          .84        1.842         74.3             26.23         .74        1.682         69.9
0                   ****WINDS CONSTANT WITH HEIGHT****          ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT          WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
               (M/SEC)   (UG/CU M)      (KM)          (M)               (M/SEC)   (UG/CU M)      (KM)          (M)
     5          2.00         1.13        9.893        139.3              3.77         .81        8.097        124.4
     5          2.50         1.01        9.191        133.6              4.71         .72        7.580        119.8
     5          3.00          .92        8.674        129.4              5.65         .65        7.188        116.4
     5          4.00          .78        7.950        123.1              7.53         .55        6.640        111.3
     5          5.00          .69        7.449        118.7              9.41         .48        6.257        107.7
0                   ****WINDS CONSTANT WITH HEIGHT****          ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT          WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
               (M/SEC)   (UG/CU M)      (KM)          (M)               (M/SEC)   (UG/CU M)      (KM)          (M)
     6          2.00          .69       20.301        125.9              5.41         .44       14.999        107.6
     6          2.50          .63       18.401        121.3              6.76         .39       14.999        104.3
     6          3.00          .58       17.021        117.7              8.11         .35       14.999        101.7
     6          4.00          .51       15.111        112.5             10.81         .30       13.970         97.5
     6          5.00          .45       14.999        108.8             13.51         .27       12.830         93.9
0 (1) THE DISTANCE TO THE POINT OF MAXIMUM CONCENTRATION IS SO GREAT THAT THE SAME STABILITY IS NOT LIKELY
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         TO PERSIST LONG ENOUGH FOR THE PLUME TO TRAVEL THIS FAR.
0 (2) THE PLUME IS CALCULATED TO BE AT A HEIGHT WHERE CARE SHOULD BE USED IN INTERPRETING THE COMPUTATION.
0 (3) NO COMPUTATION WAS ATTEMPTED FOR THIS HEIGHT AS THE POINT OF MAXIMUM CONCENTRATION IS GREATER THAN 100 KILOMETERS
         FROM THE SOURCE.
 RUN ENDED ON 09-12-89 AT 09:02:00
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FLORIDA FIRST PROCESSING, INC.

APPENDIX L-29

RESULTS OF INORGANIC WASTE TREATMENT STACK EMISSIONS MODELING USING PTPLU-2 MODEL

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1                   PTPLU-2.0  (DATED 86196)
                    AN AIR QUALITY DISPERSION MODEL IN
                    SECTION 3. NON-GUIDELINE MODELS.
                    IN UNAMAP (VERSION 6) JUL 86
                    SOURCE: FILE 21 ON UNAMAP MAGNETIC TAPE FROM NTIS.

                    IBM-PC VERSION 1.20
                    (C) COPYRIGHT 1986, TRINITY CONSULTANTS, INC.
                    SERIAL NUMBER 5959 SOLD TO ICF TECHNOLOGY, INC.
                    RUN BEGAN ON 09-21-89 AT 22:23:48

                                           >>>INPUT PARAMETERS<<<
 *** TITLE***  FFPI INORGANIC TREATMENT SCRUBBER STACK

 ***OPTIONS***                        ***METEOROLOGY***                                  ***SOURCE***
 IF = 1, USE OPTION                   AMBIENT AIR TEMPERATURE =   293.00 (K)             EMISSION RATE =     1.00 (G/SEC)
 IF = 0, IGNORE OPTION                MIXING HEIGHT           =  5000.00 (M)             STACK HEIGHT  =    30.48 (M)
 IOPT(1) = 0 (GRAD PLUME RISE)        ANEMOMETER HEIGHT       =    10.00 (M)             EXIT TEMP.    =   293.15 (K)
 IOPT(2) = 1 (STACK DOWNWASH)         WIND PROFILE EXPONENTS  = A: .07, B: .07, C: .10   EXIT VELOCITY =     9.70 (M/SEC)
 IOPT(3) = 1 (BUOY. INDUCED DISP.)                              D: .15, E: .35, F: .55   STACK DIAM.   =      .61 (M)
 IDFLT   = 1 (1 = USE DEFAULT, 0 = NOT USE DEFAULT)
 MUOR    = 2 (1 = URBAN, 2 = RURAL)
0***RECEPTOR HEIGHT*** =      .00 (M)

                                          >>>CALCULATED PARAMETERS<<<
 VOLUMETRIC FLOW =     2.83 (M**3/SEC)          BUOYANCY FLUX PARAMETER =      .00 (M**4/SEC**3)


 FFPI INORGANIC TREATMENT SCRUBBER STACK
0                  ****WINDS CONSTANT WITH HEIGHT****        ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY  WIND SPEED   MAX CONC  DIST OF MAX   PLUME HT        WIND SPEED   MAX CONC  DIST OF MAX   PLUME HT
              (M/SEC)   (UG/CU M)     (KM)          (M)            (M/SEC)   (UG/CU M)     (KM)          (M)
    1           .50       72.22       .313        66.0               .54       71.45       .305        63.3
    1           .80       65.96       .261        52.7               .86       64.39       .249        51.0
    1          1.00       61.52       .237        48.2              1.08       59.81       .232        46.9
    1          1.50       51.77       .212        42.3              1.62       49.73       .209        41.4
    1          2.00       44.18       .198        39.4              2.16       42.15       .195        38.7
    1          2.50       38.42       .190        37.6              2.70       36.47       .188        37.0
    1          3.00       33.93       .185        36.4              3.24       32.08       .183        36.0
0                  ****WINDS CONSTANT WITH HEIGHT****        ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY  WIND SPEED   MAX CONC  DIST OF MAX   PLUME HT        WIND SPEED   MAX CONC  DIST OF MAX   PLUME HT
              (M/SEC)   (UG/CU M)     (KM)          (M)            (M/SEC)   (UG/CU M)     (KM)          (M)
    2           .50       66.27       .468        66.0               .54       66.04       .452        63.3
    2           .80       62.56       .373        52.7               .86       61.50       .361        51.0
    2          1.00       59.14       .342        48.2              1.08       57.69       .333        46.9
    2          1.50       50.55       .302        42.3              1.62       48.68       .295        41.4
    2          2.00       43.52       .281        39.4              2.16       41.58       .276        38.7
    2          2.50       38.01       .268        37.6              2.70       36.13       .265        37.0
    2          3.00       33.67       .260        36.4              3.24       31.88       .257        36.0
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    2          4.00        27.33         .250         34.9            4.32        25.75         .247        34.6
    2          5.00        22.97         .243         34.0            5.41        21.57         .241        33.8
0                  ****WINDS CONSTANT WITH HEIGHT****         ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT         WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
              (M/SEC)    (UG/CU M)      (KM)          (M)             (M/SEC)    (UG/CU M)      (KM)          (M)
    3          2.00        44.90         .420         39.4            2.24        42.13         .410        38.4
    3          2.50        39.36         .400         37.6            2.79        36.65         .392        36.8
    3          3.00        34.96         .387         36.4            3.35        32.36         .380        35.8
    3          4.00        28.47         .370         34.9            4.47        26.16         .365        34.4
    3          5.00        23.98         .360         34.0            5.59        21.93         .356        33.7
    3          7.00        18.35         .347         32.9            7.83        16.87         .342        32.4
    3         10.00        13.89         .332         31.6           11.18        12.68         .329        31.3
    3         12.00        11.95         .327         31.1           13.41        10.87         .324        30.9
    3         15.00         9.87         .321         30.6           16.77         8.95         .319        30.4
1
0                  ****WINDS CONSTANT WITH HEIGHT****         ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT         WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
              (M/SEC)    (UG/CU M)      (KM)          (M)             (M/SEC)    (UG/CU M)      (KM)          (M)
    4           .50        45.94        1.442         66.0             .59        47.60        1.275        60.5
    4           .80        48.72        1.044         52.7             .95        48.14        1.000        49.3
    4          1.00        47.65        1.000         48.2            1.18        45.55         .950        45.5
    4          1.50        41.78         .873         42.3            1.77        38.76         .829        40.5
    4          2.00        36.47         .801         39.4            2.36        33.24         .768        38.0
    4          2.50        32.15         .759         37.6            2.95        28.94         .732        36.5
    4          3.00        28.66         .730         36.4            3.55        25.58         .708        35.5
    4          4.00        23.46         .695         34.9            4.73        20.69         .678        34.2
    4          5.00        19.82         .673         34.0            5.91        17.35         .660        33.5
    4          7.00        15.23         .646         32.9            8.27        13.44         .630        32.2
    4         10.00        11.59         .616         31.6           11.82        10.11         .605        31.2
    4         12.00         9.98         .604         31.1           14.18         8.67         .595        30.7
    4         15.00         8.26         .592         30.6           17.73         7.14         .585        30.3
    4         20.00         6.42         .580         30.1           23.64         5.52         .575        29.9
0                  ****WINDS CONSTANT WITH HEIGHT****         ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT         WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
              (M/SEC)    (UG/CU M)      (KM)          (M)             (M/SEC)    (UG/CU M)      (KM)          (M)
    5          2.00        30.63        1.229         38.8            2.95        24.00        1.121        36.5
    5          2.50        26.42        1.172         37.6            3.69        20.82        1.065        35.3
    5          3.00        23.78        1.116         36.4            4.43        18.34        1.028        34.5
    5          4.00        19.71        1.048         34.9            5.91        14.77        1.000        33.5
    5          5.00        16.78        1.007         34.0            7.39        12.52        1.000        32.7
0                  ****WINDS CONSTANT WITH HEIGHT****         ****STACK TOP WINDS (EXTRAPOLATED FROM  10.0 METERS)****
 STABILITY   WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT         WIND SPEED   MAX CONC   DIST OF MAX    PLUME HT
              (M/SEC)    (UG/CU M)      (KM)          (M)             (M/SEC)    (UG/CU M)      (KM)          (M)
    6          2.00        25.17        2.267         38.0            3.69        16.59        2.000        35.3
    6          2.50        20.91        2.210         37.5            4.61        14.24        2.000        34.3
    6          3.00        18.83        2.099         36.4            5.54        12.42        2.000        33.7
    6          4.00        15.74        2.000         34.9            7.38        10.04        1.896        32.7
    6          5.00        13.43        2.000         34.0            9.23         8.53        1.824        31.9
0 (1) THE DISTANCE TO THE POINT OF MAXIMUM CONCENTRATION IS SO GREAT THAT THE SAME STABILITY IS NOT LIKELY
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         TO PERSIST LONG ENOUGH FOR THE PLUME TO TRAVEL THIS FAR.
0 (2) THE PLUME IS CALCULATED TO BE AT A HEIGHT WHERE CARE SHOULD BE USED IN INTERPRETING THE COMPUTATION.
0 (3) NO COMPUTATION WAS ATTEMPTED FOR THIS HEIGHT AS THE POINT OF MAXIMUM CONCENTRATION IS GREATER THAN 100 KILOMETERS
         FROM THE SOURCE.
 RUN ENDED ON 09-21-89 AT 22:24:01
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FLORIDA FIRST PROCESSING, INC.

APPENDIX L-30

RESULTS OF SCREENING ANALYSIS FOR THE DISPERSION OF EMISSIONS FROM THE CARBON ADSORPTION/CHILLER SYSTEM STACK

SCREENING ANALYSIS FOR ANALYSIS OF IMPACTS OF EMISSIONS FROM THE CARBON ADSORPTION/CHILLER SYSTEM

Introduction

A screening analysis was carried out to analyze the impacts of the emissions of volatile organic compound emissions resulting from the unloading of organic liquids from tank trucks and rail cars. The highest emission rates of volatile organics have been estimated to result when two tank trucks and one rail car, all transporting high Btu liquids unload simultaneously. It is also assumed that the displaced vapors are not vented through the incinerator, rather, the carbon adsorption system is used for the control of these emissions. The carbon adsorption system is described in detail in Section D of the RCRA Part B Application. The methodology, inputs, and the results of this analysis are presented in the following sections.

Emission Rates

Table L-5-7 (Section L) summarizes the emissions of acetone and methylene chloride resulting from the tank truck/rail car unloading operation. The uncontrolled emission rates of acetone, and methylene chloride are as follows:

Acetone:	103 lb/hr	(13.005 g/s)
Methylene chloride:	286 lb/hr	(36.11 g/s)

The carbon adsorption system is estimated to reduce the emissions by an extent greater than 95%. Based on 95% removal efficiency, the controlled emission rates of acetone and methylene chloride are as follows:

Acetone:	5.15 lb/hr	(0.65 g/s)
Methylene chloride:	14.3 lb/hr	(1.81 g/s)

Modeling Methodology

The screening analysis was performed based on the procedure described in the EPA Document Workbook of Atmospheric Dispersion Estimates, January 1974. The centerline ground-level concentration at any point along the downwind direction can be estimated using the equation:

$$\chi = (Q/(\pi\sigma_y\sigma_z u))*\exp(-\frac{1}{2}(H/\sigma_z)^2)$$

where, χ = concentration (grams/m^3)
Q = emission rate (g/s)
σ_y = standard deviation in the horizontal direction (m)
σ_z = standard deviation in the vertical direction (m)
u = wind velocity (m/s)
H = height of discharge (m)

The standard deviation terms, σ_y and σ_z are functions of the downwind distance, x, from the emission source where the concentration is being estimated. These are valid for a 10-minute period and graphical representations of the relations of σ_y and σ_z with the downwind distance x are presented in the EPA document referenced above.

An average wind velocity of 8.5 mph was used since this is representative of the Tampa region. The atmospheric stability category is assumed to be F which represents a stable atmospheric condition with minimal vertical mixing. The discharge height is 6 feet (1.83 m). The concentrations estimated using the above equation is a 10-minute average. One-hour average concentration are estimated as follows;

$$\chi_{60} = \chi_{10}(10/60)^{0.17}$$

Table L-30-1 presents the estimated concentrations at various locations ranging from 100 to 1,500 meters from the carbon adsorber for an emission rate of 1 g/s. The maximum 1-hour concentration is estimated to occur at a point 100 meters downwind from the carbon adsorber. This concentration is 4.921 x 10^{-3} grams per cubic meter (4921.22 $\mu g/m^3$) per gram per second emission rate. Based on this result, the concentration of acetone and methylene chloride at the point 100 meters downwind from the carbon adsorber stack will be:

Acetone:	3,200 $\mu g/m^3$
Methylene chloride:	8,885 $\mu g/m^3$

This calculation does not take into account the temperature of the stack emissions, the stack velocity, and other relevant parameters which contribute to plume rise. In this case, since the emissions are emitted at a temperature of -5°F, a large fraction of the plume is expected to slump. Therefore, the concentrations of acetone and methylene chloride estimated above are believed to be several orders of magnitude higher than what would occur in reality.

TABLE L-30-1

SUMMARY OF MODELED IMPACTS OF EMISSIONS FROM THE CARBON ADSORBER DURING TANK TRUCK/RAIL CAR UNLOADING

Distance Downwind From Carbon Adsorber (meters)	σ_y (m)	σ_z (m)	Concentration (g/m^3) 10-min	1-hour	Concentration (μg/m^3) 10-min	1-hour
100	4	2.3	6.67E-03	4.92E-03	6673.6	4921.22
200	7.5	4	2.53E-03	1.87E-03	2529.5	1865.3
400	14.5	7	8.02E-04	5.92E-04	802.2	591.6
500	17.5	8.5	5.53E-04	4.08E-04	553.5	408.1
600	21	9.7	4.06E-04	3.00E-04	406.3	299.6
700	24	11	3.15E-04	2.32E-04	314.8	232.1
800	27.5	12	2.52E-04	1.86E-04	252.3	186.1
900	30.5	13	2.10E-04	1.55E-04	210.4	155.2
1000	33.5	14	1.78E-04	1.31E-04	178.1	131.3
1200	40	16	1.31E-04	9.65E-05	130.8	96.5
1400	47	17.2	1.04E-04	7.64E-05	103.6	76.4
1500	50	18	9.31E-05	6.87E-05	93.1	68.7

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-31

RESULTS OF SCREENING ANALYSIS FOR THE DISPERSION OF FUGITIVE EMISSIONS OF VOC AND PARTICULATES FROM THE FFPI FACILITY

SCREENING ANALYSIS FOR ANALYSIS OF IMPACTS OF FUGITIVE EMISSIONS OF PARTICULATES AND VOLATILE ORGANIC COMPOUNDS

Introduction

A screening analysis was carried out to analyze the impacts of the fugitive emissions of particulates and volatile organic compound emissions emitted at the proposed FFPI facility. The methodology, inputs, and the results of this analysis are presented in the following sections.

Emission Rates

Table L-5-12 and L-5-13 (Section L) summarize the fugitive emissions of volatile organic compounds from leak sources such as flanges, and emissions resulting from evaporation of organic compounds following spills. The fugitive emissions of volatile organic compounds averaged over 8,760 hours per year of operation are as follows:

From leak sources:	2.71 lb/hr (0.342 g/s)
Evaporation from spills:	0.193 lb/hr (0.024 g/s)
Total:	2.903 lb/hr (0.365 g/s)

Table L-5-16 summarizes the fugitive emissions of particulates from the proposed FFPI facility. The emission rates of PM-10 and total suspended particulates (TSP) averaged over 8,760 hours per year of operation are:

PM-10:	0.0124 lb/hr	(0.00157 g/s)
TSP:	0.0254 lb/hr	(0.0032 g/s)

Appendices L-25 and L-26 present details pertaining to the estimation of the emission rates of these fugitive emissions.

Modeling Methodology

The screening analysis was performed based on the procedure described in the EPA Document Workbook of Atmospheric Dispersion Estimates, January 1974. The centerline ground-level concentration at any point along the downwind direction can be estimated using the equation:

$$\chi = (Q/(\pi\sigma_y\sigma_z u))*\exp(-\tfrac{1}{2}(H/\sigma_z)^2)$$

where,
χ = concentration (grams/m^3)
Q = emission rate (g/s)
σ_y = standard deviation in the horizontal direction (m)
σ_z = standard deviation in the vertical direction (m)
u = wind velocity (m/s)
H = height of discharge (m)

The standard deviation terms, σ_y and σ_z are functions of the downwind distance, x, from the emission source where the concentration is being estimated. These are valid for a 10-minute period and graphical representations of the relations of σ_y and σ_z with the downwind distance x are presented in the EPA document referenced above.

The sources of fugitive emissions are assumed to be spread uniformly throughout the proposed FFPI facility. Therefore, the entire FFPI facility can be considered to be an area source of the fugitive emissions. The area of the FFPI facility will be 82.7 acres (336920 m^2). The equation described above can also be used for area sources assumed to be square shaped having a side dimension of L meters, by first determining the virtual distance x_v meters. The virtual distance x_v for an area source whose side dimension is L meters, is that distance x for which the σ_y equals L/4.3. This can be read off from the graph of σ_y against x. Since the side dimension of the FFPI facility is 580.45 meters, the graph indicates that x_v is 4,500 meters, i.e., σ_y is 135 meters (580.45/4.3) at a distance of 4,500 meters from the facility. The σ_y to be considered in the equation above for any given receptor physically located x meters away is that σ_y corresponding to $(x+x_v)$ meters. This is described in chapter 5 of the EPA document referenced above.

An average wind velocity of 8.5 mph was used since this is representative of the Tampa region. The atmospheric stability category is assumed to be F which represents a stable atmospheric condition with minimal vertical mixing. The discharge height is assumed to be 10 meters. The concentration estimated using the above equation is a 10-minute average. These are converted to 1-hour (60 min) average concentration are estimated as follows:

$$\chi_{60} = \chi_{10}(10/60)^{0.17}$$

Table L-31-1 presents the estimated concentrations at various locations ranging from 200 to 1,500 meters from the FFPI facility for an emission rate of 1 g/s. The maximum 1-hour concentration is estimated to occur at a point 600 meters downwind from the FFPI facility. This concentration is 2.51×10^{-5} grams per cubic meter (25.1 $\mu g/m^3$) per gram per second emission rate. Based on this result, the concentration of volatile organic compounds and particulate matter at the point 600 meters downwind from the FFPI facility will be:

Volatile organic compounds:	9.19 $\mu g/m^3$
PM-10:	0.0393 $\mu g/m^3$
TSP:	0.0804 $\mu g/m^3$

These concentrations are very low, and therefore, it can be concluded that the fugitive emissions of volatile organic compounds and particulates will not have any adverse effects on the ambient air quality.

TABLE L-31-1

SUMMARY OF MODELED IMPACTS OF FUGITIVE EMISSIONS FROM THE FFPI FACILITY AS AN AREA SOURCE

Distance Downwind From FFPI Facility (meters)	σ_y (m)	σ_z (m)	Concentration (g/m^3)		Concentration ($\mu g/m^3$)	
			10-min	1-hour	10-min	1-hour
200	140	4	6.61E-06	4.87E-06	6.61	4.875
400	145	7	2.99E-05	2.21E-05	29.92	22.06
500	148	8.5	3.35E-05	2.47E-05	33.53	24.72
600	150	9.7	3.40E-05	2.51E-05	34.04	25.1
700	152	11	3.33E-05	2.46E-05	33.34	24.6
800	155	12	3.20E-05	2.36E-05	32.01	23.6
900	159	13	3.03E-05	2.24E-05	30.32	22.4
1000	160	14	2.91E-05	2.15E-05	29.15	21.5
1200	165	16	2.63E-05	1.94E-05	26.3	19.4
1400	170	17.2	2.43E-05	1.79E-05	24.3	17.9
1500	172	18	2.33E-05	1.72E-05	23.3	17.2

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-32

RESULTS OF INCINERATOR STACK EMISSIONS DISPERSION MODELING USING ISC MODEL ALONG WITH 1982 METEOROLOGICAL DATA

```
1                 ISCST - VERSION 3.4 (DATED 88348)

                  IBM-PC VERSION (1.64)
                  (C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.
                  SERIAL NUMBER 5958 SOLD TO ICF TECHNOLOGY, INC
                  RUN BEGAN ON 09-15-89 AT 07:15:32


1

                       *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***

                CALCULATE (CONCENTRATION=1,DEPOSITION=2)                          ISW(1) =    1
                RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)           ISW(2) =    4
                DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                  ISW(3) =    1
                TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                          ISW(4) =    0
                CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                     ISW(5) =    0
                LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                  ISW(6) =    1

                COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
                WITH THE FOLLOWING TIME PERIODS:
                  HOURLY (YES=1,NO=0)                                             ISW(7) =    1
                  2-HOUR (YES=1,NO=0)                                             ISW(8) =    0
                  3-HOUR (YES=1,NO=0)                                             ISW(9) =    1
                  4-HOUR (YES=1,NO=0)                                            ISW(10) =    0
                  6-HOUR (YES=1,NO=0)                                            ISW(11) =    0
                  8-HOUR (YES=1,NO=0)                                            ISW(12) =    1
                  12-HOUR (YES=1,NO=0)                                           ISW(13) =    0
                  24-HOUR (YES=1,NO=0)                                           ISW(14) =    1
                PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                              ISW(15) =    1

                PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
                SPECIFIED BY ISW(7) THROUGH ISW(14):
                  DAILY TABLES (YES=1,NO=0)                                      ISW(16) =    0
                  HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                   ISW(17) =    1
                  MAXIMUM 50 TABLES (YES=1,NO=0)                                 ISW(18) =    0
                METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)        ISW(19) =    1
                RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)  ISW(20) =    0
                WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)        ISW(21) =    1
                VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3) ISW(22) =    1
                SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                ISW(23) =    0
                PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)            ISW(24) =    1
                PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)      ISW(25) =    2
                PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)            ISW(26) =    1
                CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)          ISW(27) =    1
                REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                          ISW(28) =    1
                TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                 ISW(29) =    2
                DEBUG OPTION CHOSEN (YES=1,NO=2)                                 ISW(30) =    2
                ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)              ISW(31) =    0
```

```
            NUMBER OF INPUT SOURCES                                          NSOURC =   1
            NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                         NGROUP =   0
            TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)             IPERD =   0
            NUMBER OF X (RANGE) GRID VALUES                                  NXPNTS =  10
            NUMBER OF Y (THETA) GRID VALUES                                  NYPNTS =  36
            NUMBER OF DISCRETE RECEPTORS                                     NXWYPT =   0
            SOURCE EMISSION RATE UNITS CONVERSION FACTOR                         TK =.10000E+07
            HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                 ZR =   6.70  METERS
            LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                         IMET =   9
            DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION              DECAY = .000000E+00
            SURFACE STATION NO.                                                 ISS = 12842
            YEAR OF SURFACE DATA                                                ISY = 82
            UPPER AIR STATION NO.                                               IUS = 12842
            YEAR OF UPPER AIR DATA                                              IUY = 82
            ALLOCATED DATA STORAGE                                            LIMIT = 43500 WORDS
            REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                        MIMIT =  8613 WORDS
1
                           *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***

                                         *** METEOROLOGICAL DAYS TO BE PROCESSED ***
                                                            (IF=1)

   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

                            *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                         (METERS/SEC)

                                           1.54,   3.09,   5.14,   8.23,  10.80,


                                              *** WIND PROFILE EXPONENTS ***


          STABILITY                            WIND SPEED CATEGORY
          CATEGORY         1              2              3              4              5              6
              A       .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
              B       .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
              C       .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00
              D       .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
              E       .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00
              F       .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00
```

```
                                   *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                                (DEGREES KELVIN PER METER)


              STABILITY                                WIND SPEED CATEGORY
              CATEGORY          1              2              3              4              5              6
                 A          .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                 B          .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                 C          .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                 D          .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                 E          .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01
                 F          .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01
1
                             *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                            X,Y-COORDINATES OF THE CENTER OF THE POLAR RECEPTOR GRID (METERS) = (       0.,       0.)


                                          *** RANGES OF POLAR GRID SYSTEM ***
                                                       (METERS)

          568.0,      738.0,      966.0,     1306.0,     1704.0,     2215.0,     2954.0,     3862.0,     5112.0,     6000.0,



                                        *** RADIAL ANGLES OF POLAR GRID SYSTEM ***

                                                       (DEGREES)

           10.0,       20.0,       30.0,       40.0,       50.0,       60.0,       70.0,       80.0,       90.0,      100.0,
          110.0,      120.0,      130.0,      140.0,      150.0,      160.0,      170.0,      180.0,      190.0,      200.0,
          210.0,      220.0,      230.0,      240.0,      250.0,      260.0,      270.0,      280.0,      290.0,      300.0,
          310.0,      320.0,      330.0,      340.0,      350.0,      360.0,
1
                             *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***

                                                  *** SOURCE DATA ***

                     EMISSION RATE                                               TEMP.    EXIT VEL.
                        TYPE=0,1                                                 TYPE=0    TYPE=0
         T W         (GRAMS/SEC)                                                 (DEG.K);  (M/SEC);          BLDG.    BLDG.    BLDG.
         Y A NUMBER     TYPE=2                               BASE                VERT.DIM  HORZ.DIM DIAMETER HEIGHT   LENGTH   WIDTH
  SOURCE P K  PART.  (GRAMS/SEC)      X         Y          ELEV.    HEIGHT     TYPE=1   TYPE=1,2  TYPE=0   TYPE=0   TYPE=0   TYPE=0
  NUMBER E E  CATS. *PER METER**2 (METERS)  (METERS)  (METERS)  (METERS)  (METERS)  (METERS) (METERS) (METERS) (METERS) (METERS)
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

       1 0 0     0   .10000E+01       .0         .0        .0     60.96    458.15     14.66     1.68      .00      .00      .00
```

```
* CALM HOURS (=1) FOR DAY   1 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY   6 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY   7 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0
* CALM HOURS (=1) FOR DAY   8 *  1  0  1  0  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY   9 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  10 *  0  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  16 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1
* CALM HOURS (=1) FOR DAY  17 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  18 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  1
* CALM HOURS (=1) FOR DAY  19 *  1  1  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1
* CALM HOURS (=1) FOR DAY  20 *  0  0  0  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  21 *  0  0  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY  22 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY  25 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1  0
* CALM HOURS (=1) FOR DAY  35 *  1  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  37 *  0  0  1  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  41 *  1  0  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  42 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  49 *  1  0  1  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  50 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  51 *  1  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  54 *  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  55 *  1  1  0  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY  56 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  61 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  62 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  63 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  65 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  70 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  71 *  0  1  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY  72 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  73 *  0  0  0  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY  74 *  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  75 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY  76 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY  77 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 101 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 104 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 105 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 108 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 112 *  0  0  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 117 *  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 129 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 131 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 132 *  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 134 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 135 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 136 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 137 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

```
* CALM HOURS (=1) FOR DAY 140 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 157 *  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 161 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 166 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 168 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 169 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 170 *  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 171 *  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 174 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 175 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 176 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 177 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 180 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 183 *  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 184 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 185 *  1  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 186 *  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 187 *  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 188 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 189 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 190 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 193 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 197 *  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 198 *  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 199 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 200 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 201 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 203 *  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 204 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 207 *  0  0  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 208 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 209 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0
* CALM HOURS (=1) FOR DAY 210 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 211 *  0  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 212 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 213 *  0  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 214 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 216 *  0  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 221 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 222 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 223 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 224 *  0  0  1  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 225 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  1  0  0  1  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 226 *  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 228 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 229 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 232 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 233 *  1  0  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 234 *  0  1  1  1  1  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0
```

```
 * CALM HOURS (=1) FOR DAY 235 *  0  1  0  0  0  1  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 236 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
 * CALM HOURS (=1) FOR DAY 237 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 238 *  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  1  0  1  1  0  0  1  0  1
 * CALM HOURS (=1) FOR DAY 239 *  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
 * CALM HOURS (=1) FOR DAY 240 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 241 *  1  1  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 245 *  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 246 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
 * CALM HOURS (=1) FOR DAY 247 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 248 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 254 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 256 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 259 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
 * CALM HOURS (=1) FOR DAY 260 *  1  1  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 261 *  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
 * CALM HOURS (=1) FOR DAY 262 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 263 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
 * CALM HOURS (=1) FOR DAY 265 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  0
 * CALM HOURS (=1) FOR DAY 267 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
 * CALM HOURS (=1) FOR DAY 268 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 269 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
 * CALM HOURS (=1) FOR DAY 270 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 282 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 283 *  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 284 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 286 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
 * CALM HOURS (=1) FOR DAY 288 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
 * CALM HOURS (=1) FOR DAY 289 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1  0  1
 * CALM HOURS (=1) FOR DAY 290 *  1  1  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 316 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 317 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 318 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  0  0
 * CALM HOURS (=1) FOR DAY 319 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 322 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 326 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
 * CALM HOURS (=1) FOR DAY 327 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1
 * CALM HOURS (=1) FOR DAY 328 *  0  1  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 329 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 333 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  1
 * CALM HOURS (=1) FOR DAY 334 *  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
 * CALM HOURS (=1) FOR DAY 345 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 354 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
 * CALM HOURS (=1) FOR DAY 355 *  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  1  1  1  1
 * CALM HOURS (=1) FOR DAY 356 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 364 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
 * CALM HOURS (=1) FOR DAY 365 *  0  0  0  0  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0
1
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'N'-DAY
365 DAYS

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                                                                                                          SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***

                                * 365-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                * FROM ALL SOURCES *
                                              * FOR THE RECEPTOR GRID *

                            * MAXIMUM VALUE EQUALS      .04396 AND OCCURRED AT (    1704.0,     240.0) *

 DIRECTION /                                              RANGE (METERS)
 (DEGREES) /      568.0      738.0      966.0     1306.0     1704.0     2215.0     2954.0     3862.0     5112.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .01037     .01711     .02106     .02104     .01871     .01583     .01283     .01037     .00823
    350.0 /      .00964     .01601     .01997     .02021     .01814     .01551     .01276     .01046     .00839
    340.0 /      .01021     .01729     .02229     .02341     .02164     .01895     .01591     .01323     .01070
    330.0 /      .01137     .01904     .02452     .02604     .02450     .02189     .01868     .01564     .01270
    320.0 /      .01211     .02099     .02779     .03022     .02910     .02680     .02386     .02088     .01769
    310.0 /      .01159     .02110     .02899     .03221     .03120     .02870     .02544     .02220     .01882
    300.0 /      .00990     .01854     .02618     .02989     .02960     .02788     .02547     .02295     .02011
    290.0 /      .00860     .01568     .02170     .02436     .02382     .02227     .02037     .01852     .01641
    280.0 /      .00991     .01780     .02475     .02831     .02831     .02696     .02490     .02254     .01972
    270.0 /      .01201     .02154     .03053     .03552     .03561     .03350     .03010     .02639     .02239
    260.0 /      .01271     .02213     .03084     .03570     .03590     .03390     .03045     .02655     .02231
    250.0 /      .01344     .02432     .03476     .04106     .04196     .04022     .03666     .03234     .02745
    240.0 /      .01259     .02378     .03483     .04206     .04396     .04324     .04055     .03658     .03161
    230.0 /      .00977     .01814     .02602     .03090     .03207     .03152     .02965     .02692     .02343
    220.0 /      .00709     .01297     .01867     .02252     .02377     .02370     .02245     .02029     .01746
    210.0 /      .00467     .00830     .01167     .01362     .01378     .01302     .01158     .00991     .00812
    200.0 /      .00354     .00643     .00926     .01102     .01125     .01068     .00953     .00820     .00680
    190.0 /      .00295     .00533     .00781     .00955     .01004     .00989     .00926     .00835     .00720
    180.0 /      .00276     .00497     .00737     .00920     .00989     .00995     .00951     .00869     .00761
    170.0 /      .00253     .00445     .00634     .00760     .00796     .00785     .00734     .00656     .00560
    160.0 /      .00230     .00377     .00530     .00658     .00731     .00767     .00755     .00696     .00606
    150.0 /      .00301     .00469     .00650     .00825     .00936     .00991     .00972     .00883     .00756
    140.0 /      .00452     .00685     .00875     .01007     .01066     .01083     .01052     .00972     .00853
    130.0 /      .00627     .01005     .01317     .01489     .01503     .01435     .01302     .01143     .00968
    120.0 /      .00765     .01303     .01740     .01910     .01823     .01627     .01372     .01133     .00906
    110.0 /      .00962     .01690     .02257     .02424     .02242     .01929     .01560     .01241     .00956
    100.0 /      .01238     .02165     .02843     .02982     .02698     .02271     .01792     .01395     .01053
     90.0 /      .01480     .02525     .03221     .03279     .02885     .02354     .01791     .01346     .00981
     80.0 /      .01836     .03015     .03681     .03583     .03036     .02385     .01741     .01267     .00900
     70.0 /      .02180     .03437     .04024     .03784     .03142     .02432     .01755     .01267     .00897
     60.0 /      .02093     .03214     .03682     .03434     .02868     .02251     .01663     .01236     .00908
     50.0 /      .01761     .02769     .03277     .03168     .02722     .02190     .01658     .01258     .00941
     40.0 /      .01482     .02431     .03011     .03040     .02716     .02281     .01809     .01417     .01080
     30.0 /      .01228     .02061     .02610     .02684     .02440     .02095     .01710     .01378     .01077
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     20.0 /      .01023      .01725      .02181      .02238      .02029      .01733      .01397      .01108      .00851
     10.0 /      .01009      .01688      .02089      .02075      .01814      .01493      .01165      .00908      .00693
1                                                                                                                'N'-DAY
                                                                                                                 365 DAYS
                                                                                                                 SGROUP#  1
                                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                                      * 365-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                    * FROM ALL SOURCES *
                                                  * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      .04396 AND OCCURRED AT (    1704.0,     240.0) *

  DIRECTION /                                                 RANGE (METERS)
  (DEGREES) /      6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .00719
    350.0 /      .00735
    340.0 /      .00941
    330.0 /      .01118
    320.0 /      .01591
    310.0 /      .01698
    300.0 /      .01850
    290.0 /      .01518
    280.0 /      .01806
    270.0 /      .02019
    260.0 /      .01999
    250.0 /      .02472
    240.0 /      .02868
    230.0 /      .02136
    220.0 /      .01576
    210.0 /      .00716
    200.0 /      .00605
    190.0 /      .00652
    180.0 /      .00696
    170.0 /      .00506
    160.0 /      .00550
    150.0 /      .00678
    140.0 /      .00778
    130.0 /      .00872
    120.0 /      .00791
    110.0 /      .00817
    100.0 /      .00892
     90.0 /      .00816
     80.0 /      .00740
     70.0 /      .00738
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      60.0 /        .00765
      50.0 /        .00799
      40.0 /        .00921
      30.0 /        .00929
      20.0 /        .00726
      10.0 /        .00593
1                                                                                                                                        HIGH
                                                                                                                                          1-HR
                                                                                                                                         SGROUP#  1
                                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                                             * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                                      * FROM ALL SOURCES *
                                                                   * FOR THE RECEPTOR GRID *

                                          * MAXIMUM VALUE EQUALS      4.14748 AND OCCURRED AT (      568.0,      90.0) *

 DIRECTION /                                                        RANGE (METERS)
 (DEGREES) /             568.0                 738.0                 966.0                 1306.0                1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


    360.0 /        2.77496 (142,12)     2.41389 (110,11)     2.16551 (235,14)     1.88970 (195,12)     1.84071 (332,15)
    350.0 /        2.92817 (195,11)     2.11830 (195,11)     2.15593 (153,14)     1.90867 (205, 9)     1.79953 ( 40, 9)
    340.0 /        2.95425 (145,11)     2.15576 (145,11)     2.13770 ( 73,11)     1.88205 (137,15)     1.79234 (153,11)
    330.0 /        2.91552 (262,13)     2.42733 (262,13)     2.18671 (221,12)     2.00430 (219,12)     1.82851 (134,16)
    320.0 /        2.96342 (217,14)     2.47059 (177,11)     2.16284 (184, 9)     2.01101 (196,16)     1.81764 (220, 8)
    310.0 /        2.80930 (135,11)     2.08030 (189,11)     2.16670 (251,11)     1.99494 (241,10)     1.81234 (192, 8)
    300.0 /        2.64967 (135,11)     2.13145 (118,12)     2.17970 (184,11)     2.04564 (222,12)     1.84050 (211, 8)
    290.0 /        2.80402 (118,12)     2.39121 (118,12)     2.16410 (159,11)     1.96402 (137,10)     1.84775 (251,12)
    280.0 /        2.92078 (159,13)     2.11632 (159,13)     2.17474 (111,11)     1.97472 (284,10)     1.79631 (217,18)
    270.0 /        2.93434 (158,11)     2.11996 (158,11)     2.17372 (251,13)     1.97472 (282,11)     1.85789 (244,13)
    260.0 /        2.97546 (137,14)     2.16150 (137,14)     2.17970 (249,14)     1.95903 (269,14)     1.85327 (198,11)
    250.0 /        2.95719 (249,13)     2.45843 (137,11)     2.16028 (241,11)     1.98895 (262,11)     1.79693 (365,14)
    240.0 /        2.84600 (260,12)     2.76128 (138,14)     2.13603 (270,12)     2.03438 (259,11)     1.85616 (266,16)
    230.0 /        2.68210 (260,12)     2.24340 (260,12)     2.15072 (140,13)     1.99484 (259,15)     1.84928 (196,13)
    220.0 /        2.87428 (248,13)     2.38508 (248,13)     2.20532 (259,12)     1.97472 (134,15)     1.81798 (259,17)
    210.0 /        2.92817 (166,12)     2.25190 (248,13)     2.11509 (141,11)     1.96117 (240,13)     1.84928 (197,13)
    200.0 /        1.89904 (130,14)     1.93539 (259,13)     2.05557 (259,13)     1.92877 (118, 9)     1.77969 (269,10)
    190.0 /        2.90085 (130,14)     2.44355 (130,14)     2.15126 (260,13)     1.94717 (355,12)     1.78402 (150,11)
    180.0 /        2.88090 (118,11)     2.12540 (118,11)     2.13032 (269,12)     2.01709 (203,16)     1.75795 (355,11)
    170.0 /        2.41550 (118,11)     2.01536 (183, 9)     2.15072 (183, 9)     1.92023 ( 49,11)     1.77055 (200,16)
    160.0 /        2.63857 (223,14)     2.22943 (223,14)     2.07391 ( 94,13)     2.03949 (208,12)     1.69886 (208,12)
    150.0 /        2.92869 (130,13)     2.37498 (209,12)     3.51965 (209,12)     3.60735 (209,12)     3.01595 (209,12)
    140.0 /        2.85984 (118,13)     2.52620 (137,13)     2.09459 (258,13)     1.86123 (192,18)     1.81517 (255,16)
    130.0 /        2.93434 (211,13)     2.67459 (137,13)     2.17319 (223,15)     1.91176 (260,15)     1.88691 (208,15)
    120.0 /        2.99680 (236,12)     2.16725 (236,12)     2.12557 (240,16)     2.02821 (220,16)     1.86345 (240,17)
    110.0 /        2.68021 (224,11)     2.12433 (215,13)     2.16934 (178,12)     2.81973 (209,11)     3.20193 (209,11)
    100.0 /        3.44459 (209,13)     3.28123 (209,13)     2.56797 (209,13)     1.94139 (209,13)     1.86635 (180, 9)
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      90.0 /      4.14748 (209,13)     3.94346 (209,13)     3.13088 (209,13)     2.40814 (209,13)     1.90899 (209,13)
      80.0 /      2.83554 (135,13)     2.55273 (209,13)     2.21745 (222,14)     1.97618 (263,15)     1.85714 (147,14)
      70.0 /      2.98925 (208,11)     2.42138 (206,11)     2.18671 (152,14)     1.99123 (246,11)     1.85961 (209,17)
      60.0 /      2.88685 (223,13)     2.78652 (234,11)     2.19716 (232,13)     1.90091 (112,15)     1.88222 (207,11)
      50.0 /      2.98492 (245,13)     2.68513 (184,12)     2.17970 (186,11)     1.92267 (212,15)     1.85714 (205,17)
      40.0 /      2.98298 (185,11)     2.21065 (210,11)     2.21585 (202,11)     1.92877 (226,13)     1.99780 (174, 7)
      30.0 /      2.98298 (232,11)     2.16353 (232,11)     2.19716 (247,12)     2.04153 (140,15)     1.87824 (221,17)
      20.0 /      2.99162 (194,11)     2.45890 (191,12)     2.18514 (284,12)     1.97902 (167,10)     1.83217 (230,15)
      10.0 /      2.46752 (110,11)     2.70607 (110,11)     2.16028 (148,13)     1.98691 (194,10)     1.84891 (  2,15)
1                                                                                                                  HIGH
                                                                                                                    1-HR
                                                                                                                   SGROUP#  1
                             *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                            * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                         * MAXIMUM VALUE EQUALS      4.14748 AND OCCURRED AT (      568.0,      90.0) *

 DIRECTION /                                            RANGE (METERS)
 (DEGREES) /            2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      1.66709 (132, 9)     1.47317 (132, 9)     1.21071 (247,10)      .98975 (264,24)      .95066 (264,24)
     350.0 /      2.08689 (210, 9)     1.96030 (210, 9)     1.69712 (264,19)     1.52013 (264,19)     1.37339 (264,19)
     340.0 /      1.72331 (153,11)     1.43752 (  1,10)     1.50258 (345, 8)     1.49177 (345, 8)     1.41128 (345, 8)
     330.0 /      1.71102 (188, 8)     1.43878 (363, 9)     1.16659 (363, 9)      .99747 (145, 7)     1.01937 (145, 7)
     320.0 /      1.80707 (212, 8)     1.77536 (212, 8)     1.70193 (210, 8)     1.70388 (210, 8)     1.61973 (210, 8)
     310.0 /      1.69440 (344,14)     1.48835 (344,14)     1.15145 (344,14)      .95246 (307, 8)      .89620 (307, 8)
     300.0 /      1.83103 (365, 9)     1.84272 (365, 9)     1.58946 (365, 9)     1.25306 (365, 9)     1.08112 (365, 9)
     290.0 /      1.64050 (251,12)     1.39805 (241, 9)     1.08144 (241, 9)      .96739 (161, 7)      .93045 (161, 7)
     280.0 /      1.66773 (137, 8)     1.34835 (137, 8)     1.14486 (206, 7)     1.37378 (206, 7)     1.42843 (206, 7)
     270.0 /      1.64650 (163, 8)     1.40945 (250,13)     1.19568 (200,19)      .93926 (188,17)      .89749 (119,15)
     260.0 /      1.64369 (198,11)     1.41584 ( 50,10)     1.25088 ( 19,10)     1.01583 ( 19,10)      .89454 (171, 8)
     250.0 /      1.68714 (329,10)     1.36665 (329,10)     1.00782 (251, 8)      .95515 (323, 8)      .97929 (323, 8)
     240.0 /      1.72697 (321,16)     1.45711 (328,11)     1.21470 (243, 7)     1.17107 (243, 7)     1.09584 (243, 7)
     230.0 /      1.64159 (258,17)     1.39509 ( 35,16)     1.07343 ( 35,16)      .93933 (251,20)      .88596 (251,20)
     220.0 /      1.82615 (118, 8)     1.70432 (118, 8)     1.43386 (118, 8)     1.12799 (118, 8)      .97586 (118, 8)
     210.0 /      1.73542 (256,16)     1.41415 ( 82, 9)     1.23413 ( 82, 9)      .97970 ( 82, 9)      .87135 ( 38,14)
     200.0 /      1.54291 (104, 9)     1.36420 (104, 9)     1.05825 (104, 9)      .87607 ( 38, 5)      .80865 ( 38, 5)
     190.0 /      1.51967 (150,11)     1.25176 ( 77, 9)      .99653 (341, 2)      .90176 (341, 2)      .81775 (341, 2)
     180.0 /      1.58803 (355,11)     1.21794 (355,11)     1.16705 (347, 8)     1.10442 ( 67, 8)     1.06315 ( 67, 8)
     170.0 /      1.69911 (200,16)     1.61944 ( 85, 8)     1.43814 ( 85, 8)     1.17578 ( 85, 8)     1.02624 ( 85, 8)
     160.0 /      1.26008 (283,14)     1.03082 (192,17)      .97979 (145,19)     1.15716 (  8,18)     1.23771 (  8,18)
     150.0 /      2.40450 (209,12)     1.86707 (209,12)     1.47559 (209,12)     1.15422 (209,12)     1.00346 (209,12)
     140.0 /      1.72738 (255,16)     1.37683 (255,16)     1.09451 (138,18)     1.18379 (183, 7)     1.25391 (183, 7)
     130.0 /      1.67343 (208,15)     1.74990 (187, 8)     1.69399 (187, 8)     1.43367 (187, 8)     1.25721 (187, 8)
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     120.0 /      1.69911 (171, 9)      1.36286 (171, 9)      1.03960 (185,19)       .96358 (185,19)       .88356 (185,19)
     110.0 /      2.95098 (209,11)      2.37149 (209,11)      1.86463 (209,11)      1.44449 (209,11)      1.24847 (209,11)
     100.0 /      1.66154 (180, 9)      1.54164 (265,18)      1.44993 (265,18)      1.24741 (265,18)      1.28653 (  8,16)
      90.0 /      2.07059 (209,18)      2.07673 (209,18)      1.80555 (209,18)      1.43827 (209,18)      1.24803 (209,18)
      80.0 /      1.56942 (147,14)      1.41372 (229,18)      1.20053 (229,18)       .90283 ( 73,18)       .82936 ( 73,18)
      70.0 /      1.74675 (209,17)      1.49408 (209,17)      1.22416 (209,17)       .96124 (209,17)       .83305 (209,17)
      60.0 /      1.71138 (246,10)      1.47734 (208, 8)      1.17938 (208, 8)       .93135 (  8,15)       .95223 (  8,15)
      50.0 /      1.72331 (164, 8)      1.46345 ( 64,15)      1.31216 ( 64,15)      1.09088 ( 64,15)      1.05123 (215, 7)
      40.0 /      1.91659 (174, 7)      1.61752 (174, 7)      1.29138 (174, 7)      1.00171 (174, 7)       .86572 (174, 7)
      30.0 /      1.62884 (230,12)      1.23699 (230,12)      1.00405 (339,14)       .89355 ( 65,22)       .87336 ( 65,22)
      20.0 /      1.69932 (224, 9)      1.49109 (224, 9)      1.15280 (224, 9)       .93648 (146,11)       .88369 (146,11)
      10.0 /      1.56493 (  2,15)      1.18144 (240, 9)       .98302 (146,10)       .90075 (364,17)       .84795 (364,17)
1                                                                                                                   2ND HIGH
                                                                                                                     1-HR
                                                                                                                    SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***

                         * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)      *
                                                         * FROM ALL SOURCES *
                                                       * FOR THE RECEPTOR GRID *

                          * MAXIMUM VALUE EQUALS      2.97090 AND OCCURRED AT (     568.0,     260.0) *

 DIRECTION /                                                 RANGE (METERS)
 (DEGREES) /              568.0                 738.0                 966.0                1306.0                1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      2.60497 (195,11)      2.14335 (201,11)      2.15663 (142,14)      1.88205 (253,11)      1.80355 (195,12)
     350.0 /      2.77496 (142,12)      2.02400 (143,13)      2.13311 (144,13)      1.86809 (152,16)      1.78343 (210, 9)
     340.0 /      1.81306 (195,11)      2.14048 (221,14)      2.09200 (132,11)      1.87070 (211, 9)      1.78549 (232, 9)
     330.0 /      2.86427 (248,12)      2.38190 (248,12)      2.17951 (220,15)      1.97618 (153,12)      1.82130 (363, 9)
     320.0 /      2.94533 (177,11)      2.24890 (248,12)      2.13548 (136, 9)      1.99490 (140,10)      1.79631 (159, 8)
     310.0 /      2.05259 (177,11)      2.06826 (106,13)      2.13770 (107,11)      1.96698 ( 19,12)      1.80552 (255,11)
     300.0 /      2.48941 (118,12)      2.06826 (154,13)      2.15484 (138,12)      1.96686 (187,14)      1.82041 (196,18)
     290.0 /      2.59835 (159,13)      2.02744 (159,11)      2.16130 (184,10)      1.95800 ( 50,11)      1.82409 (278,12)
     280.0 /      1.81702 (158,11)      2.09139 (250,12)      2.14552 (198,10)      1.86434 (111,11)      1.74832 (103, 8)
     270.0 /      2.86199 (159,12)      2.09139 (244,11)      2.12228 (305,10)      1.85628 (281,14)      1.84050 (163, 8)
     260.0 /      2.97090 (196,11)      2.14878 (196,11)      2.16309 (159,14)      1.92865 (256,15)      1.82252 (256,15)
     250.0 /      2.90790 (137,11)      2.32557 (138,14)      2.15452 (305,12)      1.92862 (305,13)      1.79196 (140, 9)
     240.0 /      2.54207 (138,14)      2.37607 (260,12)      2.11162 (282,12)      2.03028 (261,10)      1.84601 (253,17)
     230.0 /      1.65671 (248,13)      2.12913 (261,13)      2.14552 (139,14)      1.97618 (163, 9)      1.78711 (111, 8)
     220.0 /      2.60498 (166,12)      2.11149 (256,12)      2.17898 (257,12)      1.88775 (259,17)      1.77764 (256,11)
     210.0 /      2.70885 (248,13)      2.11830 (166,12)      2.09692 (257,14)      1.91176 (258,16)      1.84775 (305,16)
     200.0 /      1.81306 (166,12)      1.91187 (141,12)      2.03821 (298,10)      1.81073 ( 44,17)      1.75559 (118, 9)
     190.0 /      1.89695 (118,11)      1.93635 ( 94,14)      2.08314 ( 94,14)      1.86123 (191,18)      1.76822 ( 44,16)
     180.0 /      2.42620 (130,14)      2.05567 (130,14)      2.03188 ( 67,12)      1.93567 ( 77,10)      1.74950 ( 44,15)
     170.0 /      1.32959 (223,14)      1.98983 ( 77,12)      2.13980 ( 77,12)      1.87127 ( 17,14)      1.62302 (248,16)
     160.0 /      1.92941 (130,13)      1.92218 ( 94,13)      2.02800 ( 77,11)      1.84825 (209,12)      1.62744 (283,14)
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     150.0 /      2.79997 (223,14)     2.36125 (223,14)     2.12557 (283,13)     1.87162 (365,13)     1.76459 (108,17)
     140.0 /      2.61051 (211,13)     2.51091 (240,14)     2.06785 (207,15)     1.86123 (207,16)     1.75413 (283,10)
     130.0 /      2.54365 (118,13)     2.65836 (240,14)     2.07135 (209,14)     1.85779 (223,15)     1.81218 (260,15)
     120.0 /      2.84153 (224,11)     2.06883 (224,11)     2.12043 (180,12)     1.98332 (233,11)     1.82851 (202,18)
     110.0 /      2.10034 (236,12)     2.03559 (178,12)     2.13156 (239,16)     1.99995 (239,16)     1.77567 ( 61,17)
     100.0 /      2.69959 (233,13)     2.11745 (236,13)     2.16934 (163,12)     1.94054 (144,16)     1.85301 (220,17)
      90.0 /      2.86199 (233,13)     2.10438 (136,13)     2.17319 (213,13)     2.00430 (247,11)     1.84775 (236,10)
      80.0 /      2.67048 (209,13)     2.15849 (248,14)     2.19326 (185,10)     1.92267 (191,16)     1.84928 (211,17)
      70.0 /      2.94973 (235,13)     2.21110 (234,11)     2.18514 (199,12)     1.90339 (177,16)     1.79526 (306,16)
      60.0 /      2.79497 (165,12)     2.77385 (112,11)     2.18514 (203,12)     1.86906 (232,13)     1.83626 (362,16)
      50.0 /      2.84898 (210,11)     2.48332 (245,13)     2.17513 (202,10)     1.88871 (166,17)     1.84443 (230,14)
      40.0 /      2.68673 (210,11)     2.16353 (185,11)     2.20532 (203,13)     1.91272 (213,15)     1.82409 (149,18)
      30.0 /      2.46641 (191,12)     2.12913 (173,14)     2.16028 (149,13)     1.98332 (136,10)     1.82762 (230,12)
      20.0 /      2.94844 (191,12)     2.16971 (194,11)     2.18514 (263,14)     1.95192 ( 19,13)     1.72089 (195,13)
      10.0 /      2.22738 (194,11)     2.12413 (211,12)     2.15887 (213,10)     1.91869 (175,11)     1.78566 (226,12)
1                                                                                                                2ND HIGH
                                                                                                                  1-HR
                                                                                                                 SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                              * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                             * FROM ALL SOURCES *
                                                          * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      2.97090 AND OCCURRED AT (     568.0,     260.0) *

 DIRECTION /                                                  RANGE (METERS)
 (DEGREES) /           2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      1.62571 (239, 9)     1.43215 (247,10)     1.14593 (132, 9)      .94744 (137,19)      .89241 (137,19)
     350.0 /      1.67979 (  6,13)     1.69062 (264,19)     1.60963 (210, 9)     1.24075 (210, 9)     1.12767 (213, 7)
     340.0 /      1.71893 (232, 9)     1.41846 ( 16,15)     1.23926 (  1,10)      .96462 ( 23, 8)      .93349 ( 23, 8)
     330.0 /      1.69435 (363, 9)     1.41114 (188, 8)     1.11465 (188, 8)      .94457 (143, 8)      .89013 (143, 8)
     320.0 /      1.69122 (172, 9)     1.48501 (210, 8)     1.57053 (212, 8)     1.36048 ( 31, 8)     1.27535 ( 31, 8)
     310.0 /      1.59689 (365,10)     1.36672 ( 20,11)     1.05947 ( 20,11)      .94392 (187,20)      .86841 (187,20)
     300.0 /      1.66129 (356,15)     1.50640 (179, 8)     1.35605 (179, 8)     1.13696 (179, 8)     1.02693 (359, 8)
     290.0 /      1.60304 (241, 9)     1.24240 (251,12)     1.00782 (230,21)      .94159 (230,21)      .88383 (196, 1)
     280.0 /      1.64923 (196,15)     1.34481 (352,15)     1.04205 ( 18,10)     1.00049 (228, 7)      .96259 (228, 7)
     270.0 /      1.64636 (244,13)     1.40499 (200,19)     1.08044 (250,13)      .93078 (150,22)      .86481 (188,17)
     260.0 /      1.58329 ( 50,10)     1.41420 ( 19,10)     1.10732 ( 50,10)      .93501 (304, 2)      .89058 ( 19,10)
     250.0 /      1.61094 (365,14)     1.28298 (122,11)     1.00591 (329,10)      .94159 (251, 8)      .87563 (140, 8)
     240.0 /      1.67981 (217, 8)     1.41202 (216,18)     1.13389 (267, 8)     1.10463 (218, 7)     1.04943 (218, 7)
     230.0 /      1.60519 (111, 8)     1.30568 (258,17)      .99810 (162,22)      .92613 ( 41,19)      .87543 ( 41,19)
     220.0 /      1.60304 (321,15)     1.39764 (321,15)     1.08331 (197,17)      .95514 (193,19)      .89853 (193,19)
     210.0 /      1.64050 (305,16)     1.38079 (256,16)     1.01118 (210,16)      .94392 (210,16)      .86841 (210,16)
     200.0 /      1.51730 (269,10)     1.17454 (118, 9)      .98877 (341, 3)      .86945 (341, 3)      .77814 (341, 3)
     190.0 /      1.51098 ( 44,16)     1.11710 (150,11)      .96615 ( 77, 9)      .86904 (340,18)      .78593 (340,18)
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     180.0 /       1.51763 ( 17,16)      1.15897 ( 17,16)      1.09818 ( 67, 8)      1.08877 (347, 8)      1.00871 (347, 8)
     170.0 /       1.65584 ( 85, 8)      1.36285 (200,16)       .99677 (200,16)       .92466 ( 59, 8)       .85350 ( 59, 8)
     160.0 /       1.23124 (208,12)      1.01138 (305,18)       .97811 (305,18)      1.06597 (  8,17)      1.12113 (  8,17)
     150.0 /       1.44414 (299,13)      1.06912 (284,17)       .99959 (240,18)       .92353 (240,18)       .87465 ( 84, 9)
     140.0 /       1.55656 (283,10)      1.29438 (138,18)      1.00319 (255,16)       .89247 (136,20)       .85719 (153,10)
     130.0 /       1.59167 (108, 9)      1.28096 (108, 9)       .99038 (233,19)       .96582 (233,19)       .90701 (233,19)
     120.0 /       1.64956 (240,17)      1.24659 (240,17)       .99826 (156,19)       .91520 (234,19)       .83888 (234,19)
     110.0 /       1.52466 ( 61,17)      1.12759 ( 61,17)       .99959 (245,18)       .92353 (245,18)       .86247 (209,16)
     100.0 /       1.62567 ( 70,17)      1.46166 (176, 8)      1.20354 (176, 8)      1.21741 (  8,16)      1.10884 (265,18)
      90.0 /       1.64050 (236,10)      1.24240 (236,10)      1.00448 (220,20)       .93926 (220,20)       .86481 (220,20)
      80.0 /       1.55526 (211,17)      1.14757 (147,14)       .98046 ( 78,18)       .89305 (229,18)       .75860 ( 78,18)
      70.0 /       1.61475 (229,17)      1.40328 (270,17)      1.07743 (270,17)       .90861 (308, 8)       .83079 ( 75,18)
      60.0 /       1.70704 (144,17)      1.45800 ( 25,16)      1.13642 ( 25,16)       .90659 (208, 8)       .86473 (236, 9)
      50.0 /       1.63148 (316,15)      1.38474 (164, 8)      1.02000 (116,15)       .97862 (215, 7)       .96557 ( 64,15)
      40.0 /       1.72113 (233,10)      1.50316 (233,10)      1.23929 ( 42,12)       .93444 ( 42,12)       .85676 ( 43,20)
      30.0 /       1.62303 (  1,14)      1.23430 (  1,14)       .99426 (332,17)       .88854 ( 18,17)       .83823 ( 18,17)
      20.0 /       1.63743 (195,13)      1.30364 (195,13)      1.03581 (172,20)       .92786 (172,20)       .83751 (172,20)
      10.0 /       1.55917 (240, 9)      1.14558 (  2,15)       .96953 (128,14)       .89432 (363,18)       .82278 (363,18)
1                                                                                                                          HIGH
                                                                                                                            3-HR
                                                                                                                           SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                                 * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                        * FROM ALL SOURCES *
                                                      * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      2.05018 AND OCCURRED AT (     966.0,     250.0) *

  DIRECTION /                                                   RANGE (METERS)
  (DEGREES) /              568.0                 738.0                 966.0                 1306.0                1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       1.06156 (157, 4)      1.73181 (157, 4)      1.92169 (157, 4)      1.58467 (157, 4)      1.26024 (239, 5)
     350.0 /       1.01699 (195, 4)      1.58301 (153, 5)      1.84280 (153, 5)      1.63436 (153, 5)      1.25330 (153, 5)
     340.0 /        .98499 (145, 4)      1.33052 (220, 5)      1.47973 (220, 4)      1.50336 (160, 5)      1.28279 (160, 5)
     330.0 /       1.36730 (217, 5)      1.55965 (220, 5)      1.89063 (221, 4)      1.78322 (221, 4)      1.42800 (221, 4)
     320.0 /       1.22137 (217, 5)      1.30921 (109, 4)      1.74234 ( 64, 4)      1.72820 ( 64, 4)      1.40399 ( 64, 4)
     310.0 /       1.27113 (135, 4)      1.36425 (189, 4)      1.33874 ( 57, 5)      1.29461 (155, 5)      1.27468 (155, 5)
     300.0 /       1.25975 (135, 4)      1.27056 (134, 4)      1.69706 (134, 4)      1.69599 (134, 4)      1.40402 (134, 4)
     290.0 /        .93467 (118, 4)      1.28347 (197, 4)      1.40012 (137, 4)      1.26214 (137, 4)       .95129 (137, 4)
     280.0 /       1.27223 (158, 4)      1.53419 (158, 4)      1.82534 ( 39, 5)      1.65948 ( 39, 5)      1.29626 ( 39, 5)
     270.0 /       1.68843 (158, 4)      1.86961 (158, 4)      1.77886 (133, 5)      1.57559 (133, 5)      1.23752 (244, 4)
     260.0 /       1.45788 (196, 4)      1.42095 ( 61, 5)      1.58679 ( 61, 5)      1.30501 ( 61, 5)      1.15017 (279, 4)
     250.0 /       1.27351 (267, 4)      1.94779 (267, 4)      2.05018 (267, 4)      1.62824 (267, 4)      1.21932 ( 35, 5)
     240.0 /       1.04163 (260, 4)      1.42067 (241, 5)      1.67461 (241, 5)      1.50581 (123, 5)      1.32314 (123, 5)
     230.0 /       1.21467 (260, 4)      1.33601 (260, 4)      1.25357 (262, 4)      1.30090 (120, 5)      1.12963 (299, 4)
     220.0 /        .95809 (248, 5)      1.47772 (256, 4)      1.77452 (256, 4)      1.64931 (256, 4)      1.31570 (256, 4)
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     210.0 /      .97606 (166, 4)     1.18453 (141, 4)     1.28276 (141, 4)     1.03961 (141, 4)      .86254 ( 35, 4)
     200.0 /      .68846 (141, 4)     1.05537 (141, 4)     1.11653 (141, 4)     1.16079 (288, 3)     1.09911 (288, 3)
     190.0 /      .96748 (130, 5)      .89847 ( 44, 5)     1.21352 ( 44, 5)     1.25396 ( 44, 5)     1.06899 ( 44, 5)
     180.0 /     1.00696 (118, 4)      .95609 ( 77, 4)     1.16238 ( 77, 4)     1.18974 ( 44, 5)     1.09185 ( 24, 4)
     170.0 /      .82211 ( 77, 4)     1.41943 ( 77, 4)     1.64760 ( 77, 4)     1.40071 ( 77, 4)     1.01668 ( 77, 4)
     160.0 /      .88000 (223, 5)      .98475 ( 77, 4)     1.11848 ( 77, 4)      .92911 ( 77, 4)      .78646 ( 10, 5)
     150.0 /      .97948 (130, 5)      .82340 (223, 5)     1.17322 (209, 4)     1.20245 (209, 4)     1.00532 (209, 4)
     140.0 /     1.11445 (240, 5)     1.38352 (240, 5)     1.09583 (240, 5)     1.08537 (283, 4)      .97788 (283, 4)
     130.0 /     1.20596 (240, 5)     1.50266 (240, 5)     1.20439 (240, 5)      .95497 (164, 5)      .80521 (288, 5)
     120.0 /     1.00325 (236, 4)     1.02243 (234, 5)     1.15121 (234, 5)     1.19740 (162, 4)     1.03297 (204, 6)
     110.0 /      .89340 (224, 4)     1.20053 (234, 5)     1.42269 (181, 5)     1.47102 (181, 5)     1.23344 (181, 5)
     100.0 /     1.39333 (135, 5)     1.67926 (135, 5)     1.52302 (135, 5)     1.46888 (161, 5)     1.29375 (161, 6)
      90.0 /     1.39187 (233, 5)     1.55738 (225, 5)     1.78940 (225, 5)     1.51862 (225, 5)     1.10610 (225, 5)
      80.0 /     1.21035 (206, 4)     1.80801 (164, 4)     1.92246 (164, 4)     1.57941 (117, 5)     1.39257 (117, 5)
      70.0 /     1.48836 (206, 4)     1.66484 (164, 4)     1.83432 ( 20, 5)     1.73379 ( 20, 5)     1.58319 (328, 5)
      60.0 /     1.33574 (112, 4)     1.83206 (117, 4)     1.99359 (117, 4)     1.62346 (117, 4)     1.25520 (246, 4)
      50.0 /      .99508 (245, 5)     1.51766 (202, 4)     1.59702 (202, 4)     1.52576 ( 56, 5)     1.40837 ( 56, 5)
      40.0 /      .99433 (185, 4)     1.13335 (202, 4)     1.36451 ( 18, 5)     1.39330 ( 18, 5)     1.20496 ( 18, 5)
      30.0 /     1.04056 (194, 4)     1.22747 (149, 5)     1.36054 ( 18, 5)     1.42946 ( 47, 5)     1.25006 ( 47, 5)
      20.0 /     1.50135 (194, 4)     1.64833 (194, 4)     1.50059 (194, 4)     1.20893 ( 65, 5)     1.03726 ( 65, 5)
      10.0 /     1.13411 (194, 4)     1.37388 (110, 4)     1.23556 (194, 4)     1.25009 (239, 4)     1.04414 (239, 4)
1                                                                                                                   HIGH
                                                                                                                     3-HR
                                                                                                                    SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                                  * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      2.05018 AND OCCURRED AT (     966.0,     250.0) *

   DIRECTION /                                                  RANGE (METERS)
   (DEGREES) /          2215.0               2954.0               3862.0               5112.0               6000.0
  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      .92397 (239, 5)      .64046 ( 64, 6)      .64003 ( 64, 6)      .58890 ( 64, 6)      .54529 ( 64, 6)
     350.0 /      .88044 (153, 5)      .67891 (265, 4)      .68606 (264, 7)      .65323 (264, 7)      .61144 (264, 7)
     340.0 /      .96952 (160, 5)      .65268 (160, 5)      .60732 (308, 1)      .60591 (345, 3)      .57713 (345, 3)
     330.0 /     1.03749 (221, 4)      .83000 (  3, 4)      .69518 (  3, 4)      .60107 (350, 1)      .54715 (350, 1)
     320.0 /     1.02242 ( 64, 4)      .82065 (357, 4)      .72203 (357, 4)      .60370 ( 31, 3)      .55590 ( 31, 3)
     310.0 /     1.07845 (155, 5)      .83318 (155, 4)      .67748 (155, 4)      .52310 (115, 3)      .46388 (115, 3)
     300.0 /     1.04295 (134, 4)      .91827 (361, 4)      .87441 (361, 4)      .75065 (361, 4)      .66390 (361, 4)
     290.0 /      .73987 (139, 6)      .62375 (139, 6)      .53143 (336, 3)      .47777 ( 64, 2)      .46400 ( 64, 2)
     280.0 /      .93229 (137, 3)      .78524 (137, 3)      .73511 (194, 7)      .71169 (194, 7)      .66891 (194, 7)
     270.0 /      .95129 (216, 6)      .75735 ( 39, 6)      .68212 ( 39, 6)      .56507 ( 39, 6)      .50107 (217, 7)
     260.0 /      .96919 (303, 4)      .80737 (122, 6)      .77751 (122, 6)      .67277 (122, 6)      .59693 (122, 6)
     250.0 /     1.10010 (122, 4)      .92940 (113, 6)      .81032 (113, 6)      .67863 (114, 1)      .61468 (114, 1)
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    240.0 /        1.01842 (123, 5)        .87652 (123, 6)        .79296 (142, 1)        .71586 (142, 1)        .69375 ( 43, 2)
    230.0 /         .91493 (299, 4)        .90308 (343, 4)        .92597 (343, 4)        .84475 (343, 4)        .76858 (343, 4)
    220.0 /         .95510 (256, 4)        .94952 (311, 2)        .85416 (311, 2)        .70194 (311, 2)        .60918 (311, 2)
    210.0 /         .64828 (113, 1)        .67777 (113, 1)        .61607 (113, 1)        .54993 ( 38, 5)        .53724C(247, 3)
    200.0 /         .90166 (288, 3)        .66860 (288, 3)        .49198 (288, 3)        .36592 (347, 1)        .31794 (347, 1)
    190.0 /         .81101 ( 44, 5)        .65618 (346, 7)        .60165 (346, 7)        .50116 (346, 7)        .43704 (346, 7)
    180.0 /         .95719 ( 24, 4)        .79683 ( 24, 4)        .65606 ( 24, 4)        .55467 (297, 4)        .49145 (297, 4)
    170.0 /         .67401 ( 77, 4)        .55115 ( 85, 3)        .49275 ( 32, 1)        .44014 ( 32, 1)        .39630 ( 32, 1)
    160.0 /         .70354 ( 24, 5)        .60483 ( 85, 6)        .59490 (  8, 6)        .74104 (  8, 6)        .78628 (  8, 6)
    150.0 /         .81021 ( 53, 6)        .83608 ( 53, 6)        .75117 ( 53, 6)        .61498 ( 53, 6)        .53204 ( 53, 6)
    140.0 /         .77880 (283, 4)        .65435 (255, 6)        .56612 ( 24, 2)        .56951 (183, 3)        .56665 (183, 3)
    130.0 /         .91984 (346, 4)        .96596 (346, 4)        .88070 (346, 4)        .75131 ( 66, 7)        .66543 ( 66, 7)
    120.0 /         .93643 (204, 6)        .76650 (204, 6)        .59527 (204, 6)        .54605 (234, 7)        .53029 (234, 7)
    110.0 /         .98366 (209, 4)        .79050 (209, 4)        .62154 (209, 4)        .52865 (288, 6)        .47584 (184, 7)
    100.0 /        1.01983 (161, 6)        .87047 (107, 6)        .78359 (107, 6)        .64254 (107, 6)        .55626 (107, 6)
     90.0 /         .82004 (236, 4)        .84344 ( 14, 4)        .75723 ( 14, 4)        .62001 ( 14, 4)        .53660 ( 14, 4)
     80.0 /        1.07606 (117, 5)        .81296 (162, 5)        .60222 (162, 5)        .42457 (162, 5)        .34339 (162, 5)
     70.0 /        1.32603 (328, 5)        .96175 (328, 5)        .66116 (328, 5)        .42564 (328, 5)        .35336 ( 75, 6)
     60.0 /        1.00479 (246, 4)        .78606 (151, 6)        .68781 (151, 6)        .55818 (151, 6)        .48224 (151, 6)
     50.0 /        1.12006 ( 56, 5)        .78102 ( 56, 5)        .62351 (175, 6)        .55431 (175, 6)        .49837 (175, 6)
     40.0 /        1.05977 (174, 3)        .91012 ( 93, 7)        .84794 ( 93, 7)        .71493 ( 93, 7)        .62704 ( 93, 7)
     30.0 /        1.03496 (  1, 5)        .80552 (  1, 5)        .61296 ( 23, 5)        .54014 ( 84, 1)        .49864 ( 18, 6)
     20.0 /         .82824 ( 65, 5)        .87029 ( 13, 5)        .82343 ( 13, 5)        .70519 ( 13, 5)        .63031 (  3, 6)
     10.0 /         .76832 (239, 4)        .58963 ( 58, 4)        .59742 (350, 3)        .54790 (350, 3)        .49963 (350, 3)
1                                                                                                                            2ND HIGH
                                                                                                                              3-HR
                                                                                                                             SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                             * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                    * FROM ALL SOURCES *
                                                  * FOR THE RECEPTOR GRID *

                              * MAXIMUM VALUE EQUALS      1.77057 AND OCCURRED AT (     966.0,      70.0) *

  DIRECTION /                                                 RANGE (METERS)
  (DEGREES) /               568.0                738.0                966.0                1306.0                1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /         .99561 (195, 4)       1.40678 (156, 5)       1.54472 (239, 5)       1.53909 (239, 5)       1.23750 (239, 4)
    350.0 /         .94702 (153, 5)       1.27323 (160, 4)       1.39719 (160, 4)       1.14906 (160, 4)        .81991 (160, 4)
    340.0 /         .94337 (220, 5)       1.25262 (160, 4)       1.41179 (160, 5)       1.31708 (220, 4)       1.00156 (220, 4)
    330.0 /        1.10662 (220, 5)       1.52198 (221, 4)       1.54789 (220, 5)       1.17790 (220, 5)       1.04538 (160, 3)
    320.0 /         .99041 (177, 4)       1.27864 ( 64, 4)       1.47663 (218, 4)       1.45194 (218, 4)       1.19799 (218, 4)
    310.0 /         .99504 (189, 4)       1.21528 (135, 4)       1.33445 (189, 4)       1.23811 ( 19, 4)       1.00509 ( 19, 4)
    300.0 /         .82980 (118, 4)       1.24457 (135, 4)       1.32806 (138, 4)       1.14782 ( 92, 5)       1.06649 (155, 3)
    290.0 /         .92941 (159, 5)       1.12111 (137, 4)       1.37052 (197, 4)       1.10091 (197, 4)        .78706 (139, 6)
    280.0 /        1.26711 (159, 5)       1.53002 ( 39, 5)       1.43463 (158, 4)       1.30299 (330, 4)       1.18029 (330, 4)
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   270.0 /      1.23706 (196, 4)     1.54217 (133, 5)     1.65608 (158, 4)     1.45756 (244, 4)     1.21152 (133, 5)
   260.0 /      1.09671 (158, 4)     1.37462 (196, 4)     1.38702 (217, 4)     1.27640 (279, 4)     1.14042 (303, 4)
   250.0 /      1.15956 (249, 5)     1.42668 (249, 4)     1.61315 (249, 4)     1.45903 ( 35, 5)     1.15788 (122, 4)
   240.0 /       .85699 (138, 5)     1.06717 (139, 5)     1.34231 (123, 5)     1.49944 (241, 5)     1.16704 (274, 4)
   230.0 /       .72063 (139, 5)     1.12494 (139, 5)     1.23926 (120, 5)     1.20800 (290, 4)     1.11132 (120, 5)
   220.0 /       .93727 (216, 5)     1.32599 (216, 5)     1.33247 ( 17, 4)     1.40612 ( 17, 4)     1.20515 ( 17, 4)
   210.0 /       .90295 (248, 5)      .99844 (256, 4)     1.14570 (256, 4)     1.02928 ( 35, 4)      .76759 (288, 4)
   200.0 /       .63301 (130, 5)      .78181 (288, 4)     1.03469 (288, 4)     1.00197 (288, 4)      .80967 (317, 4)
   190.0 /       .76343 (118, 4)      .81498 (130, 5)      .79461 (118, 4)      .80959C(355, 4)      .71940C(355, 4)
   180.0 /       .83374 (130, 5)      .81846 (118, 4)     1.11655 ( 44, 5)     1.15248 ( 24, 4)     1.03179 ( 44, 5)
   170.0 /       .80958 (118, 4)      .85199 ( 17, 5)     1.17063 ( 17, 5)     1.12703 ( 17, 5)      .87605 ( 17, 5)
   160.0 /       .70803 (130, 5)      .74382 (223, 5)      .85039 (283, 5)      .86693 ( 10, 5)      .76149 ( 24, 5)
   150.0 /       .95565 (223, 5)      .79166 (209, 4)      .80564 (283, 5)      .66510 (283, 5)      .66304 ( 53, 6)
   140.0 /       .95328 (118, 5)      .84207 (137, 5)      .99328 (283, 4)     1.03380 ( 85, 4)      .91351 ( 85, 4)
   130.0 /       .97811 (211, 5)      .96893 (164, 5)     1.08891 (164, 5)      .92575 (288, 5)      .74045 (346, 4)
   120.0 /       .94718 (224, 4)      .83438 (240, 6)     1.15064 (162, 4)     1.14270 (240, 6)     1.02049 (240, 6)
   110.0 /       .77801 (234, 5)     1.12196 (171, 4)     1.32204 (234, 5)     1.17147 (214, 4)     1.06731 (209, 4)
   100.0 /      1.15159 (209, 5)     1.32465 (236, 5)     1.36541 (161, 5)     1.42363 (161, 6)     1.26160 (161, 5)
    90.0 /      1.38251 (209, 5)     1.37115 (233, 5)     1.34327 (240, 4)     1.21461 (185, 5)     1.04018 (185, 5)
    80.0 /      1.16959 (164, 4)     1.47469 (206, 4)     1.51062 (225, 5)     1.53641 (164, 4)     1.25682 (162, 5)
    70.0 /      1.07456 (164, 4)     1.54095 (206, 4)     1.77057 (164, 4)     1.59584 (328, 5)     1.38840 ( 20, 5)
    60.0 /      1.15214 (117, 4)     1.61940 (112, 4)     1.45539 (203, 4)     1.41157 (246, 4)     1.15857 (117, 4)
    50.0 /       .98974 (202, 4)     1.31864 ( 65, 4)     1.49655 ( 65, 4)     1.35043 ( 65, 4)     1.13479 (175, 5)
    40.0 /       .89558 (210, 4)     1.12571 ( 75, 5)     1.26530 ( 75, 5)     1.23496 ( 65, 4)     1.18606 (174, 3)
    30.0 /       .99433 (232, 4)     1.17907 (224, 5)     1.30266 (224, 5)     1.27321 (172, 5)     1.13566 (172, 5)
    20.0 /       .98281 (191, 4)     1.06036 (211, 4)     1.22475 ( 65, 5)     1.14417 (194, 4)      .88407 ( 43, 5)
    10.0 /      1.05126 (110, 4)     1.29688 (194, 4)     1.22886 (239, 4)     1.10051 (230, 4)      .87290 (230, 4)
1                                                                                                                        2ND HIGH
                                                                                                                          3-HR
                                                                                                                        SGROUP#  1
                               *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                            * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                     * FROM ALL SOURCES *
                                                   * FOR THE RECEPTOR GRID *

                             * MAXIMUM VALUE EQUALS      1.77057 AND OCCURRED AT (     966.0,      70.0) *

 DIRECTION /                                                    RANGE (METERS)
 (DEGREES) /           2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   360.0 /       .91097 (239, 4)      .61988 (110, 3)      .57065 (110, 3)      .49998 (110, 3)      .45662 (110, 3)
   350.0 /       .74436 (265, 4)      .65343 (210, 3)      .62414 (308, 2)      .55957 (308, 2)      .50495 (308, 2)
   340.0 /       .74178 (153, 4)      .59285 (308, 1)      .60727 (345, 3)      .55335 (308, 1)      .50301 (308, 1)
   330.0 /       .91180 (362, 4)      .73242 (362, 4)      .65825 (350, 1)      .54490 (  3, 4)      .46559 (  3, 4)
   320.0 /       .93786 ( 22, 5)      .69518 (361, 5)      .65084 (128, 3)      .59828 (128, 3)      .54649 (128, 3)
   310.0 /       .95321 (155, 4)      .80178 (155, 5)      .60807 (145, 8)      .51621 (145, 8)      .45316 (145, 8)
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     300.0 /       .88183 (155, 3)       .72221 (359, 3)       .70742 (359, 3)       .64768 (359, 3)       .59985 (359, 3)
     290.0 /       .68553 (336, 3)       .61762 (336, 3)       .52042 (115, 2)       .46612 (115, 2)       .44944 (278, 2)
     280.0 /       .92698 (330, 4)       .67598 (302, 6)       .67223 (137, 3)       .59322 (137, 3)       .55846 (137, 3)
     270.0 /       .94047 (244, 4)       .71153 (324, 4)       .62142 (200, 7)       .51078 (217, 7)       .49279 ( 39, 6)
     260.0 /       .93904 ( 67, 6)       .73955 (303, 4)       .59766 (276, 3)       .50921 (276, 3)       .46384 ( 50, 3)
     250.0 /       .94617 (113, 6)       .89824 (122, 4)       .74924 (114, 1)       .64967 (113, 6)       .55754 (113, 6)
     240.0 /       .97485 (123, 6)       .78101 (142, 1)       .72526 (119, 1)       .70980 ( 43, 2)       .64732 (142, 1)
     230.0 /       .86460 (290, 4)       .83926 ( 35, 6)       .77401 ( 57, 3)       .64995 ( 57, 3)       .57708 (342, 1)
     220.0 /       .92227 (311, 2)       .65694 (311, 5)       .63363 ( 61, 2)       .57174 ( 61, 2)       .52735 (348, 3)
     210.0 /       .64708 ( 35, 4)       .63974 (296, 5)       .58914 ( 38, 5)       .52434C(247, 3)       .50651 ( 38, 5)
     200.0 /       .72571 (317, 4)       .59444 (317, 4)       .46503 (317, 4)       .35847 (288, 3)       .30282 (288, 3)
     190.0 /       .61976 (346, 7)       .54961 ( 44, 5)       .53300 ( 32, 2)       .47852 ( 32, 2)       .43179 ( 32, 2)
     180.0 /       .79082 ( 44, 5)       .67694 (297, 4)       .64488 (297, 4)       .52608 ( 24, 4)       .46161 ( 38, 1)
     170.0 /       .60696 ( 17, 5)       .49303 ( 32, 1)       .48588 ( 85, 3)       .39535 ( 85, 3)       .34444 ( 85, 3)
     160.0 /       .61693 ( 10, 5)       .58954 ( 24, 5)       .53606 ( 85, 6)       .43382 ( 85, 6)       .37322 ( 85, 6)
     150.0 /       .80150 (209, 4)       .70176 (284, 6)       .65032 (284, 6)       .54707 (284, 6)       .47980 (284, 6)
     140.0 /       .75351 (255, 6)       .59991 (350, 6)       .55144 (183, 3)       .50262 ( 24, 2)       .45228 ( 24, 2)
     130.0 /       .81248 ( 66, 7)       .91442 ( 66, 7)       .87296 ( 66, 7)       .73141 (346, 4)       .63771 (346, 4)
     120.0 /       .81217 (240, 6)       .62551 (174, 6)       .53880 ( 52, 4)       .43711 (204, 6)       .44261 (318, 6)
     110.0 /       .92154 (181, 5)       .69161 ( 36, 6)       .61911 ( 36, 6)       .52472 (184, 7)       .47148 (288, 6)
     100.0 /       .96087 (109, 6)       .70780 (161, 6)       .58780 (354, 6)       .51202 (354, 6)       .45615 (354, 6)
      90.0 /       .81919 ( 14, 4)       .69289 (209, 6)       .60221 (209, 6)       .47961 (209, 6)       .41613 (209, 6)
      80.0 /      1.05956 (162, 5)       .73668 (117, 5)       .56151 (229, 6)       .39536 (229, 6)       .31430 (229, 6)
      70.0 /      1.01761 (270, 6)       .82839 (270, 6)       .61206 (270, 6)       .41403 (270, 6)       .34550 (252, 6)
      60.0 /       .83048 ( 56, 4)       .71483 (246, 4)       .53945 ( 96, 1)       .43827 ( 96, 1)       .37812 ( 96, 1)
      50.0 /       .91573 ( 65, 4)       .70700 ( 65, 4)       .55253 ( 65, 4)       .42628 ( 65, 4)       .36754 ( 65, 4)
      40.0 /       .96420 ( 65, 4)       .85686 ( 98, 8)       .76903 ( 98, 8)       .62901 ( 98, 8)       .54391 ( 98, 8)
      30.0 /       .95920 ( 47, 5)       .68111 ( 95, 6)       .60091 ( 84, 1)       .50533 ( 23, 5)       .48789 ( 84, 1)
      20.0 /       .78781 ( 13, 5)       .77506 (  3, 6)       .77068 (  3, 6)       .69278 (  3, 6)       .62358 ( 13, 5)
      10.0 /       .70956 ( 58, 4)       .57877 (350, 3)       .47142 (307, 5)       .36677 (307, 5)       .32842 ( 40, 7)
1                                                                                                                        HIGH
                                                                                                                          8-HR
                                                                                                                         SGROUP#  1
                               *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                              * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                    * FOR THE RECEPTOR GRID *

                           * MAXIMUM VALUE EQUALS      1.31350 AND OCCURRED AT (     1306.0,     360.0) *

 DIRECTION /                                                    RANGE (METERS)
 (DEGREES) /              568.0                 738.0                 966.0                1306.0                1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .65875 (157, 2)      1.07118 (157, 2)      1.23707 (239, 2)      1.31350 (239, 2)      1.14944 (239, 2)
     350.0 /       .49468 (157, 2)       .84152 (157, 2)      1.02736 (157, 2)       .97551 (157, 2)       .79295 (157, 2)
     340.0 /       .62182 (220, 2)       .96530 (220, 2)      1.11943 (160, 2)      1.05075 (160, 2)       .83033 (160, 2)
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      330.0 /        .62646 (220, 2)       .95695 (220, 2)      1.03909 (221, 2)       .92134 (221, 2)       .70812 (221, 2)
      320.0 /        .45817 (217, 2)       .64066 (204, 2)       .76914 (218, 2)       .77525 (218, 2)       .64753 (218, 2)
      310.0 /        .62817 (135, 2)       .69759 (135, 2)       .78358 (134, 2)       .86838 (155, 2)       .91938 (155, 2)
      300.0 /        .54653 (135, 2)       .89905 (134, 2)      1.15449 (134, 2)      1.12081 (134, 2)       .93914 ( 92, 2)
      290.0 /        .59330 (159, 2)       .61411 (159, 2)       .61984 (137, 2)       .54840 (137, 2)       .46163 (277, 2)
      280.0 /        .77368 (159, 2)       .74530 (159, 2)       .79361 ( 39, 2)       .74656 ( 39, 2)       .67981 (330, 2)
      270.0 /        .78637 (159, 2)       .88943 (158, 2)       .82146 (158, 2)       .90422 (315, 2)       .86132 (315, 2)
      260.0 /        .68270 (249, 2)       .86092 (249, 2)       .83045 (249, 2)       .66467 (325, 2)       .57838 (325, 2)
      250.0 /        .78483 (249, 2)       .93941 (249, 2)       .98677 (267, 2)       .79519 (267, 2)       .67986 (122, 2)
      240.0 /        .57305 (241, 2)       .93281 (241, 2)      1.26513 (123, 2)      1.27735 (123, 2)      1.07177 (123, 2)
      230.0 /        .45553 (260, 2)       .63941 (140, 2)       .72887 (120, 2)       .91815 (299, 2)       .88428 (299, 2)
      220.0 /        .44532 (216, 2)       .73546 (216, 2)       .89703 (216, 2)       .87171 (216, 2)       .73622 (256, 2)
      210.0 /        .36602 (166, 2)       .49866 (141, 2)       .56416 (141, 2)       .57500 (256, 2)       .51336 (256, 2)
      200.0 /        .30806 (141, 2)       .51984 (141, 2)       .61475 (141, 2)       .58905 (288, 2)       .50671 (288, 2)
      190.0 /        .36280 (130, 2)       .45179 ( 67, 2)       .61634 ( 44, 2)       .70839 ( 44, 2)       .65322 ( 44, 2)
      180.0 /        .38566 (118, 2)       .43217 ( 67, 2)       .58000 ( 67, 2)       .60565 ( 44, 2)       .59661 ( 44, 2)
      170.0 /        .31095 (118, 2)       .53231 ( 77, 2)       .61788 ( 77, 2)       .59813 ( 24, 2)       .55092 ( 24, 2)
      160.0 /        .33000 (223, 2)       .36928 ( 77, 2)       .41943 ( 77, 2)       .37151 ( 10, 2)       .37081 ( 10, 2)
      150.0 /        .36736 (130, 2)       .35935 (283, 2)       .51352 (209, 2)       .52094 (209, 2)       .43210 (209, 2)
      140.0 /        .44028 (240, 2)       .55189 (240, 2)       .55508 (283, 2)       .55107 ( 85, 2)       .49673 ( 85, 2)
      130.0 /        .56542 (240, 2)       .73770 (240, 2)       .63402 (240, 2)       .44192 (240, 2)       .45074 (346, 2)
      120.0 /        .45643 (236, 2)       .56018C(234, 2)       .68121C(234, 2)       .63775C(234, 2)       .52902 (162, 2)
      110.0 /        .56247 (236, 2)       .77198C(234, 2)       .95191 (181, 2)      1.05771 (181, 2)       .94671 (181, 2)
      100.0 /        .60247 (135, 2)       .77638 (236, 2)       .80453 (236, 2)       .87184 (161, 2)       .75521 (161, 2)
       90.0 /        .57193 (233, 2)       .69672C(225, 2)       .83673 (236, 2)       .84402 (236, 2)       .71797 (236, 2)
       80.0 /        .60717 (206, 2)       .79504 (206, 2)       .87701 (117, 2)       .90418 (117, 2)       .75462 (117, 2)
       70.0 /        .69587 (206, 2)       .88936 (112, 2)       .94662C( 20, 2)       .96779C( 20, 2)       .82162C( 20, 2)
       60.0 /        .74627 (112, 2)      1.01184 (112, 2)       .96377 (112, 2)       .84608 (227, 2)       .75402 (227, 2)
       50.0 /        .53697 (202, 2)       .80391 (202, 2)       .98088C(186, 2)      1.01145 ( 56, 2)       .91594 ( 56, 2)
       40.0 /        .41598 (127, 2)       .61857 (127, 2)       .65139 (177, 2)       .69037 ( 65, 2)       .63158 ( 65, 2)
       30.0 /        .62220 (149, 2)       .94225 (149, 2)       .98038 (149, 2)       .76815 (149, 2)       .53460 (149, 2)
       20.0 /        .60691 (194, 2)       .83050 (149, 2)       .86384 (149, 2)       .67644 (149, 2)       .51346 (194, 2)
       10.0 /        .43209 (194, 2)       .60979 (103, 2)       .80319 (239, 2)       .82631 (239, 2)       .69222 (239, 2)
1                                                                                                                 HIGH
                                                                                                                   8-HR
                                                                                                                  SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                                  * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                      * FROM ALL SOURCES *
                                                    * FOR THE RECEPTOR GRID *

                                * MAXIMUM VALUE EQUALS      1.31350 AND OCCURRED AT (    1306.0,     360.0) *

 DIRECTION /                                                      RANGE (METERS)
 (DEGREES) /            2215.0                2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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      360.0 /       .89132 (239, 2)     .61493 (239, 2)     .41695 (239, 2)     .27604 (239, 2)     .24518 (231, 1)
      350.0 /       .58393 (157, 2)     .38543 (157, 2)     .30946 (210, 2)     .25642 (264, 3)     .23994 (264, 3)
      340.0 /       .59387 (160, 2)     .38270 (160, 2)     .26176 ( 13, 1)     .25166C(345, 1)     .24103C(345, 1)
      330.0 /       .49867 (221, 2)     .40596 ( 33, 2)     .35760 ( 33, 2)     .28864 ( 33, 2)     .24810 ( 33, 2)
      320.0 /       .49822 ( 22, 2)     .46905 (357, 2)     .41812 (357, 2)     .35831 (116, 1)     .32188 (116, 1)
      310.0 /       .85098 (155, 2)     .70372 (155, 2)     .54709 (155, 2)     .39972 (155, 2)     .32820 (155, 2)
      300.0 /       .73030 ( 92, 2)     .50288 ( 92, 2)     .39390 (361, 2)     .32903 (337, 3)     .30576 (359, 1)
      290.0 /       .42420 (277, 2)     .35240 (277, 2)     .31597 (336, 1)     .30261 (336, 1)     .29270C(161, 1)
      280.0 /       .54028 (330, 2)     .40479 (244, 3)     .39545 (244, 3)     .34875 (244, 3)     .32900 (194, 3)
      270.0 /       .70375 (315, 2)     .50202 (315, 2)     .40528 ( 39, 3)     .36518 ( 39, 3)     .33079 ( 39, 3)
      260.0 /       .50672 (303, 2)     .42639 (303, 2)     .38271 ( 89, 3)     .32481 ( 89, 3)     .28496 ( 89, 3)
      250.0 /       .63609 (122, 2)     .54870 (113, 3)     .51311 (113, 3)     .43546 (113, 3)     .38344 (113, 3)
      240.0 /       .81462 (123, 2)     .56283 (123, 2)     .45789 (113, 2)     .38003 (  8, 3)     .35404 (  8, 3)
      230.0 /       .74343 (299, 2)     .56144 (299, 2)     .45107 (343, 2)     .40158 (343, 2)     .36083 (343, 2)
      220.0 /       .55819 (256, 2)     .52599 (311, 2)     .46142 (311, 2)     .37041 (311, 2)     .31751 (311, 2)
      210.0 /       .41010 (256, 2)     .34533 (310, 2)     .31147 (113, 1)     .25646 (113, 1)     .22260 (113, 1)
      200.0 /       .38562 (288, 2)     .35919 (309, 2)     .30934 (309, 2)     .24389 (309, 2)     .20700 (309, 2)
      190.0 /       .52847 ( 44, 2)     .41953 (297, 2)     .38185 (297, 2)     .31570 (297, 2)     .27430 (297, 2)
      180.0 /       .52901 ( 44, 2)     .42654 ( 44, 2)     .37124 (297, 2)     .31642 ( 67, 1)     .30044 ( 67, 1)
      170.0 /       .44345 ( 24, 2)     .31927 ( 24, 2)     .24089 ( 11, 2)     .19152 (297, 1)     .16809 (297, 1)
      160.0 /       .39232 ( 53, 2)     .37037 ( 53, 2)     .31206 ( 53, 2)     .27789 (  8, 3)     .29486 (  8, 3)
      150.0 /       .33986 (209, 2)     .37168 ( 59, 3)     .36864 ( 59, 3)     .32879 ( 59, 3)     .29617 ( 59, 3)
      140.0 /       .39648 ( 85, 2)     .34751 (350, 3)     .33043 (350, 3)     .28503C(183, 1)     .28363C(183, 1)
      130.0 /       .54327 (346, 2)     .55497 (346, 2)     .51816 ( 66, 3)     .44031 ( 66, 3)     .38770 ( 66, 3)
      120.0 /       .42184 ( 52, 2)     .38444 ( 52, 2)     .32352C(234, 3)     .29675C(234, 3)     .27604C(234, 3)
      110.0 /       .75716 (181, 2)     .54653 (181, 2)     .38505 (181, 2)     .31537 (209, 2)     .28043 (209, 2)
      100.0 /       .57614 (161, 2)     .41371 (185, 2)     .34299 (169, 2)     .27369 (169, 2)     .23452 (169, 2)
       90.0 /       .54822 (236, 2)     .40934 (147, 2)     .30111C(209, 3)     .24458C(169, 3)     .21759C(169, 3)
       80.0 /       .56399 (117, 2)     .38391 (117, 2)     .26103 (117, 2)     .23591C( 73, 3)     .22747C( 73, 3)
       70.0 /       .62319C( 20, 2)     .42143C( 20, 2)     .27765C( 20, 2)     .18549 ( 81, 3)     .16252 ( 81, 3)
       60.0 /       .59185 (227, 2)     .41062 (227, 2)     .27706 (227, 2)     .18514C( 74, 3)     .18506C( 74, 3)
       50.0 /       .71610 ( 56, 2)     .49155 ( 56, 2)     .32657 ( 56, 2)     .28203 (175, 3)     .26257 (175, 3)
       40.0 /       .64251 ( 98, 3)     .64224 ( 98, 3)     .56509 ( 98, 3)     .45512 ( 98, 3)     .39085 ( 98, 3)
       30.0 /       .48288 ( 95, 3)     .49411 ( 95, 3)     .44135 ( 95, 3)     .35939 ( 95, 3)     .31000 ( 95, 3)
       20.0 /       .42462 ( 83, 2)     .39279 ( 13, 2)     .37002 ( 13, 2)     .31515 ( 13, 2)     .27773 ( 13, 2)
       10.0 /       .51120 (239, 2)     .33530 (239, 2)     .28667 (307, 2)     .24118 (350, 1)     .21812 (350, 1)
1                                                                                                               2ND HIGH
                                                                                                                 8-HR
                                                                                                                SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                         * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                      * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                          * MAXIMUM VALUE EQUALS      1.23396 AND OCCURRED AT (     966.0,     360.0) *

  DIRECTION /                                              RANGE (METERS)
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  (DEGREES) /            568.0               738.0               966.0               1306.0               1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .50706 (156, 2)     .90381 (239, 2)    1.23396 (157, 2)    1.09358 (157, 2)     .84151 (157, 2)
     350.0 /       .40464 (142, 2)     .70338 (160, 2)     .85323 (160, 2)     .77457 (160, 2)     .60683 (153, 2)
     340.0 /       .50159 (160, 2)     .89536 (160, 2)    1.04659 (220, 2)     .86287 (220, 2)     .62510 (220, 2)
     330.0 /       .54689 (221, 2)     .89849 (221, 2)    1.03565 (220, 2)     .86346 (220, 2)     .63575 (220, 2)
     320.0 /       .39250 (204, 2)     .58177 (218, 2)     .71909 (204, 2)     .73327 ( 22, 2)     .64695 ( 22, 2)
     310.0 /       .37402 (189, 2)     .62767 (134, 2)     .73658 (154, 2)     .73074 (134, 2)     .57626 (154, 2)
     300.0 /       .48667 (134, 2)     .58305 (135, 2)     .93126 ( 92, 2)    1.05724 ( 92, 2)     .91268 (134, 2)
     290.0 /       .35050 (118, 2)     .50928 (137, 2)     .51395 (197, 2)     .48459 (330, 2)     .41724 (330, 2)
     280.0 /       .50418 (158, 2)     .64040 ( 39, 2)     .60447 (330, 2)     .73500 (330, 2)     .59479 ( 39, 2)
     270.0 /       .75339 (158, 2)     .77047 (159, 2)     .78873 (244, 2)     .87991 (244, 2)     .80045 (244, 2)
     260.0 /       .67980 (137, 2)     .70716 (131, 2)     .75690 (267, 2)     .64538 (249, 2)     .56821C(187, 2)
     250.0 /       .65850 (137, 2)     .91760 (267, 2)     .93761 (241, 2)     .76892 (123, 2)     .67715 (325, 2)
     240.0 /       .55361 (139, 2)     .93068 (123, 2)    1.04935 (241, 2)     .90159 (120, 2)     .80697 (120, 2)
     230.0 /       .41957 (140, 2)     .54891 (196, 2)     .72539 (299, 2)     .77087 (120, 2)     .65564 (120, 2)
     220.0 /       .39376 (257, 2)     .70322 (257, 2)     .88032 (257, 2)     .86736 (256, 2)     .72784 (216, 2)
     210.0 /       .33861 (248, 2)     .44233 (257, 2)     .54950 (256, 2)     .52564 (298, 2)     .45278 (101, 2)
     200.0 /       .23738 (130, 2)     .38030 (288, 2)     .55200 (288, 2)     .55253 (141, 2)     .45022 (101, 2)
     190.0 /       .32283 (118, 2)     .41192 ( 44, 2)     .56190 ( 67, 2)     .52351 ( 67, 2)     .41162 ( 67, 2)
     180.0 /       .31265 (130, 2)     .36117 ( 77, 2)     .50575 ( 44, 2)     .59047 ( 67, 2)     .49689 ( 67, 2)
     170.0 /       .30831 ( 77, 2)     .32746 ( 17, 2)     .50053 ( 24, 2)     .52530 ( 77, 2)     .43278 ( 11, 2)
     160.0 /       .26551 (130, 2)     .27893 (223, 2)     .32373 (283, 2)     .36334 ( 24, 2)     .36712 ( 24, 2)
     150.0 /       .35838 (223, 2)     .35304 (209, 2)     .42267 (283, 2)     .38301 (283, 2)     .29941 (283, 2)
     140.0 /       .35870 (118, 2)     .44078 (283, 2)     .53496 (209, 2)     .54971 (283, 2)     .46519 (283, 2)
     130.0 /       .36679 (211, 2)     .40407 (180, 2)     .45743 (223, 2)     .42930 (223, 2)     .38469 ( 66, 3)
     120.0 /       .38783 (240, 2)     .52647 (240, 2)     .59874 (162, 2)     .62742 (162, 2)     .50811C(234, 2)
     110.0 /       .51608 (135, 2)     .71744 (135, 2)     .91250C(234, 2)     .82436C(234, 2)     .63868C(234, 2)
     100.0 /       .55203 (236, 2)     .73215 (135, 2)     .79738 (161, 2)     .78155 ( 55, 2)     .67338 (185, 2)
      90.0 /       .51880 (209, 2)     .65014 (236, 2)     .79541C(225, 2)     .78090 (185, 2)     .65480 (185, 2)
      80.0 /       .48726C(225, 2)     .77969C(225, 2)     .84739C(225, 2)     .68363C(225, 2)     .59199 ( 84, 2)
      70.0 /       .65242 (112, 2)     .79779 (164, 2)     .89542 (212, 2)     .82323 (117, 2)     .71290 (328, 2)
      60.0 /       .64749 (192, 2)     .92951 (192, 2)     .93505 (192, 2)     .77416C(186, 2)     .64513 ( 56, 2)
      50.0 /       .46145 (263, 2)     .75577C(186, 2)     .84959 ( 56, 2)     .93683C(186, 2)     .74510C(186, 2)
      40.0 /       .37287 (185, 2)     .52526 (177, 2)     .64328 ( 65, 2)     .66514 ( 18, 2)     .60567 ( 18, 2)
      30.0 /       .41022 (194, 2)     .52206 ( 76, 2)     .62627 (172, 2)     .63564 (172, 2)     .53410 (172, 2)
      20.0 /       .54849 (149, 2)     .73417 (194, 2)     .75631 (194, 2)     .65597 (194, 2)     .48542 (178, 2)
      10.0 /       .42733 (103, 2)     .59108 (239, 2)     .63690 (103, 2)     .57379 (230, 2)     .47204 (201, 2)
1                                                                                                            2ND HIGH
                                                                                                              8-HR
                                                                                                             SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                           * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                   * FROM ALL SOURCES *
                                                 * FOR THE RECEPTOR GRID *
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                         * MAXIMUM VALUE EQUALS      1.23396 AND OCCURRED AT (     966.0,     360.0) *

  DIRECTION /                                                    RANGE (METERS)
  (DEGREES) /            2215.0                 2954.0                 3862.0                 5112.0                 6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /        .59309 (157, 2)        .37751 (157, 2)        .29845 (231, 1)        .27032 (231, 1)        .22032 (239, 2)
     350.0 /        .48163 (153, 2)        .35669 (153, 2)        .28062 (231, 1)        .25467 (210, 2)        .22391 (210, 2)
     340.0 /        .47689 (153, 2)        .33396 (153, 2)        .24778C(345, 1)        .22089 (333, 1)        .21116 (333, 1)
     330.0 /        .46119 (218, 2)        .34261 (218, 2)        .29025 (115, 2)        .24211 (115, 2)        .21619 (350, 1)
     320.0 /        .48404 (218, 2)        .40581 (116, 1)        .40319 (116, 1)        .34261 (357, 2)        .31748C(210, 1)
     310.0 /        .42182 (154, 2)        .40680 (358, 2)        .35344 (358, 2)        .28033 (358, 2)        .24351 (145, 3)
     300.0 /        .66991 (134, 2)        .44215 (361, 2)        .37091 (337, 3)        .32330 (361, 2)        .29796 (337, 3)
     290.0 /        .39143 ( 89, 2)        .34121 ( 89, 2)        .30853 (115, 1)        .29207C(161, 1)        .28509 (336, 1)
     280.0 /        .43613 ( 89, 2)        .40141 (114, 3)        .39221 (114, 3)        .34485 (194, 3)        .31344 (244, 3)
     270.0 /        .64006 (244, 2)        .45139 (244, 2)        .36767 (100, 3)        .30804 (243, 3)        .27530 (243, 3)
     260.0 /        .49068C(187, 2)        .40492 ( 89, 3)        .34702 (276, 1)        .30607 (276, 1)        .27433 (276, 1)
     250.0 /        .53350 (341, 2)        .51966 (122, 2)        .42928 (301, 3)        .36143 (301, 3)        .31618 (301, 3)
     240.0 /        .63974 (120, 2)        .52900 (113, 2)        .43308 (342, 2)        .37295 (342, 2)        .33028 (342, 2)
     230.0 /        .52170 ( 35, 2)        .48691 (312, 2)        .44397 (320, 1)        .38594 (320, 1)        .34263 (320, 1)
     220.0 /        .54962 (216, 2)        .44344 (311, 1)        .40025 (311, 1)        .32937 (311, 1)        .28582 (311, 1)
     210.0 /        .36053 ( 15, 2)        .34472 (113, 1)        .29926 (296, 2)        .24106 (296, 2)        .21173 ( 86, 1)
     200.0 /        .38306 (101, 2)        .29357 (101, 2)        .23599 (311, 1)        .19565 (311, 1)        .17035 (311, 1)
     190.0 /        .39834 (297, 2)        .37879 ( 44, 2)        .31519 ( 32, 1)        .27853 ( 32, 1)        .24964 ( 32, 1)
     180.0 /        .38465 ( 24, 2)        .39723 (297, 2)        .32966 ( 44, 2)        .31381 (297, 2)        .27557 (297, 2)
     170.0 /        .38743 ( 11, 2)        .31340 ( 11, 2)        .22804 ( 24, 2)        .17521 ( 11, 2)        .14861 ( 32, 1)
     160.0 /        .32922 ( 10, 2)        .28987 ( 59, 3)        .28230 ( 59, 3)        .24708 ( 59, 3)        .22037 ( 59, 3)
     150.0 /        .31729 ( 59, 2)        .35032 ( 59, 2)        .32962 ( 59, 2)        .27967 ( 59, 2)        .24568 ( 59, 2)
     140.0 /        .35511 (283, 2)        .31676 (136, 3)        .30229 (136, 3)        .28415 (350, 3)        .25163 (350, 3)
     130.0 /        .50235 ( 66, 3)        .55160 ( 66, 3)        .49558 (346, 2)        .40394 (346, 2)        .34881 (346, 2)
     120.0 /        .39570 (162, 2)        .33226C(234, 3)        .31838 ( 52, 2)        .24405 ( 52, 2)        .23042 (181, 3)
     110.0 /        .50792 (209, 2)        .44472 (209, 2)        .37994 (209, 2)        .26190 (181, 2)        .21022 (181, 2)
     100.0 /        .56184 (185, 2)        .39826 (169, 2)        .28998 (185, 2)        .23140C(239, 3)        .22411C(239, 3)
      90.0 /        .53371 (147, 2)        .37358 (236, 2)        .30074 (147, 2)        .23980C(209, 3)        .20807C(209, 3)
      80.0 /        .49413 ( 84, 2)        .36458 ( 84, 2)        .25817 ( 84, 2)        .20457 (235, 3)        .19037 (235, 3)
      70.0 /        .57470 (328, 2)        .40642 (328, 2)        .27530 (328, 2)        .17610 (328, 2)        .15067 (157, 3)
      60.0 /        .51419 ( 56, 2)        .35666 ( 56, 2)        .23771 ( 56, 2)        .18130 (227, 2)        .15873C(  8, 2)
      50.0 /        .53417C(186, 2)        .34455C(186, 2)        .30241 (175, 3)        .20773 ( 56, 2)        .18564C(176, 3)
      40.0 /        .52650 (226, 2)        .44260 (226, 2)        .36169 (226, 2)        .29164 ( 99, 1)        .25491 ( 99, 1)
      30.0 /        .40477 ( 40, 2)        .35755 ( 40, 2)        .29119 ( 40, 2)        .25527 ( 47, 3)        .24862C( 18, 3)
      20.0 /        .42027 ( 65, 2)        .36688 ( 65, 2)        .31378 ( 65, 2)        .25813 ( 65, 2)        .22758 ( 65, 2)
      10.0 /        .35405 (201, 2)        .33110 (307, 2)        .26732 (350, 1)        .22980 (307, 2)        .19736 (307, 2)
1                                                                                                                         HIGH
                                                                                                                          24-HR
                                                                                                                          SGROUP#  1
                             *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982      ***


                            * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)      *
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                                          * FROM ALL SOURCES *
                                        * FOR THE RECEPTOR GRID *

                        * MAXIMUM VALUE EQUALS       .58398 AND OCCURRED AT (    1306.0,     360.0) *

 DIRECTION /                                           RANGE (METERS)
 (DEGREES) /             568.0              738.0              966.0             1306.0             1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .26350C(157, 1)    .42847C(157, 1)    .54985C(239, 1)    .58398C(239, 1)    .51155C(239, 1)
     350.0 /       .19787C(157, 1)    .33661C(157, 1)    .41094C(157, 1)    .39021C(157, 1)    .31718C(157, 1)
     340.0 /       .20729 (220, 1)    .32181 (220, 1)    .38743 (160, 1)    .37122 (160, 1)    .29827 (160, 1)
     330.0 /       .21007 (220, 1)    .32290 (220, 1)    .36144C(221, 1)    .32055C(221, 1)    .26705 (218, 1)
     320.0 /       .16160C(204, 1)    .28019C(204, 1)    .34460C(204, 1)    .33247C(204, 1)    .28388C(204, 1)
     310.0 /       .21873C(135, 1)    .24329C(135, 1)    .28909 (154, 1)    .33386 (155, 1)    .36560 (155, 1)
     300.0 /       .19264C(135, 1)    .33566C(134, 1)    .44065C(134, 1)    .43618C(134, 1)    .35941C(134, 1)
     290.0 /       .19777 (159, 1)    .20472 (159, 1)    .24318C(137, 1)    .22059C(137, 1)    .21576 (139, 1)
     280.0 /       .25789 (159, 1)    .24844 (159, 1)    .26904 ( 39, 1)    .26301 ( 39, 1)    .23227 (330, 1)
     270.0 /       .26212 (159, 1)    .31016 (158, 1)    .29850 (158, 1)    .31802 (315, 1)    .31829 (315, 1)
     260.0 /       .25905C(137, 1)    .30090 (249, 1)    .30346 (249, 1)    .25178 (249, 1)    .25663 (304, 1)
     250.0 /       .27205 (249, 1)    .36071C(241, 1)    .39652C(241, 1)    .33928 (249, 1)    .29468 (249, 1)
     240.0 /       .25629C(241, 1)    .43521C(241, 1)    .52045C(241, 1)    .58384 (123, 1)    .54791 (123, 1)
     230.0 /       .20246C(260, 1)    .22269C(260, 1)    .26989C(259, 1)    .30802 (299, 1)    .29788 (299, 1)
     220.0 /       .16976C(216, 1)    .28119C(216, 1)    .36011 (257, 1)    .35840 (257, 1)    .35758 (311, 1)
     210.0 /       .13310C(166, 1)    .17122C(259, 1)    .20722C(259, 1)    .20001C(256, 1)    .17862C(256, 1)
     200.0 /       .10269 (141, 1)    .17328 (141, 1)    .25517C(288, 1)    .28213C(288, 1)    .24821C(288, 1)
     190.0 /       .12093 (130, 1)    .15186 ( 67, 1)    .21931 ( 44, 1)    .25292 ( 44, 1)    .23297 ( 44, 1)
     180.0 /       .12855 (118, 1)    .14626 ( 67, 1)    .20489 ( 67, 1)    .22790 ( 67, 1)    .22031 ( 67, 1)
     170.0 /       .10724C( 77, 1)    .18515C( 77, 1)    .21492C( 77, 1)    .19982 ( 24, 1)    .18516 ( 24, 1)
     160.0 /       .11478C(223, 1)    .12855C( 77, 1)    .14641C( 77, 1)    .14831C(283, 1)    .13521C( 10, 1)
     150.0 /       .12465C(223, 1)    .16461C(283, 1)    .21130C(283, 1)    .22467C(283, 1)    .21418C(283, 1)
     140.0 /       .15317C(240, 1)    .19633C(283, 1)    .24853C(283, 1)    .24803C(283, 1)    .21163C(283, 1)
     130.0 /       .19808C(240, 1)    .26096C(240, 1)    .22944C(240, 1)    .16850C(233, 1)    .21556 ( 66, 1)
     120.0 /       .20292C(236, 1)    .25519C(234, 1)    .33717C(234, 1)    .35100C(234, 1)    .31557C(234, 1)
     110.0 /       .25006C(236, 1)    .30374C(234, 1)    .36293C(234, 1)    .36274 (181, 1)    .33613 (181, 1)
     100.0 /       .24553C(236, 1)    .34685C(236, 1)    .37894C(180, 1)    .41445C(161, 1)    .36960C(161, 1)
      90.0 /       .24081C(233, 1)    .37288C(225, 1)    .42819C(225, 1)    .37592C(236, 1)    .32020C(236, 1)
      80.0 /       .23028C(225, 1)    .37416C(225, 1)    .41112C(225, 1)    .33398C(225, 1)    .26620C(117, 1)
      70.0 /       .24854C(112, 1)    .33880C(112, 1)    .34233C(212, 1)    .33873C( 20, 1)    .28757C( 20, 1)
      60.0 /       .28429C(112, 1)    .38546C(112, 1)    .36715C(112, 1)    .30749C( 56, 1)    .28673C( 56, 1)
      50.0 /       .17899 (202, 1)    .26797 (202, 1)    .37759C( 56, 1)    .44953C( 56, 1)    .40708C( 56, 1)
      40.0 /       .14915C(185, 1)    .20636 (127, 1)    .29696C( 74, 1)    .34546C( 74, 1)    .31073C( 74, 1)
      30.0 /       .20923 (149, 1)    .31953 (149, 1)    .33759 (149, 1)    .29829C( 74, 1)    .25423C( 74, 1)
      20.0 /       .20230 (194, 1)    .27689 (149, 1)    .28806 (149, 1)    .26411C(213, 1)    .20917C(213, 1)
      10.0 /       .14403 (194, 1)    .26270C(239, 1)    .35697C(239, 1)    .36725C(239, 1)    .30765C(239, 1)
1                                                                                                       HIGH
                                                                                                        24-HR
                                                                                                        SGROUP#  1
                                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***
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                         * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                          * FROM ALL SOURCES *
                                        * FOR THE RECEPTOR GRID *

                       * MAXIMUM VALUE EQUALS       .58398 AND OCCURRED AT (    1306.0,     360.0) *

 DIRECTION /                                        RANGE (METERS)
 (DEGREES) /          2215.0           2954.0           3862.0           5112.0           6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .39779C(239, 1)  .27639C(239, 1)  .19590 (231, 1)  .16382 (231, 1)  .14375 (231, 1)
    350.0 /      .23357C(157, 1)  .19554 (231, 1)  .17613 (231, 1)  .14685 (231, 1)  .12847 (231, 1)
    340.0 /      .25506 (153, 1)  .20017 (153, 1)  .15715 ( 13, 1)  .12938 ( 13, 1)  .11202 ( 13, 1)
    330.0 /      .22217 (218, 1)  .17345 (115, 1)  .16332 (115, 1)  .14108 (115, 1)  .12564 (115, 1)
    320.0 /      .23200C(204, 1)  .18399C(204, 1)  .14833 (116, 1)  .13462 (116, 1)  .12260 (116, 1)
    310.0 /      .35423 (155, 1)  .30983 (155, 1)  .25307 (155, 1)  .19376 (155, 1)  .16296 (155, 1)
    300.0 /      .27904 (337, 1)  .27497 (337, 1)  .24772 (337, 1)  .20791 (337, 1)  .18396 (337, 1)
    290.0 /      .19292 (139, 1)  .20762 (336, 1)  .20550 (336, 1)  .18871 (336, 1)  .17537 (336, 1)
    280.0 /      .22611 (244, 1)  .22241 (244, 1)  .20008 (244, 1)  .16683 (244, 1)  .14953 (359, 1)
    270.0 /      .28135 (315, 1)  .22868 (100, 1)  .20940 (100, 1)  .17709 (276, 1)  .15751 (276, 1)
    260.0 /      .28039 (304, 1)  .27692 (304, 1)  .24770 (304, 1)  .20490 (304, 1)  .17878 (304, 1)
    250.0 /      .28877 (113, 1)  .29989 (113, 1)  .27240 (113, 1)  .22593 (113, 1)  .19691 (113, 1)
    240.0 /      .46345 (123, 1)  .35629 (123, 1)  .29901 (342, 1)  .26651 (342, 1)  .23984 (342, 1)
    230.0 /      .26089 (312, 1)  .29353 (343, 1)  .29869 (343, 1)  .27083 (343, 1)  .24588 (343, 1)
    220.0 /      .42861 (311, 1)  .43535 (311, 1)  .38711 (311, 1)  .31443 (311, 1)  .27108 (311, 1)
    210.0 /      .17546 (296, 1)  .18100 (296, 1)  .16153 (296, 1)  .13067 (296, 1)  .11204 (296, 1)
    200.0 /      .21376 (309, 1)  .22075 (309, 1)  .19936 (309, 1)  .16410 (309, 1)  .14239 (309, 1)
    190.0 /      .22581 (297, 1)  .23690 (297, 1)  .21490 (297, 1)  .17707 (297, 1)  .15355 (297, 1)
    180.0 /      .21235 (297, 1)  .22859 (297, 1)  .21130 (297, 1)  .17694 (297, 1)  .15467 (297, 1)
    170.0 /      .15895 ( 11, 1)  .14220 ( 11, 1)  .12092 ( 11, 1)  .09728 ( 11, 1)  .08461 ( 11, 1)
    160.0 /      .13940 ( 59, 1)  .15713 ( 59, 1)  .15043 ( 59, 1)  .12974 ( 59, 1)  .12415C(  8, 1)
    150.0 /      .21143 ( 59, 1)  .24068 ( 59, 1)  .23276 ( 59, 1)  .20283 ( 59, 1)  .18062 ( 59, 1)
    140.0 /      .16295C(283, 1)  .16900 ( 60, 1)  .18014 ( 60, 1)  .17230 ( 60, 1)  .16136 ( 60, 1)
    130.0 /      .26918 ( 66, 1)  .28476 ( 66, 1)  .26104 ( 66, 1)  .21763 ( 66, 1)  .18999 ( 66, 1)
    120.0 /      .26858C(234, 1)  .23367 ( 52, 1)  .20804 ( 52, 1)  .17810 (181, 1)  .16404 (181, 1)
    110.0 /      .28654 (181, 1)  .23112 (181, 1)  .18675 (181, 1)  .15077 ( 52, 1)  .13179 ( 52, 1)
    100.0 /      .29087C(180, 1)  .21182C(180, 1)  .15484C(180, 1)  .11586C(169, 1)  .10223C(169, 1)
     90.0 /      .24484C(236, 1)  .17812C(185, 1)  .15642C(169, 1)  .13127C(169, 1)  .11523C(169, 1)
     80.0 /      .22526 ( 84, 1)  .19143 ( 84, 1)  .15394 ( 84, 1)  .12449C(235, 1)  .11864C(235, 1)
     70.0 /      .22988C(328, 1)  .16257C(328, 1)  .11012C(328, 1)  .09000 ( 81, 1)  .07830 ( 81, 1)
     60.0 /      .22853C( 56, 1)  .15851C( 56, 1)  .10784 (151, 1)  .08311 (151, 1)  .07021 (151, 1)
     50.0 /      .31827C( 56, 1)  .23868C(175, 1)  .20697C(175, 1)  .17203C(175, 1)  .15318C(175, 1)
     40.0 /      .24264C( 74, 1)  .21417 ( 98, 1)  .18949 ( 99, 1)  .15657 ( 99, 1)  .13602 ( 99, 1)
     30.0 /      .24749 ( 95, 1)  .24294 ( 95, 1)  .21230 ( 95, 1)  .17039 ( 95, 1)  .14613 ( 95, 1)
     20.0 /      .16589C(333, 1)  .14044 ( 13, 1)  .13229 ( 13, 1)  .11248 ( 13, 1)  .09896 ( 13, 1)
     10.0 /      .22720C(239, 1)  .14902C(239, 1)  .09761C(239, 1)  .08039 (350, 1)  .07301 (363, 1)
1                                                                                                  2ND HIGH
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                                                                                                    24-HR
                                                                                                    SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                              * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)    *
                                                   * FROM ALL SOURCES *
                                                 * FOR THE RECEPTOR GRID *

                              * MAXIMUM VALUE EQUALS      .51464 AND OCCURRED AT (     966.0,     240.0) *

 DIRECTION /                                            RANGE (METERS)
 (DEGREES) /          568.0              738.0              966.0              1306.0             1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .21148C(239, 1)    .40170C(239, 1)    .49359C(157, 1)    .43743C(157, 1)    .33661C(157, 1)
    350.0 /      .13488 (142, 1)    .23459 (160, 1)    .28463 (160, 1)    .25966 (153, 1)    .23227 (153, 1)
    340.0 /      .16925 (160, 1)    .30511 (160, 1)    .34893 (220, 1)    .31488 (153, 1)    .29707 (153, 1)
    330.0 /      .19022C(221, 1)    .31252C(221, 1)    .35332 (220, 1)    .29930 (218, 1)    .24657C(221, 1)
    320.0 /      .15272 (217, 1)    .21803 (218, 1)    .29998 (218, 1)    .31321 (218, 1)    .26808 (218, 1)
    310.0 /      .14356C(189, 1)    .21933C(134, 1)    .27404C(134, 1)    .31977 (154, 1)    .30663 (154, 1)
    300.0 /      .17775C(134, 1)    .21188C(135, 1)    .31431 ( 92, 1)    .36455 ( 92, 1)    .33654 ( 92, 1)
    290.0 /      .13005C(197, 1)    .20266C(197, 1)    .21640C(197, 1)    .21928 (139, 1)    .16888C(137, 1)
    280.0 /      .17859 (158, 1)    .23679 (158, 1)    .25383 (158, 1)    .24806 (330, 1)    .22616 ( 39, 1)
    270.0 /      .25594 (158, 1)    .25682 (159, 1)    .28708 (133, 1)    .29572 (244, 1)    .27071 (244, 1)
    260.0 /      .23235 (249, 1)    .25487C(267, 1)    .27536C(267, 1)    .22232 (325, 1)    .21764 (303, 1)
    250.0 /      .25091C(137, 1)    .34471 (249, 1)    .37044C(267, 1)    .33505C(241, 1)    .28281 (122, 1)
    240.0 /      .18459 (139, 1)    .34896 (123, 1)    .51464 (123, 1)    .48698C(241, 1)    .40642C(241, 1)
    230.0 /      .14594C(140, 1)    .22240C(140, 1)    .25530 (120, 1)    .29230 (120, 1)    .28365 (120, 1)
    220.0 /      .14614 (257, 1)    .27404 (257, 1)    .34741C(216, 1)    .34809C(216, 1)    .30515C(216, 1)
    210.0 /      .11778C(248, 1)    .16623 (141, 1)    .19113C(256, 1)    .19066C(259, 1)    .15749C(101, 1)
    200.0 /      .08241C(166, 1)    .16834C(288, 1)    .20492 (141, 1)    .18418 (141, 1)    .17618 (309, 1)
    190.0 /      .10761 (118, 1)    .14514 ( 44, 1)    .19390 ( 67, 1)    .19139 ( 67, 1)    .18110 (297, 1)
    180.0 /      .10422 (130, 1)    .12568C( 77, 1)    .16880 ( 44, 1)    .20254 ( 44, 1)    .20078 ( 44, 1)
    170.0 /      .10365 (118, 1)    .11415C( 17, 1)    .16691 ( 24, 1)    .18271C( 77, 1)    .16429 ( 11, 1)
    160.0 /      .08850 (130, 1)    .10791C(283, 1)    .14554C(283, 1)    .13535C( 10, 1)    .12639 ( 24, 1)
    150.0 /      .12245 (130, 1)    .13449C(209, 1)    .19563C(209, 1)    .19845C(209, 1)    .16461C(209, 1)
    140.0 /      .11961 (118, 1)    .19206C(240, 1)    .20380C(209, 1)    .19974C(209, 1)    .16814 ( 85, 1)
    130.0 /      .13456C(236, 1)    .17961C(180, 1)    .17690C(180, 1)    .16610C(240, 1)    .16509C(233, 1)
    120.0 /      .15413C(180, 1)    .22147C(180, 1)    .22668C(233, 1)    .21565 (162, 1)    .21913 (181, 1)
    110.0 /      .19376C(135, 1)    .28788C(135, 1)    .32602C(135, 1)    .33613C(234, 1)    .27282C(234, 1)
    100.0 /      .21604C(135, 1)    .27416C(180, 1)    .36727C(236, 1)    .40956C(180, 1)    .36460C(180, 1)
     90.0 /      .21914C(225, 1)    .28903C(236, 1)    .37224C(236, 1)    .36224C(225, 1)    .29501C(185, 1)
     80.0 /      .20300C(247, 1)    .30376C(247, 1)    .32602C(247, 1)    .31709C(117, 1)    .24124 ( 84, 1)
     70.0 /      .23207 (206, 1)    .30236C(212, 1)    .33132C( 20, 1)    .30743C(328, 1)    .28516C(328, 1)
     60.0 /      .21583 (192, 1)    .30984 (192, 1)    .32930C(212, 1)    .29338C(112, 1)    .25277 (227, 1)
     50.0 /      .16782C(263, 1)    .24047C(186, 1)    .31210C(186, 1)    .29808C(186, 1)    .27760C(175, 1)
     40.0 /      .13870 (127, 1)    .19460 (149, 1)    .27443C(174, 1)    .30039C(174, 1)    .27220C(174, 1)
     30.0 /      .13674 (194, 1)    .19888C( 76, 1)    .28180C( 74, 1)    .27144 (149, 1)    .24644 ( 47, 1)
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      20.0 /      .18285 (149, 1)      .24472 (194, 1)      .28705C(213, 1)      .22581 (149, 1)      .19252C(333, 1)
      10.0 /      .14244 (103, 1)      .21611C(213, 1)      .26180 (230, 1)      .25299 (230, 1)      .20532 (230, 1)
1                                                                                                                2ND HIGH
                                                                                                                 24-HR
                                                                                                                 SGROUP#  1
                             *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1982     ***


                          * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                           * MAXIMUM VALUE EQUALS       .51464 AND OCCURRED AT (     966.0,     240.0) *

 DIRECTION /                                                 RANGE (METERS)
 (DEGREES) /          2215.0               2954.0               3862.0               5112.0               6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      .23724C(157, 1)      .21767 (231, 1)      .18973C(239, 1)      .12772C(239, 1)      .10297C(239, 1)
     350.0 /      .19930 (231, 1)      .15984 (153, 1)      .12459 (153, 1)      .09703C(210, 1)      .08531C(210, 1)
     340.0 /      .21594 (160, 1)      .17298 ( 13, 1)      .15119 (153, 1)      .10887 (153, 1)      .09723 (231, 1)
     330.0 /      .17406C(221, 1)      .17318 (218, 1)      .13273 (  3, 1)      .11224C(345, 1)      .10630C(345, 1)
     320.0 /      .20520 (218, 1)      .16344 (357, 1)      .14824C(204, 1)      .12438 (307, 1)      .11518 (307, 1)
     310.0 /      .27478 (154, 1)      .23129 (154, 1)      .20742 (358, 1)      .17885 (358, 1)      .15941 (358, 1)
     300.0 /      .27899 ( 92, 1)      .21249 ( 92, 1)      .19155 (359, 1)      .17701 (359, 1)      .16426 (359, 1)
     290.0 /      .19201 (336, 1)      .16115 (139, 1)      .14578 (360, 1)      .13121 (360, 1)      .11860 (360, 1)
     280.0 /      .20058 ( 45, 1)      .18347 ( 45, 1)      .15998 (359, 1)      .15681 (359, 1)      .14756C(356, 1)
     270.0 /      .24909 ( 39, 1)      .22718 ( 39, 1)      .20544 (276, 1)      .17408 (100, 1)      .15212 ( 39, 1)
     260.0 /      .22219 (303, 1)      .23894 ( 89, 1)      .22409 ( 89, 1)      .18939 ( 89, 1)      .16603 ( 89, 1)
     250.0 /      .26898 ( 87, 1)      .26934 ( 87, 1)      .24184 (114, 1)      .20535 (114, 1)      .18058 (114, 1)
     240.0 /      .32982 (120, 1)      .30049 (342, 1)      .26637 (123, 1)      .19442 (123, 1)      .16322C(365, 1)
     230.0 /      .25989 (120, 1)      .27540 (312, 1)      .26011 (312, 1)      .22567 (312, 1)      .20256 (312, 1)
     220.0 /      .27076 (296, 1)      .28536 (296, 1)      .26020 (296, 1)      .21516 (296, 1)      .18683 (296, 1)
     210.0 /      .16584 (310, 1)      .16414 (310, 1)      .14301 (310, 1)      .11771 (309, 1)      .10244 (309, 1)
     200.0 /      .19326C(288, 1)      .13623C(288, 1)      .10604 (310, 1)      .08620 (310, 1)      .07421 (310, 1)
     190.0 /      .18808 ( 44, 1)      .18495 (309, 1)      .18106 (309, 1)      .16315 (309, 1)      .14971 (309, 1)
     180.0 /      .20330 ( 67, 1)      .18260 ( 67, 1)      .16268 ( 67, 1)      .14062 ( 67, 1)      .12765 ( 67, 1)
     170.0 /      .15137 ( 24, 1)      .11267 ( 24, 1)      .09087 (351, 1)      .07407 (351, 1)      .06462 (351, 1)
     160.0 /      .13876 ( 53, 1)      .13785 ( 85, 1)      .12613 ( 85, 1)      .11701C(  8, 1)      .11493 ( 59, 1)
     150.0 /      .19138C(283, 1)      .16814 ( 53, 1)      .15660 ( 53, 1)      .13410 ( 53, 1)      .11948 ( 53, 1)
     140.0 /      .14753C(136, 1)      .15552 ( 59, 1)      .15076 ( 59, 1)      .13141 ( 59, 1)      .11697 ( 59, 1)
     130.0 /      .18109 (346, 1)      .18499 (346, 1)      .16519 (346, 1)      .13465 (346, 1)      .11627 (346, 1)
     120.0 /      .23501 ( 52, 1)      .22157C(234, 1)      .19907 (181, 1)      .17033 ( 52, 1)      .14758 ( 52, 1)
     110.0 /      .22199 (182, 1)      .20428 ( 52, 1)      .18242 ( 52, 1)      .14804 (181, 1)      .12934 (181, 1)
     100.0 /      .28962C(161, 1)      .20168C(161, 1)      .14036C(185, 1)      .11247C(180, 1)      .09506C(180, 1)
      90.0 /      .23971C(185, 1)      .17465 (147, 1)      .13581 (147, 1)      .10350C(209, 1)      .08988C(209, 1)
      80.0 /      .20051C(117, 1)      .13787C(117, 1)      .12959C(235, 1)      .11755 ( 84, 1)      .09941 ( 84, 1)
      70.0 /      .21812C( 20, 1)      .14788C(229, 1)      .10843 ( 81, 1)      .07044C(328, 1)      .06027C(157, 1)
      60.0 /      .20088 (227, 1)      .14387 (227, 1)      .10565C( 56, 1)      .07277 (227, 1)      .06232C(175, 1)
```

```
      50.0 /      .26349C(175, 1)     .21847C( 56, 1)     .14514C( 56, 1)     .09232C( 56, 1)     .07309 ( 48, 1)
      40.0 /      .22209C(174, 1)     .20846 ( 99, 1)     .18841 ( 98, 1)     .15173 ( 98, 1)     .13030 ( 98, 1)
      30.0 /      .21204 ( 47, 1)     .17444 ( 47, 1)     .14555 ( 47, 1)     .11903 ( 47, 1)     .10554 ( 47, 1)
      20.0 /      .15149C(213, 1)     .12983C(333, 1)     .10966C( 65, 1)     .09709 (  3, 1)     .08940 (  3, 1)
      10.0 /      .15499C(201, 1)     .11037 (307, 1)     .09556 (307, 1)     .07919 (363, 1)     .07271 (350, 1)

RUN ENDED ON 09-15-89 AT 09:11:10
```

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-33

RESULTS OF INCINERATOR STACK EMISSIONS DISPERSION MODELING USING ISC MODEL ALONG WITH 1983 METEOROLOGICAL DATA

```
1              ISCST - VERSION 3.4 (DATED 88348)

               IBM-PC VERSION (1.64)
               (C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.
               SERIAL NUMBER 5958 SOLD TO ICF TECHNOLOGY, INC
               RUN BEGAN ON 09-15-89 AT 09:11:12


1
                      *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***

           CALCULATE (CONCENTRATION=1,DEPOSITION=2)                            ISW(1) =   1
           RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)             ISW(2) =   4
           DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                    ISW(3) =   1
           TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                            ISW(4) =   0
           CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                       ISW(5) =   0
           LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                    ISW(6) =   1

           COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
           WITH THE FOLLOWING TIME PERIODS:
             HOURLY (YES=1,NO=0)                                               ISW(7) =   1
             2-HOUR (YES=1,NO=0)                                               ISW(8) =   0
             3-HOUR (YES=1,NO=0)                                               ISW(9) =   1
             4-HOUR (YES=1,NO=0)                                              ISW(10) =   0
             6-HOUR (YES=1,NO=0)                                              ISW(11) =   0
             8-HOUR (YES=1,NO=0)                                              ISW(12) =   1
             12-HOUR (YES=1,NO=0)                                             ISW(13) =   0
             24-HOUR (YES=1,NO=0)                                             ISW(14) =   1
           PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                                ISW(15) =   1

           PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
           SPECIFIED BY ISW(7) THROUGH ISW(14):
             DAILY TABLES (YES=1,NO=0)                                        ISW(16) =   0
             HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                     ISW(17) =   1
             MAXIMUM 50 TABLES (YES=1,NO=0)                                   ISW(18) =   0
           METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)          ISW(19) =   1
           RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)  ISW(20) =   0
           WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)          ISW(21) =   1
           VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)   ISW(22) =   1
           SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                  ISW(23) =   0
           PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)              ISW(24) =   1
           PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)        ISW(25) =   2
           PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)              ISW(26) =   1
           CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)            ISW(27) =   1
           REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                            ISW(28) =   1
           TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                   ISW(29) =   2
           DEBUG OPTION CHOSEN (YES=1,NO=2)                                   ISW(30) =   2
           ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)                ISW(31) =   0
```

```
          NUMBER OF INPUT SOURCES                                         NSOURC =   1
          NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                        NGROUP =   0
          TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)            IPERD =   0
          NUMBER OF X (RANGE) GRID VALUES                                 NXPNTS =  10
          NUMBER OF Y (THETA) GRID VALUES                                 NYPNTS =  36
          NUMBER OF DISCRETE RECEPTORS                                    NXWYPT =   0
          SOURCE EMISSION RATE UNITS CONVERSION FACTOR                        TK =.10000E+07
          HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                ZR =    6.70  METERS
          LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                        IMET =    9
          DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION             DECAY = .000000E+00
          SURFACE STATION NO.                                                ISS = 12842
          YEAR OF SURFACE DATA                                               ISY = 83
          UPPER AIR STATION NO.                                              IUS = 12842
          YEAR OF UPPER AIR DATA                                             IUY = 83
          ALLOCATED DATA STORAGE                                           LIMIT = 43500 WORDS
          REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                       MIMIT =  8613 WORDS
1
                           *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***

                                       *** METEOROLOGICAL DAYS TO BE PROCESSED ***
                                                        (IF=1)

       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

                            *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                     (METERS/SEC)

                                        1.54,   3.09,   5.14,   8.23,  10.80,


                                            *** WIND PROFILE EXPONENTS ***


        STABILITY                                  WIND SPEED CATEGORY
        CATEGORY          1              2              3              4              5              6
            A        .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
            B        .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
            C        .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00
            D        .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
            E        .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00
            F        .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00
```

```
                                        *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                                  (DEGREES KELVIN PER METER)


                    STABILITY                                 WIND SPEED CATEGORY
                    CATEGORY          1              2              3              4              5              6
                        A        .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                        B        .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                        C        .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                        D        .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                        E        .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01
                        F        .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01
1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                               X,Y-COORDINATES OF THE CENTER OF THE POLAR RECEPTOR GRID (METERS) = (       0.,       0.)


                                             *** RANGES OF POLAR GRID SYSTEM ***
                                                          (METERS)

              568.0,      738.0,      966.0,     1306.0,     1704.0,     2215.0,     2954.0,     3862.0,     5112.0,     6000.0,



                                           *** RADIAL ANGLES OF POLAR GRID SYSTEM ***

                                                          (DEGREES)

               10.0,       20.0,       30.0,       40.0,       50.0,       60.0,       70.0,       80.0,       90.0,      100.0,
              110.0,      120.0,      130.0,      140.0,      150.0,      160.0,      170.0,      180.0,      190.0,      200.0,
              210.0,      220.0,      230.0,      240.0,      250.0,      260.0,      270.0,      280.0,      290.0,      300.0,
              310.0,      320.0,      330.0,      340.0,      350.0,      360.0,
1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***

                                                     *** SOURCE DATA ***

                         EMISSION RATE                                                     TEMP.    EXIT VEL.
                           TYPE=0,1                                                        TYPE=0    TYPE=0
               T W       (GRAMS/SEC)                                                      (DEG.K);  (M/SEC);              BLDG.     BLDG.     BLDG.
               Y A NUMBER   TYPE=2                                   BASE                 VERT.DIM  HORZ.DIM DIAMETER   HEIGHT    LENGTH     WIDTH
        SOURCE P K  PART.  (GRAMS/SEC)      X         Y        ELEV.    HEIGHT    TYPE=1    TYPE=1,2  TYPE=0    TYPE=0    TYPE=0    TYPE=0
        NUMBER E E  CATS. *PER METER**2 (METERS)  (METERS)  (METERS)  (METERS)  (METERS)   (METERS)  (METERS)  (METERS)  (METERS)  (METERS)
      - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

             1 0 0     0    .10000E+01        .0         .0        .0     60.96    458.15      14.66      1.68       .00       .00       .00
```

```
* CALM HOURS (=1) FOR DAY  11 *  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  12 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  13 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  14 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0
* CALM HOURS (=1) FOR DAY  15 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  16 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  17 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  18 *  1  1  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  21 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1
* CALM HOURS (=1) FOR DAY  22 *  1  0  1  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  23 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  24 *  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  25 *  1  0  1  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  26 *  1  1  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  28 *  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  29 *  0  1  1  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  1  0  0  1  0
* CALM HOURS (=1) FOR DAY  30 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  31 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  0  0
* CALM HOURS (=1) FOR DAY  39 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  40 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  0
* CALM HOURS (=1) FOR DAY  42 *  0  0  0  0  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  45 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  46 *  1  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  49 *  0  0  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  50 *  0  1  1  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  54 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  55 *  1  1  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1
* CALM HOURS (=1) FOR DAY  61 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  62 *  0  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  67 *  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  72 *  0  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  73 *  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  0
* CALM HOURS (=1) FOR DAY  78 *  0  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  81 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  82 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  88 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  91 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  93 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  94 *  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  96 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0  1  0
* CALM HOURS (=1) FOR DAY 100 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 101 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 102 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 104 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 107 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 108 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 110 *  0  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 111 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 115 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
```

```
* CALM HOURS (=1) FOR DAY 116 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 117 *  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 118 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 119 *  0  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 121 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 122 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1
* CALM HOURS (=1) FOR DAY 123 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 124 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1  1
* CALM HOURS (=1) FOR DAY 125 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 126 *  0  1  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 128 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 129 *  0  1  1  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 130 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 139 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 141 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 142 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 143 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 144 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 145 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 146 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 147 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 150 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 151 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 152 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 153 *  1  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 154 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 155 *  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 156 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 159 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  1
* CALM HOURS (=1) FOR DAY 160 *  1  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 163 *  1  1  0  0  0  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 164 *  0  0  0  1  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 165 *  1  1  0  1  1  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 166 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 167 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 168 *  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 169 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 170 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 171 *  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 172 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 173 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1  0  0
* CALM HOURS (=1) FOR DAY 174 *  0  0  0  0  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 175 *  1  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 176 *  1  0  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  1  1  1  0  0
* CALM HOURS (=1) FOR DAY 177 *  0  1  1  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 178 *  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  1
* CALM HOURS (=1) FOR DAY 180 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 181 *  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 182 *  0  1  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

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* CALM HOURS (=1) FOR DAY 183 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 184 *  0  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 185 *  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 186 *  0  1  1  0  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  1  0  1  0  1
* CALM HOURS (=1) FOR DAY 187 *  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 188 *  1  1  0  1  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 189 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 190 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  0  0
* CALM HOURS (=1) FOR DAY 191 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 195 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 196 *  1  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 197 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 198 *  0  0  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 199 *  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 200 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 202 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 203 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 204 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 205 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 208 *  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 211 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 213 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 214 *  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 216 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 218 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 219 *  1  0  0  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 220 *  0  0  0  1  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 221 *  0  0  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 222 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 223 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 224 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 225 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 231 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  0  1
* CALM HOURS (=1) FOR DAY 232 *  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 233 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 234 *  0  1  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 235 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 236 *  0  1  0  0  1  0  0  1  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 239 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 240 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 241 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 242 *  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 244 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 245 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 246 *  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 247 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  1  0
* CALM HOURS (=1) FOR DAY 248 *  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 249 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 250 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
```

```
* CALM HOURS (=1) FOR DAY 251 *  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 252 *  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 253 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 254 *  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 255 *  0  0  0  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 257 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 258 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0
* CALM HOURS (=1) FOR DAY 259 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 260 *  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 261 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 262 *  0  0  1  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 263 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 264 *  0  0  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 265 *  1  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 272 *  0  0  0  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 273 *  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 274 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 276 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 277 *  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1
* CALM HOURS (=1) FOR DAY 278 *  1  1  1  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 279 *  1  1  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 280 *  1  1  1  1  1  1  1  0  1  1  1  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 281 *  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 284 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 285 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 286 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 287 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 297 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 299 *  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 302 *  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 303 *  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 307 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 308 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1  1
* CALM HOURS (=1) FOR DAY 309 *  1  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 310 *  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  1  1  1  1  1
* CALM HOURS (=1) FOR DAY 312 *  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 313 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  1
* CALM HOURS (=1) FOR DAY 314 *  0  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 317 *  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 318 *  1  1  1  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 319 *  0  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 321 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0
* CALM HOURS (=1) FOR DAY 325 *  1  0  1  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 326 *  0  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 336 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 342 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 347 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1  1  0
* CALM HOURS (=1) FOR DAY 348 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 351 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

```
 * CALM HOURS (=1) FOR DAY 357 *  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
 * CALM HOURS (=1) FOR DAY 362 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
 * CALM HOURS (=1) FOR DAY 363 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0
1                                                                                                         'N'-DAY
                                                                                                          365 DAYS
                                                                                                          SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983    ***


                                    * 365-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                              * MAXIMUM VALUE EQUALS       .03459 AND OCCURRED AT (    1704.0,     240.0) *

 DIRECTION /                                                RANGE (METERS)
 (DEGREES) /       568.0        738.0        966.0      1306.0      1704.0      2215.0      2954.0      3862.0      5112.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .00835       .01243       .01507      .01579      .01492      .01340      .01152      .00978      .00810
    350.0 /       .00830       .01303       .01656      .01809      .01756      .01601      .01387      .01183      .00981
    340.0 /       .00946       .01542       .01970      .02110      .02002      .01789      .01516      .01259      .01012
    330.0 /       .01164       .01912       .02414      .02518      .02323      .02025      .01684      .01387      .01114
    320.0 /       .01348       .02206       .02812      .02999      .02846      .02552      .02175      .01815      .01467
    310.0 /       .01508       .02420       .03059      .03231      .03031      .02693      .02296      .01941      .01603
    300.0 /       .01501       .02341       .02917      .03078      .02915      .02644      .02334      .02052      .01764
    290.0 /       .01272       .01915       .02303      .02387      .02279      .02115      .01916      .01712      .01483
    280.0 /       .01272       .01990       .02517      .02754      .02708      .02534      .02274      .01993      .01695
    270.0 /       .01425       .02228       .02850      .03158      .03127      .02937      .02643      .02325      .01983
    260.0 /       .01500       .02248       .02793      .03022      .02923      .02685      .02384      .02105      .01824
    250.0 /       .01575       .02364       .03001      .03363      .03363      .03181      .02891      .02573      .02225
    240.0 /       .01538       .02335       .02998      .03410      .03459      .03314      .03044      .02727      .02366
    230.0 /       .01451       .02261       .02902      .03258      .03269      .03108      .02834      .02517      .02168
    220.0 /       .01283       .02034       .02557      .02742      .02637      .02424      .02157      .01892      .01617
    210.0 /       .01037       .01682       .02129      .02244      .02090      .01843      .01560      .01312      .01082
    200.0 /       .00770       .01254       .01607      .01734      .01674      .01544      .01372      .01194      .01006
    190.0 /       .00607       .00997       .01294      .01416      .01389      .01303      .01173      .01028      .00873
    180.0 /       .00555       .00984       .01360      .01560      .01570      .01490      .01342      .01167      .00978
    170.0 /       .00507       .00950       .01364      .01613      .01644      .01566      .01409      .01221      .01011
    160.0 /       .00486       .00901       .01304      .01570      .01625      .01565      .01414      .01223      .01009
    150.0 /       .00469       .00806       .01122      .01372      .01485      .01506      .01431      .01280      .01083
    140.0 /       .00482       .00816       .01140      .01417      .01561      .01602      .01531      .01371      .01160
    130.0 /       .00492       .00864       .01274      .01638      .01814      .01851      .01763      .01591      .01369
    120.0 /       .00565       .01009       .01496      .01880      .02001      .01941      .01740      .01484      .01208
    110.0 /       .00842       .01487       .02067      .02387      .02382      .02196      .01878      .01541      .01211
    100.0 /       .01259       .02203       .02921      .03128      .02893      .02475      .01964      .01518      .01129
     90.0 /       .01533       .02540       .03231      .03367      .03071      .02601      .02046      .01570      .01160
     80.0 /       .01773       .02731       .03237      .03179      .02791      .02301      .01779      .01361      .01011
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     70.0 /     .01935     .02924     .03394     .03255     .02797     .02262     .01728     .01323     .00996
     60.0 /     .01834     .02735     .03096     .02889     .02455     .01993     .01550     .01212     .00933
     50.0 /     .01594     .02386     .02740     .02642     .02336     .01971     .01584     .01262     .00983
     40.0 /     .01440     .02123     .02443     .02373     .02104     .01775     .01428     .01144     .00900
     30.0 /     .01357     .01949     .02250     .02254     .02100     .01887     .01629     .01376     .01122
     20.0 /     .01195     .01716     .01996     .02006     .01851     .01635     .01380     .01145     .00918
     10.0 /     .00966     .01392     .01626     .01640     .01520     .01352     .01156     .00971     .00789
1                                                                                                     'N'-DAY
                                                                                                      365 DAYS
                                                                                                      SGROUP#  1
                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***

                           * 365-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                              * FROM ALL SOURCES *
                                            * FOR THE RECEPTOR GRID *

                      * MAXIMUM VALUE EQUALS       .03459 AND OCCURRED AT (     1704.0,     240.0) *

  DIRECTION /                                              RANGE (METERS)
  (DEGREES) /      6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /     .00721
    350.0 /     .00876
    340.0 /     .00887
    330.0 /     .00977
    320.0 /     .01288
    310.0 /     .01429
    300.0 /     .01606
    290.0 /     .01350
    280.0 /     .01531
    270.0 /     .01795
    260.0 /     .01673
    250.0 /     .02029
    240.0 /     .02160
    230.0 /     .01973
    220.0 /     .01466
    210.0 /     .00963
    200.0 /     .00902
    190.0 /     .00788
    180.0 /     .00874
    170.0 /     .00894
    160.0 /     .00891
    150.0 /     .00968
    140.0 /     .01034
    130.0 /     .01239
    120.0 /     .01060
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      110.0 /       .01042
      100.0 /       .00944
       90.0 /       .00969
       80.0 /       .00850
       70.0 /       .00847
       60.0 /       .00804
       50.0 /       .00849
       40.0 /       .00784
       30.0 /       .00988
       20.0 /       .00801
       10.0 /       .00693
1                                                                                                                         HIGH
                                                                                                                           1-HR
                                                                                                                          SGROUP#  1
                                *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                               * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                        * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                            * MAXIMUM VALUE EQUALS      3.00310 AND OCCURRED AT (     568.0,      20.0) *

  DIRECTION /                                                    RANGE (METERS)
  (DEGREES) /              568.0                 738.0                 966.0                1306.0                1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /      2.98634 (234,13)      2.47099 (234,13)      2.08691 (244,13)      1.86697 (234,14)      1.82443 (356,15)
      350.0 /      2.96733 (210,14)      2.46494 (210,14)      2.17474 (104,14)      2.12816 (245, 9)      2.51774 (225, 8)
      340.0 /      2.99680 (210,13)      2.60131 (227,11)      2.16130 (281,11)      1.92502 (253,10)      1.84364 (225, 8)
      330.0 /      2.98925 (188,12)      2.76723 (228,11)      2.13501 (238,15)      1.97902 (284,13)      1.83592 ( 75,12)
      320.0 /      2.98925 (184,11)      2.16522 (184,11)      2.19169 (185,14)      1.86809 (139,14)      1.85062 (281,10)
      310.0 /      2.97455 (202,11)      2.48000 (202,11)      2.18671 (121,16)      1.98895 (175,11)      1.84481 (214,17)
      300.0 /      3.00310 (230,12)      2.81480 (249,12)      2.13311 (121,15)      1.98895 (218,11)      1.87101 (171,12)
      290.0 /      2.98492 (234,12)      2.48332 (234,12)      2.16028 (148,13)      1.97799 (193,10)      1.83255 (261,10)
      280.0 /      2.63857 (117,14)      2.73905 (214,13)      2.17970 (202,10)      1.91923 (195,10)      1.85789 (192,18)
      270.0 /      2.97090 (170,14)      2.76723 (191,12)      2.17951 (209,15)      1.94828 (169,15)      1.84109 (193,17)
      260.0 /      2.97546 (177,11)      2.68416 (225,13)      2.19169 (193,15)      2.02216 (160,11)      1.84775 (283,14)
      250.0 /      2.98925 (162,13)      2.76290 (126,12)      2.19169 (234,11)      2.01229 (251,13)      1.84340 (253,17)
      240.0 /      2.97090 (192,13)      2.47723 (154,11)      2.16551 (161,15)      1.88775 (168,13)      1.87719 (163, 7)
      230.0 /      2.99360 (198,11)      2.82084 (230,14)      2.20532 (170,16)      2.03438 (250,11)      1.82443 (163, 8)
      220.0 /      2.91946 (166,11)      2.81287 (184,13)      2.17474 (126,14)      2.01301 (295,11)      1.77873 (162,18)
      210.0 /      2.99360 (253,13)      2.53071 (229,13)      2.19837 (147,14)      1.96686 (271,15)      1.88985 (  6, 9)
      200.0 /      2.80088 (208,13)      2.67937 (229,13)      2.22964 (208,15)      1.89014 (208,15)      1.84084 (251,16)
      190.0 /      2.99791 (167,13)      2.17140 (167,13)      2.13922 (125,12)      1.93282 (145,10)      1.65945 ( 13,12)
      180.0 /      2.84600 (181,12)      2.37607 (181,12)      2.19169 (208,12)      1.86650 (208,12)      1.86345 (236,10)
      170.0 /      2.68210 (181,12)      2.24340 (181,12)      2.18514 (198,10)      1.87050 (271,13)      1.82466 (153,11)
      160.0 /      2.58811 (101,14)      2.53948 (116,11)      2.11509 (187,10)      1.88426 (265,16)      1.84481 (208,17)
      150.0 /      2.74660 (101,14)      2.64219 (271,12)      2.15593 (236,16)      1.97114 (272,14)      1.80249 (236,17)
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      140.0 /      2.82205 (125,13)      2.49568 (271,12)      2.18514 (208,11)      1.86342 (208,11)      1.86635 (273,16)
      130.0 /      2.95561 (160,12)      2.75535 (226,14)      2.10352 (152, 9)      1.94053 (181,10)      1.81763 (225,11)
      120.0 /      2.99791 (163,12)      2.80977 (195,14)      2.16551 (203,16)      2.06419 (215,13)      1.84891 (263,15)
      110.0 /      2.82783 (188,11)      2.37024 (188,11)      2.04647 (205, 9)      2.14935 (309,15)      2.48725 (309,15)
      100.0 /      2.84874 (223,12)      2.43798 (191,13)      2.20532 (169,16)      2.04769 (236,15)      1.86164 (173,17)
       90.0 /      2.97769 (230,13)      2.73318 (191,13)      2.20374 (201,14)      1.90736 ( 14,14)      1.84775 (200,18)
       80.0 /      2.88256 (197,14)      2.24890 (198,12)      2.21745 (239,16)      1.93145 (102,11)      1.76902 (200,17)
       70.0 /      2.97656 (226,12)      2.63174 (109,11)      2.20374 (249,14)      1.98895 (222,10)      1.82466 (258,16)
       60.0 /      2.84600 (231,13)      2.37607 (231,13)      2.20532 (201,12)      2.02826 (263,14)      1.80231 (352,16)
       50.0 /      2.97546 (155,11)      2.42877 (118,11)      2.16934 (242,11)      1.91770 (140,15)      1.83044 (352,15)
       40.0 /      2.98925 (202,12)      2.73905 (235,12)      2.18866 (248,14)      2.02826 (200,16)      1.85480 (312,12)
       30.0 /      2.98408 (222,14)      2.45890 (228,12)      2.19326 (201,11)      1.99995 (160,15)      1.84775 (242,10)
       20.0 /      3.00310 (154,12)      2.46876 (219,12)      2.15593 (134,15)      1.99484 (233,11)      1.82443 (  9,15)
       10.0 /      2.84874 (223,14)      2.37024 (176,12)      2.13603 (201, 9)      1.94053 (285,13)      1.84601 (143, 8)
1                                                                                                                     HIGH
                                                                                                                       1-HR
                                                                                                                      SGROUP#  1
                             *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                            * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                     * FROM ALL SOURCES *
                                                   * FOR THE RECEPTOR GRID *

                         * MAXIMUM VALUE EQUALS      3.00310 AND OCCURRED AT (     568.0,      20.0) *

   DIRECTION /                                               RANGE (METERS)
   (DEGREES) /             2215.0                2954.0                3862.0                5112.0                6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /      1.73944 (255,11)      1.40975 (225,19)      1.25501 (332, 9)      1.16996 (332, 9)      1.08168 (332, 9)
      350.0 /      2.48269 (225, 8)      2.05602 (225, 8)      1.61069 (225, 8)      1.23180 (225, 8)      1.05604 (225, 8)
      340.0 /      1.78766 (225, 8)      1.60947 ( 92, 9)      1.60414 ( 92, 9)      1.43266 ( 92, 9)      1.29476 ( 92, 9)
      330.0 /      1.64382 ( 75,12)      1.27357 (322,15)      1.01195 ( 65,24)       .92148 (247, 9)       .88092 (159, 1)
      320.0 /      1.65239 (281,10)      1.30909 (184, 8)      1.16892 (184, 8)      1.08972 (311,20)      1.05832 (311,20)
      310.0 /      1.65663 (219, 9)      1.45712 (219, 9)      1.54922 (311,15)      1.49222 (311,15)      1.39518 (311,15)
      300.0 /      1.73503 (185,10)      1.49870 (181, 8)      1.23928 (181, 8)       .98622 (181, 8)       .93084 (259, 8)
      290.0 /      1.71936 (192,17)      1.39202 (258,10)      1.07193 (258,10)       .91739 (182,21)       .86514 (  2, 4)
      280.0 /      1.71615 (180, 9)      1.60161 (175, 8)      1.41100 (175, 8)      1.14386 (175, 8)      1.08600 (193, 7)
      270.0 /      1.65367 (310, 9)      1.51960 (310, 9)      1.28884 (310, 9)      1.02222 (310, 9)       .90025 (203, 8)
      260.0 /      1.67207 (250,10)      1.46569 (250,10)      1.19568 (171,17)       .95263 (215, 7)       .96781 (215, 7)
      250.0 /      1.75570 (253,17)      1.43573 (326, 9)      1.56597 (287, 9)      1.53856 (287, 9)      1.44858 (287, 9)
      240.0 /      2.28065 (163, 7)      2.23583 (163, 7)      1.89128 (163, 7)      1.48547 (163, 7)      1.28500 (163, 7)
      230.0 /      1.70297 (191, 8)      1.43716 ( 50,11)      1.15892 ( 40,10)      1.08613 (288, 8)      1.05271 (288, 8)
      220.0 /      1.63743 (255,14)      1.41791 (325, 9)      1.18121 (216,17)       .94821 (287,16)       .87563 (283,20)
      210.0 /      1.95864 (  6, 9)      1.73392 (  6, 9)      1.41749 ( 44,13)      1.48212 ( 44,13)      1.43853 ( 44,13)
      200.0 /      1.74350 (251,16)      1.38476 (251,16)      1.17977 (364,20)      1.10054 (364,20)      1.01902 (364,20)
      190.0 /      1.52938 ( 28,13)      1.24959 ( 28,13)       .98419 (199, 8)       .92239 (357,10)       .88092 (214,21)
      180.0 /      1.64956 (236,10)      1.42739 ( 49,11)      1.39263 (348,22)      1.46085 (348,22)      1.42047 (348,22)
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      170.0 /       1.74386 (153,11)      1.39492 (153,11)      1.01895 (153,11)       .99223 (357,17)       .95840 (357,17)
      160.0 /       1.55284 (208,17)      1.35021 ( 55,10)      1.10095 (295,16)       .94987 (297,11)       .89448 (297,11)
      150.0 /       1.62850 (316,15)      1.41379 (204, 9)      1.20286 (204, 9)       .91296 (204, 9)       .86826 (297,10)
      140.0 /       1.66153 (273,16)      1.26129 (273,16)      1.03581 (137,19)       .92786 (137,19)       .85954 (258,19)
      130.0 /       1.69911 (151,12)      1.36285 (151,12)      1.40272 (309,13)      1.40939 (309,13)      1.34421 (309,13)
      120.0 /       1.57074 (215,17)      1.43346 (102,10)      1.23696 (102,10)       .93182 (102,10)       .86846 (204,19)
      110.0 /       2.38108 (309,15)      1.96992 (309,15)      1.56306 (309,15)      1.21642 (309,15)      1.05412 (309,15)
      100.0 /       1.64506 (195,17)      1.33342 ( 48,10)       .99351 (204,17)       .92661 (156,19)       .87543 ( 21,10)
       90.0 /       1.73944 (221,17)      1.45979 (144, 8)      1.12923 (144, 8)       .88387 (313,16)       .82014 ( 87, 9)
       80.0 /       1.71623 (169,18)      1.49004 (169,18)      1.39207 (255, 9)      1.18637 (255, 9)      1.04328 (255, 9)
       70.0 /       1.74386 (258,16)      1.48556 (221,12)      1.27501 (221,12)      1.10070 (357,16)      1.08214 (357,16)
       60.0 /       1.61409 (352,16)      1.44509 (247,17)      1.21783 (247,17)      1.28904 ( 92,10)      1.27092 ( 92,10)
       50.0 /       1.71615 (225,16)      1.56475 (297,12)      1.46058 (297,12)      1.25328 (297,12)      1.11462 (297,12)
       40.0 /       1.71008 (312,12)      1.50227 (232,10)      1.27547 (232,10)       .94989 (232,10)       .78480 (328,20)
       30.0 /       1.95307 (226, 8)      2.22765 (226, 8)      2.05973 (226, 8)      1.67645 (226, 8)      1.45656 (226, 8)
       20.0 /       1.70831 (259, 9)      1.39231 (259, 9)      1.07410 (259, 9)       .89432 (338,22)       .82279 (338,22)
       10.0 /       1.64971 (143, 8)      1.42251 (225,17)      1.20540 (225,17)       .89590 (225,17)       .84218 (339, 4)
1                                                                                                                       2ND HIGH
                                                                                                                         1-HR
                                                                                                                       SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                         * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                      * FROM ALL SOURCES *
                                                    * FOR THE RECEPTOR GRID *

                          * MAXIMUM VALUE EQUALS      2.99680 AND OCCURRED AT (     568.0,      20.0) *

    DIRECTION /                                                RANGE (METERS)
    (DEGREES) /              568.0                738.0                966.0               1306.0               1704.0
   - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /       2.97090 (239,12)      2.23791 (176,12)      2.00635 (157,13)      1.84759 (345,12)      1.81769 (255,11)
      350.0 /       2.91464 (248,11)      2.11477 (248,11)      2.14947 (119,14)      2.00303 (225, 8)      2.23371 (245, 9)
      340.0 /       2.72631 (112,13)      2.33054 (228,11)      2.12114 (318,14)      1.87879 ( 46,15)      1.78986 ( 96,17)
      330.0 /       2.72631 (112,13)      2.60132 (227,11)      2.11510 (121,12)      1.86614 (247,11)      1.76822 ( 75, 9)
      320.0 /       2.34294 (202,11)      2.11102 (178,12)      2.18337 (263,13)      1.86650 (185,14)      1.83592 (149, 8)
      310.0 /       2.88044 (223,13)      2.15539 (195,11)      2.18671 (194,11)      1.86999 (121,16)      1.76247 (140, 8)
      300.0 /       2.98466 (217,14)      2.41814 (195,11)      2.13172 (112,12)      1.97902 (261,13)      1.83766 (183, 9)
      290.0 /       2.90538 (214,12)      2.42409 (214,12)      2.14484 (230,11)      1.88955 (194,15)      1.81234 (171, 9)
      280.0 /       2.54151 (214,13)      2.33054 (191,12)      2.17319 (193,11)      1.86086 (202,10)      1.83626 (228, 9)
      270.0 /       2.94844 (190,14)      2.45890 (190,14)      2.14484 (283,15)      1.90388 (185, 9)      1.81500 (141, 7)
      260.0 /       2.97090 (217,12)      2.42409 (231,12)      2.13156 (249,11)      1.99995 (249,11)      1.84224 (249,10)
      250.0 /       2.97715 (147,12)      2.61570 (116,12)      2.18514 (251,11)      1.97593 (251,15)      1.84050 (212,15)
      240.0 /       2.96593 (154,11)      2.47072 (116,12)      2.15887 (274,12)      1.87951 (161,16)      1.86345 (252,17)
      230.0 /       2.78201 (192,11)      2.69521 (118,13)      2.19169 (250,12)      2.01909 (184, 9)      1.79850 (163,17)
      220.0 /       2.84600 (170,13)      2.44957 (166,11)      2.16670 (192,10)      2.00430 (162,16)      1.73935 (307,16)
      210.0 /       2.80088 (208,13)      2.48609 (253,13)      2.15126 (168,16)      1.94828 (190,13)      1.83294 (166,17)
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      200.0 /      2.55016 (118,12)     2.13428 (167,14)     2.21745 (199,11)     1.88444 (199,11)     1.73526 (299,11)
      190.0 /      2.86710 (118,12)     2.10181 (118,12)     2.08912 (298,12)     1.92094 (303,14)     1.62095 (165,16)
      180.0 /      2.23217 (167,13)     2.01700 (147,13)     2.13501 (147,13)     1.85174 (182,16)     1.76459 (182,16)
      170.0 /      1.30327 (101,14)     2.00220 (199,10)     2.12557 (199,10)     1.86342 (198,10)     1.80796 (181,14)
      160.0 /      2.25141 (116,11)     2.21301 (101,14)     2.09808 (233,14)     1.87035 (191,18)     1.83294 (240,10)
      150.0 /      2.50552 (125,13)     2.53948 (116,11)     2.08872 (272,14)     1.89599 (236,17)     1.71684 (269,17)
      140.0 /      2.32782 (160,12)     2.39709 (125,13)     2.11617 (227,16)     1.82186 (151,11)     1.84071 (151,11)
      130.0 /      2.52885 (226,14)     2.47391 (160,12)     2.06476 (181,10)     1.89411 (140,17)     1.77055 (151,12)
      120.0 /      2.66492 (188,11)     2.32062 (226,14)     1.94517 ( 72,13)     1.91799 ( 73,11)     1.77872 (215,17)
      110.0 /      2.23217 (163,12)     2.10669 (195,14)     1.98558 (180,14)     1.88935 (309,16)     1.94917 (309,16)
      100.0 /      2.49113 (230,13)     2.11697 (188,15)     2.19326 (173,12)     1.87876 (169,16)     1.78848 (229,17)
       90.0 /      2.86427 (198,12)     2.46824 (230,13)     2.16988 (229,14)     1.90682 (191,16)     1.81769 (221,17)
       80.0 /      2.69938 (198,12)     2.24640 (197,11)     2.19716 (197,13)     1.90388 (155, 9)     1.76902 (280,16)
       70.0 /      2.97546 (145,11)     2.47723 (188,13)     2.18514 (281,14)     1.91272 (174,14)     1.80249 (284,15)
       60.0 /      2.71219 (184,14)     2.34797 (109,11)     2.19716 (232,13)     1.98691 (232,11)     1.76755 (259,11)
       50.0 /      2.96342 (196,11)     2.31555 (235,11)     2.16028 (134,16)     1.90091 (256,15)     1.81582 (140,15)
       40.0 /      2.77120 (235,11)     2.31555 (235,11)     2.18017 (224, 9)     1.92512 (143, 9)     1.85327 (182,12)
       30.0 /      2.94844 (228,12)     2.44319 (235,12)     2.15593 (203,11)     1.93082 (255,13)     1.80507 ( 21,15)
       20.0 /      2.99680 (174,12)     2.31864 (191,14)     2.14931 (200,14)     1.92088 (317,12)     1.81600 (112,17)
       10.0 /      2.82783 (176,12)     2.07077 (223,14)     2.11617 (120,16)     1.82933 (123, 9)     1.69368 (172,18)
1                                                                                                                         2ND HIGH
                                                                                                                           1-HR
                                                                                                                          SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                              * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                                   * FROM ALL SOURCES *
                                                                * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      2.99680 AND OCCURRED AT (     568.0,      20.0) *

  DIRECTION /                                                  RANGE (METERS)
  (DEGREES) /              2215.0               2954.0               3862.0               5112.0               6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /      1.61485 (264, 9)     1.39274 (255,11)     1.19833 (225,19)     1.02549 (224, 7)     1.00959 (224, 7)
      350.0 /      1.95969 (245, 9)     1.53122 (245, 9)     1.28084 (223, 8)     1.03543 (223, 8)      .92458 (311,24)
      340.0 /      1.71138 ( 96,17)     1.47573 (231, 9)     1.32338 (203, 9)     1.12710 (203, 9)      .99356 (203, 9)
      330.0 /      1.57689 (322,15)     1.25305 ( 75,12)     1.00432 ( 65, 5)      .91205 ( 65,24)      .86439 (247, 9)
      320.0 /      1.64382 (149, 8)     1.28991 (246, 9)     1.10153 (311,17)     1.02165 (311,17)      .94103 (311,17)
      310.0 /      1.56955 (127, 8)     1.45142 (262,17)     1.24709 (262,17)      .93658 (262,17)      .85498 (130, 7)
      300.0 /      1.67532 (181, 8)     1.39055 (185,10)     1.05692 (327, 9)      .95017 (171, 8)      .90063 (  9, 9)
      290.0 /      1.61083 (248, 9)     1.37288 (192,17)     1.02000 (182,21)      .90881 (132,21)      .84924 (244,18)
      280.0 /      1.64966 (175, 8)     1.50041 (180, 9)     1.16731 (221, 9)     1.00807 (193, 7)      .99494 (175, 8)
      270.0 /      1.65087 (  1,14)     1.45390 (  1,14)     1.20052 (263,17)      .94587 (172, 2)      .88548 (310, 9)
      260.0 /      1.64650 (176, 9)     1.40499 (171,17)     1.15577 ( 73,10)      .94848 (330, 8)      .90509 (330, 8)
      250.0 /      1.65400 (326, 9)     1.40077 (253,17)     1.14727 (326, 9)      .96562 (335, 9)      .93546 (335, 9)
      240.0 /      1.69940 (197, 8)     1.49469 (197, 8)     1.20053 (176,18)     1.06182 (194, 7)     1.08856 (194, 7)
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     230.0 /     1.62984 (198, 9)     1.40014 ( 40,10)     1.13772 (351,19)      .95380 (351,19)      .87664 (148,18)
     220.0 /     1.62925 (325, 9)     1.37908 (216,17)     1.13495 (325, 9)      .93501 (161, 7)      .87172 (287,16)
     210.0 /     1.69040 ( 39, 9)     1.46062 ( 39, 9)     1.40694 (  6, 9)     1.09428 (  6, 9)     1.03564 (185, 7)
     200.0 /     1.64159 (148,16)     1.30568 (148,16)     1.00681 (251,16)      .90511 (190, 7)      .86045 (190, 7)
     190.0 /     1.38240 ( 13,12)     1.02263 (189,19)      .98031 (357,10)      .91294 (199, 8)      .85184 (357,10)
     180.0 /     1.60365 ( 49,11)     1.35015 (116, 9)     1.17759 (116, 9)      .93348 (116, 9)      .87232 ( 44, 9)
     170.0 /     1.60259 (321,16)     1.26621 (124,16)     1.00139 (364, 9)      .91106 (265,18)      .83570 (265,18)
     160.0 /     1.54640 (240,10)     1.30606 (295,16)     1.05127 ( 55,10)      .92780 (357,13)      .88305 (357,13)
     150.0 /     1.46691 (236,17)     1.32745 (316,15)     1.01986 (360,16)      .90991 (333, 1)      .85953 (160,19)
     140.0 /     1.56046 (151,11)     1.14360 (151,11)     1.02917 (169,20)      .89537 (169,20)      .83751 (137,19)
     130.0 /     1.62504 (347,16)     1.32569 (347,16)     1.00034 ( 44,17)      .91106 (279,18)      .86317 (100, 1)
     120.0 /     1.56516 (197,19)     1.18365 (201,17)      .95352 (204,19)      .92661 (204,19)      .81639 (332,22)
     110.0 /     1.76875 (309,16)     1.51586 (233,10)     1.21071 (227,18)      .95448 (207,22)      .90292 (177,16)
     100.0 /     1.64032 ( 48,10)     1.30739 (195,17)      .98808 (297,14)      .92613 ( 21,10)      .86846 (156,19)
      90.0 /     1.66144 (144, 8)     1.39274 (221,17)     1.01794 (221,17)      .86066 (222,18)      .78891 (313,16)
      80.0 /     1.63398 (258,17)     1.47873 (104,18)     1.26238 (104,18)      .94374 (104,18)      .86661 (137, 3)
      70.0 /     1.71936 (215,14)     1.39492 (258,16)     1.03291 (357,16)      .95722 (221,12)      .83396 (122,18)
      60.0 /     1.56233 ( 16,15)     1.26987 ( 31,13)     1.20193 ( 92,10)      .93953 (215,15)      .91136 (215,15)
      50.0 /     1.64506 (248,17)     1.50041 (225,16)     1.33178 (314, 9)     1.14343 (314, 9)     1.00882 (314, 9)
      40.0 /     1.64369 (182,12)     1.48794 (159,16)     1.26751 (159,16)      .94613 (159,16)      .77251 (232,10)
      30.0 /     1.69942 (173,10)     1.48080 (173,10)     1.13945 (173,10)      .92886 (338, 7)      .85676 (338, 7)
      20.0 /     1.55155 (  9,15)     1.25652 (245,10)      .99659 (245,10)      .88844 (362,18)      .81823 (362,18)
      10.0 /     1.40420 (225,17)     1.25579 (143, 8)      .99810 (105,12)      .89349 (339, 4)      .84137 (284,16)
1                                                                                                                  HIGH
                                                                                                                    3-HR
                                                                                                                   SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                             * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                     * FROM ALL SOURCES *
                                                  * FOR THE RECEPTOR GRID *

                          * MAXIMUM VALUE EQUALS      2.01281 AND OCCURRED AT (     966.0,     40.0) *

  DIRECTION /                                                RANGE (METERS)
  (DEGREES) /             568.0                738.0                966.0               1306.0               1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /     1.36625 (239, 4)     1.30032 (239, 4)     1.32860 (219, 5)     1.25625 (219, 5)      .99296 (219, 5)
     350.0 /     1.68923 (210, 5)     1.33075 (210, 5)     1.30217 (219, 5)     1.11047 (219, 5)      .91676 (156, 3)
     340.0 /     1.64680 (210, 5)     1.26795 (210, 5)     1.09209 (238, 5)     1.18628 (345, 5)     1.09446 (345, 5)
     330.0 /     1.09969 (121, 4)     1.73055 (121, 4)     1.86611 (121, 4)     1.73257 (247, 4)     1.49745 (247, 4)
     320.0 /     1.28909 (184, 4)     1.38790 (121, 4)     1.49638 (121, 4)     1.26802 ( 89, 5)     1.02331 (149, 3)
     310.0 /     1.17220 (121, 5)     1.74875 (121, 5)     1.81934 (121, 5)     1.56359 (336, 5)     1.42242 (336, 5)
     300.0 /     1.26757 (217, 5)     1.37400 (214, 5)     1.42668 (214, 5)     1.57550 (171, 4)     1.54488 (171, 4)
     290.0 /     1.35377 (117, 5)     1.44906 (117, 5)     1.56451 (213, 4)     1.57876 (213, 4)     1.33048 (213, 4)
     280.0 /     1.14141 (117, 5)     1.52324 (148, 4)     1.70433 (148, 4)     1.50400 (148, 4)     1.19583 (211, 3)
     270.0 /     1.81400 (231, 4)     1.41167 (231, 4)     1.18248 (162, 4)     1.19328 (326, 5)     1.09446 (326, 5)
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      260.0 /      1.86832 (231, 4)      1.66113 (111, 4)      1.50168 (111, 4)      1.45577 (301, 5)      1.33151 (301, 5)
      250.0 /      1.51319 (215, 4)      1.44191 (191, 4)      1.63923 (251, 5)      1.69234 (251, 5)      1.43899 (251, 5)
      240.0 /      1.21985 (192, 5)      1.47861 (161, 5)      1.78414 (161, 5)      1.74197 (289, 4)      1.66031 (289, 4)
      230.0 /      1.47853 (190, 4)      1.55983 (192, 4)      1.37487 (192, 4)      1.30029 (250, 4)      1.16613 (325, 4)
      220.0 /      1.61307 (190, 4)      1.86144 (192, 4)      1.78378 (126, 5)      1.48339 (126, 5)      1.16912 (162, 6)
      210.0 /      1.42077 (190, 4)      1.50625 (190, 4)      1.16706 (190, 4)      1.24935 (270, 5)      1.18516 (270, 5)
      200.0 /      1.32631 (167, 5)      1.34198 (167, 5)      1.32081 (299, 5)      1.31069 (299, 4)      1.09160 (299, 4)
      190.0 /      1.33918 (167, 5)      1.36920 (106, 4)      1.40048 (106, 4)      1.08009 (106, 4)       .78966 ( 39, 4)
      180.0 /      1.11668 (106, 4)      1.69139 (106, 4)      1.76442 (106, 4)      1.57285 (265, 5)      1.25137 (265, 5)
      170.0 /       .89403 (181, 4)       .97440 (271, 5)      1.29686 (271, 5)      1.21899 (271, 5)      1.04513 (167, 6)
      160.0 /      1.32643 (101, 5)      1.28612 (101, 5)      1.16012 ( 61, 4)      1.37024 ( 61, 4)      1.24563 ( 61, 4)
      150.0 /      1.43690 (101, 5)      1.39961 (101, 5)      1.21589 (236, 6)      1.21822 (272, 5)      1.04761 (272, 5)
      140.0 /      1.07133 (226, 5)      1.30103 (226, 5)      1.13546 (208, 4)      1.18231 (208, 4)       .99483 (208, 4)
      130.0 /      1.21044 (226, 5)      1.39861 (226, 5)      1.01766 (226, 5)      1.14909 ( 81, 6)      1.09462 ( 81, 6)
      120.0 /       .99930C(163, 4)       .93659 (195, 5)      1.10662 ( 72, 5)      1.15616 ( 72, 5)       .96263 ( 72, 5)
      110.0 /       .97752 (102, 5)      1.40292 (102, 5)      1.40713 (102, 5)      1.25891 (309, 5)      1.41362 (309, 5)
      100.0 /       .94958 (223, 4)      1.32634 (102, 5)      1.34715 (102, 5)      1.46544 (206, 4)      1.28271 (206, 4)
       90.0 /      1.29982 (191, 5)      1.55448 (191, 5)      1.52004 (278, 5)      1.84575 (278, 5)      1.70694 (278, 5)
       80.0 /      1.68460 (197, 5)      1.88060 (197, 5)      1.98871 (111, 5)      1.67180 (111, 5)      1.21646 (111, 5)
       70.0 /      1.96122 (188, 5)      1.68276 (249, 5)      1.89316 (249, 5)      1.58313 (137, 3)      1.51996 (137, 3)
       60.0 /      1.64296 (188, 5)      1.50360 (163, 5)      1.58645 (163, 5)      1.25335 (163, 5)      1.16326 (259, 4)
       50.0 /      1.44017 (235, 4)      1.62529 (242, 5)      1.61798 (242, 5)      1.23006 (242, 5)      1.17249 (219, 6)
       40.0 /      1.77090 (235, 4)      1.90450 (248, 5)      2.01281 (248, 5)      1.69724 (339, 5)      1.57305 (339, 5)
       30.0 /      1.94380 (222, 5)      1.41505 (222, 5)      1.36178 (128, 5)      1.22156 (123, 4)       .99324 (123, 4)
       20.0 /      1.29062 (222, 5)      1.28054 (143, 5)      1.38561 (200, 5)      1.40013 (245, 4)      1.31433 (245, 4)
       10.0 /      1.20661 (239, 4)      1.18642 (239, 4)      1.28285 (157, 4)      1.16385 (157, 4)       .93629 (319, 5)
1                                                                                                                           HIGH
                                                                                                                             3-HR
                                                                                                                            SGROUP#  1
                                *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                               * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                         * FROM ALL SOURCES *
                                                      * FOR THE RECEPTOR GRID *

                            * MAXIMUM VALUE EQUALS      2.01281 AND OCCURRED AT (      966.0,      40.0) *

  DIRECTION /                                                      RANGE (METERS)
  (DEGREES) /                 2215.0                2954.0                3862.0                5112.0                6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /       .74839 (  2, 4)       .59245C(225, 7)       .55972C(225, 7)       .47886C(225, 7)       .42528C(225, 7)
      350.0 /       .91396 (156, 3)       .81461 ( 37, 1)       .72411 (311, 8)       .73925 (311, 8)       .72006 (311, 8)
      340.0 /       .87345 (345, 5)       .85581 (328, 2)       .80816 (328, 2)       .68881 (328, 2)       .60699 (328, 2)
      330.0 /      1.15406 (247, 4)       .79230 (247, 4)       .63411 (103, 6)       .51901 (220, 6)       .49407 (220, 6)
      320.0 /      1.01570 (324, 3)       .93509 (324, 3)       .79286 (324, 3)       .65637 ( 65, 1)       .57445 (105, 1)
      310.0 /      1.12101 (336, 5)       .77698 (336, 5)       .61310 ( 64, 6)       .52352 ( 96, 3)       .47783 (210, 7)
      300.0 /      1.31488 (171, 4)       .97436 (171, 4)       .68060 (171, 4)       .57254 (361, 8)       .52430 (348, 1)
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    290.0 /      1.00397 (213, 4)      .68278 (171, 1)      .75601 (171, 1)      .73955 (171, 1)      .69924 (171, 1)
    280.0 /       .98816 (211, 3)      .72777 ( 51, 5)      .58407 ( 47, 6)      .51226 ( 47, 6)      .46813 (179, 3)
    270.0 /       .86923 (326, 5)      .71773 (304, 6)      .65958 (304, 6)      .55003 (304, 6)      .49706 ( 25, 4)
    260.0 /      1.05251 (301, 5)      .81789 (267, 6)      .74360 (267, 6)      .61480 (267, 6)      .53430 (267, 6)
    250.0 /      1.13498 (253, 6)      .90340 (253, 6)      .73943 ( 19, 3)      .68224 (  8, 3)      .63018 (  8, 3)
    240.0 /      1.35167 (289, 4)      .96094 (289, 4)      .74090 (266, 6)      .64775 (353, 3)      .58919 (353, 3)
    230.0 /      1.07169 (325, 4)      .93251 (354, 7)      .89334 (354, 7)      .77081 (354, 7)      .68346 (354, 7)
    220.0 /       .92520 (162, 6)      .76944 (316, 3)      .76925 (316, 3)      .68681 (316, 3)      .61824 (316, 3)
    210.0 /      1.33858 (313, 4)     1.38732 (313, 4)     1.19424 (313, 4)      .89737 (313, 4)      .73166 (313, 4)
    200.0 /       .98753 (329, 4)      .89585 (329, 4)      .75074 (329, 4)      .63058 (  5, 3)      .57460 (  5, 3)
    190.0 /       .78671 (364, 8)      .84248 (364, 8)      .78033 (364, 8)      .66324 (364, 8)      .58995 (364, 8)
    180.0 /       .90640 (265, 5)      .70749 (348, 8)      .79633 (348, 8)      .79762 (348, 8)      .76404 (348, 8)
    170.0 /       .82275 (167, 6)      .73685 (364, 3)      .70517 (364, 3)      .62599 (364, 3)      .56860 (364, 3)
    160.0 /       .98119 ( 61, 4)      .68170 (299, 6)      .66361 (299, 6)      .58304 (299, 6)      .52305 (299, 6)
    150.0 /       .77924 (272, 5)      .50924 (236, 6)      .47737 (346, 7)      .42348 (346, 7)      .40255 (315, 6)
    140.0 /       .73297 (208, 4)      .72191 ( 38, 6)      .66586 ( 38, 6)      .55588 ( 38, 6)      .48475 ( 38, 6)
    130.0 /       .89183 ( 81, 6)      .63513 ( 81, 6)      .51621 ( 80, 2)      .46989 (309, 5)      .44813 (309, 5)
    120.0 /       .72269 ( 80, 6)      .67382 ( 80, 6)      .56542 ( 80, 6)      .49641 (204, 7)      .48757 (204, 7)
    110.0 /      1.33215 (309, 5)     1.09164 (309, 5)      .86038 (309, 5)      .69404 (340, 7)      .62834 (340, 7)
    100.0 /       .98452 (206, 4)      .86422 ( 77, 4)      .75900 ( 77, 4)      .61128 ( 77, 4)      .52533 ( 77, 4)
     90.0 /      1.36374 (278, 5)      .95803 (278, 5)      .68693 ( 60, 1)      .53607 ( 60, 1)      .45443 ( 60, 1)
     80.0 /      1.01545 (169, 6)      .82357 (169, 6)      .60740 (169, 6)      .50393C(255, 3)      .46161C(255, 3)
     70.0 /      1.25854 (137, 3)      .91400 (137, 3)      .64450 (137, 3)      .56618 ( 59, 7)      .50647 ( 59, 7)
     60.0 /       .93510 (259, 4)      .66002 (259, 4)      .59782 (108, 7)      .59764 (206, 1)      .58737 (206, 1)
     50.0 /      1.05316 (219, 6)      .87910 (219, 6)      .70840 (219, 6)      .58678 ( 86, 4)      .53781 ( 86, 4)
     40.0 /      1.25699 (339, 5)      .88170 (339, 5)      .63488 ( 73, 5)      .50506 ( 53, 6)      .46434 (312, 6)
     30.0 /       .84269 (123, 6)      .82997 (328, 6)      .74788 (328, 6)      .65738 (327, 6)      .62263 (327, 6)
     20.0 /      1.10140 (245, 4)      .84948 (245, 4)      .65214 (245, 4)      .51946 (158, 6)      .46933 (338, 8)
     10.0 /       .74278 (319, 5)      .64585 ( 79, 7)      .58521 ( 79, 7)      .48419 ( 79, 7)      .43956 (340, 1)
1                                                                                                                     2ND HIGH
                                                                                                                       3-HR
                                                                                                                      SGROUP#  1
                                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983    ***


                                * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                        * FROM ALL SOURCES *
                                                      * FOR THE RECEPTOR GRID *

                                 * MAXIMUM VALUE EQUALS      1.76861 AND OCCURRED AT (     738.0,      80.0) *

  DIRECTION /                                                 RANGE (METERS)
  (DEGREES) /              568.0               738.0               966.0               1306.0               1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      1.07546 (210, 5)     1.05105 (234, 5)      .99488 (239, 4)     1.03988C(220, 4)      .94321 (  2, 4)
    350.0 /       .97155 (248, 4)     1.11347 (219, 5)     1.09832 ( 79, 4)     1.04146C(220, 4)      .87332C(220, 4)
    340.0 /       .90880 (112, 5)      .91975 (238, 5)      .98329 (345, 5)     1.05072 (179, 5)      .92709 (179, 5)
    330.0 /       .99829 (210, 5)     1.41926 (238, 5)     1.66772 (247, 4)     1.55686 (285, 4)     1.24962 (285, 4)
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   320.0 /       .88989 (212, 4)      1.26495 (212, 4)      1.36799 ( 89, 5)      1.20061 (121, 4)      1.01008 ( 89, 5)
   310.0 /      1.02745 (184, 4)      1.43947 ( 82, 5)      1.62889 ( 82, 5)      1.55627 (211, 4)      1.34520 (211, 4)
   300.0 /      1.16301 (230, 4)      1.26742 ( 82, 5)      1.41579 ( 82, 5)      1.21723 ( 91, 4)      1.11092 (185, 4)
   290.0 /      1.17740 (214, 4)      1.21643 (214, 5)      1.47675 (193, 4)      1.35639 (193, 4)      1.03651 (193, 4)
   280.0 /      1.07824 (214, 4)      1.18943 (214, 4)      1.31517 (117, 4)      1.23830 (211, 3)      1.16542 (148, 4)
   270.0 /      1.39327 (170, 5)      1.33944 (170, 5)      1.10407 (326, 4)      1.10980 (301, 4)      1.00847 (282, 4)
   260.0 /      1.60364 (215, 4)      1.56043 (215, 4)      1.25702 (162, 4)      1.23422 (249, 4)      1.12685 (249, 4)
   250.0 /      1.41660 (191, 4)      1.40695 (215, 4)      1.59619 (251, 4)      1.50331 (251, 4)      1.35009 (306, 5)
   240.0 /      1.08493 (215, 4)      1.29492 (277, 4)      1.51201 (277, 4)      1.61532 (161, 5)      1.24878 (161, 5)
   230.0 /      1.43591 (192, 4)      1.47355 (118, 5)      1.35545 (250, 4)      1.15559 (162, 6)      1.13348 (189, 5)
   220.0 /      1.60362 (192, 4)      1.57764 (126, 5)      1.73843 (192, 4)      1.39541 (300, 4)      1.07376 (300, 4)
   210.0 /      1.13889 (208, 5)      1.02544 (208, 5)      1.12105 (126, 5)      1.14320 ( 24, 4)      1.02076 (313, 4)
   200.0 /      1.30475 (208, 5)      1.31836 (208, 5)      1.30374 (299, 4)      1.10235 (299, 5)       .98216 (329, 4)
   190.0 /       .95570 (118, 4)      1.20526 (167, 4)      1.16051 (167, 4)       .90886 (125, 4)       .76313 (341, 4)
   180.0 /       .94867 (181, 4)      1.41292 (265, 5)      1.69778 (265, 5)      1.38916 (106, 4)       .97188 (106, 4)
   170.0 /       .60244 (265, 5)       .95243 (265, 5)      1.02964 (265, 5)      1.15285 (167, 6)       .93624 (271, 5)
   160.0 /       .75273 (116, 4)       .85082 (116, 4)      1.02667 (100, 5)      1.23555 (208, 6)      1.16037 (208, 6)
   150.0 /       .83519 (125, 5)       .94587 (236, 6)      1.10332 (272, 5)      1.20740 (236, 6)      1.00800 (236, 6)
   140.0 /       .94068 (125, 5)       .83189 (271, 4)      1.02624 (226, 5)       .97372 (107, 5)       .85266 (107, 5)
   130.0 /       .98520 (160, 4)       .82464 (160, 4)       .90161 ( 81, 6)       .91483 (100, 4)       .81665 (100, 4)
   120.0 /       .88831C(188, 4)       .86807 (226, 5)       .94262 (116, 6)       .96689 (116, 6)       .87835 (153, 6)
   110.0 /       .94261C(188, 4)      1.17669 (180, 5)      1.26196 (180, 5)      1.15825 (183, 6)      1.07135 (183, 6)
   100.0 /       .90491 (102, 5)      1.17393 (280, 5)      1.33653 (173, 5)      1.19643 (279, 5)      1.05429 (279, 5)
    90.0 /      1.17748 (197, 5)      1.32225 (173, 5)      1.38323 (173, 5)      1.47209 (207, 4)      1.27764 (207, 4)
    80.0 /      1.50835 (222, 4)      1.76861 (111, 5)      1.67918 (197, 5)      1.23822 (197, 5)      1.10169 ( 78, 4)
    70.0 /      1.49729 (222, 4)      1.64803 (163, 5)      1.74070 (163, 5)      1.57090 (249, 5)      1.16844 (174, 5)
    60.0 /      1.03063 (258, 5)      1.42719 (146, 4)      1.42037 (146, 4)      1.24686 (259, 4)       .97394 (156, 4)
    50.0 /      1.14099 (242, 5)      1.34394 (235, 4)      1.41011 (242, 4)      1.18207 (156, 4)       .97102 (256, 5)
    40.0 /      1.68267 (222, 5)      1.68487 (235, 4)      1.65066 (128, 5)      1.59897 (248, 5)      1.22052 (172, 5)
    30.0 /      1.24898 (235, 4)      1.23951 (235, 4)      1.27230 (123, 4)      1.17146 (128, 5)       .92523 (197, 4)
    20.0 /      1.00103 (154, 4)      1.24449 (149, 4)      1.23453 (143, 5)      1.16848 (245, 5)       .96379 (319, 4)
    10.0 /       .95105 (223, 5)      1.11810 (135, 5)      1.12758 (200, 5)      1.01959 (319, 5)       .90862 (157, 4)
1                                                                                                                   2ND HIGH
                                                                                                                     3-HR
                                                                                                                    SGROUP#  1
                                 *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                              * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                          * FROM ALL SOURCES *
                                                        * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      1.76861 AND OCCURRED AT (     738.0,      80.0) *

 DIRECTION /                                                     RANGE (METERS)
 (DEGREES) /            2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   360.0 /       .70826 (219, 5)       .58944 ( 76, 7)       .51134 ( 76, 7)       .40810 ( 76, 7)       .36056 (332, 3)
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  350.0 /      .82756 (225, 3)     .75870 (156, 3)     .71329 ( 37, 1)     .57280 ( 37, 1)     .49143 ( 37, 1)
  340.0 /      .77205 (328, 2)     .70973 ( 66, 1)     .65848 ( 66, 1)     .55410 ( 66, 2)     .49778 ( 66, 2)
  330.0 /      .90825 (285, 4)     .76102 (103, 6)     .58693 ( 33, 1)     .49240 (103, 6)     .42592 ( 65, 2)
  320.0 /      .90990 (149, 3)     .86320 ( 65, 1)     .78931 ( 65, 1)     .62677 (324, 3)     .57232 ( 65, 1)
  310.0 /     1.02636 (211, 4)     .69645 (211, 4)     .60051 ( 96, 3)     .50777 ( 64, 6)     .46630 ( 96, 3)
  300.0 /      .92927 (185, 4)     .68117 (185, 4)     .64646 (361, 8)     .55521 (348, 1)     .51425 (361, 8)
  290.0 /      .79883 (130, 4)     .67669 (213, 4)     .60190 (331, 2)     .56072 (331, 2)     .51486 (331, 2)
  280.0 /      .96069 (261, 4)     .71553 (211, 3)     .57913 ( 51, 5)     .51185 (179, 3)     .46594 ( 47, 6)
  270.0 /      .84621 (282, 4)     .66205 (335, 4)     .56945 (172, 1)     .53114 ( 25, 4)     .48151 (172, 1)
  260.0 /      .90007 (249, 4)     .73054 (301, 5)     .58421 (209, 6)     .51047 (275, 3)     .47844 (275, 3)
  250.0 /     1.11966 (306, 5)     .80697 (306, 5)     .72413 (  8, 3)     .67368 ( 19, 3)     .61197 ( 19, 3)
  240.0 /     1.05370 (181, 6)     .88754 (163, 3)     .72438 (163, 3)     .61338 (266, 6)     .54292 (335, 6)
  230.0 /      .97582 (189, 5)     .89573 (325, 4)     .72324 (325, 4)     .59096 (351, 7)     .52825 (351, 7)
  220.0 /      .79259 (190, 3)     .69513 (270, 6)     .70393 (353, 1)     .66209 (353, 1)     .61129 (353, 1)
  210.0 /      .96170 (270, 5)     .68215 (270, 5)     .55576 (270, 2)     .51695 (270, 2)     .47951 ( 44, 5)
  200.0 /      .81451 (299, 4)     .66236 (  5, 3)     .68675 (  5, 3)     .58755 (329, 4)     .50450 (  8, 1)
  190.0 /      .61819 ( 39, 4)     .61188 (359, 3)     .55614 (359, 3)     .46875 (316, 1)     .41512 (316, 1)
  180.0 /      .80873 ( 35, 4)     .65746 (364, 2)     .59796 (364, 2)     .50741 (364, 2)     .45336 (364, 2)
  170.0 /      .72680 (265, 4)     .63761 (153, 4)     .61091 (349, 6)     .55459 (349, 6)     .50347 (349, 6)
  160.0 /      .93909 (208, 6)     .67931 ( 61, 4)     .60132 (  3, 6)     .50663 (  3, 6)     .46264 ( 24, 6)
  150.0 /      .75693 (236, 6)     .50654 (272, 5)     .43528 (  3, 3)     .41923 (315, 6)     .37985 (346, 7)
  140.0 /      .68077 ( 81, 5)     .64779 ( 23, 5)     .59297 ( 23, 5)     .49455 ( 81, 1)     .43727 (320, 6)
  130.0 /      .66512 (151, 4)     .57579 ( 70, 3)     .50705 ( 70, 3)     .44436 (100, 1)     .41086 (100, 1)
  120.0 /      .71334 (153, 6)     .63080 ( 69, 7)     .55228 (114, 7)     .45971 ( 40, 6)     .43124 ( 40, 6)
  110.0 /      .85489 (183, 6)     .75343 (340, 7)     .76698 (340, 7)     .66487 (309, 5)     .57373 (309, 5)
  100.0 /      .86858 ( 77, 4)     .74042 ( 77, 6)     .65544 ( 77, 6)     .52977 ( 77, 6)     .45542 ( 77, 6)
   90.0 /      .97580 (207, 4)     .81552 ( 60, 1)     .64795 (278, 5)     .49493 ( 28, 6)     .43839 ( 28, 6)
   80.0 /      .89145 ( 78, 4)     .69949 (205, 6)     .60058 (143, 6)     .50320 (143, 6)     .44020 (143, 6)
   70.0 /      .95182 (174, 5)     .71119 (122, 6)     .64431 ( 59, 7)     .51417 (256, 6)     .49807 (  8, 6)
   60.0 /      .77326 (144, 3)     .65861 (108, 7)     .56716 (206, 1)     .57737 ( 27, 6)     .57889 ( 27, 6)
   50.0 /      .79010 (256, 5)     .70452 (312, 5)     .64287 ( 86, 4)     .54545 (219, 6)     .46266 (219, 6)
   40.0 /     1.09682 ( 73, 5)     .87118 ( 73, 5)     .59479 (339, 5)     .48216 (312, 6)     .44585 ( 53, 6)
   30.0 /      .79974 (328, 6)     .82714 (123, 6)     .73758 (226, 3)     .61314 (328, 6)     .53054 (328, 6)
   20.0 /      .76500 (319, 4)     .69060 (158, 6)     .62815 (158, 6)     .51806 (338, 8)     .45153 (158, 6)
   10.0 /      .73140 ( 76, 3)     .63555 ( 76, 3)     .51938 ( 76, 3)     .44039 (340, 1)     .42157 ( 79, 7)
1                                                                                                          HIGH
                                                                                                            8-HR
                                                                                                           SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***

                             * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                           * MAXIMUM VALUE EQUALS      1.23560 AND OCCURRED AT (     966.0,      50.0) *

 DIRECTION /                                             RANGE (METERS)
 (DEGREES) /              568.0              738.0              966.0              1306.0              1704.0
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 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .51234 (239, 2)      .69317 (157, 2)      .68424 (157, 2)      .52785 (157, 2)      .43758 (  2, 2)
    350.0 /       .73510 (210, 2)      .67548 (210, 2)      .68740 (219, 2)      .59833 (219, 2)      .47908C(218, 2)
    340.0 /       .74622 (210, 2)      .70017 (210, 2)      .60283 (179, 2)      .58439 (179, 2)      .47894 (179, 2)
    330.0 /       .49821C(188, 2)      .74331 (121, 2)      .86344 (247, 2)      .85590 (247, 2)      .73491 (247, 2)
    320.0 /       .67877 (121, 2)     1.04758 (121, 2)     1.10909 (121, 2)      .87720 (121, 2)      .69893 (103, 2)
    310.0 /       .68173 (121, 2)     1.08319 (121, 2)     1.20222 (121, 2)     1.01657 (121, 2)      .75227 (121, 2)
    300.0 /       .79890 (214, 2)     1.01123 (214, 2)      .92314 (214, 2)      .76236C(171, 2)      .75705C(171, 2)
    290.0 /       .93550 (214, 2)     1.11156 (214, 2)      .93639 (214, 2)      .78628 (193, 2)      .58721 (193, 2)
    280.0 /       .81612 (214, 2)      .96559 (214, 2)     1.01365 (193, 2)      .86586 (193, 2)      .74331 (261, 2)
    270.0 /       .94575 (170, 2)      .90392 (170, 2)      .82413 (326, 2)      .90444 (326, 2)      .79997 (326, 2)
    260.0 /       .72125 (170, 2)      .67684 (170, 2)      .87524 (274, 2)      .88124 (274, 2)      .73517 (274, 2)
    250.0 /       .65667 (191, 2)      .95039 (251, 2)     1.21328 (251, 2)     1.19837 (251, 2)     1.05993 (293, 2)
    240.0 /       .69484 (192, 2)      .93423 (161, 2)     1.19313 (161, 2)     1.17221 (289, 2)     1.11853 (289, 2)
    230.0 /       .96504 (192, 2)     1.00600 (192, 2)      .85526 (192, 2)      .77023 (294, 2)      .73963 (189, 2)
    220.0 /       .86297 (192, 2)     1.01515 (192, 2)      .95241 (192, 2)      .90830 (300, 2)      .76911 (300, 2)
    210.0 /       .64982 (190, 2)      .82113 (190, 2)      .83538 (300, 2)      .92496 (300, 2)      .81634 (300, 2)
    200.0 /       .82015 (167, 2)      .95254 (167, 2)      .98531 (299, 2)      .90659 (299, 2)      .70961 (299, 2)
    190.0 /       .83525 (167, 2)      .89233 (167, 2)      .73722 (167, 2)      .62393 (166, 2)      .59602 (341, 2)
    180.0 /       .54512 (167, 2)      .65839 (147, 2)      .86758 (147, 2)      .84776 (147, 2)      .68701 (147, 2)
    170.0 /       .41104C(181, 2)      .47985 (265, 2)      .62520 (265, 2)      .64651 (265, 2)      .57952 (265, 2)
    160.0 /       .64057 (101, 2)      .81168 (101, 2)      .82538 (101, 2)      .72000 (101, 2)      .57004 (101, 2)
    150.0 /       .57401 (101, 2)      .60893 (101, 2)      .49574 (101, 2)      .50133 (115, 2)      .43839 (115, 2)
    140.0 /       .40638 (226, 2)      .49916 (226, 2)      .51331 ( 81, 2)      .54379 ( 81, 2)      .46922 ( 81, 2)
    130.0 /       .49323 (226, 2)      .62929 (226, 2)      .55781 (226, 2)      .68651C( 42, 2)      .64025C( 42, 2)
    120.0 /       .47660C(188, 2)      .43024C(188, 2)      .52665C( 42, 2)      .65186C( 42, 2)      .60772C( 42, 2)
    110.0 /       .66882C(188, 2)      .74543C(188, 2)      .67114C(188, 2)      .70826 (309, 2)      .77375 (309, 2)
    100.0 /       .56715C(188, 2)      .67787 (152, 2)      .78616 (173, 2)      .83348 (206, 2)      .73645 (206, 2)
     90.0 /       .64578 (197, 2)      .71797C(278, 2)     1.04655C(278, 2)     1.12112C(278, 2)      .96699C(278, 2)
     80.0 /       .97363 (197, 2)     1.00045 (197, 2)     1.01105 (111, 2)      .84086 (111, 2)      .60811 (111, 2)
     70.0 /       .98069C(188, 2)      .83110 (197, 2)      .80689 (137, 2)      .62053 (137, 2)      .56019 (221, 2)
     60.0 /       .82148C(188, 2)      .80309 (242, 2)      .88147 (242, 2)      .74489 (242, 2)      .55370 (242, 2)
     50.0 /       .78925 (235, 2)     1.16734 (242, 2)     1.23560 (242, 2)      .99842 (242, 2)      .71548 (242, 2)
     40.0 /       .78897 (235, 2)      .82232 (235, 2)      .82139 (248, 2)      .66193 (296, 2)      .61096 (296, 2)
     30.0 /       .72912 (222, 2)      .93183 (149, 2)      .92441 (149, 2)      .70775 (149, 2)      .52749C(245, 2)
     20.0 /       .52153 (143, 2)      .77979 (143, 2)     1.01082C(245, 2)     1.10084C(245, 2)      .97059C(245, 2)
     10.0 /       .45250 (239, 2)      .58142 (143, 2)      .63760 (157, 2)      .54791 (157, 2)      .51558 (319, 2)
1                                                                                                                   HIGH
                                                                                                                     8-HR
                                                                                                                    SGROUP#  1
                                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                                        * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                         * FROM ALL SOURCES *
                                                       * FOR THE RECEPTOR GRID *

                                     * MAXIMUM VALUE EQUALS      1.23560 AND OCCURRED AT (     966.0,      50.0) *
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 DIRECTION /                                            RANGE (METERS)
 (DEGREES) /          2215.0              2954.0              3862.0              5112.0              6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      .37441 (  2, 2)     .32614C(225, 3)     .29733C(225, 3)     .24765 (332, 2)     .22468 (332, 2)
     350.0 /      .39170C(156, 1)     .32516C(156, 1)     .27154 (311, 3)     .27722 (311, 3)     .27002 (311, 3)
     340.0 /      .44095 ( 66, 1)     .50039 ( 66, 1)     .48043 ( 66, 1)     .41491 ( 66, 1)     .36772 ( 66, 1)
     330.0 /      .59012 (247, 2)     .44932 (247, 2)     .34234 (247, 2)     .28172 (362, 1)     .25266 (362, 1)
     320.0 /      .57990 (324, 1)     .66280 (324, 1)     .63836 (324, 1)     .55211 (324, 1)     .48953 (324, 1)
     310.0 /      .51271 (121, 2)     .40739 ( 96, 2)     .35920 ( 64, 3)     .29465 ( 64, 3)     .26776 (311, 2)
     300.0 /      .65960C(171, 2)     .51275C(171, 2)     .50664 (361, 3)     .47522 (361, 3)     .44138 (361, 3)
     290.0 /      .43465 (361, 2)     .35402 (331, 1)     .37539 (331, 1)     .35872 (171, 1)     .33577 (171, 1)
     280.0 /      .60681 (261, 2)     .48653 ( 51, 2)     .41171 ( 51, 2)     .34165 (179, 1)     .32536 (179, 1)
     270.0 /      .62875 (326, 2)     .44938 (326, 2)     .33257 (138, 1)     .28655C(263, 3)     .26551C(263, 3)
     260.0 /      .54774 (274, 2)     .37652 (301, 2)     .28427 (150, 3)     .28037 (150, 3)     .26567 (150, 3)
     250.0 /      .89923 (293, 2)     .68548 (293, 2)     .50541 (293, 2)     .36682 (287, 2)     .33538 (287, 2)
     240.0 /      .92573 (289, 2)     .67867 (289, 2)     .47740 (289, 2)     .35803 (353, 3)     .32697 (353, 3)
     230.0 /      .62554 (325, 2)     .53038 (354, 3)     .51553 (354, 3)     .44962 (354, 3)     .40036 (354, 3)
     220.0 /      .57963 (300, 2)     .41142 (  7, 2)     .32263 (  5, 1)     .28924 (  5, 1)     .26067 (  5, 1)
     210.0 /      .63008 (300, 2)     .52025 (313, 2)     .44784 (313, 2)     .33651 (313, 2)     .27437 (313, 2)
     200.0 /      .60224 (341, 2)     .49043 (334, 1)     .50575 (334, 1)     .46288 (334, 1)     .42142 (334, 1)
     190.0 /      .51350 (341, 2)     .49685 (359, 1)     .45235 (359, 1)     .37465 (359, 1)     .32600 (359, 1)
     180.0 /      .50039 (147, 2)     .51593 (364, 1)     .47173 (364, 1)     .39979 (364, 1)     .35612 (364, 1)
     170.0 /      .48253 (265, 2)     .37248 (265, 2)     .38641 ( 42, 3)     .36057 ( 42, 3)     .33272 ( 42, 3)
     160.0 /      .42154 (101, 2)     .42881 (  3, 3)     .40823 (  3, 3)     .35048 (  3, 3)     .31000 (  3, 3)
     150.0 /      .35855 (  3, 2)     .39672 (  3, 2)     .37561 (  3, 2)     .32161 (  3, 2)     .28420 (  3, 2)
     140.0 /      .35754 ( 81, 2)     .30837 ( 23, 2)     .28451 ( 23, 2)     .23800 ( 23, 2)     .23135 (347, 1)
     130.0 /      .51160C( 42, 2)     .43770 (347, 2)     .35529 (347, 2)     .26730 (347, 2)     .26617C(101, 1)
     120.0 /      .48572C( 42, 2)     .42282 (114, 3)     .37938 (114, 3)     .31037 (114, 3)     .26845 (114, 3)
     110.0 /      .72065 (309, 2)     .58853 (309, 2)     .46390 (309, 2)     .35874 (309, 2)     .31557 (340, 3)
     100.0 /      .74385 ( 77, 2)     .70685 ( 77, 2)     .60460 ( 77, 2)     .47718 ( 77, 2)     .40615 ( 77, 2)
      90.0 /      .73786C(278, 2)     .50095C(278, 2)     .40455 ( 60, 1)     .31275 ( 60, 1)     .26353 ( 60, 1)
      80.0 /      .40552C(280, 2)     .32255C(143, 3)     .29845C(143, 3)     .25042C(143, 3)     .21922C(143, 3)
      70.0 /      .53562 (221, 2)     .44116 (221, 2)     .33252 (221, 2)     .27463 ( 59, 3)     .24248 ( 59, 3)
      60.0 /      .37982 (242, 2)     .29722 (108, 3)     .26622 (108, 3)     .22618 ( 33, 3)     .22027 (206, 1)
      50.0 /      .50449 (312, 2)     .46298 (312, 2)     .38774 (312, 2)     .30916 (312, 2)     .26875 (312, 2)
      40.0 /      .49208 (296, 2)     .45226 (340, 2)     .41013 (340, 2)     .33740 (340, 2)     .29215 (340, 2)
      30.0 /      .49307 ( 98, 2)     .44512 ( 98, 2)     .37741 (345, 3)     .33633 (345, 3)     .30413 (345, 3)
      20.0 /      .77660C(245, 2)     .57884C(245, 2)     .46823 (338, 3)     .43259 (338, 3)     .39721 (338, 3)
      10.0 /      .43783 (319, 2)     .43956 ( 79, 3)     .39468 ( 79, 3)     .32351 ( 79, 3)     .28022 ( 79, 3)
1                                                                                                                2ND HIGH
                                                                                                                  8-HR
                                                                                                                SGROUP#  1
                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                     * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                * FROM ALL SOURCES *
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                                          * FOR THE RECEPTOR GRID *

                          * MAXIMUM VALUE EQUALS      1.16040 AND OCCURRED AT (    1306.0,     240.0) *

 DIRECTION /                                                    RANGE (METERS)
 (DEGREES) /          568.0               738.0               966.0               1306.0              1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .50727 (157, 2)     .51084 (219, 2)     .58558 (219, 2)     .52449 (219, 2)     .41021 (142, 2)
    350.0 /       .43914 (157, 2)     .57618 (219, 2)     .58874C(218, 2)     .58748C(218, 2)     .44079 (219, 2)
    340.0 /       .39383C(188, 2)     .48372 (179, 2)     .59208 (104, 2)     .57469 (104, 2)     .46085 (104, 2)
    330.0 /       .47860 (121, 2)     .68640 (247, 2)     .79066 (121, 2)     .72844 (103, 2)     .67496 ( 75, 2)
    320.0 /       .48341 (184, 2)     .68106 ( 89, 2)     .75378 ( 89, 2)     .76352 (103, 2)     .61000 (121, 2)
    310.0 /       .58386 ( 82, 2)     .75507 (127, 2)     .90608 (127, 2)     .83838 (127, 2)     .66417 (127, 2)
    300.0 /       .64171 ( 82, 2)     .74416 ( 82, 2)     .74060 (121, 2)     .67758 (214, 2)     .60008 (344, 2)
    290.0 /       .71016 (117, 2)     .87661 (117, 2)     .88251 (193, 2)     .72375 (194, 2)     .58140 (213, 2)
    280.0 /       .72521 (170, 2)     .87952 (193, 2)     .82258 (214, 2)     .78450 (261, 2)     .63227 (193, 2)
    270.0 /       .68025 (231, 2)     .71554 (193, 2)     .79150 (193, 2)     .76292 (131, 2)     .68147 (301, 2)
    260.0 /       .70062 (231, 2)     .65698 (274, 2)     .80365 (275, 2)     .79413 (275, 2)     .69514 (301, 2)
    250.0 /       .56745 (215, 2)     .76386 (191, 2)     .84959 (293, 2)    1.08913 (293, 2)    1.01942 (251, 2)
    240.0 /       .52664 (166, 2)     .62035 (126, 2)     .93563 (289, 2)    1.16040 (161, 2)     .96740 (306, 2)
    230.0 /       .71399 (166, 2)     .72037 (166, 2)     .75292 (250, 2)     .74551 (189, 2)     .70236 (325, 2)
    220.0 /       .73135 (166, 2)     .81588 (166, 2)     .88550 (300, 2)     .73327 (192, 2)     .63048 (307, 2)
    210.0 /       .54901 (166, 2)     .67364 (167, 2)     .80613 (190, 2)     .67598 (190, 2)     .61200 (270, 2)
    200.0 /       .50382 (208, 2)     .80352 (299, 2)     .84547 (167, 2)     .64929 (341, 2)     .66724 (341, 2)
    190.0 /       .36523 (166, 2)     .62515 (166, 2)     .72586 (166, 2)     .61450 (341, 2)     .45897 (166, 2)
    180.0 /       .42190 (106, 2)     .64034 (106, 2)     .66911 (106, 2)     .62222 (265, 2)     .50075 (265, 2)
    170.0 /       .30333 (101, 2)     .42171 (271, 2)     .51945 (271, 2)     .47078 (271, 2)     .47841 (321, 2)
    160.0 /       .28232 (116, 2)     .40029 (271, 2)     .53620 (298, 2)     .56046 (298, 2)     .49667 ( 61, 2)
    150.0 /       .31839 (271, 2)     .36714 (271, 2)     .45391 (115, 2)     .45840 (272, 2)     .39564 (298, 2)
    140.0 /       .35276 (125, 2)     .37066 ( 81, 2)     .44128 (106, 2)     .44716 (208, 2)     .37525 (208, 2)
    130.0 /       .44412 (160, 2)     .46432 (160, 2)     .55392C( 42, 2)     .58583 (100, 2)     .56652 (100, 2)
    120.0 /       .42827C(163, 2)     .38623 (226, 2)     .48740 ( 72, 2)     .54808 ( 72, 2)     .50051 ( 80, 2)
    110.0 /       .37304 (102, 2)     .54100 (102, 2)     .62965 (205, 2)     .59042 (205, 2)     .46937 (205, 2)
    100.0 /       .47367 (152, 2)     .67631 (173, 2)     .74484 (206, 2)     .79121 (308, 2)     .68665 (308, 2)
     90.0 /       .52297 (191, 2)     .68600 (191, 2)     .75076 (207, 2)     .86677 (207, 2)     .79899 (207, 2)
     80.0 /       .67239C(188, 2)     .95904 (137, 2)     .98665 (137, 2)     .77359 (137, 2)     .57117 (155, 2)
     70.0 /       .80382 (197, 2)     .79308 (137, 2)     .75788 (203, 2)     .59134 (203, 2)     .50076C(174, 2)
     60.0 /       .55291 (235, 2)     .72112 (232, 2)     .84250 (232, 2)     .72224 (232, 2)     .52884 (232, 2)
     50.0 /       .77039 (242, 2)     .88639 (235, 2)     .81549 (156, 2)     .67871 (156, 2)     .53702 (256, 2)
     40.0 /       .64019 (222, 2)     .77710 (248, 2)     .75314 (242, 2)     .64986 (248, 2)     .60171 (339, 2)
     30.0 /       .67090 (149, 2)     .68726 (128, 2)     .75518 (128, 2)     .63623C(245, 2)     .52139 (123, 2)
     20.0 /       .51991 (149, 2)     .69935 (149, 2)     .83977 (143, 2)     .70586 (143, 2)     .54688 (319, 2)
     10.0 /       .42050 (223, 2)     .57721 (157, 2)     .61823 (143, 2)     .53398 (319, 2)     .41377 (157, 2)
1                                                                                                          2ND HIGH
                                                                                                            8-HR
                                                                                                           SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***
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                         * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                      * FROM ALL SOURCES *
                                                   * FOR THE RECEPTOR GRID *

                          * MAXIMUM VALUE EQUALS      1.16040 AND OCCURRED AT (    1306.0,     240.0) *

DIRECTION /                                                    RANGE (METERS)
(DEGREES) /             2215.0                2954.0                3862.0                5112.0                6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


    360.0 /       .32663C(220, 2)       .30636 (  2, 2)       .28547C(172, 3)       .24630C(172, 3)       .21939C(172, 3)
    350.0 /       .34661C(218, 2)       .30674 ( 37, 1)       .26851 ( 37, 1)       .25086 (245, 1)       .24019 (245, 1)
    340.0 /       .40081 (328, 1)       .44018 (328, 1)       .41214 (328, 1)       .34811 (328, 1)       .30516 (328, 1)
    330.0 /       .57357 ( 75, 2)       .42056 ( 75, 2)       .32091 (362, 1)       .25483 (247, 2)       .22216 (105, 1)
    320.0 /       .56968 (103, 2)       .45035 ( 99, 1)       .46194 (105, 1)       .42445 (105, 1)       .38750 (105, 1)
    310.0 /       .47836 (127, 2)       .39787 ( 64, 3)       .33184 ( 96, 2)       .28864 (311, 2)       .25492C(130, 1)
    300.0 /       .52043 (344, 2)       .48636 ( 20, 3)       .45268 ( 20, 3)       .38133 ( 20, 3)       .33425 ( 20, 3)
    290.0 /       .43116 (213, 2)       .34402 (171, 1)       .37345 (171, 1)       .35265 (331, 1)       .32582 (331, 1)
    280.0 /       .52381 ( 51, 2)       .43239 (138, 2)       .35588 (138, 2)       .32279 ( 51, 2)       .27394 ( 51, 2)
    270.0 /       .57013 (301, 2)       .43196 (301, 2)       .32592 ( 19, 2)       .28642 ( 19, 2)       .25602 ( 19, 2)
    260.0 /       .54584 (301, 2)       .36342 (274, 2)       .28030 (267, 3)       .23545C(119, 1)       .23756C(119, 1)
    250.0 /       .78994 (251, 2)       .54879 (251, 2)       .40376 (287, 2)       .35809 (293, 2)       .29257 (293, 2)
    240.0 /       .79209 (306, 2)       .56276 (306, 2)       .42487 ( 57, 2)       .35097 ( 57, 2)       .30515 ( 57, 2)
    230.0 /       .61864 (189, 2)       .50758 (325, 2)       .46944 (354, 2)       .41818 (354, 2)       .37594 (354, 2)
    220.0 /       .51549 (307, 2)       .38860 (300, 2)       .32009 (  7, 2)       .26140 (353, 1)       .24045 (353, 1)
    210.0 /       .50486 (  6, 2)       .42770 (300, 2)       .36699 (365, 2)       .29818 (365, 2)       .26727 (  4, 3)
    200.0 /       .50530 (299, 2)       .48669 (341, 2)       .37112 (341, 2)       .26578 (341, 2)       .22221 (  8, 1)
    190.0 /       .47297 (359, 1)       .40262 (364, 3)       .37252 (364, 3)       .31756 (364, 3)       .28315 (364, 3)
    180.0 /       .49474 (364, 1)       .32682 (147, 2)       .34129C(348, 3)       .34184C(348, 3)       .32745C(348, 3)
    170.0 /       .42889 (321, 2)       .36780 ( 42, 3)       .33583 (320, 1)       .32866 (320, 1)       .31184 (320, 1)
    160.0 /       .38889 ( 61, 2)       .33410 (363, 3)       .31121 (363, 3)       .26379 (363, 3)       .23244 (363, 3)
    150.0 /       .33721 (115, 2)       .33648 ( 70, 1)       .32351 ( 70, 1)       .28324 ( 70, 1)       .25469 ( 70, 1)
    140.0 /       .29759 ( 70, 2)       .30770 ( 70, 1)       .28259 ( 70, 1)       .23700 (  3, 1)       .22208 (  3, 1)
    130.0 /       .48916 (347, 2)       .37217 (100, 2)       .28030 (332, 3)       .26324 (332, 3)       .24510 (332, 3)
    120.0 /       .46081 ( 80, 2)       .39025 ( 45, 1)       .34174 ( 45, 1)       .27426 ( 45, 1)       .24690 (204, 3)
    110.0 /       .46989 ( 34, 2)       .42926 ( 34, 2)       .39902 (340, 3)       .35222 (340, 3)       .30970 (309, 2)
    100.0 /       .57262 (206, 2)       .39507 (206, 2)       .34502 (346, 2)       .27997 (346, 2)       .24159 (346, 2)
     90.0 /       .65721 (207, 2)       .48887 (207, 2)       .35254 (207, 2)       .24249 (207, 2)       .20693 ( 69, 1)
     80.0 /       .40528 (111, 2)       .30644 (169, 3)       .22660 (169, 3)       .18023 (207, 3)       .16491 (207, 3)
     70.0 /       .40792C(174, 2)       .33766 ( 59, 3)       .32075 ( 59, 3)       .23057 (221, 2)       .18692 (206, 3)
     60.0 /       .35409 (232, 2)       .24751 (259, 2)       .24195 ( 33, 3)       .22411 (206, 1)       .20906 ( 33, 3)
     50.0 /       .47605 (242, 2)       .34451 (225, 2)       .27714 (124, 1)       .24548 (124, 1)       .22007 (124, 1)
     40.0 /       .48008 (339, 2)       .34864 (296, 2)       .29580 ( 92, 3)       .24378 ( 92, 3)       .21148 ( 92, 3)
     30.0 /       .47250 (136, 2)       .42826 (136, 2)       .36853 ( 98, 2)       .32032 ( 86, 2)       .29560 (123, 3)
     20.0 /       .45494 (319, 2)       .45205 (338, 3)       .43550C(245, 2)       .32714C(245, 2)       .30400C( 67, 1)
     10.0 /       .42789 ( 79, 3)       .33244 (319, 2)       .28915 (158, 2)       .27871 (338, 1)       .26475 (338, 1)
1                                                                                                                       HIGH
                                                                                                                        24-HR
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                                                                                                                      SGROUP#  1
                                          *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***

                                         * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                            * FROM ALL SOURCES *
                                                          * FOR THE RECEPTOR GRID *

                                       * MAXIMUM VALUE EQUALS       .56789 AND OCCURRED AT (    1306.0,     250.0) *

 DIRECTION /                                                       RANGE (METERS)
 (DEGREES) /            568.0                 738.0                 966.0                1306.0                1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /         .18631C(239, 1)       .23106 (157, 1)       .22808 (157, 1)       .20275C(219, 1)       .16243C(219, 1)
     350.0 /         .24505 (210, 1)       .22526 (210, 1)       .26217C(219, 1)       .22877C(219, 1)       .24114C(225, 1)
     340.0 /         .24881 (210, 1)       .23400 (210, 1)       .23026C(318, 1)       .23787C(318, 1)       .22661C( 96, 1)
     330.0 /         .17620C(247, 1)       .30507C(247, 1)       .38375C(247, 1)       .38041C(247, 1)       .32670C(247, 1)
     320.0 /         .24684C(121, 1)       .38097C(121, 1)       .40340C(121, 1)       .31920C(121, 1)       .23795C( 26, 1)
     310.0 /         .24798C(121, 1)       .39413C(121, 1)       .43810C(121, 1)       .37718 (127, 1)       .35620 (127, 1)
     300.0 /         .30803C(214, 1)       .39664C(214, 1)       .37561C(214, 1)       .30046 (133, 1)       .27496C(171, 1)
     290.0 /         .35656C(214, 1)       .42434C(214, 1)       .36084C(214, 1)       .28421C(213, 1)       .24703C(130, 1)
     280.0 /         .31090C(214, 1)       .38529C(117, 1)       .37576 (193, 1)       .34539 (193, 1)       .28237C(261, 1)
     270.0 /         .33218C(170, 1)       .32608C(170, 1)       .35515 (193, 1)       .37299C(326, 1)       .38112C(169, 1)
     260.0 /         .31143C(231, 1)       .25893C(170, 1)       .31012C(274, 1)       .32702C(169, 1)       .28493C(169, 1)
     250.0 /         .23885C(191, 1)       .41246C(251, 1)       .54980C(251, 1)       .56789C(251, 1)       .49602C(251, 1)
     240.0 /         .23406C(166, 1)       .32651 (161, 1)       .42520 (161, 1)       .42449 (161, 1)       .41717 (289, 1)
     230.0 /         .32168 (192, 1)       .33533 (192, 1)       .29654C(126, 1)       .32729C(189, 1)       .32750C(189, 1)
     220.0 /         .33089C(166, 1)       .38101C(166, 1)       .35628C(166, 1)       .33508C(126, 1)       .28971 (270, 1)
     210.0 /         .26247C(166, 1)       .35441C(166, 1)       .39698C(166, 1)       .39304C(166, 1)       .34580C(166, 1)
     200.0 /         .36454C(167, 1)       .42361C(167, 1)       .37718C(167, 1)       .34558C(299, 1)       .27081C(299, 1)
     190.0 /         .37152C(167, 1)       .39759C(167, 1)       .33114C(167, 1)       .27770C(166, 1)       .26148 (359, 1)
     180.0 /         .25083C(167, 1)       .29519C(167, 1)       .38559C(147, 1)       .37679C(147, 1)       .30534C(147, 1)
     170.0 /         .13701C(181, 1)       .19555C(265, 1)       .25826C(265, 1)       .28035C(167, 1)       .26010C(167, 1)
     160.0 /         .24403C(101, 1)       .30921C(101, 1)       .31443C(101, 1)       .31074C(208, 1)       .26864C(208, 1)
     150.0 /         .21872C(101, 1)       .23241C(101, 1)       .19096C(101, 1)       .19320C(208, 1)       .17774C( 81, 1)
     140.0 /         .14880C(125, 1)       .20132 (226, 1)       .21840C( 81, 1)       .25481C( 81, 1)       .25133C( 81, 1)
     130.0 /         .19738C(160, 1)       .23001 (226, 1)       .21924 (226, 1)       .24399C(100, 1)       .25445C(100, 1)
     120.0 /         .15887C(188, 1)       .14341C(188, 1)       .21667C( 72, 1)       .24435 ( 80, 1)       .27573 ( 80, 1)
     110.0 /         .22294C(188, 1)       .24848C(188, 1)       .24522C(205, 1)       .29822C(309, 1)       .32579C(309, 1)
     100.0 /         .19077C(173, 1)       .33738C(173, 1)       .42363C(173, 1)       .40781C(173, 1)       .34422 ( 77, 1)
      90.0 /         .25850C(197, 1)       .29582C(155, 1)       .40699C(278, 1)       .43599C(278, 1)       .37605C(278, 1)
      80.0 /         .39355C(197, 1)       .41366C(197, 1)       .36921C(155, 1)       .31924C(155, 1)       .24070 (207, 1)
      70.0 /         .32826C(197, 1)       .35535C(197, 1)       .36472 (137, 1)       .34968 (137, 1)       .29287 (137, 1)
      60.0 /         .27383C(188, 1)       .34121C(242, 1)       .37691C(242, 1)       .32187C(242, 1)       .26111C(108, 1)
      50.0 /         .32438C(242, 1)       .49153C(242, 1)       .52036C(242, 1)       .42109C(242, 1)       .30379C(242, 1)
      40.0 /         .27491C(235, 1)       .35371C(248, 1)       .38500C(248, 1)       .32222C(248, 1)       .23959C(248, 1)
      30.0 /         .29165C(222, 1)       .31061 (149, 1)       .30814 (149, 1)       .26348C(123, 1)       .25416C(123, 1)
      20.0 /         .21057C(143, 1)       .31816C(143, 1)       .34905C(143, 1)       .33512C(245, 1)       .29566C(245, 1)
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     10.0 /       .16827C(223, 1)       .25617C(143, 1)       .30116C(143, 1)       .29086C(143, 1)       .24576C(143, 1)
1                                                                                                                    HIGH
                                                                                                                     24-HR
                                                                                                                     SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                                  * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                                * MAXIMUM VALUE EQUALS       .56789 AND OCCURRED AT (    1306.0,     250.0) *

 DIRECTION /                                                        RANGE (METERS)
 (DEGREES) /             2215.0                2954.0                3862.0                5112.0                6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .15894C(225, 1)       .14399C(225, 1)       .13229C(220, 1)       .13052C(220, 1)       .12754C(220, 1)
    350.0 /       .22042C(225, 1)       .19427C(245, 1)       .19536C(245, 1)       .18236C(245, 1)       .17019C(245, 1)
    340.0 /       .22007 ( 66, 1)       .24883 ( 66, 1)       .23991 ( 66, 1)       .20884 ( 66, 1)       .18605 ( 66, 1)
    330.0 /       .26272C(247, 1)       .20498 ( 75, 1)       .16638 ( 75, 1)       .12908 ( 75, 1)       .11436 ( 65, 1)
    320.0 /       .25506 ( 99, 1)       .26037 (324, 1)       .23950 (324, 1)       .20114 (324, 1)       .17634 (324, 1)
    310.0 /       .31539 (127, 1)       .30691 ( 64, 1)       .29356 ( 64, 1)       .25572 ( 64, 1)       .22923 ( 64, 1)
    300.0 /       .26929C(171, 1)       .24344C(171, 1)       .20715C(171, 1)       .16831 (361, 1)       .15447 (361, 1)
    290.0 /       .24028 ( 20, 1)       .24381 ( 20, 1)       .21582 ( 20, 1)       .17397 ( 20, 1)       .14917 ( 20, 1)
    280.0 /       .27270 (138, 1)       .24943 ( 58, 1)       .21468 ( 58, 1)       .16927 ( 58, 1)       .14367 ( 58, 1)
    270.0 /       .35316C(169, 1)       .29870C(169, 1)       .24347 (138, 1)       .19112 (138, 1)       .16206 (138, 1)
    260.0 /       .21862C(169, 1)       .18805 (267, 1)       .16037 (267, 1)       .13559 (  1, 1)       .12282 (  1, 1)
    250.0 /       .39002C(251, 1)       .28194 ( 19, 1)       .26559 ( 19, 1)       .23022 ( 19, 1)       .20575 ( 19, 1)
    240.0 /       .37731 (289, 1)       .31909 (289, 1)       .29462 (353, 1)       .27608 (353, 1)       .25435 (353, 1)
    230.0 /       .37233 (354, 1)       .44095 (354, 1)       .43602 (354, 1)       .38558 (354, 1)       .34544 (354, 1)
    220.0 /       .27062 (270, 1)       .23082 (270, 1)       .20001 (354, 1)       .17677 (354, 1)       .15821 (354, 1)
    210.0 /       .27339C(166, 1)       .21998C(313, 1)       .19066C(313, 1)       .14559C(313, 1)       .12862 (  4, 1)
    200.0 /       .21571 (341, 1)       .17692 (341, 1)       .16882 (334, 1)       .15441 (334, 1)       .14056 (334, 1)
    190.0 /       .30818 (359, 1)       .32423 (359, 1)       .30687 (359, 1)       .26695 (359, 1)       .23966 (359, 1)
    180.0 /       .22620 (364, 1)       .23739 (364, 1)       .21670 (364, 1)       .18193 (364, 1)       .16069 (364, 1)
    170.0 /       .23206C(265, 1)       .19733C(265, 1)       .16337C( 42, 1)       .15251 (320, 1)       .14561 (320, 1)
    160.0 /       .20518C(208, 1)       .18995 (  3, 1)       .18051 (  3, 1)       .15458 (  3, 1)       .13648 (  3, 1)
    150.0 /       .16732 (  3, 1)       .19424 (  3, 1)       .19186 (  3, 1)       .17054 (  3, 1)       .15358 (  3, 1)
    140.0 /       .25397 ( 70, 1)       .25426 ( 70, 1)       .22372 ( 70, 1)       .17997 ( 70, 1)       .15437 ( 70, 1)
    130.0 /       .24258C(100, 1)       .21664C(100, 1)       .18543C(100, 1)       .15250C(100, 1)       .13500C(100, 1)
    120.0 /       .30221C( 45, 1)       .29688C( 45, 1)       .25887C( 45, 1)       .20842C( 45, 1)       .17991C( 45, 1)
    110.0 /       .30343C(309, 1)       .24780C(309, 1)       .19533C(309, 1)       .15105C(309, 1)       .13040C(309, 1)
    100.0 /       .37988 ( 77, 1)       .36540 ( 77, 1)       .31545 ( 77, 1)       .25095 ( 77, 1)       .21447 ( 77, 1)
     90.0 /       .28695C(278, 1)       .21237 (207, 1)       .16190 (207, 1)       .11817 (207, 1)       .09933C(144, 1)
     80.0 /       .22181 (207, 1)       .19277 (207, 1)       .16229 (207, 1)       .13065 (207, 1)       .11406 (207, 1)
     70.0 /       .24773C(221, 1)       .21299C(221, 1)       .17167C(221, 1)       .13167C(221, 1)       .11309C(221, 1)
     60.0 /       .25599C(108, 1)       .22704C(108, 1)       .18648C(108, 1)       .14285C(108, 1)       .11995C(108, 1)
     50.0 /       .21811C(248, 1)       .17973C(312, 1)       .15173C(312, 1)       .12191C(312, 1)       .10632C(312, 1)
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     40.0 /      .18318C( 73, 1)     .15077 (340, 1)     .13672 (340, 1)     .12043C(312, 1)     .11051C(312, 1)
     30.0 /      .23412C(123, 1)     .20941 (328, 1)     .20158 (338, 1)     .18113 (338, 1)     .16408 (338, 1)
     20.0 /      .23697C(245, 1)     .22374 (338, 1)     .22351 (338, 1)     .20040 (338, 1)     .18147 (338, 1)
     10.0 /      .20340 ( 79, 1)     .18829 ( 79, 1)     .16839 (338, 1)     .15616 (338, 1)     .14447 (338, 1)
1                                                                                                      2ND HIGH
                                                                                                       24-HR
                                                                                                       SGROUP#  1
                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983     ***


                    * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                               * FROM ALL SOURCES *
                                              * FOR THE RECEPTOR GRID *

                     * MAXIMUM VALUE EQUALS       .41403 AND OCCURRED AT (    1306.0,     240.0) *

  DIRECTION /                                             RANGE (METERS)
  (DEGREES) /            568.0               738.0               966.0              1306.0              1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .16909 (157, 1)     .19485C(219, 1)     .22400C(219, 1)     .17595 (157, 1)     .15472C(225, 1)
    350.0 /      .16192C(248, 1)     .21959C(219, 1)     .20426C(318, 1)     .21623C(225, 1)     .16972C(219, 1)
    340.0 /      .13128C(188, 1)     .17208C(318, 1)     .21072C(219, 1)     .23425C( 96, 1)     .20995C(318, 1)
    330.0 /      .17404C(121, 1)     .27029C(121, 1)     .28751C(121, 1)     .26946 (103, 1)     .25725 ( 75, 1)
    320.0 /      .18544C(184, 1)     .28486C(247, 1)     .32529C(247, 1)     .27811C(247, 1)     .23411 (103, 1)
    310.0 /      .21956C( 82, 1)     .29215C( 82, 1)     .35179 (127, 1)     .37263C(121, 1)     .28083C(121, 1)
    300.0 /      .23779C( 82, 1)     .28502C( 82, 1)     .28352 (133, 1)     .29471C(214, 1)     .26877 (133, 1)
    290.0 /      .31563C(117, 1)     .38960C(117, 1)     .35519C(117, 1)     .26409 (193, 1)     .23842C(213, 1)
    280.0 /      .30501C(117, 1)     .36785C(214, 1)     .35955C(117, 1)     .29145C(261, 1)     .27363 (193, 1)
    270.0 /      .30240C(231, 1)     .28197 (193, 1)     .33358C(326, 1)     .36996C(169, 1)     .34014C(326, 1)
    260.0 /      .25834C(170, 1)     .24368C(231, 1)     .29598C(169, 1)     .31343C(274, 1)     .26353C(274, 1)
    250.0 /      .21664C(251, 1)     .27799C(191, 1)     .31353 (161, 1)     .41011C(168, 1)     .40540C(168, 1)
    240.0 /      .23161 (192, 1)     .27596C(126, 1)     .31977 (289, 1)     .41403 (289, 1)     .36058 (161, 1)
    230.0 /      .31748C(166, 1)     .32053C(166, 1)     .28717C(250, 1)     .30637 (162, 1)     .29579C(325, 1)
    220.0 /      .28766 (192, 1)     .33838 (192, 1)     .35258C(126, 1)     .31285 (300, 1)     .27988C(126, 1)
    210.0 /      .24809C(190, 1)     .31439C(190, 1)     .31480C(167, 1)     .30840 (300, 1)     .27223 (300, 1)
    200.0 /      .21214C(208, 1)     .31302C(166, 1)     .37543C(299, 1)     .28668C(166, 1)     .23521 (341, 1)
    190.0 /      .16244C(166, 1)     .27810C(166, 1)     .32300C(166, 1)     .23245C(167, 1)     .22147 (341, 1)
    180.0 /      .15180C(147, 1)     .29262C(147, 1)     .29688C(167, 1)     .26932C(167, 1)     .22446C(167, 1)
    170.0 /      .11555C(101, 1)     .18167C(167, 1)     .24725C(167, 1)     .27507C(265, 1)     .25908C(265, 1)
    160.0 /      .12557C(116, 1)     .20244C(208, 1)     .29047C(208, 1)     .27429C(101, 1)     .23476C(265, 1)
    150.0 /      .13202C(125, 1)     .14244C(116, 1)     .18240C(236, 1)     .19125C( 81, 1)     .16711C(115, 1)
    140.0 /      .14856 (226, 1)     .14920C( 81, 1)     .19274 (226, 1)     .20020C(272, 1)     .21600 ( 70, 1)
    130.0 /      .17217 (226, 1)     .20637C(160, 1)     .18909C(100, 1)     .22884C( 42, 1)     .21342C( 42, 1)
    120.0 /      .14990C(163, 1)     .13950C(102, 1)     .17709 ( 80, 1)     .24363C( 72, 1)     .26270C( 45, 1)
    110.0 /      .16580C(102, 1)     .24045C(102, 1)     .24520C(102, 1)     .25338C(173, 1)     .21904C(205, 1)
    100.0 /      .18905C(188, 1)     .27572C(102, 1)     .32773C(308, 1)     .35165C(308, 1)     .33194C(173, 1)
     90.0 /      .19107C(223, 1)     .28729C(173, 1)     .37336C(155, 1)     .36160C(155, 1)     .31128 (207, 1)
     80.0 /      .23069C(222, 1)     .33173 (137, 1)     .35543 (137, 1)     .30071 (137, 1)     .23717C(155, 1)
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      70.0 /       .32690C(188, 1)      .30872 (137, 1)      .31553C(249, 1)      .26182C(249, 1)      .25379C(221, 1)
      60.0 /       .23139C(196, 1)      .28845C(232, 1)      .33700C(232, 1)      .28890C(232, 1)      .24279C(242, 1)
      50.0 /       .29181C(196, 1)      .35298C(248, 1)      .40331C(248, 1)      .36445C(248, 1)      .29329C(248, 1)
      40.0 /       .25607C(222, 1)      .30136C(242, 1)      .31711C(242, 1)      .25543C(242, 1)      .20599 (339, 1)
      30.0 /       .22363 (149, 1)      .24991C(128, 1)      .27461C(128, 1)      .23592 (149, 1)      .20351 (328, 1)
      20.0 /       .19359C(222, 1)      .23312 (149, 1)      .30766C(245, 1)      .30129C(143, 1)      .22921C(143, 1)
      10.0 /       .16455C(239, 1)      .19241 (157, 1)      .21256 (157, 1)      .20345C(319, 1)      .19653C(319, 1)
1                                                                                                              2ND HIGH
                                                                                                               24-HR
                                                                                                               SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1983    ***


                              * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS       .41403 AND OCCURRED AT (    1306.0,     240.0) *

   DIRECTION /                                              RANGE (METERS)
   (DEGREES) /           2215.0              2954.0              3862.0              5112.0              6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .13872C(220, 1)      .13353C(245, 1)      .12770C(245, 1)      .11307C(245, 1)      .10217C(245, 1)
     350.0 /       .17888C(245, 1)      .17341C(225, 1)      .15808 ( 75, 1)      .14387 ( 75, 1)      .13346 ( 75, 1)
     340.0 /       .18872C( 96, 1)      .14779 (328, 1)      .13816 (328, 1)      .11654 (328, 1)      .10210 (328, 1)
     330.0 /       .24099 ( 75, 1)      .20139C(247, 1)      .15588C(247, 1)      .12872 ( 65, 1)      .11029 ( 75, 1)
     320.0 /       .24936 (324, 1)      .25687 ( 99, 1)      .23039 ( 99, 1)      .19051 ( 99, 1)      .16653 ( 99, 1)
     310.0 /       .28101 ( 64, 1)      .26322 (127, 1)      .21489 (127, 1)      .16905 (127, 1)      .14609 (127, 1)
     300.0 /       .22129 (133, 1)      .18874 ( 20, 1)      .18516 (361, 1)      .16628C(171, 1)      .14370C(171, 1)
     290.0 /       .21998C(130, 1)      .19527C(171, 1)      .18385C(171, 1)      .16142C(171, 1)      .14585C(171, 1)
     280.0 /       .25675 ( 58, 1)      .24647 (138, 1)      .20332 (138, 1)      .15535 (138, 1)      .13000 (138, 1)
     270.0 /       .30723 (138, 1)      .28671 (138, 1)      .24017C(169, 1)      .18289C(169, 1)      .15405C(169, 1)
     260.0 /       .20144C(274, 1)      .15998 (209, 1)      .15026 (  1, 1)      .12863 (209, 1)      .11635 (209, 1)
     250.0 /       .34407 (293, 1)      .27484 (293, 1)      .21186 (293, 1)      .18585 (  8, 1)      .16880 (  8, 1)
     240.0 /       .28591 (161, 1)      .27859 (353, 1)      .26698 (289, 1)      .21792 (289, 1)      .19320 (289, 1)
     230.0 /       .28132C(189, 1)      .30155 ( 43, 1)      .28664 ( 43, 1)      .24539 ( 43, 1)      .21654 ( 43, 1)
     220.0 /       .22229 (300, 1)      .20604 (  4, 1)      .19146 (  4, 1)      .16491 (  4, 1)      .14750 (  4, 1)
     210.0 /       .22381 (270, 1)      .19364C(166, 1)      .17221 (  4, 1)      .14543 (  4, 1)      .12061C(313, 1)
     200.0 /       .19347C(299, 1)      .16675 (365, 1)      .15818 (  5, 1)      .14738 (  5, 1)      .13519 (  5, 1)
     190.0 /       .19761 (341, 1)      .16475 (364, 1)      .15051 (364, 1)      .12641 (364, 1)      .11171 (364, 1)
     180.0 /       .22240C(147, 1)      .16129 (359, 1)      .13552 (359, 1)      .10535 (359, 1)      .09966C(348, 1)
     170.0 /       .21159C(167, 1)      .16318 (364, 1)      .16174C(265, 1)      .15167C( 42, 1)      .13948C( 42, 1)
     160.0 /       .19874C(265, 1)      .15487C(265, 1)      .14447C( 12, 1)      .12540C( 12, 1)      .11245C( 12, 1)
     150.0 /       .15411 ( 38, 1)      .16033 ( 38, 1)      .14498 ( 38, 1)      .11913 ( 38, 1)      .10782 (  5, 1)
     140.0 /       .22925C( 81, 1)      .19555C( 81, 1)      .17474 ( 38, 1)      .15045 ( 38, 1)      .13360 ( 38, 1)
     130.0 /       .22436C(347, 1)      .20310C(347, 1)      .16664C(347, 1)      .13729 ( 70, 1)      .12033 ( 70, 1)
     120.0 /       .27615 ( 80, 1)      .24690 ( 80, 1)      .20407 ( 80, 1)      .15832 ( 80, 1)      .13470 ( 80, 1)
     110.0 /       .19839 (114, 1)      .18307C(151, 1)      .16629C(151, 1)      .14116C(151, 1)      .12529C(151, 1)
```

```
  100.0 /       .24945 (206, 1)     .21587 (114, 1)     .17902 (114, 1)     .13793 (114, 1)     .12006C( 54, 1)
   90.0 /       .26908 (207, 1)     .19582C( 55, 1)     .15368C(144, 1)     .11815C(144, 1)     .09914C( 28, 1)
   80.0 /       .17715 (137, 1)     .13726C(169, 1)     .10342C(159, 1)     .08399 (105, 1)     .07318 (105, 1)
   70.0 /       .22362 (137, 1)     .16754C(108, 1)     .13425C(108, 1)     .10349 ( 59, 1)     .09096 ( 59, 1)
   60.0 /       .17040C(242, 1)     .11732C(221, 1)     .10828C(221, 1)     .09651 ( 27, 1)     .09384 ( 27, 1)
   50.0 /       .20682C(242, 1)     .14661C(248, 1)     .10558C(124, 1)     .09351C(124, 1)     .08383C(124, 1)
   40.0 /       .16793 (339, 1)     .14576C(312, 1)     .13533C(312, 1)     .11247 (340, 1)     .09739 (340, 1)
   30.0 /       .22024 (328, 1)     .20831C(123, 1)     .18243C(123, 1)     .16071 ( 86, 1)     .14814 ( 86, 1)
   20.0 /       .19772 (158, 1)     .18551 (158, 1)     .15896 (158, 1)     .12623 (158, 1)     .10779 (158, 1)
   10.0 /       .19662 ( 76, 1)     .18199 ( 76, 1)     .15916 ( 79, 1)     .12500 ( 79, 1)     .10632 ( 79, 1)

RUN ENDED ON 09-15-89 AT 11:03:56
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FLORIDA FIRST PROCESSING, INC.

APPENDIX L-34

RESULTS OF INCINERATOR STACK EMISSIONS DISPERSION MODELING USING ISC MODEL ALONG WITH 1984 METEOROLOGICAL DATA

```
1              ISCST - VERSION 3.4 (DATED 88348)

               IBM-PC VERSION (1.64)
               (C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.
               SERIAL NUMBER 5958 SOLD TO ICF TECHNOLOGY, INC
               RUN BEGAN ON 09-15-89 AT 11:03:58


1
                        *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***

           CALCULATE (CONCENTRATION=1,DEPOSITION=2)                            ISW(1) =   1
           RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)             ISW(2) =   4
           DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                    ISW(3) =   1
           TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                            ISW(4) =   0
           CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                       ISW(5) =   0
           LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                    ISW(6) =   1

           COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
           WITH THE FOLLOWING TIME PERIODS:
             HOURLY (YES=1,NO=0)                                               ISW(7) =   1
             2-HOUR (YES=1,NO=0)                                               ISW(8) =   0
             3-HOUR (YES=1,NO=0)                                               ISW(9) =   1
             4-HOUR (YES=1,NO=0)                                              ISW(10) =   0
             6-HOUR (YES=1,NO=0)                                              ISW(11) =   0
             8-HOUR (YES=1,NO=0)                                              ISW(12) =   1
             12-HOUR (YES=1,NO=0)                                             ISW(13) =   0
             24-HOUR (YES=1,NO=0)                                             ISW(14) =   1
           PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                                ISW(15) =   1

           PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
           SPECIFIED BY ISW(7) THROUGH ISW(14):
             DAILY TABLES (YES=1,NO=0)                                        ISW(16) =   0
             HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                     ISW(17) =   1
             MAXIMUM 50 TABLES (YES=1,NO=0)                                   ISW(18) =   0
           METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)          ISW(19) =   1
           RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)  ISW(20) =   0
           WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)          ISW(21) =   1
           VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)   ISW(22) =   1
           SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                  ISW(23) =   0
           PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)              ISW(24) =   1
           PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)        ISW(25) =   2
           PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)              ISW(26) =   1
           CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)            ISW(27) =   1
           REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                            ISW(28) =   1
           TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                   ISW(29) =   2
           DEBUG OPTION CHOSEN (YES=1,NO=2)                                   ISW(30) =   2
           ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)                ISW(31) =   0
```

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          NUMBER OF INPUT SOURCES                                              NSOURC =   1
          NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                             NGROUP =   0
          TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)                 IPERD =   0
          NUMBER OF X (RANGE) GRID VALUES                                      NXPNTS =  10
          NUMBER OF Y (THETA) GRID VALUES                                      NYPNTS =  36
          NUMBER OF DISCRETE RECEPTORS                                         NXWYPT =   0
          SOURCE EMISSION RATE UNITS CONVERSION FACTOR                             TK =.10000E+07
          HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                     ZR =   6.70  METERS
          LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                             IMET =   9
          DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION                  DECAY = .000000E+00
          SURFACE STATION NO.                                                     ISS = 12842
          YEAR OF SURFACE DATA                                                    ISY = 84
          UPPER AIR STATION NO.                                                   IUS = 12842
          YEAR OF UPPER AIR DATA                                                  IUY = 84
          ALLOCATED DATA STORAGE                                                LIMIT = 43500 WORDS
          REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                            MIMIT =  8613 WORDS
1
                        *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***

                                  *** METEOROLOGICAL DAYS TO BE PROCESSED ***
                                                   (IF=1)

     1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
     1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
     1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
     1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
     1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
     1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
     1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
     1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

                         *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                  (METERS/SEC)

                                      1.54,   3.09,   5.14,   8.23,  10.80,


                                        *** WIND PROFILE EXPONENTS ***


        STABILITY                            WIND SPEED CATEGORY
        CATEGORY         1             2             3             4             5             6
            A       .70000E-01    .70000E-01    .70000E-01    .70000E-01    .70000E-01    .70000E-01
            B       .70000E-01    .70000E-01    .70000E-01    .70000E-01    .70000E-01    .70000E-01
            C       .10000E+00    .10000E+00    .10000E+00    .10000E+00    .10000E+00    .10000E+00
            D       .15000E+00    .15000E+00    .15000E+00    .15000E+00    .15000E+00    .15000E+00
            E       .35000E+00    .35000E+00    .35000E+00    .35000E+00    .35000E+00    .35000E+00
            F       .55000E+00    .55000E+00    .55000E+00    .55000E+00    .55000E+00    .55000E+00
```

```
                                   *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                             (DEGREES KELVIN PER METER)


               STABILITY                               WIND SPEED CATEGORY
               CATEGORY          1              2              3              4              5              6
                   A        .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                   B        .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                   C        .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                   D        .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                   E        .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01
                   F        .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01
1
                          *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                        X,Y-COORDINATES OF THE CENTER OF THE POLAR RECEPTOR GRID (METERS) = (       0.,       0.)


                                         *** RANGES OF POLAR GRID SYSTEM ***
                                                    (METERS)

           568.0,     738.0,     966.0,    1306.0,    1704.0,    2215.0,    2954.0,    3862.0,    5112.0,    6000.0,



                                       *** RADIAL ANGLES OF POLAR GRID SYSTEM ***

                                                    (DEGREES)

            10.0,      20.0,      30.0,      40.0,      50.0,      60.0,      70.0,      80.0,      90.0,     100.0,
           110.0,     120.0,     130.0,     140.0,     150.0,     160.0,     170.0,     180.0,     190.0,     200.0,
           210.0,     220.0,     230.0,     240.0,     250.0,     260.0,     270.0,     280.0,     290.0,     300.0,
           310.0,     320.0,     330.0,     340.0,     350.0,     360.0,
1
                          *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***

                                              *** SOURCE DATA ***

                       EMISSION RATE                                       TEMP.    EXIT VEL.
                          TYPE=0,1                                         TYPE=0    TYPE=0
           T W         (GRAMS/SEC)                                        (DEG.K);  (M/SEC);            BLDG.    BLDG.    BLDG.
           Y A NUMBER     TYPE=2                          BASE             VERT.DIM  HORZ.DIM DIAMETER  HEIGHT   LENGTH    WIDTH
    SOURCE P K  PART.   (GRAMS/SEC)      X        Y       ELEV.   HEIGHT    TYPE=1   TYPE=1,2  TYPE=0   TYPE=0   TYPE=0   TYPE=0
    NUMBER E E  CATS.  *PER METER**2 (METERS) (METERS) (METERS) (METERS) (METERS)  (METERS) (METERS) (METERS) (METERS) (METERS)
  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

         1 0 0    0     .10000E+01       .0        .0       .0    60.96    458.15     14.66     1.68      .00      .00      .00
```

```
* CALM HOURS (=1) FOR DAY   3 *  1  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY   4 *  1  0  1  1  1  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1
* CALM HOURS (=1) FOR DAY   5 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY   6 *  1  1  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY   7 *  0  1  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY   8 *  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  25 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  26 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY  28 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY  29 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  30 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  33 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  34 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  37 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY  38 *  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  44 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0  1  1
* CALM HOURS (=1) FOR DAY  45 *  1  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  47 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  1
* CALM HOURS (=1) FOR DAY  48 *  0  0  1  0  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  49 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  50 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY  51 *  1  0  1  1  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  52 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY  54 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  55 *  1  0  1  1  1  0  0  1  1  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  56 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY  61 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  62 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1
* CALM HOURS (=1) FOR DAY  63 *  1  0  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  64 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  69 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  73 *  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1
* CALM HOURS (=1) FOR DAY  76 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  77 *  0  1  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  78 *  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY  79 *  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  82 *  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  83 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  84 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  85 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  86 *  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  1  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  91 *  1  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  92 *  0  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  93 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  97 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  98 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  99 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 102 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 103 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
```

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* CALM HOURS (=1) FOR DAY 104 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 105 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 106 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 110 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 111 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 112 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 115 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 116 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 118 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  1
* CALM HOURS (=1) FOR DAY 119 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 120 *  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 121 *  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 122 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 123 *  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 128 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 131 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 133 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 134 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 135 *  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 136 *  0  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 140 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 141 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 142 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 143 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 144 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 146 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1
* CALM HOURS (=1) FOR DAY 147 *  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 148 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 153 *  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 154 *  0  0  1  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 155 *  1  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 156 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 157 *  0  0  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 163 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 165 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 166 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 167 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 169 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 170 *  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 171 *  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 172 *  1  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 173 *  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 174 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 179 *  1  0  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 182 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 186 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 187 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1
* CALM HOURS (=1) FOR DAY 189 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 190 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

```
* CALM HOURS (=1) FOR DAY 191 *  1  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 192 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  1
* CALM HOURS (=1) FOR DAY 193 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 194 *  0  1  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 195 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 196 *  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 197 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 198 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 200 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 201 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 202 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 203 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 204 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 208 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 212 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1  0  0  1
* CALM HOURS (=1) FOR DAY 214 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 215 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 217 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 218 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 219 *  1  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1
* CALM HOURS (=1) FOR DAY 220 *  0  1  1  0  1  1  1  0  0  0  0  0  0  0  1  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 221 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0
* CALM HOURS (=1) FOR DAY 222 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 223 *  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 224 *  0  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 225 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 226 *  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 227 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 228 *  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 229 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 230 *  0  1  1  0  0  0  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 231 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 233 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 234 *  1  0  1  0  0  0  1  0  0  0  0  0  1  0  0  0  1  1  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 235 *  1  0  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 236 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 237 *  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 238 *  0  1  0  1  1  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 239 *  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 241 *  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 243 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 244 *  1  0  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 245 *  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 246 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY 247 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 248 *  0  1  0  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 249 *  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 250 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 253 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
```

```
* CALM HOURS (=1) FOR DAY 254 *  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 255 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 256 *  1  1  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 257 *  0  1  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1
* CALM HOURS (=1) FOR DAY 258 *  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 259 *  0  0  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 273 *  0  0  0  1  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 274 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 277 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 278 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 279 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 283 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 287 *  0  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 288 *  1  1  1  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 289 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 290 *  0  1  1  0  1  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 291 *  0  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 292 *  0  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 295 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 296 *  0  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 298 *  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 301 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0
* CALM HOURS (=1) FOR DAY 302 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 304 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 305 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 308 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 309 *  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1
* CALM HOURS (=1) FOR DAY 310 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 315 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0
* CALM HOURS (=1) FOR DAY 316 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 318 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 320 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 321 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 322 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 325 *  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 331 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 333 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 334 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 335 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  1
* CALM HOURS (=1) FOR DAY 336 *  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 337 *  0  1  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 338 *  1  1  1  0  0  0  1  1  0  1  0  0  0  0  0  0  0  0  1  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 339 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 342 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1
* CALM HOURS (=1) FOR DAY 343 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 344 *  0  1  1  1  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 345 *  0  0  0  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1
* CALM HOURS (=1) FOR DAY 346 *  1  1  1  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1
* CALM HOURS (=1) FOR DAY 347 *  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1  1
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 * CALM HOURS (=1) FOR DAY 348 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 349 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 351 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 354 *  1  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 355 *  0  0  1  1  1  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 356 *  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
 * CALM HOURS (=1) FOR DAY 357 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
 * CALM HOURS (=1) FOR DAY 358 *  1  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  1  1
 * CALM HOURS (=1) FOR DAY 359 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1
 * CALM HOURS (=1) FOR DAY 360 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 364 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
 * CALM HOURS (=1) FOR DAY 365 *  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 366 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
1                                                                                                                   'N'-DAY
                                                                                                                    366 DAYS
                                                                                                                    SGROUP#   1
                                          *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                                            * 366-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                             * FROM ALL SOURCES *
                                                           * FOR THE RECEPTOR GRID *

                                       * MAXIMUM VALUE EQUALS       .04343 AND OCCURRED AT (    1704.0,     240.0) *

 DIRECTION /                                                            RANGE (METERS)
 (DEGREES) /       568.0          738.0          966.0         1306.0         1704.0         2215.0         2954.0         3862.0         5112.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


     360.0 /      .00661         .00998         .01221         .01256         .01148         .00993         .00816         .00664         .00527
     350.0 /      .00699         .01085         .01325         .01339         .01185         .00976         .00757         .00591         .00459
     340.0 /      .00863         .01341         .01603         .01581         .01381         .01130         .00874         .00681         .00524
     330.0 /      .01183         .01894         .02304         .02281         .01985         .01614         .01236         .00947         .00714
     320.0 /      .01442         .02406         .03050         .03136         .02808         .02345         .01850         .01456         .01124
     310.0 /      .01555         .02636         .03402         .03580         .03279         .02804         .02270         .01828         .01444
     300.0 /      .01419         .02409         .03137         .03384         .03211         .02875         .02476         .02122         .01789
     290.0 /      .01170         .01946         .02475         .02602         .02430         .02168         .01883         .01642         .01416
     280.0 /      .01257         .02161         .02883         .03169         .03060         .02808         .02491         .02186         .01871
     270.0 /      .01430         .02485         .03432         .03934         .03919         .03669         .03277         .02859         .02417
     260.0 /      .01452         .02405         .03207         .03618         .03600         .03380         .03032         .02656         .02256
     250.0 /      .01477         .02422         .03210         .03643         .03685         .03554         .03313         .03020         .02669
     240.0 /      .01544         .02668         .03695         .04296         .04343         .04136         .03783         .03391         .02945
     230.0 /      .01338         .02266         .03042         .03411         .03315         .03014         .02618         .02254         .01909
     220.0 /      .01021         .01725         .02335         .02687         .02706         .02554         .02287         .01993         .01682
     210.0 /      .00712         .01211         .01651         .01919         .01951         .01857         .01671         .01452         .01215
     200.0 /      .00545         .00928         .01268         .01469         .01494         .01426         .01290         .01129         .00951
     190.0 /      .00572         .01028         .01428         .01619         .01583         .01447         .01251         .01056         .00866
     180.0 /      .00560         .01003         .01395         .01587         .01561         .01440         .01265         .01094         .00923
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     170.0 /     .00532     .00890     .01192     .01331     .01292     .01171     .01006     .00849     .00699
     160.0 /     .00602     .00997     .01340     .01515     .01485     .01349     .01142     .00935     .00737
     150.0 /     .00582     .00968     .01318     .01530     .01562     .01496     .01349     .01166     .00962
     140.0 /     .00513     .00881     .01244     .01506     .01592     .01571     .01457     .01285     .01079
     130.0 /     .00491     .00880     .01302     .01625     .01735     .01713     .01584     .01401     .01189
     120.0 /     .00531     .00920     .01353     .01706     .01855     .01858     .01728     .01520     .01272
     110.0 /     .00716     .01189     .01594     .01798     .01783     .01653     .01440     .01211     .00976
     100.0 /     .01171     .02054     .02754     .02995     .02823     .02472     .02023     .01612     .01236
      90.0 /     .01662     .02935     .03874     .04101     .03746     .03169     .02496     .01926     .01433
      80.0 /     .01883     .03093     .03813     .03792     .03305     .02685     .02041     .01535     .01121
      70.0 /     .02077     .03230     .03821     .03682     .03142     .02504     .01865     .01381     .00997
      60.0 /     .02004     .03032     .03520     .03337     .02804     .02199     .01614     .01190     .00863
      50.0 /     .01622     .02392     .02731     .02573     .02184     .01755     .01343     .01039     .00800
      40.0 /     .01307     .02012     .02419     .02413     .02142     .01787     .01403     .01092     .00827
      30.0 /     .01070     .01762     .02241     .02343     .02153     .01855     .01507     .01201     .00926
      20.0 /     .00905     .01504     .01965     .02128     .02021     .01793     .01495     .01217     .00958
      10.0 /     .00724     .01122     .01413     .01509     .01438     .01291     .01094     .00902     .00716
1                                                                                                        'N'-DAY
                                                                                                         366 DAYS
                                                                                                         SGROUP#  1
                               *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***

                                 * 366-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                           * MAXIMUM VALUE EQUALS      .04343 AND OCCURRED AT (    1704.0,     240.0) *

   DIRECTION /                                            RANGE (METERS)
   (DEGREES) /     6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /     .00460
     350.0 /     .00400
     340.0 /     .00452
     330.0 /     .00608
     320.0 /     .00968
     310.0 /     .01261
     300.0 /     .01619
     290.0 /     .01299
     280.0 /     .01699
     270.0 /     .02176
     260.0 /     .02038
     250.0 /     .02463
     240.0 /     .02690
     230.0 /     .01733
     220.0 /     .01515
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     210.0 /        .01085
     200.0 /        .00853
     190.0 /        .00768
     180.0 /        .00835
     170.0 /        .00624
     160.0 /        .00639
     150.0 /        .00850
     140.0 /        .00961
     130.0 /        .01071
     120.0 /        .01133
     110.0 /        .00853
     100.0 /        .01052
      90.0 /        .01201
      80.0 /        .00933
      70.0 /        .00826
      60.0 /        .00722
      50.0 /        .00694
      40.0 /        .00704
      30.0 /        .00792
      20.0 /        .00829
      10.0 /        .00621
1                                                                                                                                 HIGH
                                                                                                                                   1-HR
                                                                                                                                  SGROUP#  1
                                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                                   * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                            * FROM ALL SOURCES *
                                                         * FOR THE RECEPTOR GRID *

                                * MAXIMUM VALUE EQUALS      3.29045 AND OCCURRED AT (     1704.0,     340.0) *

   DIRECTION /                                                         RANGE (METERS)
   (DEGREES) /              568.0                     738.0                     966.0                    1306.0                    1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       2.97715 (142,13)        2.15045 (142,13)        2.20374 (215,14)        1.87215 (215,14)        1.82812 (105,12)
     350.0 /       2.49730 (142,13)        1.98593 (103,13)        2.16670 (184,10)        2.00190 (315,12)        1.75810 (202,11)
     340.0 /       2.99791 (167,13)        2.30742 (170,11)        2.13603 (289,11)        3.08886 (316, 9)        3.29045 (316, 9)
     330.0 /       2.98298 (185,11)        2.73956 (170,11)        2.18866 (217,16)        1.93282 (187,10)        1.78671 (145, 7)
     320.0 /       2.97546 (208,11)        2.52620 (212,14)        2.22298 (215,15)        1.90091 (167,15)        1.81500 ( 50,11)
     310.0 /       2.99360 (210,13)        2.67459 (212,14)        2.21083 (215,13)        1.97472 (292,13)        1.83218 ( 49,17)
     300.0 /       2.92817 (258,12)        2.72829 (157,11)        2.20374 (211,15)        2.01707 (192,16)        1.85062 (211, 8)
     290.0 /       2.68210 (158,13)        2.43365 (157,11)        2.16284 (163, 9)        1.96117 (145, 9)        1.84775 (169,11)
     280.0 /       2.97465 (247,11)        2.48429 (247,11)        2.38149 (234,16)        2.39933 (234,16)        2.00196 (234,16)
     270.0 /       2.98408 (146,11)        2.72244 (120,11)        2.38149 (234,16)        2.39933 (234,16)        2.00196 (234,16)
     260.0 /       2.79497 (227,11)        2.42845 (120,11)        2.14552 (281,14)        1.93566 (248,11)        1.84109 (160,17)
     250.0 /       2.92869 (116,13)        2.71172 (223,13)        2.16934 (164,15)        2.01709 (236,10)        1.82043 (280, 9)
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     240.0 /      3.03213 (221,12)     2.50263 (221,12)     2.20374 (258,13)     1.98408 (303,11)     1.84051 (164, 8)
     230.0 /      2.99360 (235,14)     2.79082 (163,11)     2.15663 (207,14)     1.98691 (188,16)     1.86352 (258,16)
     220.0 /      2.57247 (241,14)     2.71688 (229,13)     2.19169 (193,11)     1.98332 (192,10)     2.01008 (234,15)
     210.0 /      2.99791 (134,14)     2.73905 (214,14)     2.10352 (250,13)     1.94828 (190,10)     2.01007 (234,15)
     200.0 /      2.84153 (156,11)     2.44319 (214,14)     2.15593 (133,14)     1.84351 (304,11)     1.81234 (187,14)
     190.0 /      2.88044 (131,14)     2.10543 (131,14)     2.20924 (222,12)     1.95604 (178,15)     1.94084 (234,14)
     180.0 /      2.56214 (131,14)     2.08690 (235,15)     2.15072 (236,12)     1.83823 (152,16)     1.78986 (257,10)
     170.0 /      2.62273 (221,11)     2.10254 (192,13)     2.19169 (221,10)     2.05077 (134,16)     2.26692 (151, 7)
     160.0 /      2.99680 (247,13)     2.16725 (247,13)     2.15126 (222,10)     1.96330 ( 78,12)     1.77909 (151,11)
     150.0 /      2.98329 (163,12)     2.51540 (197,11)     2.20374 (221,14)     1.88907 (273,16)     1.79226 (188,15)
     140.0 /      2.94974 (147,13)     2.66313 (197,11)     2.12985 (183,14)     1.93282 (286,14)     1.74381 (229,16)
     130.0 /      2.56500 (188,12)     2.78482 (188,12)     2.00044 (179,12)     1.89832 (221,17)     1.80247 (204,17)
     120.0 /      2.78201 (203,14)     2.01983 (203,14)     2.12557 (228,12)     1.97977 (230,14)     1.88691 (213,15)
     110.0 /      2.99370 (226,12)     2.61156 (226,11)     2.23520 (222,14)     1.89274 (222,14)     1.77055 (232,11)
     100.0 /      2.72484 (219,13)     2.61156 (226,11)     2.19716 (245,13)     1.91254 ( 30,12)     1.78266 (347,16)
      90.0 /      2.29634 (188,11)     2.51540 (188,11)     2.19307 (243,14)     2.55238 (174, 7)     2.69754 (174, 7)
      80.0 /      2.84271 ( 82,12)     2.66313 (188,11)     2.19169 (213,13)     1.99494 (257,11)     1.82252 (191,16)
      70.0 /      3.01179 (219,12)     2.43600 (259,13)     2.16934 (203,13)     1.97977 (290,11)     1.84891 (180, 9)
      60.0 /      2.94844 (194,13)     2.77814 (218,11)     2.19874 (249,12)     2.03539 (194,11)     1.83664 (112,17)
      50.0 /      2.98466 (238,14)     2.42138 (145,12)     2.17970 (247,12)     2.04769 (209,12)     1.70807 (209,12)
      40.0 /      2.96342 (242,13)     2.47059 (225,11)     2.17319 (203,12)     1.90091 (117,15)     1.85714 (232, 9)
      30.0 /      2.69959 (196,12)     1.95831 (196,12)     2.16371 (229,14)     2.01076 (229,14)     1.84050 ( 25,16)
      20.0 /      2.86199 (196,12)     2.11149 (199,13)     2.19716 (157,13)     1.92267 (248,14)     1.81886 (248,14)
      10.0 /      2.98408 (249,11)     2.16767 (249,11)     2.15484 (201,10)     1.85216 (111,16)     1.80247 (192,17)
1                                                                                                                      HIGH
                                                                                                                        1-HR
                                                                                                                       SGROUP#  1
                               *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                              * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                        * FROM ALL SOURCES *
                                                      * FOR THE RECEPTOR GRID *

                           * MAXIMUM VALUE EQUALS      3.29045 AND OCCURRED AT (     1704.0,     340.0) *

   DIRECTION /                                           RANGE (METERS)
   (DEGREES) /           2215.0               2954.0               3862.0               5112.0               6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      1.55909 (162,10)     1.46047 (197,18)     1.25217 (197,18)      .93896 (197,18)      .85824 (341, 2)
     350.0 /      1.67789 (249, 9)     1.46892 (249, 9)     1.13396 (249, 9)      .89516 (200, 7)      .87562 (200, 7)
     340.0 /      2.91494 (316, 9)     2.30743 (316, 9)     1.81531 (316, 9)     1.41067 (316, 9)     1.22164 (316, 9)
     330.0 /      1.83376 (145, 7)     1.67260 (145, 7)     1.41450 (145, 7)     1.12349 (145, 7)      .97544 (145, 7)
     320.0 /      1.64454 (336,10)     1.91288 ( 44,10)     1.87705 ( 44,10)     1.65524 ( 44,10)     1.48800 ( 44,10)
     310.0 /      1.63148 ( 49,17)     1.25423 (309, 8)     1.07218 (309, 8)      .91623 (171, 8)      .89210 (171, 8)
     300.0 /      1.69552 (171, 9)     1.36107 (171, 9)     1.10783 (302,16)     1.06918 (158, 7)     1.09662 (158, 7)
     290.0 /      1.64050 (169,11)     1.57087 (162, 6)     1.77574 (162, 6)     1.75813 (162, 6)     1.66295 (162, 6)
     280.0 /      1.71181 (197, 8)     1.39292 (197, 8)     1.18865 (220,19)      .96902 (213, 7)     1.08946 (213, 7)
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      270.0 /     2.20525 (203, 7)     2.24480 (203, 7)     1.92276 (203, 7)     1.50134 (203, 7)     1.28899 (203, 7)
      260.0 /     1.69552 (247, 9)     1.59211 (203, 7)     1.33479 (203, 7)     1.15716 (352, 8)     1.14905 (352, 8)
      250.0 /     1.69552 (365,14)     1.47485 (307,15)     1.24939 (208,19)      .95117 (189, 7)      .95762 (189, 7)
      240.0 /     1.83127 (335, 9)     1.63274 (335, 9)     1.33502 (335, 9)     1.15497 (267, 7)     1.06502 (267, 7)
      230.0 /     1.76836 (258,16)     1.49276 (220,17)     1.25952 (338,11)      .94991 (338,11)      .90632 ( 16,14)
      220.0 /     2.16753 (234,15)     1.89986 (234,15)     1.50561 (234,15)     1.14255 (234,15)      .97355 (234,15)
      210.0 /     2.16752 (234,15)     1.89986 (234,15)     1.50560 (234,15)     1.23273 (325,11)     1.14722 (325,11)
      200.0 /     1.62228 (193, 9)     1.38389 (338,13)     1.06793 (338,13)      .92152 (234,12)      .84597 (234,12)
      190.0 /     1.87090 (234,14)     1.58710 (234,14)     1.27829 (270, 7)     1.26740 (270, 7)     1.19933 (270, 7)
      180.0 /     1.71138 (257,10)     1.36893 (257,10)     1.30312 (329, 8)     1.24631 (329, 8)     1.16335 (329, 8)
      170.0 /     2.17192 (151, 7)     1.77103 (151, 7)     1.38256 (151, 7)     1.05694 (151, 7)      .90608 (151, 7)
      160.0 /     1.69942 (201,14)     1.48080 (201,14)     1.20333 (192, 9)      .89803 (192, 9)      .77715 ( 62,18)
      150.0 /     1.48152 (155, 9)     1.46957 (202,18)     1.25727 (202,18)      .94140 (202,18)      .84017 (115, 7)
      140.0 /     1.70533 (189,19)     1.48406 (189,19)     1.14104 (189,19)      .91520 (160,19)      .85290 ( 28, 2)
      130.0 /     1.71936 (204,17)     1.37288 (204,17)     1.10783 (245,10)      .92353 (218,18)      .86514 (101, 3)
      120.0 /     1.67343 (213,15)     1.44219 ( 77,10)     1.12043 ( 77,10)      .90874 (101, 8)      .91293 (101, 8)
      110.0 /     1.69911 (232,11)     1.36285 (232,11)     1.02285 (220,20)      .91929 (220,20)      .84924 (355,17)
      100.0 /     1.60258 (347,16)     1.22476 (347,16)     1.02984 (217,20)      .95685 (217,20)      .87838 (217,20)
       90.0 /     2.38767 (174, 7)     1.88716 (174, 7)     1.48025 (174, 7)     1.14628 (174, 7)      .99061 (174, 7)
       80.0 /     1.61987 (176, 7)     1.47873 (135, 9)     1.26239 (135, 9)      .96120 (301,17)      .89662 ( 26,16)
       70.0 /     1.70731 (321,16)     1.37675 (321,16)     1.01058 (321,16)      .91294 (141,19)      .88917 ( 86,14)
       60.0 /     1.68714 (357,10)     1.38643 (230,13)     1.09010 ( 49,18)      .93590 (224, 9)      .90837 (224, 9)
       50.0 /     1.45964 (338,16)     1.31047 (218, 9)     1.10359 (218, 9)      .89248 (233, 3)      .85718 (289,17)
       40.0 /     1.73144 (181, 7)     1.48378 (181, 7)     1.25217 (348,17)      .93896 (348,17)      .86236 (172, 8)
       30.0 /     1.64650 ( 25,16)     1.39203 (274,15)     1.07192 (274,15)      .89450 (126,18)      .84760 ( 44,13)
       20.0 /     1.68862 (172, 9)     1.47485 (172, 9)     1.19832 (162,18)     1.08254 (234,19)     1.15654 (234,19)
       10.0 /     1.71936 (192,17)     1.47755 (193,15)     1.47493 (106,11)     1.34143 (106,11)     1.22247 (106,11)
1                                                                                                                   2ND HIGH
                                                                                                                     1-HR
                                                                                                                    SGROUP#  1
                                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                                * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                                 * MAXIMUM VALUE EQUALS      2.98408 AND OCCURRED AT (     568.0,      70.0) *

   DIRECTION /                                                RANGE (METERS)
   (DEGREES) /           568.0                738.0                966.0               1306.0               1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /     2.97715 (186,14)     2.15045 (186,14)     2.17970 (293,13)     1.86086 (293,13)     1.78402 (100,13)
      350.0 /     2.23217 (167,13)     1.98145 (118,12)     2.13172 (103,13)     1.86976 (208,15)     1.75413 (167,17)
      340.0 /     2.35794 (185,11)     2.17140 (167,13)     2.07857 (112,12)     1.85653 (215,10)     1.77381 (355,12)
      330.0 /     2.75507 (103,14)     2.30987 (158,12)     2.18337 (143,16)     1.92862 (166, 9)     1.74150 (345,11)
      320.0 /     2.75508 (103,14)     2.30987 (158,12)     2.18671 (140,15)     1.89832 (236,17)     1.80552 (167,15)
      310.0 /     2.86427 (158,14)     2.48609 (210,13)     2.19837 (210,16)     1.88134 (215,13)     1.80796 (210, 8)
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   300.0 /      2.84600 (158,13)     2.37607 (158,13)     2.18514 (186,12)     1.97114 (249,10)     1.83218 (201, 9)
   290.0 /      2.23057 (157,11)     2.24340 (158,13)     2.13931 (142,14)     1.96117 (204, 9)     1.83255 (163, 8)
   280.0 /      2.61342 (191,13)     2.17126 (191,13)     2.20532 (259,12)     1.97902 (246,10)     1.86345 (161,18)
   270.0 /      2.97656 (207,11)     2.43600 (191,13)     2.15593 (186,11)     2.01709 (146,10)     1.85616 (278,14)
   260.0 /      2.69959 (207,12)     2.08029 (240,13)     2.13282 (353,12)     1.90867 (197,10)     1.81234 (214,17)
   250.0 /      2.92078 (187,12)     2.13739 (116,13)     2.13172 (153,14)     1.94476 (303,14)     1.81234 (278,16)
   240.0 /      2.93611 (132,12)     2.41894 (223,13)     2.14498 (137,10)     1.97902 (236,13)     1.78505 (170,18)
   230.0 /      2.93989 (147,12)     2.61156 (192,11)     2.13770 (250,11)     1.95625 (278,11)     1.79807 (191, 8)
   220.0 /      2.56109 (229,13)     2.61156 (192,11)     2.18514 (236,16)     1.96384 (258,14)     1.87824 (260,15)
   210.0 /      2.68021 (156,11)     2.17140 (134,14)     2.07938 (190,10)     1.93082 (195,10)     1.79888 (284,15)
   200.0 /      2.25207 (214,14)     2.12296 (137,14)     2.15126 (235,13)     1.83016 (235,13)     1.77872 (235,17)
   190.0 /      1.65021 (156,11)     1.95754 (178,16)     2.11509 (131,16)     1.87472 (222,12)     1.79234 (136, 9)
   180.0 /      1.48548 (235,15)     2.05870 (185,14)     2.12043 (219,10)     1.82041 (151, 9)     1.74518 (151, 9)
   170.0 /      2.36907 (247,13)     1.89243 (221,11)     2.07272 (193,10)     1.94475 (193,10)     1.84775 (220, 9)
   160.0 /      2.94794 (221,11)     2.12359 (221,11)     2.13501 (229,11)     1.95604 (220,16)     1.74097 (229,17)
   150.0 /      2.73176 (229,12)     2.48706 (163,12)     1.90250 (228,16)     1.87939 (188,15)     1.72519 (273,16)
   140.0 /      2.43936 (197,11)     2.21361 (188,12)     2.08678 (115,16)     1.84314 (154,18)     1.73746 (273,17)
   130.0 /      2.47399 (147,13)     2.04071 (244,14)     1.96882 (287,15)     1.87035 (156,17)     1.77883 (314,16)
   120.0 /      2.21917 (226,12)     2.00220 (228,12)     2.09362 (230,14)     1.87875 (224,14)     1.78121 (224,14)
   110.0 /      2.91464 (156,12)     2.49040 (226,12)     2.18671 (212,15)     1.88452 (223,15)     1.76459 (230,15)
   100.0 /      2.59283 (156,12)     2.10438 (120,13)     2.15072 (230,16)     1.90981 ( 73,12)     1.74950 ( 30,14)
    90.0 /      2.10544 ( 82,12)     2.08533 (157,12)     2.16934 (171,12)     1.99995 (196,16)     1.86345 (257,17)
    80.0 /      2.61342 (259,13)     2.44112 ( 82,12)     2.18514 (112,16)     1.92865 (191,16)     1.82001 (354,16)
    70.0 /      2.98408 (147,14)     2.42733 (225,13)     2.16130 (194,10)     1.96045 (309,10)     1.80770 (337,15)
    60.0 /      2.94175 (163,13)     2.45890 (194,13)     2.18514 (197,13)     1.99484 (259,15)     1.80249 (121,16)
    50.0 /      2.98408 (242,11)     2.16767 (242,11)     2.16309 (243,13)     1.96384 (238,15)     1.63114 (200,17)
    40.0 /      2.94533 (225,11)     2.15827 (145,12)     2.14931 (165,10)     1.85779 (203,12)     1.80552 (117,15)
    30.0 /      2.05260 (225,11)     1.93635 ( 50,13)     2.10803 ( 73,11)     1.95625 ( 26,14)     1.83255 (356,15)
    20.0 /      2.22164 (249,11)     2.07433 (196,12)     2.16670 (295,13)     1.92094 (289,10)     1.81763 (105,14)
    10.0 /      2.94973 (189,11)     2.14309 (189,11)     2.14552 (295,12)     1.84911 (201,10)     1.74518 ( 87, 9)
1                                                                                                                     2ND HIGH
                                                                                                                       1-HR
                                                                                                                      SGROUP#  1
                                *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                             * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                   * FROM ALL SOURCES *
                                                 * FOR THE RECEPTOR GRID *

                              * MAXIMUM VALUE EQUALS      2.98408 AND OCCURRED AT (     568.0,      70.0) *

 DIRECTION /                                                      RANGE (METERS)
 (DEGREES) /             2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   360.0 /      1.55357 (105,12)     1.22802 (106,14)      .99232 (341, 2)      .93078 (341, 2)      .84795 (114, 6)
   350.0 /      1.62228 (202,13)     1.29616 (202,13)      .94467 (202,13)      .81084 (259, 9)      .82913 (259, 9)
   340.0 /      1.72113 (140,17)     1.50316 (140,17)     1.19228 (289, 9)      .95369 (289, 9)      .83054 (289, 9)
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     330.0 /      1.61817 (364,16)      1.29413 (364,16)      1.02704 (113, 7)      1.00293 (113, 7)       .95844 (113, 7)
     320.0 /      1.63270 ( 44,10)      1.33734 (336,10)      1.06892 (324, 8)      1.04652 (324, 8)       .98995 (324, 8)
     310.0 /      1.53699 (366,11)      1.23822 ( 49,17)       .98479 (149,18)       .89716 ( 44,12)       .84397 ( 52,13)
     300.0 /      1.65240 (211, 8)      1.31858 (302,16)      1.02256 (195, 8)       .99953 (183, 7)      1.01951 (183, 7)
     290.0 /      1.61987 (198, 8)      1.39764 (243, 9)      1.07468 (243, 9)      1.09816 (119, 7)      1.15182 (194, 7)
     280.0 /      1.69123 (236, 9)      1.39237 (220,19)      1.07456 ( 51,11)       .93796 (201, 7)       .93712 ( 62, 8)
     270.0 /      1.68364 (188, 8)      1.48367 (188, 8)      1.30313 (290, 8)      1.11990 (290, 8)       .98934 (290, 8)
     260.0 /      1.66772 (319,15)      1.45993 (208, 8)      1.23700 ( 98,10)      1.01765 (203, 7)       .89241 (145,19)
     250.0 /      1.68862 (307,15)      1.45552 (208,19)      1.13653 (307,15)       .93766 (208,19)       .86218 (296,18)
     240.0 /      1.72320 (185, 8)      1.51006 (185, 8)      1.27338 (194, 8)      1.08340 (194, 8)       .95668 (194, 8)
     230.0 /      1.72697 (191, 8)      1.45807 (338,11)      1.14529 (220,17)       .93225 ( 16,14)       .88416 (206, 7)
     220.0 /      1.65580 (258,17)      1.42651 (258,17)      1.08874 (258,17)       .93733 (307, 9)       .88369 (251, 8)
     210.0 /      1.62228 (293,16)      1.29616 (293,16)      1.28981 (325,11)      1.14254 (234,15)       .97355 (234,15)
     200.0 /      1.59572 ( 78,10)      1.29616 (193, 9)      1.02026 (234,12)       .89431 (211,21)       .82278 (211,21)
     190.0 /      1.72331 (136, 9)      1.47873 (209,17)      1.26992 (234,14)      1.09699 (234,11)       .98834 (234,11)
     180.0 /      1.62228 (219,17)      1.29616 (219,17)       .99957 (257,10)       .90626 (155, 8)       .88383 (155, 8)
     170.0 /      1.64050 (220, 9)      1.30194 (229,10)      1.04164 (347, 9)       .93229 (219, 8)       .90539 (219, 8)
     160.0 /      1.60304 (235,10)      1.41851 (192, 9)      1.13945 (201,14)       .85747 ( 62,18)       .76771 ( 19,19)
     150.0 /      1.46158 (188,15)      1.39237 (320,17)      1.18865 (320,17)       .91048 ( 49,19)       .82436 ( 49,19)
     140.0 /      1.61888 (201,13)      1.40636 (201,13)      1.09451 (201,17)       .89801 ( 28, 2)       .83888 (160,19)
     130.0 /      1.56516 (203,17)      1.31858 (245,10)      1.00138 (204,17)       .88411 (122,18)       .85437 (196,18)
     120.0 /      1.62994 ( 77,10)      1.26680 (213,15)       .98914 (257,18)       .90355 ( 37, 3)       .85954 (162,19)
     110.0 /      1.62984 (292,16)      1.29990 (292,16)       .99677 (232,11)       .87305 (355,17)       .83103 (220,20)
     100.0 /      1.51221 ( 56, 9)      1.15648 ( 56, 9)      1.02642 (177,22)       .95448 (177,22)       .87656 (177,22)
      90.0 /      1.64956 (257,17)      1.43214 (225,19)      1.21071 (225,19)       .90470 (191,18)       .84137 (337,17)
      80.0 /      1.56212 (292,15)      1.23283 (176, 7)      1.03615 (301,17)       .95272 ( 26,16)       .88173 (301,17)
      70.0 /      1.61724 (337,15)      1.28298 ( 86,13)      1.00444 (114,22)       .91294 (177,23)       .85012 ( 86,12)
      60.0 /      1.58275 (230,13)      1.36665 (357,10)      1.06918 (230,13)       .92773 (127,18)       .84851 (127,18)
      50.0 /      1.33666 (289,16)      1.27211 (338,16)      1.02464 (233, 3)       .88746 (233, 7)       .79984 (233, 7)
      40.0 /      1.59167 (357,11)      1.46047 (348,17)      1.17931 (181, 7)       .92886 ( 18,20)       .85676 ( 18,20)
      30.0 /      1.59286 (274,15)      1.25429 ( 25,16)      1.00386 (126,18)       .89097 ( 44,13)       .83129 ( 25,11)
      20.0 /      1.62303 (105,14)      1.40975 (162,18)      1.13653 (172, 9)       .90160 (217,18)       .87282 (217,18)
      10.0 /      1.69352 (193,15)      1.45158 (106,11)      1.13786 (193,15)       .85472 (346,12)       .83402 (346,12)
1                                                                                                                          HIGH
                                                                                                                            3-HR
                                                                                                                           SGROUP#  1
                                *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                               * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                         * FROM ALL SOURCES *
                                                      * FOR THE RECEPTOR GRID *

                            * MAXIMUM VALUE EQUALS      2.26447 AND OCCURRED AT (     568.0,     270.0) *

 DIRECTION /                                                      RANGE (METERS)
 (DEGREES) /               568.0                738.0                966.0               1306.0               1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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     360.0 /     1.41981 (186, 5)    1.38154 (186, 5)    1.08284 (186, 5)     .96841 (323, 5)     .91448 (323, 5)
     350.0 /      .95404 (186, 5)    1.33565 (103, 5)    1.37139 (103, 5)    1.07814 (103, 5)     .89867 (294, 5)
     340.0 /     1.05711 (128, 5)    1.37312 (128, 5)    1.28607 (128, 5)    1.15465 (127, 3)    1.09682 (316, 3)
     330.0 /     1.53933 (208, 4)    1.75139 (208, 4)    1.53411 (208, 4)    1.39866 (356, 4)    1.28387 (356, 4)
     320.0 /     1.62611 (208, 4)    1.66973 (208, 4)    1.36056 (141, 4)    1.38877 (292, 4)    1.21065 (292, 4)
     310.0 /     1.50139 (158, 5)    1.57628 (212, 5)    1.66679 (211, 4)    1.58190 (211, 4)    1.41153 (143, 4)
     300.0 /     1.84848 (158, 5)    1.54167 (158, 5)    1.59205 (210, 4)    1.27461 (210, 4)    1.04380 (112, 3)
     290.0 /     1.35177 (158, 5)    1.31613 (246, 4)    1.42297 (246, 4)    1.27232 (163, 3)    1.17125 (163, 3)
     280.0 /     1.57586 (207, 4)    1.44299 (207, 4)    1.40352 (236, 5)    1.55194 (262, 5)    1.39808 (262, 5)
     270.0 /     2.26447 (207, 4)    1.97474 (207, 4)    1.41014 (363, 4)    1.73282 (363, 4)    1.61329 (363, 4)
     260.0 /     1.74606 (207, 4)    1.37694 (207, 4)    1.33679 ( 70, 4)    1.39832 (298, 4)    1.32105 (306, 5)
     250.0 /     1.92141 (116, 5)    1.40154 (116, 5)    1.30791 (287, 4)    1.44139 ( 46, 4)    1.37537 ( 46, 4)
     240.0 /     1.38931 (132, 4)    1.36075 (132, 4)    1.30575 (276, 4)    1.37296 (276, 4)    1.17288 (276, 4)
     230.0 /     1.32613 (241, 5)    1.42002 (241, 5)    1.48346 (250, 4)    1.36440 (250, 4)    1.09277 (137, 3)
     220.0 /     1.14874 (241, 5)    1.40117 (192, 4)    1.30295 (191, 4)    1.26690 (250, 4)    1.14255 (  2, 5)
     210.0 /     1.01430 (133, 5)    1.51064 (133, 5)    1.57003 (133, 5)    1.38210 (130, 5)    1.21640 (130, 5)
     200.0 /     1.00204 (156, 4)    1.42622 (133, 5)    1.53552 (133, 5)    1.32266 ( 68, 4)    1.15296 ( 68, 4)
     190.0 /     1.32631 (131, 5)    1.32144 (131, 5)    1.24188 (342, 5)    1.42792 (342, 5)    1.28111 (342, 5)
     180.0 /     1.54838 (131, 5)    1.78038 (131, 5)    1.62177 (131, 5)    1.30151 (342, 5)    1.16490 (342, 5)
     170.0 /     1.23353 (221, 4)    1.25906 (221, 4)    1.05900 (221, 4)    1.33147 (151, 3)    1.42169 (151, 3)
     160.0 /     1.41464 (229, 4)    1.41559 (229, 4)    1.39077 ( 78, 4)    1.25614 ( 78, 4)    1.08586 (318, 5)
     150.0 /     1.21639 (229, 4)    1.12497 (229, 4)    1.10319 (179, 4)    1.18245 ( 69, 5)    1.04254 ( 69, 5)
     140.0 /     1.05708 (147, 5)     .89099 (221, 5)     .98802 ( 45, 5)    1.09383 ( 45, 5)     .95599 ( 45, 5)
     130.0 /     1.10769 (147, 5)    1.09847 (147, 5)     .97187 (221, 6)    1.15607 (221, 6)    1.06349 (221, 6)
     120.0 /     1.34276 (203, 5)    1.13586 (203, 5)     .85236 (230, 5)     .98338 (249, 5)     .89054 (249, 5)
     110.0 /     1.80105 (226, 4)    1.70065 (226, 4)    1.45990 (222, 5)    1.19920 (222, 5)     .86001 (222, 5)
     100.0 /     1.54287 (226, 4)    1.49175 (226, 4)    1.24920 ( 82, 5)    1.23541 (245, 6)    1.14991 (245, 6)
      90.0 /     1.14564 (219, 5)    1.80357 (154, 4)    2.08851 (154, 4)    1.79413 (154, 4)    1.37603 (174, 3)
      80.0 /     1.04489 (225, 5)    1.54098 (189, 5)    1.81310 (189, 5)    1.62127 (189, 5)    1.24812 (189, 5)
      70.0 /     1.23844 (225, 4)    1.48752 (288, 5)    1.62932 (288, 5)    1.42510 (309, 4)    1.16284 (200, 6)
      60.0 /     1.42043 (225, 4)    1.56958 (218, 4)    1.49984 (166, 4)    1.21436 (289, 5)     .92799 (121, 6)
      50.0 /     1.56307 (238, 5)    1.71910 (238, 5)    1.58449 (166, 4)    1.27966 (166, 4)     .90632 (166, 4)
      40.0 /     1.31946 (242, 5)    1.37358 (123, 4)    1.36188 (129, 4)    1.12921 (162, 5)     .97538 (357, 4)
      30.0 /      .89986 (196, 4)    1.26061 (119, 4)    1.35687 (119, 4)    1.30271 (110, 4)    1.07158 (110, 4)
      20.0 /      .95400 (196, 4)    1.17274 (119, 4)    1.44153 (200, 4)    1.56936 (144, 5)    1.37393 (144, 5)
      10.0 /     1.05650 (243, 4)     .91441 (243, 4)     .89253 (183, 4)    1.13716 ( 85, 6)    1.09966 ( 85, 6)
1                                                                                                             HIGH
                                                                                                               3-HR
                                                                                                              SGROUP#  1
                             *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                            * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                         * MAXIMUM VALUE EQUALS      2.26447 AND OCCURRED AT (     568.0,     270.0) *

  DIRECTION /                                              RANGE (METERS)
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```
 (DEGREES) /          2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .73819 (323, 5)      .63209 ( 87, 6)      .54421 ( 87, 6)      .47258 (197, 6)      .43068 (197, 6)
     350.0 /       .69962 (200, 3)      .64243 (200, 3)      .57342 (200, 3)      .50553 (200, 3)      .46743 (200, 3)
     340.0 /       .97165 (316, 3)      .76914 (316, 3)      .60510 (316, 3)      .49731 (166, 6)      .44655 (166, 6)
     330.0 /      1.02728 (356, 4)      .72015 (356, 4)      .62775 (364, 6)      .51632 (364, 6)      .45107 (364, 6)
     320.0 /      1.03272 ( 65, 4)      .89177 ( 65, 4)      .71816 ( 65, 4)      .60047 ( 87, 1)      .54216 ( 87, 1)
     310.0 /      1.12569 (143, 4)      .88537 (149, 6)      .75699 (149, 6)      .60276 (149, 6)      .51648 (149, 6)
     300.0 /       .88906 ( 17, 5)      .87739 ( 24, 2)      .86713 ( 24, 2)      .76810 ( 24, 2)      .68940 ( 24, 2)
     290.0 /      1.00076 (163, 3)      .81131 (163, 3)      .64916 (163, 3)      .58604 (162, 2)      .55432 (162, 2)
     280.0 /      1.09370 (262, 5)      .75352 (262, 5)      .57277 (279, 6)      .55244 (279, 6)      .51734 (279, 6)
     270.0 /      1.29374 (363, 4)      .96836 ( 49, 4)      .76824 ( 49, 4)      .57775 (361, 5)      .50030 ( 43, 7)
     260.0 /      1.14977 (306, 5)      .90560 (306, 5)      .68402 (360, 7)      .58504 (360, 7)      .51751 (363, 2)
     250.0 /      1.12011 ( 46, 4)      .79483 ( 46, 4)      .63579 (331, 5)      .63552 (350, 3)      .61312 (350, 3)
     240.0 /      1.07456 (102, 4)      .92196 (268, 6)      .88642 (264, 2)      .79775 (353, 6)      .75971 (353, 6)
     230.0 /       .89303 (137, 3)      .63688 (137, 3)      .57095 (282, 3)      .54593 (102, 3)      .51528 (102, 3)
     220.0 /       .94907 (  2, 5)      .82288 (284, 6)      .72683 (276, 3)      .66593 (276, 3)      .61235 (276, 3)
     210.0 /       .93716 (130, 5)      .63857 (130, 5)      .62449 ( 20, 5)      .59616 (325, 4)      .55792 (325, 4)
     200.0 /       .88156 ( 68, 4)      .59662 ( 68, 4)      .49180 ( 21, 4)      .39995 (326, 6)      .38574 (273, 8)
     190.0 /       .98958 (342, 5)      .67989 (328, 3)      .64723 (209, 6)      .57557 (209, 6)      .52219 (209, 6)
     180.0 /       .89688 (342, 5)      .69042 (271, 6)      .61000 (271, 6)      .49247 (271, 6)      .42323 (271, 6)
     170.0 /      1.26634 (151, 3)      .98906 (151, 3)      .75836 (151, 3)      .57618 (151, 3)      .49398 (151, 3)
     160.0 /       .86776 (318, 5)      .81631 ( 19, 4)      .76636 ( 19, 4)      .65025 ( 19, 4)      .57221 ( 19, 4)
     150.0 /       .84744 (317, 5)      .94783 ( 67, 3)      .90417 ( 67, 3)      .77806 ( 67, 3)      .68927 ( 67, 3)
     140.0 /       .73497 ( 45, 5)      .66714 (189, 7)      .63642 ( 31, 6)      .58322 ( 31, 6)      .53139 ( 31, 6)
     130.0 /       .85499 (221, 6)      .81710 (341, 6)      .73427 (341, 6)      .60150 (341, 6)      .52057 (341, 6)
     120.0 /       .84776 ( 89, 4)      .75659 ( 89, 4)      .62019 ( 89, 4)      .49621 ( 27, 8)      .45108 ( 27, 8)
     110.0 /       .77543 (101, 6)      .84685 (101, 6)      .79411 (101, 6)      .67448 (101, 6)      .59385 (101, 6)
     100.0 /      1.00267 (245, 6)      .82907 (245, 6)      .66859 (245, 6)      .51709 (245, 6)      .45208 (172, 6)
      90.0 /      1.16340 (174, 3)      .88101 (174, 3)      .76537 (177, 7)      .68084 (177, 7)      .61105 (177, 7)
      80.0 /       .87913 (189, 5)      .67975 (233, 4)      .62068 (233, 4)      .51610 (233, 4)      .45028 (233, 4)
      70.0 /       .93954 (355, 5)      .83222 ( 86, 5)      .82313 ( 86, 5)      .77057 ( 86, 5)      .72215 ( 86, 5)
      60.0 /       .78822 (181, 6)      .66138 (182, 5)      .53325 (182, 5)      .41002 (127, 6)      .35912 (127, 6)
      50.0 /       .68519 (356, 5)      .67255 (233, 3)      .64358 (233, 3)      .55620 (233, 3)      .49396 (233, 3)
      40.0 /       .82337 (357, 4)      .66871 ( 53, 5)      .65003 ( 53, 5)      .56780 ( 53, 5)      .50601 ( 53, 5)
      30.0 /       .91926 ( 24, 5)      .87271 (126, 6)      .76441 (126, 6)      .62261 (126, 6)      .53962 (126, 6)
      20.0 /      1.05569 (144, 5)      .88985 ( 95, 6)      .76093 ( 95, 6)      .60076 ( 95, 6)      .51194 ( 95, 6)
      10.0 /       .95462 ( 65, 6)      .96411 ( 65, 6)      .85682 ( 65, 6)      .69757 ( 65, 6)      .60284 ( 65, 6)
1                                                                                                                   2ND HIGH
                                                                                                                     3-HR
                                                                                                                    SGROUP#  1
                            *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                        * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                   * FROM ALL SOURCES *
                                                  * FOR THE RECEPTOR GRID *
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                           * MAXIMUM VALUE EQUALS      1.71021 AND OCCURRED AT (     568.0,     260.0) *

 DIRECTION /                                                    RANGE (METERS)
 (DEGREES) /              568.0                 738.0                 966.0                 1306.0                1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      1.08610 (142, 5)       .99329 (103, 5)      1.04779 (103, 5)       .90630 (129, 3)       .87958 (129, 3)
     350.0 /       .91558 (103, 5)       .95108 (118, 4)      1.01906 (289, 4)      1.06290 (294, 5)       .75660 (103, 5)
     340.0 /       .99969 (167, 5)      1.12199 (289, 4)      1.24404 (289, 4)      1.02962 (316, 3)      1.03347 (127, 3)
     330.0 /       .99523 (185, 4)      1.15017 (211, 5)      1.24584 (246, 5)      1.18482 (246, 5)      1.07437 (166, 3)
     320.0 /      1.20495 (210, 5)      1.42010 (210, 5)      1.35640 (208, 4)      1.25149 ( 57, 5)      1.15301 ( 57, 5)
     310.0 /      1.30460 (212, 5)      1.43100 ( 64, 5)      1.65657 ( 64, 5)      1.52148 (143, 4)      1.27789 (211, 4)
     300.0 /      1.01294 (258, 4)      1.49073 (210, 4)      1.42430 (246, 4)      1.16293 (209, 4)      1.04184 ( 17, 5)
     290.0 /       .84193 (246, 4)      1.13965 (158, 5)      1.16503 (163, 3)      1.15020 (246, 4)       .88526 (212, 4)
     280.0 /      1.09402 (147, 4)      1.31621 (236, 5)      1.35664 (139, 5)      1.22615 ( 42, 5)      1.11039 (168, 5)
     270.0 /      1.15423 (147, 4)      1.10884 (146, 4)      1.39877 (207, 4)      1.52453 (211, 6)      1.38910 (159, 6)
     260.0 /      1.71021 (116, 5)      1.24971 (116, 5)      1.22474 (206, 5)      1.35102 (306, 5)      1.24943 (298, 4)
     250.0 /      1.16949 (227, 4)      1.22115 (287, 4)      1.24168 (164, 4)      1.09928 (303, 5)       .87893 (153, 5)
     240.0 /      1.19200 (116, 5)      1.16663 (164, 5)      1.22589 (164, 5)      1.22817 (281, 4)      1.16025 (240, 6)
     230.0 /       .99816 (235, 5)      1.19799 (192, 4)      1.25370 (285, 4)      1.21692 (285, 4)      1.07613 (312, 5)
     220.0 /      1.06253 (192, 4)      1.22680 (241, 5)      1.24104 (192, 4)      1.16823 (  2, 5)      1.06376 (250, 4)
     210.0 /       .99998 (134, 5)       .91302 (214, 5)      1.23062 (130, 5)      1.23379 (133, 5)       .92611 (190, 4)
     200.0 /       .90742 (133, 5)       .81440 (214, 5)      1.19292 ( 68, 4)      1.23639 (133, 5)      1.03739 (342, 4)
     190.0 /       .75683 (156, 4)       .90881 (137, 5)      1.06687 (131, 5)       .93708 ( 63, 4)       .90307 ( 63, 4)
     180.0 /       .62391 (185, 5)      1.00327 (185, 5)      1.13798 (185, 5)      1.21169 (131, 5)       .96215 ( 31, 4)
     170.0 /       .89988 (131, 5)      1.09476 (131, 5)      1.01141 (131, 5)      1.05889 ( 61, 4)       .88553 ( 61, 4)
     160.0 /      1.20671 (221, 4)      1.10861 ( 78, 4)      1.19193 (229, 4)      1.17308 (318, 5)       .97700 ( 36, 4)
     150.0 /       .99443 (163, 4)       .94288 (179, 4)      1.05545 ( 69, 5)      1.06027 (115, 6)       .93907 (228, 6)
     140.0 /       .81312 (197, 4)       .88771 (197, 4)       .98104 (179, 4)       .95202 (253, 3)       .86783 (253, 3)
     130.0 /       .85505 (188, 4)       .92835 (188, 4)       .89221 (147, 5)       .79361 (228, 5)       .78157 ( 59, 2)
     120.0 /      1.16858 (226, 4)      1.10277 (226, 4)       .83306 (249, 5)       .91210 (228, 5)       .85812 ( 77, 4)
     110.0 /      1.51774 (203, 5)      1.33649 (203, 5)       .99722 (226, 4)       .95653 (230, 5)       .84048 (230, 5)
     100.0 /      1.21463 (219, 5)      1.16978 ( 82, 5)      1.13573 (245, 6)      1.08427 (  7, 4)       .98557 (  7, 4)
      90.0 /      1.06809 (154, 4)      1.31869 (243, 5)      1.39283 (243, 5)      1.39364 (174, 3)      1.32137 (154, 4)
      80.0 /       .99208 (136, 4)      1.40634 (136, 4)      1.44348 (309, 4)      1.29047 (309, 4)      1.03429 ( 78, 6)
      70.0 /      1.15207 (259, 5)      1.32621 (225, 4)      1.52614 (309, 4)      1.32118 (288, 5)      1.13193 (355, 5)
      60.0 /      1.38270 (238, 5)      1.50093 (238, 5)      1.42330 (289, 5)      1.17596 (166, 4)       .88665 (289, 5)
      50.0 /      1.44348 (184, 4)      1.46760 (166, 4)      1.56637 (238, 5)      1.19629 (238, 5)       .87755 (356, 5)
      40.0 /      1.08656 (225, 4)      1.27142 (129, 4)      1.29994 (123, 4)      1.09752 (129, 4)       .93166 (162, 5)
      30.0 /       .82266 (119, 4)      1.06197 (110, 4)      1.33320 (110, 4)      1.19527 ( 50, 5)      1.00065 (102, 6)
      20.0 /       .84804 (243, 4)      1.13465 (112, 5)      1.40919 (144, 5)      1.44673 (200, 4)      1.18934 (200, 4)
      10.0 /      1.01734 (186, 5)       .88476 (186, 5)       .87483 ( 85, 6)       .70634 (126, 5)       .80515 ( 65, 6)
1                                                                                                                        2ND HIGH
                                                                                                                          3-HR
                                                                                                                         SGROUP#  1
                               *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                          * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
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                                              * FROM ALL SOURCES *
                                            * FOR THE RECEPTOR GRID *

                         * MAXIMUM VALUE EQUALS      1.71021 AND OCCURRED AT (     568.0,     260.0) *

DIRECTION /                                               RANGE (METERS)
(DEGREES) /        2215.0              2954.0              3862.0              5112.0              6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .72193 (129, 3)     .56685 (197, 6)     .53790 (197, 6)     .44409 ( 25, 3)     .41629 ( 25, 3)
    350.0 /      .67068 (294, 5)     .48964 (249, 3)     .41837 ( 87, 2)     .41176 ( 87, 2)     .39145 ( 87, 2)
    340.0 /      .83922 (127, 3)     .62625 (127, 3)     .55794 (166, 6)     .47022 (316, 3)     .41030 ( 18, 4)
    330.0 /      .85830 (166, 3)     .71351 (364, 6)     .58538 ( 94, 1)     .49394 ( 94, 1)     .44295 ( 10, 4)
    320.0 /      .94478 (292, 4)     .72390 (324, 3)     .66986 ( 87, 1)     .58548 (324, 3)     .53480 (324, 3)
    310.0 /      .95369 (149, 6)     .78588 (143, 4)     .61219 (332, 6)     .50504 (332, 6)     .45196 (211, 1)
    300.0 /      .88721 (143, 3)     .82263 (143, 3)     .77562 (302, 6)     .72195 (302, 6)     .67076 (302, 6)
    290.0 /      .80500 (212, 4)     .61664 (212, 4)     .59191 (162, 2)     .50459 (163, 3)     .45374 (332, 3)
    280.0 /      .89300 (168, 5)     .64308 (197, 3)     .54835c( 51, 4)     .48563 (203, 1)     .47211 (203, 1)
    270.0 /     1.15685 ( 49, 4)     .91036 (363, 4)     .71900 (361, 5)     .57741 ( 49, 4)     .49877 (331, 6)
    260.0 /      .97364 (298, 4)     .71876 (360, 7)     .68369 (306, 5)     .54865 (363, 2)     .51575 (360, 7)
    250.0 /      .71510 (133, 6)     .66096 ( 22, 6)     .62622 (350, 3)     .56557 (331, 5)     .52666 (239, 6)
    240.0 /      .94261 (240, 6)     .91601 (102, 4)     .82972 (268, 6)     .77845 (264, 2)     .69558 (264, 2)
    230.0 /      .85408 (312, 5)     .63653 (258, 6)     .56018 ( 12, 5)     .52993 ( 12, 5)     .49059 ( 12, 5)
    220.0 /      .90992 (284, 6)     .71734 ( 20, 3)     .68926 (284, 6)     .59857 ( 14, 2)     .55895 ( 14, 2)
    210.0 /      .79253 (190, 4)     .63653 ( 20, 5)     .61945 (325, 4)     .54846 ( 20, 5)     .49543 ( 20, 6)
    200.0 /      .81655 (342, 4)     .57854 (  3, 4)     .47883 (327, 5)     .39714 ( 12, 1)     .37757 ( 12, 1)
    190.0 /      .73882 ( 63, 4)     .66527 (342, 5)     .58270 (328, 3)     .45907 (328, 3)     .39978 (270, 3)
    180.0 /      .84776 ( 31, 4)     .66387 ( 31, 4)     .55719 (327, 6)     .45291 (327, 6)     .39061 (327, 6)
    170.0 /      .68130 ( 31, 5)     .50852 (229, 4)     .48800 (  3, 6)     .47299 (  3, 6)     .44873 (  3, 6)
    160.0 /      .76324 (293, 5)     .64756 ( 19, 5)     .59192 ( 19, 5)     .49255 ( 19, 5)     .42987 ( 19, 5)
    150.0 /      .84367 ( 67, 3)     .86827 (325, 6)     .83386 (325, 6)     .72069 (325, 6)     .64043 (325, 6)
    140.0 /      .68408 (253, 3)     .61667 ( 31, 6)     .58330 (189, 7)     .48795 ( 67, 1)     .44972 ( 28, 3)
    130.0 /      .80968 ( 59, 2)     .73026 ( 59, 2)     .60217 ( 59, 2)     .46214 ( 59, 2)     .43134 (155, 7)
    120.0 /      .78789 ( 77, 4)     .62907 ( 77, 4)     .54262 ( 27, 8)     .47419 ( 89, 4)     .42808 (101, 3)
    110.0 /      .75193 (  5, 5)     .72965 (108, 7)     .71001 (108, 7)     .62779 (108, 7)     .56707 (108, 7)
    100.0 /      .85360 ( 97, 6)     .77751 ( 97, 6)     .65249 ( 97, 6)     .51507 (172, 6)     .43997 (245, 6)
     90.0 /      .99963 (257, 6)     .76622 (177, 7)     .66557 (174, 3)     .50211 (174, 3)     .43923 (231, 3)
     80.0 /      .81732 ( 78, 6)     .64731 (176, 3)     .53333 (231, 6)     .43497 (231, 6)     .39268 ( 26, 6)
     70.0 /      .93496 ( 50, 6)     .80185 (232, 6)     .69027 (232, 6)     .56128 (178, 1)     .50664 (178, 1)
     60.0 /      .78363 (182, 5)     .65359 (181, 6)     .51159 (181, 6)     .40754 (182, 5)     .35140 (175, 2)
     50.0 /      .64909 (181, 5)     .58557 (289, 6)     .53432 (289, 6)     .46151 (289, 6)     .43051 (233, 1)
     40.0 /      .73616 (125, 5)     .65628 (110, 6)     .56405 (110, 6)     .45678 (110, 6)     .39627 (110, 6)
     30.0 /      .91520 (126, 6)     .82937 ( 24, 5)     .69121 ( 24, 5)     .53683 ( 24, 5)     .49744 ( 25, 4)
     20.0 /      .93280 ( 95, 6)     .76788 ( 88, 6)     .66085 (113, 6)     .54535 (113, 6)     .47481 (113, 6)
     10.0 /      .90567 ( 85, 6)     .68337 (125, 4)     .61601 (125, 4)     .50702 (125, 4)     .44033 (125, 4)
1                                                                                                         HIGH
                                                                                                          8-HR
                                                                                                          SGROUP#  1
                        *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***
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                              * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                            * MAXIMUM VALUE EQUALS      1.44786 AND OCCURRED AT (     966.0,     90.0) *

 DIRECTION /                                                 RANGE (METERS)
 (DEGREES) /          568.0                 738.0                 966.0                1306.0                1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .56986 (142, 2)       .64331 (215, 2)       .68714 (215, 2)       .55048 (215, 2)       .43946 ( 87, 3)
    350.0 /       .44217 (128, 2)       .65114 (215, 2)       .69620 (215, 2)       .56199 (215, 2)       .43188 (202, 2)
    340.0 /       .51559 (128, 2)       .66873 (128, 2)       .62100 (128, 2)       .54850 ( 84, 2)       .45650 (289, 2)
    330.0 /       .74075 (208, 2)       .88649 (208, 2)       .80207 (208, 2)       .61082 ( 84, 2)       .50888 (148, 2)
    320.0 /       .70029 (210, 2)       .94156 (210, 2)       .94545 (210, 2)       .92113 ( 57, 2)       .84810 ( 57, 2)
    310.0 /       .88512 (210, 2)      1.09998 (210, 2)      1.10507 (205, 2)       .98078 (143, 2)       .82467 (143, 2)
    300.0 /       .89207 (158, 2)       .95847 (210, 2)       .88886 (210, 2)       .71686 (217, 2)       .73904 (302, 2)
    290.0 /       .63140 (158, 2)       .68938 (159, 2)       .75860 (159, 2)       .61560 (159, 2)       .52538 (217, 2)
    280.0 /       .59095 (207, 2)       .73696 (139, 2)       .88917 (167, 2)       .94750 (168, 2)       .90758 (168, 2)
    270.0 /       .84919 (207, 2)       .74056 (207, 2)       .81095 (139, 2)       .78078 ( 93, 2)       .73399 (363, 2)
    260.0 /       .92909 (116, 2)       .90233 (116, 2)       .87708 (164, 2)       .78060 (306, 2)       .72952 (306, 2)
    250.0 /       .99528 (116, 2)      1.33613 (164, 2)      1.42823 (164, 2)      1.14401 (164, 2)       .84923 (280, 2)
    240.0 /      1.03182 (132, 2)      1.03144 (132, 2)       .92628 (164, 2)       .93303 (281, 2)       .85790 (281, 2)
    230.0 /       .76029 (132, 2)       .90123 (241, 2)       .93760 (241, 2)       .99040 (250, 2)       .90494 (250, 2)
    220.0 /       .49211 (134, 2)       .56213 (241, 2)       .69803 (307, 2)       .90286 (  2, 2)       .87448 (  2, 2)
    210.0 /       .47279 (134, 2)       .57225 (133, 2)       .59403 (133, 2)       .61500 (130, 2)       .59364 (130, 2)
    200.0 /       .50601 (131, 2)       .61033 (133, 2)       .65273 (133, 2)       .73954 (342, 2)       .68281 (342, 2)
    190.0 /       .79364 (131, 2)       .94504 (131, 2)       .87707 (131, 2)       .84366 (342, 2)       .75547 (342, 2)
    180.0 /       .68586 (131, 2)       .82774 (131, 2)       .77492 (131, 2)       .58269 (131, 2)       .49233 (342, 2)
    170.0 /       .47732 (221, 2)       .49628 (221, 2)       .66698 ( 61, 2)       .69332 ( 61, 2)       .57822 ( 61, 2)
    160.0 /       .54046 (221, 2)       .58836 ( 61, 2)       .74372 ( 61, 2)       .69956 ( 61, 2)       .54823 ( 61, 2)
    150.0 /       .47581 (229, 2)       .52777 (115, 2)       .69009 (115, 2)       .67578C(273, 2)       .65291C(273, 2)
    140.0 /       .39641 (147, 2)       .48076 (115, 2)       .65536 (115, 2)       .65341 (115, 2)       .53483 (115, 2)
    130.0 /       .41538 (147, 2)       .41193 (147, 2)       .51643 (228, 2)       .49106 (228, 2)       .39167 (228, 2)
    120.0 /       .54651 (203, 2)       .54144 (203, 2)       .57178 (228, 2)       .55654 (228, 2)       .57886 ( 89, 2)
    110.0 /       .81663 (226, 2)       .88615 (226, 2)       .66465 (226, 2)       .55469C(230, 2)       .45963C(230, 2)
    100.0 /       .74856 (226, 2)       .90145 (226, 2)       .87620C(154, 2)       .79359C(154, 2)       .61652C(  7, 2)
     90.0 /       .78489C(154, 2)      1.27974C(154, 2)      1.44786C(154, 2)      1.23094C(154, 2)       .90580C(154, 2)
     80.0 /       .66411 (225, 2)       .99632C(154, 2)      1.05400C(154, 2)       .83935C(154, 2)       .68245 (257, 2)
     70.0 /       .84568 (225, 2)      1.02949C(290, 2)      1.30093C(290, 2)      1.23668C(290, 2)       .98734C(290, 2)
     60.0 /       .88460C(238, 2)      1.12014C(238, 2)      1.08825C(238, 2)       .83811C(238, 2)       .61262 (182, 2)
     50.0 /       .92269C(194, 2)       .93221C(238, 2)       .89121C(238, 2)       .68960C(238, 2)       .55081 (181, 2)
     40.0 /       .91782C(194, 2)       .96905C(194, 2)       .87412 (123, 2)       .70523 (123, 2)       .55107 (125, 2)
     30.0 /       .50796C(194, 2)       .73124 (110, 2)       .89347 (110, 2)       .84756 (110, 2)       .68374 (110, 2)
     20.0 /       .45610 (119, 2)       .69219 (119, 2)       .72308 (119, 2)       .76157 (144, 2)       .66895 (144, 2)
     10.0 /       .41342 (142, 2)       .52591 (183, 2)       .55277 (129, 2)       .51801 (129, 2)       .41567 (129, 2)
1                                                                                                                     HIGH
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                                                                                                                     8-HR
                                                                                                                     SGROUP#  1
                                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                                        * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)      *
                                                            * FROM ALL SOURCES *
                                                          * FOR THE RECEPTOR GRID *

                                      * MAXIMUM VALUE EQUALS      1.44786 AND OCCURRED AT (     966.0,      90.0) *

 DIRECTION /                                                    RANGE (METERS)
 (DEGREES) /           2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .50948 ( 87, 3)      .53554 ( 87, 3)      .50090 ( 87, 3)      .42920 ( 87, 3)      .38036 ( 87, 3)
    350.0 /       .38210 (202, 2)      .28987 (202, 2)      .22581 ( 58, 2)      .19439 ( 87, 1)      .17712 ( 87, 1)
    340.0 /       .37811 (289, 2)      .28843 (316, 2)      .27027 ( 18, 2)      .24800 ( 18, 2)      .22601 ( 18, 2)
    330.0 /       .39623 (148, 2)      .27184 (148, 2)      .22184 ( 94, 1)      .18663 ( 94, 1)      .16611 ( 10, 2)
    320.0 /       .67392 ( 57, 2)      .47013 ( 57, 2)      .34430 ( 65, 2)      .28925 (100, 1)      .25709 (100, 1)
    310.0 /       .72257 (302, 2)      .56525 (302, 2)      .45801 ( 57, 3)      .35986 ( 57, 3)      .30522 ( 57, 3)
    300.0 /       .70142 (302, 2)      .56828 (302, 2)      .44027 ( 24, 1)      .40311 ( 24, 1)      .36950 ( 24, 1)
    290.0 /       .46794 (212, 2)      .35434 (212, 2)      .27451 (162, 1)      .27168 (162, 1)      .25820 (162, 1)
    280.0 /       .76404 (168, 2)      .57599 (168, 2)      .44455 ( 72, 2)      .43734C(203, 1)      .43426C(203, 1)
    270.0 /       .67821 (266, 2)      .60605 (266, 2)      .49921 (266, 2)      .41081 (217, 1)      .39145 (217, 1)
    260.0 /       .62457 (306, 2)      .49073 (306, 2)      .41725 (361, 3)      .35993 (361, 3)      .31914 (361, 3)
    250.0 /       .69741 (280, 2)      .49853 (280, 2)      .40053 (351, 2)      .37227 (351, 2)      .34128 (351, 2)
    240.0 /       .72381 ( 74, 2)      .55216 ( 74, 2)      .48909 (283, 2)      .39287 (283, 2)      .33782 (313, 3)
    230.0 /       .72558 (250, 2)      .52446 (250, 2)      .37948 (250, 2)      .30354 ( 12, 2)      .28374 ( 12, 2)
    220.0 /       .71910 (  2, 2)      .51414 (  2, 2)      .47812 ( 14, 1)      .45228 ( 14, 1)      .41794 ( 14, 1)
    210.0 /       .51318 (130, 2)      .40242 (130, 2)      .33345 ( 20, 2)      .29834 ( 13, 3)      .27220 ( 13, 3)
    200.0 /       .54132 (342, 2)      .38199 (342, 2)      .26899 (342, 2)      .20805 ( 16, 2)      .19734 ( 16, 2)
    190.0 /       .58301 (342, 2)      .41110C(234, 2)      .35995C(234, 2)      .29805C(234, 2)      .26328C(234, 2)
    180.0 /       .45101 (327, 3)      .44785 (327, 3)      .41127 (329, 1)      .35754 (329, 1)      .31936 (329, 1)
    170.0 /       .45081 (151, 1)      .35557 (151, 1)      .27499 (151, 1)      .21183 ( 51, 3)      .18648 ( 51, 3)
    160.0 /       .59421 ( 19, 2)      .63716 ( 19, 2)      .59055 ( 19, 2)      .49869 ( 19, 2)      .43895 ( 19, 2)
    150.0 /       .54196C(273, 2)      .47240 ( 67, 2)      .41121 ( 67, 2)      .33058 ( 67, 2)      .28743C( 56, 3)
    140.0 /       .39190 (115, 2)      .34811 ( 67, 1)      .34513 ( 67, 1)      .30565 ( 67, 1)      .27392 ( 67, 1)
    130.0 /       .46683 ( 11, 2)      .47333 ( 11, 2)      .41847 ( 11, 2)      .33673 ( 11, 2)      .28837 ( 11, 2)
    120.0 /       .58766 ( 89, 2)      .51983 ( 89, 2)      .42190 ( 89, 2)      .32687 (107, 1)      .30258 (107, 1)
    110.0 /       .38541 (  5, 2)      .35647 (108, 3)      .35653 (108, 3)      .32318 (108, 3)      .29592 (108, 3)
    100.0 /       .49629 (109, 2)      .38720 (109, 2)      .34283 ( 97, 3)      .30990 ( 97, 3)      .28324 ( 97, 3)
     90.0 /       .69280C( 55, 2)      .53531C( 55, 2)      .47206 (177, 3)      .39713 (177, 3)      .34828 (177, 3)
     80.0 /       .52679C(290, 2)      .39350 (233, 2)      .32168 (233, 2)      .24738 (233, 2)      .20882 (233, 2)
     70.0 /       .71006C(290, 2)      .61514 (178, 1)      .59739 (178, 1)      .51976 (178, 1)      .46184 (178, 1)
     60.0 /       .51205 (182, 2)      .39478 (182, 2)      .29621 (182, 2)      .21271 (182, 2)      .17404 (182, 2)
     50.0 /       .41992 (181, 2)      .47053 (233, 1)      .46698 (233, 1)      .43108 (129, 3)      .40303 (129, 3)
     40.0 /       .50735 (125, 2)      .42384 (125, 2)      .33535 ( 53, 2)      .29031 ( 53, 2)      .25721 ( 53, 2)
     30.0 /       .56670 (114, 2)      .58489 (114, 2)      .52414 (114, 2)      .42711 (114, 2)      .36824 (114, 2)
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     20.0 /      .51442 (144, 2)      .47614 (125, 1)      .43967 (125, 1)      .36966 (125, 1)      .32461 (125, 1)
     10.0 /      .43531 ( 85, 2)      .41482 ( 85, 2)      .37347 ( 27, 1)      .33499 ( 27, 1)      .30493 ( 27, 1)
1                                                                                                              2ND HIGH
                                                                                                                8-HR
                                                                                                               SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                              * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                     * FROM ALL SOURCES *
                                                   * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      1.04364 AND OCCURRED AT (     966.0,      90.0) *

 DIRECTION /                                                    RANGE (METERS)
 (DEGREES) /            568.0                738.0                966.0               1306.0               1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .53243 (186, 2)      .59815 (142, 2)      .58513 (183, 2)      .46137 (183, 2)      .38831 (215, 2)
    350.0 /      .42766 (167, 2)      .57096 (128, 2)      .52846 (128, 2)      .40704 (202, 2)      .39929 (215, 2)
    340.0 /      .42490 (167, 2)      .60269 (118, 2)      .60652 (118, 2)      .51375 (289, 2)      .42800 ( 84, 2)
    330.0 /      .47115 (128, 2)      .63276 (128, 2)      .67344 ( 84, 2)      .60434 (210, 2)      .49345 (210, 2)
    320.0 /      .65807 (208, 2)      .82704 (205, 2)      .91275 (205, 2)      .78082 (211, 2)      .61549 (211, 2)
    310.0 /      .81147 (158, 2)     1.00385 (205, 2)     1.00380 (210, 2)      .93351 (205, 2)      .78467 (302, 2)
    300.0 /      .75547 (210, 2)      .85901 (158, 2)      .85336 (142, 2)      .68600 (169, 2)      .62131 (217, 2)
    290.0 /      .42160 (159, 2)      .61882 (158, 2)      .62775 (246, 2)      .61237 (217, 2)      .52402 (212, 2)
    280.0 /      .42704 (139, 2)      .72254 (167, 2)      .86296 (139, 2)      .82709 (167, 2)      .65280 (167, 2)
    270.0 /      .43286 (147, 2)      .64140 (139, 2)      .67477 ( 93, 2)      .76403 (139, 2)      .70113 ( 93, 2)
    260.0 /      .65694 (207, 2)      .82053 (164, 2)      .71869 (206, 2)      .69581 (164, 2)      .63010 (305, 2)
    250.0 /      .85449 (164, 2)      .93564 (116, 2)      .79234 (153, 2)      .88173 (280, 2)      .80732 (164, 2)
    240.0 /      .58417 (241, 2)      .88887 (164, 2)      .84338 (137, 2)      .90157 ( 74, 2)      .85641 ( 74, 2)
    230.0 /      .68292 (241, 2)      .72812 (132, 2)      .86966 (250, 2)      .82476 (241, 2)      .65588 (241, 2)
    220.0 /      .48453 (241, 2)      .54191 (307, 2)      .68859 (  2, 2)      .72616 (250, 2)      .63159 (250, 2)
    210.0 /      .38443 (133, 2)      .39849 (134, 2)      .50952 (130, 2)      .57960 (284, 2)      .56914 (284, 2)
    200.0 /      .38999 (133, 2)      .58645 (131, 2)      .60224 (342, 2)      .59743 (130, 2)      .54868 (130, 2)
    190.0 /      .32519 (178, 2)      .54870 (178, 2)      .72829 (342, 2)      .65715 (131, 2)      .45617 (152, 2)
    180.0 /      .33130 (235, 2)      .52522 (178, 2)      .57349 (178, 2)      .55316 (342, 2)      .44976 ( 31, 2)
    170.0 /      .35560 (192, 2)      .47967 (192, 2)      .46315 (192, 2)      .48496C(220, 2)      .50072 (151, 1)
    160.0 /      .53534 (229, 2)      .56096 (221, 2)      .61161C(220, 2)      .58741 (275, 2)      .54645 (275, 2)
    150.0 /      .42261 (221, 2)      .49359 (221, 2)      .59189 ( 69, 2)      .67495 ( 69, 2)      .60810 ( 69, 2)
    140.0 /      .30605 (221, 2)      .45984 (221, 2)      .50827 (221, 2)      .44820 ( 67, 2)      .41828 ( 67, 2)
    130.0 /      .32234 (188, 2)      .40784 (228, 2)      .41095 (221, 2)      .38402 (221, 2)      .38881 ( 59, 1)
    120.0 /      .49677 (226, 2)      .51305 (226, 2)      .47365 (203, 2)      .50859 ( 96, 2)      .46561 ( 96, 2)
    110.0 /      .58415 (203, 2)      .53977 (203, 2)      .55235C(230, 2)      .44975 (222, 2)      .42761 (292, 2)
    100.0 /      .47168 (219, 2)      .71896C(154, 2)      .78659 (226, 2)      .68495C(  7, 2)      .60758C(154, 2)
     90.0 /      .53692 (219, 2)      .88294 (171, 2)     1.04364 (171, 2)      .93832 (171, 2)      .82674C( 55, 2)
     80.0 /      .65487C(154, 2)      .78989 (171, 2)      .87100 (309, 2)      .82749 (309, 2)      .67304C(290, 2)
     70.0 /      .57782C(194, 2)      .85122C(288, 2)     1.02710C(288, 2)      .95243C(288, 2)      .75851C(288, 2)
     60.0 /      .77690C(194, 2)      .83788C(290, 2)      .95696C(290, 2)      .80633C(290, 2)      .61256C(  6, 2)
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        50.0 /       .84116 (242, 2)      .92098C(194, 2)      .72477C(194, 2)      .63615 (181, 2)      .48108C(238, 2)
        40.0 /       .77250 (242, 2)      .85384 (123, 2)      .79341C(194, 2)      .56518 (321, 2)      .51271 (123, 2)
        30.0 /       .43615 (110, 2)      .61022 (119, 2)      .75553 (124, 2)      .78160 (124, 2)      .66386 (124, 2)
        20.0 /       .44950 (129, 2)      .66801 (129, 2)      .72101 (200, 2)      .72609 (200, 2)      .59789 (200, 2)
        10.0 /       .39619 (243, 2)      .46311 (129, 2)      .55272 (183, 2)      .43650 (200, 2)      .41448 ( 85, 2)
1                                                                                                                      2ND HIGH
                                                                                                                        8-HR
                                                                                                                       SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                              * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      1.04364 AND OCCURRED AT (     966.0,      90.0) *

   DIRECTION /                                                  RANGE (METERS)
   (DEGREES) /            2215.0               2954.0               3862.0               5112.0               6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

       360.0 /       .27682 (323, 2)      .22072 (114, 1)      .25875 (114, 1)      .26355 (114, 1)      .25384 (114, 1)
       350.0 /       .26670 ( 58, 2)      .26078 ( 58, 2)      .21996 ( 87, 1)      .18659 (200, 1)      .17317 (200, 1)
       340.0 /       .36437 (316, 2)      .28719 (289, 2)      .22691 (316, 2)      .18648C(166, 3)      .16813C(166, 3)
       330.0 /       .38523 (356, 2)      .27006 (356, 2)      .20254 ( 10, 2)      .18330 ( 10, 2)      .16343 ( 94, 1)
       320.0 /       .54622 ( 65, 2)      .44568 ( 65, 2)      .33533 (100, 1)      .25342 ( 94, 1)      .21626 ( 94, 1)
       310.0 /       .61739 (143, 2)      .53749 ( 57, 3)      .40582 (302, 2)      .31034 (366, 3)      .29145 (366, 3)
       300.0 /       .50011 (217, 2)      .43227 ( 24, 1)      .42048 (302, 2)      .28571 (302, 2)      .25979C(226, 1)
       290.0 /       .40125 (217, 2)      .29858 (359, 2)      .24878 (212, 2)      .23212 (215, 1)      .23979 (215, 1)
       280.0 /       .52551 ( 41, 2)      .49005 ( 72, 2)      .41723 (168, 2)      .36732 ( 72, 2)      .31922 ( 72, 2)
       270.0 /       .64215 (363, 2)      .54417 (361, 2)      .48271 (361, 2)      .39126 (361, 2)      .33698 (361, 2)
       260.0 /       .53706 (268, 2)      .48194 (268, 2)      .39916 (268, 2)      .30805 (268, 2)      .26164 (360, 3)
       250.0 /       .58051 (339, 2)      .42922 (269, 2)      .38252 (269, 2)      .35507 (363, 1)      .33719 (350, 1)
       240.0 /       .68079 (281, 2)      .55154 (283, 2)      .44328 (282, 2)      .37773 (264, 1)      .33772 ( 15, 1)
       230.0 /       .48715 (241, 2)      .40716C(338, 2)      .33306C(338, 2)      .27033 (250, 2)      .24004 ( 13, 3)
       220.0 /       .51665 (313, 2)      .44529 ( 14, 1)      .37280 (327, 1)      .30372 ( 21, 3)      .27594 (312, 3)
       210.0 /       .48741 (284, 2)      .37230 (284, 2)      .32455 ( 13, 3)      .28575 ( 20, 2)      .25210 ( 20, 2)
       200.0 /       .43456 (130, 2)      .30159 (130, 2)      .23726 (326, 2)      .20276 (326, 2)      .17900 (326, 2)
       190.0 /       .43183C(234, 2)      .39314 (342, 2)      .25891 (328, 2)      .22615 (209, 3)      .20602 (209, 3)
       180.0 /       .39908 (328, 3)      .43122 ( 21, 1)      .40060 ( 21, 1)      .33726 ( 21, 1)      .29569 ( 21, 1)
       170.0 /       .42500 ( 61, 2)      .27638 ( 61, 2)      .24741 ( 51, 3)      .21048 (151, 1)      .18100 (151, 1)
       160.0 /       .47844 (275, 2)      .44222C( 73, 3)      .37867C( 73, 3)      .30208C( 73, 3)      .25925C( 73, 3)
       150.0 /       .48885 ( 67, 2)      .40425 ( 60, 1)      .35439 ( 67, 1)      .30471 ( 67, 1)      .28423 ( 67, 2)
       140.0 /       .34317 ( 67, 2)      .32952 ( 60, 3)      .32200 ( 60, 3)      .28984 ( 60, 3)      .26578 ( 60, 3)
       130.0 /       .39839 ( 59, 1)      .35494 ( 59, 1)      .30582C(155, 3)      .28056C(155, 3)      .26488C(155, 3)
       120.0 /       .48590 ( 89, 3)      .46658 ( 89, 3)      .39863 ( 89, 3)      .31881 ( 89, 2)      .28581C(224, 3)
       110.0 /       .38143 ( 89, 1)      .35646 (  5, 2)      .30198 (  5, 2)      .23762 (  5, 2)      .20296 ( 53, 3)
       100.0 /       .48223C(  7, 2)      .35996 (272, 1)      .33122 (176, 3)      .29973 (176, 3)      .27401 (176, 3)
        90.0 /       .61212C(154, 2)      .51296 (177, 3)      .40727C( 55, 2)      .32636 (175, 3)      .28415 (175, 3)
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       80.0 /      .50646C(355, 2)      .36816C( 48, 2)      .28702 (175, 2)      .23045 (175, 2)      .19703 (175, 2)
       70.0 /      .54973C(288, 2)      .47469C( 86, 2)      .48449C( 86, 2)      .45931C( 86, 2)      .43094C( 86, 2)
       60.0 /      .46055C(  6, 2)      .30969C(  6, 2)      .23616C(230, 2)      .19249C(230, 2)      .17077 (175, 1)
       50.0 /      .40569 (233, 1)      .42461 (129, 3)      .45296 (129, 3)      .41833 (233, 1)      .37945 (233, 1)
       40.0 /      .41405 (124, 2)      .34722 ( 53, 2)      .33331 (125, 2)      .27232 (125, 3)      .25532 (125, 3)
       30.0 /      .50589 (124, 2)      .49080 (124, 3)      .44084 (124, 3)      .36098 (124, 3)      .31242 (124, 3)
       20.0 /      .47079 ( 66, 2)      .41965 ( 66, 2)      .35520 ( 66, 3)      .28941 ( 66, 3)      .24970 ( 66, 3)
       10.0 /      .38750 (340, 2)      .37985 ( 65, 3)      .37270 ( 65, 3)      .33295 ( 65, 3)      .30277 ( 65, 3)
1                                                                                                                  HIGH
                                                                                                                   24-HR
                                                                                                                   SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                                  * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                     * FROM ALL SOURCES *
                                                   * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS       .53342 AND OCCURRED AT (      966.0,      90.0) *

 DIRECTION /                                                  RANGE (METERS)
 (DEGREES) /            568.0                738.0                966.0                1306.0               1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /      .19821C(142, 1)      .22376C(215, 1)      .23900C(215, 1)      .19147C(215, 1)      .18390 ( 87, 1)
      350.0 /      .15459C(167, 1)      .22648C(215, 1)      .24216C(215, 1)      .19548C(215, 1)      .15022C(202, 1)
      340.0 /      .18001C(128, 1)      .23447C(128, 1)      .24541C( 84, 1)      .23973C( 84, 1)      .19472C( 84, 1)
      330.0 /      .25798C(208, 1)      .31127C(208, 1)      .29783C( 84, 1)      .29535C( 84, 1)      .24479C( 84, 1)
      320.0 /      .23644 (210, 1)      .32291 (210, 1)      .33264 (210, 1)      .34872 ( 57, 1)      .34164 ( 57, 1)
      310.0 /      .30507 (210, 1)      .39922 (210, 1)      .40380 (210, 1)      .37554 ( 57, 1)      .40087 ( 57, 1)
      300.0 /      .30214 (158, 1)      .33872 (210, 1)      .35060C(142, 1)      .31672C(143, 1)      .31915C(143, 1)
      290.0 /      .21061 (158, 1)      .23092 (159, 1)      .25460 (159, 1)      .22990C(217, 1)      .20327C(217, 1)
      280.0 /      .19698 (207, 1)      .25135C(167, 1)      .30942C(167, 1)      .35580 (161, 1)      .35377 (161, 1)
      270.0 /      .28307 (207, 1)      .24687 (207, 1)      .29249 (159, 1)      .34533 (159, 1)      .32756 (159, 1)
      260.0 /      .41293C(116, 1)      .40104C(116, 1)      .31241C(116, 1)      .26022 (306, 1)      .24323 (306, 1)
      250.0 /      .44235C(116, 1)      .47076 (164, 1)      .52756 (164, 1)      .45415 (164, 1)      .34542 (164, 1)
      240.0 /      .35428 (132, 1)      .37380 (132, 1)      .39505 (164, 1)      .41242 ( 74, 1)      .39443 ( 74, 1)
      230.0 /      .26603C(241, 1)      .35934C(241, 1)      .38816C(241, 1)      .35495C(241, 1)      .32180C(250, 1)
      220.0 /      .19684C(134, 1)      .24605C(241, 1)      .25813C(241, 1)      .30360 (  2, 1)      .29670 (  2, 1)
      210.0 /      .18912C(134, 1)      .19904C(133, 1)      .20854 (130, 1)      .26195 (130, 1)      .26152 (130, 1)
      200.0 /      .17624C(131, 1)      .21229C(133, 1)      .22704C(133, 1)      .27072C(342, 1)      .25338C(342, 1)
      190.0 /      .27605C(131, 1)      .32871C(131, 1)      .30507C(131, 1)      .30801C(342, 1)      .27899C(342, 1)
      180.0 /      .23856C(131, 1)      .28791C(131, 1)      .26954C(131, 1)      .26103 (152, 1)      .28419 (328, 1)
      170.0 /      .21214C(221, 1)      .22057C(221, 1)      .25410C( 61, 1)      .26416C( 61, 1)      .23730 (151, 1)
      160.0 /      .24875C(229, 1)      .27559C(229, 1)      .28340C( 61, 1)      .26696C( 61, 1)      .24565 (151, 1)
      150.0 /      .21326C(229, 1)      .24140C(115, 1)      .32985C(115, 1)      .33943C(115, 1)      .29561C(115, 1)
      140.0 /      .15856C(147, 1)      .21867C(221, 1)      .26255C(115, 1)      .26398C(115, 1)      .24851 ( 67, 1)
      130.0 /      .16615C(147, 1)      .20293C(221, 1)      .27621C(221, 1)      .29016C(221, 1)      .32540 ( 59, 1)
      120.0 /      .19885C(226, 1)      .20651C(226, 1)      .21782C(228, 1)      .27610 ( 96, 1)      .34140 ( 89, 1)
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     110.0 /       .32677C(226, 1)       .35551C(226, 1)       .27137C(226, 1)       .26258C(224, 1)       .25724C(224, 1)
     100.0 /       .29955C(226, 1)       .36178C(226, 1)       .32551C(154, 1)       .31112C(245, 1)       .26825C(245, 1)
      90.0 /       .28917C(154, 1)       .47148C(154, 1)       .53342C(154, 1)       .45351C(154, 1)       .42132C( 55, 1)
      80.0 /       .29630C(225, 1)       .36706C(154, 1)       .38831C(154, 1)       .37938C(257, 1)       .31880C(257, 1)
      70.0 /       .37594C(225, 1)       .37512C(225, 1)       .43364C(290, 1)       .41223C(290, 1)       .32911C(290, 1)
      60.0 /       .33640C(225, 1)       .41268C(238, 1)       .40093C(238, 1)       .30878C(238, 1)       .25684 (181, 1)
      50.0 /       .30756C(194, 1)       .34344C(238, 1)       .32834C(238, 1)       .25863 (181, 1)       .24056 (181, 1)
      40.0 /       .30594C(194, 1)       .34168C(123, 1)       .35034C(123, 1)       .28389C(123, 1)       .26866 (125, 1)
      30.0 /       .16932C(194, 1)       .28273C(110, 1)       .34825C(110, 1)       .34556 (124, 1)       .35128 (124, 1)
      20.0 /       .15864C(119, 1)       .24076C(119, 1)       .27476C(200, 1)       .27724C(200, 1)       .27117 ( 88, 1)
      10.0 /       .14922C(249, 1)       .17530 (183, 1)       .19145C(121, 1)       .20596C( 85, 1)       .23112C( 85, 1)
1                                                                                                                          HIGH
                                                                                                                           24-HR
                                                                                                                           SGROUP#  1
                                *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                               * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                        * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                            * MAXIMUM VALUE EQUALS       .53342 AND OCCURRED AT (     966.0,      90.0) *

 DIRECTION /                                                     RANGE (METERS)
 (DEGREES) /                2215.0                2954.0                3862.0                5112.0                5112.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .21496 ( 87, 1)       .22745 ( 87, 1)       .21349 ( 87, 1)       .18336 ( 87, 1)       .16265 ( 87, 1)
     350.0 /       .13290C(202, 1)       .10490 ( 87, 1)       .09557 ( 87, 1)       .08555 ( 66, 1)       .07917 ( 66, 1)
     340.0 /       .15920C(289, 1)       .14206 ( 58, 1)       .12897 ( 58, 1)       .10840 ( 58, 1)       .09550 ( 58, 1)
     330.0 /       .18197C( 84, 1)       .13276 ( 58, 1)       .11208 ( 58, 1)       .08673 ( 58, 1)       .07288 ( 58, 1)
     320.0 /       .29320 ( 57, 1)       .22447 ( 57, 1)       .16363 ( 57, 1)       .13168 (100, 1)       .11530 (100, 1)
     310.0 /       .37928 ( 57, 1)       .32355 ( 57, 1)       .25844 ( 57, 1)       .19365 ( 57, 1)       .16101 ( 57, 1)
     300.0 /       .29538C(143, 1)       .25384C(143, 1)       .20766C(143, 1)       .19103C( 44, 1)       .18148C( 44, 1)
     290.0 /       .17826C(212, 1)       .15433C(169, 1)       .13328C(169, 1)       .11209 (162, 1)       .10839 (162, 1)
     280.0 /       .31111 (161, 1)       .26079 ( 42, 1)       .23284 ( 43, 1)       .21215 ( 43, 1)       .19319 ( 43, 1)
     270.0 /       .33604 (266, 1)       .31864 (266, 1)       .27339 (266, 1)       .21689 (266, 1)       .19138 (168, 1)
     260.0 /       .22273 (268, 1)       .21443C(360, 1)       .20312C(360, 1)       .18037C(360, 1)       .16476C(360, 1)
     250.0 /       .26578 (264, 1)       .27555 (264, 1)       .26950 (350, 1)       .27257 (350, 1)       .26241 (350, 1)
     240.0 /       .33118 ( 74, 1)       .30177 (264, 1)       .27914 (264, 1)       .24146 ( 15, 1)       .22348 ( 15, 1)
     230.0 /       .26335C(250, 1)       .22353 ( 14, 1)       .22086 ( 14, 1)       .19372 ( 14, 1)       .17600 ( 13, 1)
     220.0 /       .26845 (284, 1)       .27470 (326, 1)       .27704 ( 14, 1)       .25141 ( 14, 1)       .22784 ( 14, 1)
     210.0 /       .23759 ( 20, 1)       .27031 ( 20, 1)       .25955 ( 20, 1)       .22393 ( 20, 1)       .19833 ( 20, 1)
     200.0 /       .21740 ( 21, 1)       .22362 ( 21, 1)       .20059 ( 21, 1)       .16407 ( 21, 1)       .14190 ( 21, 1)
     190.0 /       .27800 (328, 1)       .25988 (328, 1)       .21742 (328, 1)       .16734 (328, 1)       .14038 (328, 1)
     180.0 /       .32387 (328, 1)       .31548 (328, 1)       .27264 (328, 1)       .21629 (328, 1)       .18439 (328, 1)
     170.0 /       .21316 (151, 1)       .17371 (151, 1)       .14167 (151, 1)       .11489 (151, 1)       .10205 (151, 1)
     160.0 /       .25197 ( 19, 1)       .27505 ( 19, 1)       .25786 ( 19, 1)       .21944 ( 19, 1)       .19367 ( 19, 1)
     150.0 /       .34539 ( 67, 1)       .36131 ( 67, 1)       .33035 ( 67, 1)       .27510 ( 67, 1)       .23994 ( 67, 1)
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     140.0 /       .26930 ( 67, 1)      .26799 ( 67, 1)      .24274 ( 67, 1)      .20318 ( 67, 1)      .17838 ( 67, 1)
     130.0 /       .33938 ( 59, 1)      .30998 ( 59, 1)      .25939 ( 59, 1)      .20288 ( 59, 1)      .17286 ( 59, 1)
     120.0 /       .36171 ( 89, 1)      .33175 ( 89, 1)      .27555 ( 89, 1)      .21180 ( 89, 1)      .17793 ( 89, 1)
     110.0 /       .22728C(224, 1)      .20693 ( 89, 1)      .17137 ( 89, 1)      .13137 ( 89, 1)      .11377C(174, 1)
     100.0 /       .26137C( 97, 1)      .26661 (272, 1)      .24387 (272, 1)      .20525 (272, 1)      .18109 (272, 1)
      90.0 /       .36318C( 55, 1)      .29174C( 55, 1)      .25312 (177, 1)      .20415 (177, 1)      .17572 (177, 1)
      80.0 /       .25047C( 78, 1)      .18920C( 78, 1)      .13825C(231, 1)      .11003C(255, 1)      .10181C(255, 1)
      70.0 /       .23669C(290, 1)      .21200 (178, 1)      .20507 (178, 1)      .17781 (178, 1)      .15772 (178, 1)
      60.0 /       .23204 (181, 1)      .19448 (181, 1)      .15787 (181, 1)      .12265 (181, 1)      .10484 (181, 1)
      50.0 /       .22224C(233, 1)      .22949C(233, 1)      .21758C(233, 1)      .19170C(233, 1)      .17390C(233, 1)
      40.0 /       .27139 (125, 1)      .25450 (125, 1)      .22440 (125, 1)      .18619 (125, 1)      .16396 (125, 1)
      30.0 /       .32729 (124, 1)      .27905 (124, 1)      .22418 (124, 1)      .18313 ( 18, 1)      .16467 ( 18, 1)
      20.0 /       .30524 ( 88, 1)      .29410 ( 88, 1)      .25222 ( 88, 1)      .19878 ( 88, 1)      .16890 ( 88, 1)
      10.0 /       .23154C( 85, 1)      .21390C( 85, 1)      .19300 ( 65, 1)      .16615 ( 65, 1)      .14828 ( 65, 1)
1                                                                                                             2ND HIGH
                                                                                                              24-HR
                                                                                                              SGROUP#  1
                       *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                     * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                   * FROM ALL SOURCES *
                                                 * FOR THE RECEPTOR GRID *

                      * MAXIMUM VALUE EQUALS      .43503 AND OCCURRED AT (    1306.0,     90.0) *

   DIRECTION /                                            RANGE (METERS)
   (DEGREES) /        568.0               738.0               966.0               1306.0              1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .19374C(186, 1)      .20805C(142, 1)      .19504 (183, 1)      .16031C(121, 1)      .13506C(215, 1)
     350.0 /       .15380C(128, 1)      .19860C(128, 1)      .18701C(103, 1)      .15398C(167, 1)      .13888C(215, 1)
     340.0 /       .16046C(118, 1)      .23001C(118, 1)      .23164C(118, 1)      .21631C(289, 1)      .19221C(289, 1)
     330.0 /       .17090C(128, 1)      .24237C(128, 1)      .29148C(208, 1)      .23325C(118, 1)      .18462C(118, 1)
     320.0 /       .22892C(208, 1)      .27568 (205, 1)      .30425 (205, 1)      .29900C(118, 1)      .27697C(118, 1)
     310.0 /       .28078 (158, 1)      .33469 (205, 1)      .36865 (205, 1)      .37021C(215, 1)      .32539C(215, 1)
     300.0 /       .25750 (210, 1)      .31271C(142, 1)      .34144 (210, 1)      .30782C(142, 1)      .26986C(302, 1)
     290.0 /       .14101 (159, 1)      .20696C(246, 1)      .22832C(246, 1)      .21941 (160, 1)      .20265 (161, 1)
     280.0 /       .16604C(147, 1)      .24584 (139, 1)      .28869 (139, 1)      .32867 (168, 1)      .32594 (168, 1)
     270.0 /       .17613C(116, 1)      .21657 (139, 1)      .28541 (139, 1)      .30536 (265, 1)      .32520 (265, 1)
     260.0 /       .21904 (207, 1)      .27501 (164, 1)      .29557 (164, 1)      .25141C(305, 1)      .23428C(305, 1)
     250.0 /       .29292 (164, 1)      .41584C(116, 1)      .37532C(153, 1)      .38168C(153, 1)      .32262C(153, 1)
     240.0 /       .23499C(116, 1)      .33706 (164, 1)      .33504 ( 74, 1)      .36639 (164, 1)      .32548C(250, 1)
     230.0 /       .25466 (132, 1)      .24594 (132, 1)      .31786 (137, 1)      .34841C(250, 1)      .28760C(241, 1)
     220.0 /       .19562C(241, 1)      .21336C(192, 1)      .23834C(250, 1)      .25878C(250, 1)      .26216 (284, 1)
     210.0 /       .14170C(156, 1)      .15940C(134, 1)      .20662C(133, 1)      .23591C(  3, 1)      .23270 (284, 1)
     200.0 /       .15822C(156, 1)      .20463C(131, 1)      .21993C(235, 1)      .23082C(235, 1)      .20242C(235, 1)
     190.0 /       .11950C(156, 1)      .18290 (178, 1)      .26502C(342, 1)      .22857C(131, 1)      .25460 (328, 1)
     180.0 /       .14737C(235, 1)      .22900C(235, 1)      .24537C(235, 1)      .21438C(342, 1)      .25196 (152, 1)
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     170.0 /      .14236C(192, 1)      .19303C(192, 1)      .19185C(192, 1)      .22764 (151, 1)      .22040C( 61, 1)
     160.0 /      .24021C(221, 1)      .24932C(221, 1)      .27764C(229, 1)      .26176C(229, 1)      .22671C(229, 1)
     150.0 /      .18790C(221, 1)      .21954C(221, 1)      .26312C( 69, 1)      .30036C( 69, 1)      .28622 ( 67, 1)
     140.0 /      .14138C(221, 1)      .19111C(115, 1)      .25264C(221, 1)      .23474C(221, 1)      .21843C(115, 1)
     130.0 /      .10745 (188, 1)      .16477C(147, 1)      .19844C(228, 1)      .26321 ( 59, 1)      .25819C(221, 1)
     120.0 /      .19118C(203, 1)      .19191C(203, 1)      .19832 ( 96, 1)      .26879 ( 89, 1)      .31654 ( 96, 1)
     110.0 /      .20321C(203, 1)      .22057C(222, 1)      .24334C(222, 1)      .21571C(230, 1)      .21410 ( 89, 1)
     100.0 /      .20964C(219, 1)      .26540C(154, 1)      .32106C(226, 1)      .29915C(154, 1)      .24886C(225, 1)
      90.0 /      .23863C(219, 1)      .33768C(171, 1)      .40471C(171, 1)      .43503C( 55, 1)      .33372C(154, 1)
      80.0 /      .24127C(154, 1)      .34048C(225, 1)      .38711C(309, 1)      .36778C(309, 1)      .29864C( 78, 1)
      70.0 /      .23605C(218, 1)      .34316C(290, 1)      .42917C(309, 1)      .39071C(309, 1)      .29528C(309, 1)
      60.0 /      .32591C(238, 1)      .36160C(218, 1)      .31899C(290, 1)      .27392C(255, 1)      .23038C(255, 1)
      50.0 /      .28913C(238, 1)      .30699C(194, 1)      .24159C(194, 1)      .25406C(238, 1)      .19651C(233, 1)
      40.0 /      .25750 (242, 1)      .32302C(194, 1)      .26447C(194, 1)      .24544 (125, 1)      .20831C(123, 1)
      30.0 /      .16757C(110, 1)      .21225C(119, 1)      .28724 (124, 1)      .33317C(110, 1)      .27039C(110, 1)
      20.0 /      .14984 (129, 1)      .22268 (129, 1)      .25151C(119, 1)      .26489C(144, 1)      .26304 ( 66, 1)
      10.0 /      .14380C(142, 1)      .16971C(121, 1)      .18741 (129, 1)      .17643 (129, 1)      .18683 ( 88, 1)
1                                                                                                                 2ND HIGH
                                                                                                                  24-HR
                                                                                                                  SGROUP#  1
                               *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1984     ***


                          * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                    * FROM ALL SOURCES *
                                                  * FOR THE RECEPTOR GRID *

                           * MAXIMUM VALUE EQUALS      .43503 AND OCCURRED AT (    1306.0,      90.0) *

  DIRECTION /                                                   RANGE (METERS)
  (DEGREES) /          2215.0               2954.0               3862.0               5112.0               6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      .10408 ( 80, 1)      .09995 ( 80, 1)      .08625 (114, 1)      .08785 (114, 1)      .08461 (114, 1)
     350.0 /      .10985 ( 87, 1)      .10083C(202, 1)      .09271 ( 66, 1)      .08208 ( 87, 1)      .07373 ( 87, 1)
     340.0 /      .14163C( 84, 1)      .12092C(289, 1)      .09225C(289, 1)      .08267 ( 18, 1)      .07534 ( 18, 1)
     330.0 /      .14675C(356, 1)      .12074C( 84, 1)      .08918 ( 94, 1)      .07179 (113, 1)      .06371 (113, 1)
     320.0 /      .23241C(118, 1)      .18060C(118, 1)      .15722 (100, 1)      .11887 ( 65, 1)      .10267 ( 65, 1)
     310.0 /      .25328C(302, 1)      .21146C(366, 1)      .18422C(366, 1)      .15308C(366, 1)      .13556C(366, 1)
     300.0 /      .26897C(302, 1)      .23860C(302, 1)      .19930C(302, 1)      .16079C(143, 1)      .13711C(302, 1)
     290.0 /      .17219 (161, 1)      .14721 ( 23, 1)      .13178 ( 23, 1)      .10732 ( 23, 1)      .10285C(215, 1)
     280.0 /      .28975 (168, 1)      .25138 (161, 1)      .22240 ( 42, 1)      .17701 ( 42, 1)      .15198 ( 42, 1)
     270.0 /      .31600 (265, 1)      .28070 (265, 1)      .24625 (168, 1)      .21237 (168, 1)      .18518 (266, 1)
     260.0 /      .21005C(360, 1)      .21387 (268, 1)      .19287 (361, 1)      .16536 (361, 1)      .14614 (361, 1)
     250.0 /      .26116 (280, 1)      .23463 (350, 1)      .25389 (264, 1)      .23656C(351, 1)      .23053C(351, 1)
     240.0 /      .31449C(250, 1)      .28173C(250, 1)      .25536 ( 15, 1)      .23518 (264, 1)      .20623 (264, 1)
     230.0 /      .21844 (137, 1)      .20507 ( 13, 1)      .21127 ( 13, 1)      .19333 ( 13, 1)      .17222 ( 14, 1)
     220.0 /      .25879 (327, 1)      .27139 ( 14, 1)      .25611 ( 20, 1)      .22249 ( 20, 1)      .19791 ( 20, 1)
     210.0 /      .23305 (130, 1)      .19754 (271, 1)      .18491 ( 13, 1)      .16975 ( 13, 1)      .15467 ( 13, 1)
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   200.0 /      .20789C(342, 1)     .18518 (326, 1)     .17507 (326, 1)     .14962 (326, 1)     .13225 (326, 1)
   190.0 /      .22219C(342, 1)     .16159C(342, 1)     .13998C(234, 1)     .11591C(234, 1)     .10239C(234, 1)
   180.0 /      .22371 (152, 1)     .19583 ( 21, 1)     .17942 ( 21, 1)     .14933 ( 21, 1)     .13020 ( 21, 1)
   170.0 /      .16967C(229, 1)     .14936C(229, 1)     .12830C(229, 1)     .10754C(229, 1)     .09622C(229, 1)
   160.0 /      .21532 (151, 1)     .17419 (275, 1)     .14314 (275, 1)     .11024 (275, 1)     .09295 (275, 1)
   150.0 /      .31250 ( 60, 1)     .31200 ( 60, 1)     .28090 ( 60, 1)     .23371 ( 60, 1)     .20535 ( 60, 1)
   140.0 /      .22852 ( 60, 1)     .23236 ( 60, 1)     .21256 ( 60, 1)     .17960 ( 60, 1)     .15911 ( 60, 1)
   130.0 /      .21651 ( 11, 1)     .22052 ( 11, 1)     .19506 ( 11, 1)     .15661 ( 11, 1)     .13381 ( 11, 1)
   120.0 /      .32499 ( 96, 1)     .29953 ( 96, 1)     .25264 ( 96, 1)     .19776 ( 96, 1)     .17280 (107, 1)
   110.0 /      .22636 ( 89, 1)     .18864 ( 96, 1)     .16168 ( 96, 1)     .13004 ( 96, 1)     .11258 ( 96, 1)
   100.0 /      .25908 (272, 1)     .25224C( 97, 1)     .22575C( 97, 1)     .18834C( 97, 1)     .16594C( 97, 1)
    90.0 /      .30600 (177, 1)     .29087 (177, 1)     .23385C( 55, 1)     .18366C( 55, 1)     .15941C( 55, 1)
    80.0 /      .23826C(225, 1)     .17773C(231, 1)     .13778C( 78, 1)     .10608C(231, 1)     .09133C(231, 1)
    70.0 /      .22732C(233, 1)     .20784 (175, 1)     .18581 (175, 1)     .15560C( 86, 1)     .14573C( 86, 1)
    60.0 /      .18620C(182, 1)     .14356C(182, 1)     .10771C(182, 1)     .07735C(182, 1)     .06890 (175, 1)
    50.0 /      .20086 (181, 1)     .15854 (129, 1)     .16070 (129, 1)     .14908 (129, 1)     .13829 (129, 1)
    40.0 /      .17391 (124, 1)     .16095 ( 18, 1)     .15718 ( 18, 1)     .13773 ( 18, 1)     .12291 ( 18, 1)
    30.0 /      .21721 (126, 1)     .20649 ( 18, 1)     .20562 ( 18, 1)     .16946 (124, 1)     .14174 (124, 1)
    20.0 /      .28586 ( 66, 1)     .27227 ( 66, 1)     .23430 ( 66, 1)     .18687 ( 66, 1)     .16018 ( 66, 1)
    10.0 /      .21322 ( 88, 1)     .20982 ( 88, 1)     .18761C( 85, 1)     .15794C( 85, 1)     .14225C( 85, 1)

RUN ENDED ON 09-15-89 AT 12:57:16
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FLORIDA FIRST PROCESSING, INC.

APPENDIX L-35

RESULTS OF INCINERATOR STACK EMISSIONS DISPERSION MODELING USING ISC MODEL ALONG WITH 1985 METEOROLOGICAL DATA

```
1               ISCST - VERSION 3.4 (DATED 88348)

                IBM-PC VERSION (1.64)
                (C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.
                SERIAL NUMBER 5958 SOLD TO ICF TECHNOLOGY, INC
                RUN BEGAN ON 09-15-89 AT 12:57:18


1
                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***

              CALCULATE (CONCENTRATION=1,DEPOSITION=2)                            ISW(1) =   1
              RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)             ISW(2) =   4
              DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                    ISW(3) =   1
              TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                            ISW(4) =   0
              CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                       ISW(5) =   0
              LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                    ISW(6) =   1

              COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
              WITH THE FOLLOWING TIME PERIODS:
                HOURLY (YES=1,NO=0)                                               ISW(7) =   1
                2-HOUR (YES=1,NO=0)                                               ISW(8) =   0
                3-HOUR (YES=1,NO=0)                                               ISW(9) =   1
                4-HOUR (YES=1,NO=0)                                              ISW(10) =   0
                6-HOUR (YES=1,NO=0)                                              ISW(11) =   0
                8-HOUR (YES=1,NO=0)                                              ISW(12) =   1
                12-HOUR (YES=1,NO=0)                                             ISW(13) =   0
                24-HOUR (YES=1,NO=0)                                             ISW(14) =   1
              PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                                ISW(15) =   1

              PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
              SPECIFIED BY ISW(7) THROUGH ISW(14):
                DAILY TABLES (YES=1,NO=0)                                        ISW(16) =   0
                HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                     ISW(17) =   1
                MAXIMUM 50 TABLES (YES=1,NO=0)                                   ISW(18) =   0
              METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)          ISW(19) =   1
              RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)  ISW(20) =   0
              WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)          ISW(21) =   1
              VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)   ISW(22) =   1
              SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                  ISW(23) =   0
              PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)              ISW(24) =   1
              PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)        ISW(25) =   2
              PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)              ISW(26) =   1
              CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)            ISW(27) =   1
              REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                            ISW(28) =   1
              TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                   ISW(29) =   2
              DEBUG OPTION CHOSEN (YES=1,NO=2)                                   ISW(30) =   2
              ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)                ISW(31) =   0
```

```
         NUMBER OF INPUT SOURCES                                            NSOURC =   1
         NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                           NGROUP =   0
         TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)               IPERD =   0
         NUMBER OF X (RANGE) GRID VALUES                                    NXPNTS =  10
         NUMBER OF Y (THETA) GRID VALUES                                    NYPNTS =  36
         NUMBER OF DISCRETE RECEPTORS                                       NXWYPT =   0
         SOURCE EMISSION RATE UNITS CONVERSION FACTOR                           TK =.10000E+07
         HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                   ZR =    6.70  METERS
         LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                           IMET =   9
         DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION                DECAY = .000000E+00
         SURFACE STATION NO.                                                   ISS = 12842
         YEAR OF SURFACE DATA                                                  ISY = 85
         UPPER AIR STATION NO.                                                 IUS = 12842
         YEAR OF UPPER AIR DATA                                                IUY = 85
         ALLOCATED DATA STORAGE                                              LIMIT = 43500 WORDS
         REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                          MIMIT =  8613 WORDS
1
                       *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***

                                  *** METEOROLOGICAL DAYS TO BE PROCESSED ***
                                                   (IF=1)

      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

                        *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                 (METERS/SEC)

                                   1.54,   3.09,   5.14,   8.23,  10.80,


                                        *** WIND PROFILE EXPONENTS ***


        STABILITY                                WIND SPEED CATEGORY
        CATEGORY         1              2              3              4              5              6
           A        .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
           B        .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
           C        .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00
           D        .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
           E        .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00
           F        .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00
```

```
                         *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                   (DEGREES KELVIN PER METER)


       STABILITY                                WIND SPEED CATEGORY
       CATEGORY         1              2              3              4              5              6
          A         .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
          B         .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
          C         .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
          D         .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
          E         .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01
          F         .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01
1
                     *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                  X,Y-COORDINATES OF THE CENTER OF THE POLAR RECEPTOR GRID (METERS) = (       0.,       0.)


                                  *** RANGES OF POLAR GRID SYSTEM ***
                                               (METERS)

     568.0,     738.0,     966.0,    1306.0,    1704.0,    2215.0,    2954.0,    3862.0,    5112.0,    6000.0,



                                *** RADIAL ANGLES OF POLAR GRID SYSTEM ***

                                               (DEGREES)

      10.0,      20.0,      30.0,      40.0,      50.0,      60.0,      70.0,      80.0,      90.0,     100.0,
     110.0,     120.0,     130.0,     140.0,     150.0,     160.0,     170.0,     180.0,     190.0,     200.0,
     210.0,     220.0,     230.0,     240.0,     250.0,     260.0,     270.0,     280.0,     290.0,     300.0,
     310.0,     320.0,     330.0,     340.0,     350.0,     360.0,
1
                     *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***

                                          *** SOURCE DATA ***

                   EMISSION RATE                                            TEMP.    EXIT VEL.
                      TYPE=0,1                                              TYPE=0    TYPE=0
          T W      (GRAMS/SEC)                                             (DEG.K);  (M/SEC);            BLDG.     BLDG.     BLDG.
          Y A NUMBER  TYPE=2                               BASE             VERT.DIM  HORZ.DIM DIAMETER  HEIGHT    LENGTH    WIDTH
   SOURCE P K  PART. (GRAMS/SEC)     X         Y          ELEV.    HEIGHT    TYPE=1    TYPE=1,2  TYPE=0   TYPE=0    TYPE=0    TYPE=0
   NUMBER E E  CATS. *PER METER**2 (METERS)  (METERS)  (METERS)  (METERS)  (METERS)  (METERS) (METERS)  (METERS)  (METERS)  (METERS)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        1 0 0     0    .10000E+01        .0         .0        .0     60.96    458.15     14.66      1.68       .00       .00       .00
```

```
* CALM HOURS (=1) FOR DAY   3 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY   6 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY   7 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY   8 *  1  1  1  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1
* CALM HOURS (=1) FOR DAY   9 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY  10 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY  11 *  1  1  0  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  14 *  0  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  15 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY  16 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  1  0
* CALM HOURS (=1) FOR DAY  18 *  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  19 *  1  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  1  0  0  1  1  0
* CALM HOURS (=1) FOR DAY  20 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  21 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  22 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY  23 *  1  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY  24 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  26 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  27 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  29 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  0  0
* CALM HOURS (=1) FOR DAY  33 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY  34 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  38 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  44 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  45 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  47 *  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  49 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  51 *  1  1  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  57 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  58 *  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  59 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  60 *  0  0  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  68 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  69 *  0  1  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  70 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  71 *  1  1  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY  72 *  1  1  1  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  73 *  1  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  74 *  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  77 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  78 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  81 *  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  82 *  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  84 *  0  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  86 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  87 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY  91 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  92 *  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  93 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

```
* CALM HOURS (=1) FOR DAY  94 *  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  97 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  98 *  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 107 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 115 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 116 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 117 *  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 118 *  0  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 121 *  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 128 *  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 129 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 132 *  1  0  1  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 133 *  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 134 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 135 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 136 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 139 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 142 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 145 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 146 *  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 148 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 149 *  0  1  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 150 *  0  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 151 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 154 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1
* CALM HOURS (=1) FOR DAY 155 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1
* CALM HOURS (=1) FOR DAY 156 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 158 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 159 *  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 160 *  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 165 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 167 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 168 *  1  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 169 *  0  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 170 *  0  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 171 *  1  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 172 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 176 *  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 177 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 178 *  0  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 180 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 183 *  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 184 *  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 185 *  1  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0
* CALM HOURS (=1) FOR DAY 186 *  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 189 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 190 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 191 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 192 *  0  1  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

```
* CALM HOURS (=1) FOR DAY 193 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 194 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 195 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 196 *  0  1  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 198 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 202 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 205 *  0  0  1  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 210 *  1  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  1  0  0  1  0
* CALM HOURS (=1) FOR DAY 211 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 212 *  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 213 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 214 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 215 *  0  0  1  1  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 216 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 219 *  0  0  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 221 *  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 222 *  0  0  0  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 223 *  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 224 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 225 *  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 229 *  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 230 *  0  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 234 *  0  0  0  0  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 236 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 237 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 247 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 250 *  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 253 *  0  0  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 254 *  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 255 *  0  0  0  0  1  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 265 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 267 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 268 *  0  1  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 269 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 271 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 275 *  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 276 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 277 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 278 *  0  0  0  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  1  1  1  1  0
* CALM HOURS (=1) FOR DAY 283 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 284 *  1  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 285 *  1  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 286 *  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 287 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY 288 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 293 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 294 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 305 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 306 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

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 * CALM HOURS (=1) FOR DAY 309 *  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 310 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  1
 * CALM HOURS (=1) FOR DAY 311 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  1
 * CALM HOURS (=1) FOR DAY 314 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
 * CALM HOURS (=1) FOR DAY 315 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 320 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 321 *  0  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 327 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 330 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 331 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
 * CALM HOURS (=1) FOR DAY 333 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0
 * CALM HOURS (=1) FOR DAY 345 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
 * CALM HOURS (=1) FOR DAY 354 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
 * CALM HOURS (=1) FOR DAY 355 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 356 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
 * CALM HOURS (=1) FOR DAY 357 *  0  1  1  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 358 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
 * CALM HOURS (=1) FOR DAY 359 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 361 *  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  1
 * CALM HOURS (=1) FOR DAY 362 *  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1  1
 * CALM HOURS (=1) FOR DAY 363 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
 * CALM HOURS (=1) FOR DAY 364 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
1                                                                                                                                   'N'-DAY
                                                                                                                                    365 DAYS
                                                                                                                                    SGROUP#  1
                                           *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                                             * 365-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                              * FROM ALL SOURCES *
                                                            * FOR THE RECEPTOR GRID *

                                       * MAXIMUM VALUE EQUALS       .05040 AND OCCURRED AT (      966.0,       70.0) *

  DIRECTION /                                                       RANGE (METERS)
  (DEGREES) /       568.0          738.0          966.0         1306.0         1704.0         2215.0         2954.0         3862.0         5112.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /      .01080         .01545         .01815         .01839         .01696         .01492         .01262         .01059         .00866
      350.0 /      .00981         .01405         .01660         .01707         .01600         .01436         .01239         .01057         .00880
      340.0 /      .00921         .01360         .01638         .01681         .01548         .01359         .01152         .00977         .00813
      330.0 /      .01022         .01586         .01953         .02000         .01804         .01533         .01250         .01034         .00851
      320.0 /      .01182         .01919         .02430         .02533         .02318         .01993         .01635         .01342         .01087
      310.0 /      .01302         .02156         .02768         .02945         .02775         .02484         .02137         .01819         .01512
      300.0 /      .01418         .02359         .03000         .03129         .02879         .02508         .02103         .01771         .01474
      290.0 /      .01322         .02182         .02762         .02879         .02657         .02324         .01954         .01645         .01372
      280.0 /      .01257         .02148         .02840         .03074         .02901         .02578         .02195         .01861         .01549
      270.0 /      .01244         .02264         .03201         .03682         .03629         .03335         .02910         .02493         .02076
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   260.0 /      .01127      .02077      .02968      .03429      .03384      .03116      .02733      .02354      .01973
   250.0 /      .01150      .02148      .03084      .03565      .03520      .03269      .02933      .02613      .02279
   240.0 /      .01123      .02076      .02974      .03492      .03562      .03451      .03240      .02975      .02641
   230.0 /      .00932      .01697      .02379      .02729      .02711      .02540      .02294      .02044      .01775
   220.0 /      .00683      .01275      .01820      .02115      .02109      .01967      .01746      .01512      .01265
   210.0 /      .00473      .00902      .01303      .01512      .01492      .01371      .01190      .01007      .00824
   200.0 /      .00377      .00683      .00960      .01108      .01111      .01050      .00946      .00828      .00698
   190.0 /      .00368      .00625      .00851      .00977      .00992      .00962      .00898      .00813      .00707
   180.0 /      .00382      .00629      .00853      .01005      .01057      .01061      .01027      .00960      .00861
   170.0 /      .00400      .00630      .00829      .00971      .01014      .00991      .00908      .00796      .00667
   160.0 /      .00411      .00652      .00867      .01023      .01076      .01066      .01000      .00898      .00770
   150.0 /      .00427      .00731      .01043      .01286      .01367      .01345      .01238      .01090      .00922
   140.0 /      .00452      .00773      .01100      .01352      .01447      .01441      .01344      .01189      .01003
   130.0 /      .00520      .00866      .01212      .01467      .01572      .01593      .01529      .01394      .01208
   120.0 /      .00627      .01054      .01511      .01853      .01976      .01961      .01826      .01618      .01367
   110.0 /      .00902      .01553      .02147      .02462      .02443      .02248      .01932      .01601      .01273
   100.0 /      .01404      .02414      .03152      .03321      .03038      .02589      .02065      .01611      .01213
    90.0 /      .01950      .03312      .04212      .04328      .03896      .03279      .02584      .02002      .01501
    80.0 /      .02415      .03934      .04791      .04686      .04008      .03178      .02332      .01693      .01192
    70.0 /      .02754      .04282      .05040      .04796      .04022      .03139      .02282      .01665      .01195
    60.0 /      .02650      .03908      .04424      .04087      .03371      .02608      .01894      .01392      .01014
    50.0 /      .02218      .03138      .03460      .03171      .02641      .02092      .01580      .01212      .00925
    40.0 /      .01926      .02783      .03166      .02997      .02549      .02045      .01549      .01180      .00888
    30.0 /      .01696      .02477      .02903      .02865      .02550      .02149      .01713      .01350      .01034
    20.0 /      .01450      .02144      .02586      .02649      .02431      .02104      .01720      .01382      .01076
    10.0 /      .01205      .01759      .02103      .02152      .01975      .01710      .01400      .01129      .00884
1                                                                                                              'N'-DAY
                                                                                                               365 DAYS
                                                                                                               SGROUP#  1
                          *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                            * 365-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                 * FROM ALL SOURCES *
                                               * FOR THE RECEPTOR GRID *

                       * MAXIMUM VALUE EQUALS       .05040 AND OCCURRED AT (      966.0,       70.0) *

 DIRECTION /                                          RANGE (METERS)
 (DEGREES) /      6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   360.0 /      .00768
   350.0 /      .00788
   340.0 /      .00728
   330.0 /      .00763
   320.0 /      .00963
   310.0 /      .01353
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      300.0 /        .01328
      290.0 /        .01240
      280.0 /        .01391
      270.0 /        .01858
      260.0 /        .01772
      250.0 /        .02097
      240.0 /        .02441
      230.0 /        .01626
      220.0 /        .01133
      210.0 /        .00729
      200.0 /        .00627
      190.0 /        .00644
      180.0 /        .00797
      170.0 /        .00596
      160.0 /        .00696
      150.0 /        .00830
      140.0 /        .00898
      130.0 /        .01096
      120.0 /        .01224
      110.0 /        .01105
      100.0 /        .01024
       90.0 /        .01265
       80.0 /        .00972
       70.0 /        .00993
       60.0 /        .00852
       50.0 /        .00796
       40.0 /        .00758
       30.0 /        .00883
       20.0 /        .00926
       10.0 /        .00763
1                                                                                                       HIGH
                                                                                                         1-HR
                                                                                                        SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                                 * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                   * FROM ALL SOURCES *
                                                 * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      3.02460 AND OCCURRED AT (      568.0,      70.0) *

  DIRECTION /                                                RANGE (METERS)
  (DEGREES) /             568.0              738.0              966.0              1306.0             1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /      2.97656 (113,12)    2.47723 (222,12)    2.22298 (151,11)    2.04564 (188,10)    1.79807 (197, 8)
      350.0 /      2.98634 (235,13)    2.47099 (235,13)    2.16028 (186,11)    1.91745 (139,10)    1.87661 (228, 9)
      340.0 /      2.96172 (115,11)    2.38190 (224,11)    2.18514 (192,10)    2.26339 ( 31, 9)    2.34094 ( 31, 9)
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   330.0 /      2.97546 (177,11)     2.45286 (218,11)     2.16670 (113,16)     1.99993 (201, 9)     1.79693 (346,10)
   320.0 /      2.90114 (228,14)     2.80183 (233,11)     2.17970 (209,10)     1.98895 (193, 9)     1.84071 (276, 9)
   310.0 /      3.01938 (211,12)     2.47763 (201,11)     2.16309 (209,13)     1.93566 (253,10)     1.80864 (316,15)
   300.0 /      2.96592 (201,14)     2.47723 (201,14)     2.21745 (209,12)     2.01706 (207,14)     1.87433 (304, 8)
   290.0 /      2.95561 (184,11)     2.59574 (124,14)     2.20532 (296,14)     1.89390 ( 84,11)     1.83766 (236, 9)
   280.0 /      3.01276 (211,11)     2.59574 (124,14)     2.20532 (194,11)     1.97114 (256,11)     1.87368 (251,16)
   270.0 /      2.98634 (194,13)     2.47099 (194,13)     2.21745 (215,15)     2.03438 (188, 9)     1.81763 (295, 9)
   260.0 /      3.01067 (250,12)     2.17096 (250,12)     2.15663 (251,15)     1.98691 (289,15)     1.85327 (250,10)
   250.0 /      3.01067 (251,12)     2.48000 (256,12)     2.13311 (124,13)     1.89411 (125,17)     1.77180 (111, 8)
   240.0 /      2.98467 (250,13)     2.57074 (178,11)     2.18866 (251,13)     1.96029 (268,13)     1.82851 ( 65,16)
   230.0 /      2.99680 (251,11)     2.57074 (178,11)     2.18514 (250,11)     2.03438 (265,11)     1.77909 ( 65,12)
   220.0 /      2.57268 (201,12)     2.79271 (201,12)     2.11288 ( 98,10)     1.94545 (264, 9)     1.78302 (151, 9)
   210.0 /      1.89668 (201,12)     2.09407 (201,12)     2.12673 (184,16)     2.01709 (249,10)     1.83338 (339,12)
   200.0 /      2.86199 (175,12)     2.11697 (126,14)     2.10339 (126,14)     1.99995 (171,10)     1.76038 (279, 9)
   190.0 /      2.69959 (175,12)     2.06702 (146,13)     2.18514 (174,12)     2.06211 (175,15)     1.76073 (171,17)
   180.0 /      2.99680 (216,13)     2.80006 (189,11)     2.15100 ( 51,14)     1.97387 ( 69,10)     1.83294 (209,18)
   170.0 /      2.82783 (128,11)     2.37024 (128,11)     2.10352 (279,14)     2.27097 (355,16)     2.38359 (355,16)
   160.0 /      2.98466 (146,14)     2.73318 (214,14)     2.03821 (  6,13)     1.87534 (171,18)     1.70678 (171,18)
   150.0 /      3.00239 (249,12)     2.53612 (177,12)     2.39047 (355,13)     2.99872 (355,13)     2.82830 (355,13)
   140.0 /      2.48238 (210,14)     2.14567 (136,11)     2.15484 (270,12)     2.38010 (355,15)     2.49975 (355,15)
   130.0 /      3.01699 (154,11)     2.46494 (210,14)     2.16988 (154,10)     2.03949 (215,10)     1.85264 (136, 9)
   120.0 /      2.98408 (178,12)     2.16767 (178,12)     2.15452 (210,16)     1.97165 (227,16)     1.79293 (235,17)
   110.0 /      2.99791 (249,11)     2.48706 (267,12)     2.19326 (270,14)     1.91176 (265,16)     1.81218 (265,16)
   100.0 /      2.33605 (139,14)     2.12719 (154,12)     2.18514 (129,11)     2.03438 (247,13)     1.88203 (266,16)
    90.0 /      3.00547 (222,14)     2.80685 (233,14)     2.18919 (188,16)     1.95604 (151,10)     1.80939 (253,13)
    80.0 /      2.78201 (131,11)     2.32558 (223,11)     2.23520 (160,15)     1.94053 (133,10)     1.82557 (188,15)
    70.0 /      3.02460 (168,13)     2.68512 (223,12)     2.19837 (236,15)     2.00793 (213,10)     1.88203 (218,16)
    60.0 /      3.01699 (197,13)     2.53612 (223,12)     2.20924 (249,14)     1.99484 (277,14)     1.82041 (199, 9)
    50.0 /      2.99680 (193,11)     3.01416 (221,14)     2.62344 (221,14)     2.03871 (221,14)     1.86345 (214,17)
    40.0 /      3.01067 (236,13)     2.47999 (150,11)     2.22964 (159,11)     2.04769 (247,11)     1.88222 (232, 9)
    30.0 /      2.99094 (168,12)     2.16150 (247,12)     2.16551 (301,13)     2.00598 (245,16)     1.76902 (178,15)
    20.0 /      2.94794 (236,14)     2.40302 (110,11)     2.20924 (151,12)     1.95251 (193,10)     1.78302 (193,17)
    10.0 /      2.92253 (214,11)     2.31297 (130,11)     2.13950 (139,15)     1.99123 (198,10)     1.82443 (103,11)
1                                                                                                                      HIGH
                                                                                                                        1-HR
                                                                                                                       SGROUP#  1
                                *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                               * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                   * FROM ALL SOURCES *
                                                  * FOR THE RECEPTOR GRID *

                             * MAXIMUM VALUE EQUALS      3.02460 AND OCCURRED AT (     568.0,      70.0) *

 DIRECTION /                                                   RANGE (METERS)
 (DEGREES) /            2215.0              2954.0              3862.0              5112.0              6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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     360.0 /     1.72697 (197, 8)    1.45979 (256,16)    1.12912 (256,16)     .92436 (140, 8)     .86236 (169, 8)
     350.0 /     1.70343 (159, 8)    1.47755 (231, 9)    1.26006 ( 97,17)     .94265 ( 97,17)     .90376 ( 20, 9)
     340.0 /     2.02922 ( 31, 9)    1.57739 ( 31, 9)    1.43267 (332, 8)    1.39760 (332, 8)    1.31651 (332, 8)
     330.0 /     1.61956 ( 57, 9)    1.43636 ( 57, 9)    1.11758 ( 57, 9)     .92381 (208,17)     .86624 (208,17)
     320.0 /     1.56046 (276, 9)    1.34177 (361,15)    1.16313 (302, 8)    1.12760 (302, 8)    1.13726 (254, 7)
     310.0 /     1.64451 ( 10,11)    1.38767 (222,10)    1.18602 (222,10)     .93684 (194, 7)     .88495 (194, 7)
     300.0 /     1.73944 (211, 9)    1.87889 ( 14,11)    1.82061 ( 14,11)    1.52469 ( 14,11)    1.33212 ( 14,11)
     290.0 /     1.72697 (176, 9)    1.38655 (176, 9)    1.01565 (129,22)     .93412 (130, 7)     .88181 (130, 7)
     280.0 /     1.72697 (314,16)    1.38655 (314,16)    1.02524 (239, 8)     .94395 (245, 8)     .86855 (245, 8)
     270.0 /     1.62303 (295, 9)    1.49187 (241, 7)    1.55885 (241, 7)    1.45277 (241, 7)    1.33901 (241, 7)
     260.0 /     1.71573 (173,10)    1.42287 (294, 8)    1.15283 (294, 8)     .93412 (166, 3)     .88181 (166, 3)
     250.0 /     1.54550 (296, 9)    1.30596 (246,16)    1.03552 (339,11)    1.25932 (329, 8)    1.32506 (329, 8)
     240.0 /     1.71094 (173,17)    1.58728 (165,17)    1.67012 (165,17)    1.55417 (165,17)    1.42758 (165,17)
     230.0 /     1.68335 (211,17)    1.39509 (328,17)    1.07343 (328,17)     .97413 (364, 9)     .93315 (364, 9)
     220.0 /     1.70704 (151, 9)    1.58728 (165,16)    1.67011 (165,16)    1.55416 (165,16)    1.42758 (165,16)
     210.0 /     1.71530 (149, 8)    1.41015 (339,12)    1.18121 (225,17)     .90362 ( 84, 9)     .82899 ( 15, 6)
     200.0 /     1.71615 (256,15)    1.50041 (256,15)    1.19084 (116, 9)     .90355 ( 38, 6)     .84218 (166, 2)
     190.0 /     1.62228 (150, 9)    1.39630 (312,16)    1.19084 (312,16)     .91708 (188,22)     .84435 (310, 8)
     180.0 /     1.64923 (249,16)    1.30944 (249,16)    1.00105 (188,21)     .89266 (188,21)     .85712 (339,24)
     170.0 /     2.10855 (355,16)    1.66737 (355,16)    1.30791 (355,16)    1.01279 (355,16)     .87523 (355,16)
     160.0 /     1.61065 (210,17)    1.56802 (363,12)    1.48795 (363,12)    1.28243 (363,12)    1.14359 (363,12)
     150.0 /     2.33798 (355,13)    1.80120 (355,13)    1.40363 (355,13)    1.20919 (283, 8)    1.17772 (283, 8)
     140.0 /     2.21534 (355,15)    1.75666 (355,15)    1.56605 ( 18,13)    1.37334 ( 18,13)    1.23197 ( 18,13)
     130.0 /     1.62303 (196,13)    1.39203 (190,10)    1.07193 (190,10)     .96280 (  4, 5)     .89749 (155, 8)
     120.0 /     1.69943 (160, 8)    1.62403 (  4,16)    1.43224 (  4,16)    1.17196 (  4,16)    1.02643 (  4,16)
     110.0 /     1.71893 (132, 9)    1.52683 (  4,18)    1.41704 (  4,18)    1.19969 (  4,18)    1.06197 (  4,18)
     100.0 /     1.69958 ( 83, 8)    1.44555 ( 83, 8)    1.18339 (201,16)     .95882 (284,17)     .87990 (284,17)
      90.0 /     1.72373 (253,13)    1.46047 ( 62,18)    1.25217 ( 62,18)    1.00417 (182, 7)    1.06231 (182, 7)
      80.0 /     1.71573 (284,16)    1.42160 (364,15)    1.11020 (364,15)     .96338 (161, 7)     .90507 (161, 7)
      70.0 /     1.70297 (105,12)    1.39203 ( 87,17)    1.07489 (141, 7)     .90160 (245,18)     .87282 (245,18)
      60.0 /     1.62583 (214, 8)    1.30206 (214, 8)    1.08570 (312,14)     .89789 (231,18)     .85203 (220,17)
      50.0 /     1.71377 (198, 8)    1.49961 (221,17)    1.25439 ( 29,17)     .94794 ( 29,17)     .86473 (219,18)
      40.0 /     1.69942 (219, 9)    1.50227 (160,19)    1.27547 (160,19)     .94983 (160,19)     .85631 ( 73,11)
      30.0 /     1.61333 ( 25,11)    1.31975 ( 25,11)    1.02018 (143, 8)     .95017 (143, 8)     .87323 (143, 8)
      20.0 /     1.70704 (193,17)    1.36679 (193,17)    1.02358 (332,15)     .95252 (332,15)     .87505 (332,15)
      10.0 /     1.71573 (162, 8)    1.40499 (196,17)    1.19568 (196,17)     .92277 (335,16)     .88674 (307, 9)
1                                                                                                              2ND HIGH
                                                                                                                1-HR
                                                                                                               SGROUP#  1
                             *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985    ***


                        * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                               * FOR THE RECEPTOR GRID *

                         * MAXIMUM VALUE EQUALS      2.99848 AND OCCURRED AT (      568.0,      40.0) *

  DIRECTION /                                                RANGE (METERS)
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 (DEGREES) /           568.0               738.0               966.0              1306.0              1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      2.96593 (222,12)    2.39092 (188,11)    2.19169 (232,10)    1.88703 (151,11)    1.77909 (306,16)
     350.0 /      2.87680 (195,11)    2.41490 (195,11)    2.14484 (301,12)    1.90398 (302,11)    1.84443 (163, 8)
     340.0 /      2.86427 (224,11)    2.25741 (224,13)    2.10215 (235,12)    1.90565 ( 74,11)    1.84443 (188, 8)
     330.0 /      2.92966 (218,11)    2.39092 (224,13)    2.15072 (236,10)    1.99494 (235,10)    1.78711 (114, 8)
     320.0 /      2.84600 (266,12)    2.39358 (228,14)    2.14881 (238,14)    1.93082 (149,10)    1.75457 (330,12)
     310.0 /      2.95399 (201,11)    2.25991 (228,14)    2.12985 (274,15)    1.92094 (114,10)    1.73936 (206, 8)
     300.0 /      2.87428 (224,12)    2.38508 (224,12)    2.19169 (208,12)    1.90867 (232,15)    1.84224 (113,17)
     290.0 /      2.87529 (225,12)    2.47391 (184,11)    2.18017 (224, 9)    1.89012 (318,14)    1.79888 (318,14)
     280.0 /      2.98925 (217,11)    2.49219 (211,11)    2.20374 (225,11)    1.96686 (201,10)    1.84601 (203, 8)
     270.0 /      2.96796 (185,11)    2.42550 ( 84,12)    2.19326 (207,11)    1.97114 (289,11)    1.79526 (295,11)
     260.0 /      2.34294 (256,12)    1.99677 (125,11)    2.15126 (216,12)    1.97472 (194,10)    1.81560 (320, 9)
     250.0 /      2.97455 (256,12)    2.17096 (251,12)    2.12144 (217,10)    1.87035 (125,14)    1.77111 (317,14)
     240.0 /      2.71219 (268,12)    2.15246 (250,13)    2.16670 (126,12)    1.95903 (280,13)    1.77300 (173,17)
     230.0 /      2.50369 (250,13)    2.16725 (251,11)    2.17474 (185,10)    2.02417 (184, 9)    1.76755 ( 65,17)
     220.0 /      2.36907 (251,11)    2.07401 (147,12)    2.10171 (126,11)    1.84218 (297,14)    1.78266 (316, 9)
     210.0 /      1.66259 (175,12)    2.08332 (107,11)    2.04731 ( 40,13)    1.96105 ( 59,11)    1.77980 (149, 8)
     200.0 /      1.57819 (107,12)    2.08937 (107,12)    1.99650 (126,13)    1.84422 ( 35,14)    1.71895 ( 15, 9)
     190.0 /      2.10034 (216,13)    1.95831 (175,12)    2.06970 (175,13)    1.86442 ( 13,12)    1.75777 (232,17)
     180.0 /      2.62966 (189,11)    2.16725 (216,13)    1.96236 (349,12)    1.88871 (160,16)    1.74408 (  8,11)
     170.0 /      2.50369 (146,14)    2.35798 (189,11)    2.09543 (184,10)    1.97472 (184,10)    1.85062 (128, 9)
     160.0 /      2.66492 (128,11)    2.68513 (177,12)    2.02800 (138, 9)    1.85628 (269,10)    1.70296 (354,13)
     150.0 /      2.34280 (177,12)    2.49317 (249,12)    2.16988 (215,14)    1.95020 ( 92,13)    1.72487 (233,15)
     140.0 /      2.38533 (154,11)    2.07358 (210,14)    2.10983 (232,16)    1.90200 (283,10)    1.85714 (253,17)
     130.0 /      2.96733 (210,14)    2.17362 (154,11)    2.16824 (117,10)    2.03438 (150,10)    1.81763 (196,13)
     120.0 /      2.72484 (160,14)    2.01258 (210,16)    2.15126 (190,13)    1.92209 (188,17)    1.75457 (211,15)
     110.0 /      2.98329 (267,12)    2.17140 (249,11)    2.17951 (198,11)    1.90091 (215,13)    1.80552 (215,13)
     100.0 /      2.23793 (222,14)    2.06867 (134,12)    2.18478 (134,12)    1.92512 (182,11)    1.85264 (287,16)
      90.0 /      2.96593 (139,14)    2.76128 (223,11)    2.18693 (189,13)    1.93145 ( 58,10)    1.72519 (121,16)
      80.0 /      2.35794 (230,12)    2.23093 (233,14)    2.19716 (209,15)    1.93365 (188,15)    1.81685 (144, 8)
      70.0 /      2.98298 (230,12)    2.38774 (229,12)    2.19716 (209,16)    2.00597 ( 97,15)    1.85245 (141, 7)
      60.0 /      2.95538 (193,12)    2.45286 (264,12)    2.20374 (213,13)    1.94831 (198, 9)    1.79246 ( 71,10)
      50.0 /      2.99094 (157,12)    2.75041 (127,11)    2.20374 (234,11)    1.87214 (234,11)    1.84109 (176,14)
      40.0 /      2.99848 (161,11)    2.31649 (127,11)    2.19169 (230,15)    1.97799 (192, 9)    1.83766 (179, 8)
      30.0 /      2.97546 (247,12)    2.15414 (168,12)    2.14947 ( 69,13)    1.95903 (283,14)    1.76685 (285,11)
      20.0 /      2.94175 (265,13)    2.12359 (236,14)    2.20813 (161,12)    1.94053 (219,10)    1.78003 (196,18)
      10.0 /      2.76314 (130,11)    2.25741 (188,11)    2.13950 (187,13)    1.88546 (254,11)    1.81596 (233,10)
1                                                                                                                 2ND HIGH
                                                                                                                   1-HR
                                                                                                                  SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                         * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)      *
                                                     * FROM ALL SOURCES *
                                                  * FOR THE RECEPTOR GRID *
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                    * MAXIMUM VALUE EQUALS      2.99848 AND OCCURRED AT (     568.0,      40.0) *

 DIRECTION /                                               RANGE (METERS)
 (DEGREES) /          2215.0                2954.0                3862.0                5112.0                6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      1.66144 (256,16)      1.38655 (197, 8)      1.03051 (140, 8)       .91936 (186,19)       .84414 ( 64,11)
    350.0 /      1.69352 (231, 9)      1.47456 ( 97,17)      1.13786 (231, 9)       .92886 (347, 5)       .85719 (233, 8)
    340.0 /      1.70297 (115, 9)      1.37458 (115, 9)      1.22208 ( 31, 9)      1.11402 (221, 9)      1.08651 (221, 9)
    330.0 /      1.61096 (346,10)      1.24306 (163, 7)      1.02000 (306,24)       .91739 (306,24)       .85584 (213, 7)
    320.0 /      1.55354 (212, 9)      1.17568 (212, 9)      1.05886 (238, 7)      1.11242 (254, 7)      1.05917 (302, 8)
    310.0 /      1.62571 (247,10)      1.33553 ( 10,11)      1.04697 (239,16)       .93523 (239,16)       .87401 (206, 7)
    300.0 /      1.72156 (304, 8)      1.43507 (304, 8)      1.14808 (304, 8)       .92657 (  2, 9)       .88468 (287, 8)
    290.0 /      1.69911 (172, 9)      1.36285 (172, 9)      1.01509 (176, 9)       .91868 (247, 9)       .86218 (247, 9)
    280.0 /      1.69554 (207, 8)      1.36251 (207, 8)      1.01509 (314,16)       .92087 (239, 8)       .85012 (201,22)
    270.0 /      1.59372 ( 41,10)      1.38767 ( 73,10)      1.18602 ( 73,10)       .94587 (172,20)       .89210 (236, 8)
    260.0 /      1.69190 (294, 8)      1.37109 (173,10)      1.03340 (290,20)       .93308 (328, 9)       .86880 ( 75, 8)
    250.0 /      1.52158 (246,16)      1.29036 (328,15)      1.02700 (200, 8)      1.05504 (339,11)      1.00895 (339,11)
    240.0 /      1.64801 (112, 8)      1.43215 (168, 9)      1.21071 (168, 9)      1.17866 (313, 8)      1.17084 (313, 8)
    230.0 /      1.64032 ( 50,10)      1.35501 (211,17)      1.01195 (262,21)       .93229 (317,17)       .90539 (317,17)
    220.0 /      1.69942 (171, 9)      1.48080 (171, 9)      1.34509 (341, 8)      1.39850 (165,20)      1.40587 (165,20)
    210.0 /      1.69624 (339,12)      1.38074 (149, 8)      1.12271 (339,12)       .89317 ( 15, 6)       .81916 ( 84, 9)
    200.0 /      1.68126 ( 15, 9)      1.43418 ( 15, 9)      1.16687 ( 40,17)       .89349 (166, 2)       .83709 ( 38, 6)
    190.0 /      1.47853 (171,17)      1.29616 (150, 9)      1.00195 (146,20)       .90766 (  8,10)       .84033 (188,22)
    180.0 /      1.54640 (209,18)      1.12898 (209,18)       .95898 (287,18)       .87607 ( 59, 6)       .85197 ( 59, 8)
    170.0 /      1.66419 ( 34,12)      1.40636 (184,17)      1.10095 (184,19)       .91294 (200,18)       .85437 (210,19)
    160.0 /      1.41467 (363,12)      1.29040 (210,17)      1.09803 (355,17)      1.03892 (355,17)       .97074 (355,17)
    150.0 /      1.50231 (184,18)      1.30116 (360,16)      1.14998 (283, 8)      1.08087 (355,13)       .93092 (355,13)
    140.0 /      1.69767 (153, 7)      1.60861 ( 18,13)      1.38199 (355,15)      1.19954 (363,18)      1.19248 (363,18)
    130.0 /      1.59286 (190,10)      1.23430 (196,13)      1.05823 (  4, 5)       .92274 (155, 8)       .89373 (190, 7)
    120.0 /      1.68451 (221,12)      1.57940 (221,12)      1.37066 (221,12)      1.11767 (221,12)       .97728 (221,12)
    110.0 /      1.68862 (206,18)      1.48794 ( 67,15)      1.26751 ( 67,15)       .94613 ( 67,15)       .92396 (  3,14)
    100.0 /      1.58292 (266,16)      1.38298 (201,16)      1.17222 ( 83, 8)       .91573 ( 83, 8)       .84924 ( 87,18)
     90.0 /      1.60861 (224,17)      1.40071 (224,17)      1.07618 (224,17)       .93896 ( 62,18)       .81965 (105, 9)
     80.0 /      1.62984 (191, 9)      1.37109 (284,16)      1.05251 (364,16)       .90510 (223,18)       .87569 (223,18)
     70.0 /      1.69911 (284,10)      1.37458 (105,12)      1.07192 ( 87,17)       .89789 (162,19)       .82438 (364,17)
     60.0 /      1.60833 ( 71,10)      1.27847 (312,14)      1.00902 (231,18)       .88746 (181,20)       .80769 (231,18)
     50.0 /      1.71024 (221,17)      1.44901 ( 29,17)      1.19568 (196,19)       .91106 (181,21)       .85230 ( 56,18)
     40.0 /      1.67072 (232, 9)      1.48085 (219, 9)      1.14122 (219, 9)       .91128 ( 73,11)       .85439 (284, 9)
     30.0 /      1.56516 (178,15)      1.18104 (178,15)      1.01736 (332,17)       .94821 (332,17)       .87172 (332,17)
     20.0 /      1.61065 (306,15)      1.29040 (306,15)      1.01118 (326, 6)       .93501 (305, 7)       .86152 (305, 7)
     10.0 /      1.69552 (202,18)      1.37109 (162, 8)      1.02811 (335,16)       .90977 (307, 9)       .85718 (  1,17)
1                                                                                                                    HIGH
                                                                                                                      3-HR
                                                                                                                    SGROUP#  1
                        *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985      ***


                       * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
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                                       * FROM ALL SOURCES *
                                      * FOR THE RECEPTOR GRID *

                        * MAXIMUM VALUE EQUALS      2.13157 AND OCCURRED AT (     966.0,      80.0) *

 DIRECTION /                                            RANGE (METERS)
 (DEGREES) /           568.0                738.0                966.0                1306.0               1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      1.55542 (139, 4)     1.68137 (139, 4)     1.47340 (139, 4)     1.10217 (139, 4)      .99813 (330, 5)
    350.0 /      1.52900 (139, 4)     1.69179 (139, 4)     1.53866 (139, 4)     1.19469 (139, 4)     1.17276 ( 96, 3)
    340.0 /      1.19277 (224, 4)     1.34592 (121, 4)     1.39753 (121, 4)     1.43553 ( 55, 4)     1.25945 ( 55, 4)
    330.0 /      1.36805 (235, 4)     1.63918 (235, 4)     1.67539 (121, 4)     1.30949 (121, 4)     1.10064 (  1, 5)
    320.0 /      1.64509 (266, 4)     1.94582 (266, 4)     1.76424 (238, 5)     1.76627 (238, 5)     1.46756 (238, 5)
    310.0 /      1.43667 (266, 4)     1.61893 (266, 4)     1.35731 (266, 4)     1.22124 (275, 4)      .97201 ( 30, 4)
    300.0 /      1.17912 (208, 4)     1.90987 (208, 4)     2.09781 (208, 4)     1.71636 (208, 4)     1.22745 (208, 4)
    290.0 /      1.27788 (225, 4)     1.51181 (246, 4)     1.76000 (246, 4)     1.60765 (246, 4)     1.49154 (318, 5)
    280.0 /      1.27332 (225, 4)     1.29492 (225, 4)     1.36870 (216, 4)     1.21909 (294, 4)     1.17570 (299, 5)
    270.0 /       .99545 (194, 5)     1.28595 (240, 4)     1.60336 (297, 4)     1.84899 (297, 4)     1.65967 (297, 4)
    260.0 /      1.05256 (250, 4)      .98711 (314, 4)     1.15165 (251, 5)     1.21382 (290, 5)     1.10443 (290, 5)
    250.0 /      1.25155 (251, 4)     1.20287 (175, 4)     1.51139 (271, 4)     1.48721 (271, 4)     1.32965 (343, 5)
    240.0 /      1.49361 (251, 4)     1.26638 (250, 5)     1.42417 (259, 4)     1.58050 (259, 4)     1.38276 (259, 4)
    230.0 /      1.33311 (251, 4)     1.33184 (111, 4)     1.41347 (185, 4)     1.26837 (185, 4)     1.14583 (211, 6)
    220.0 /      1.00559 (147, 4)     1.36617 (147, 4)     1.32082 (147, 4)     1.45103 (337, 5)     1.38457 (337, 5)
    210.0 /       .86320 (107, 4)     1.23407 (107, 4)     1.29124 (107, 4)     1.06529 (107, 4)      .88948 ( 99, 5)
    200.0 /       .95400 (175, 4)     1.27993 (126, 5)     1.36663 (126, 5)     1.09919 (126, 5)      .96823 (279, 3)
    190.0 /       .89986 (175, 4)     1.19048 (175, 5)     1.47029 (175, 5)     1.34494 (175, 5)     1.02818 (175, 5)
    180.0 /       .99893 (216, 5)     1.28171 (175, 5)     1.51691 (175, 5)     1.53410 (176, 4)     1.49086 (176, 4)
    170.0 /      1.07436 (128, 4)      .99060 (128, 4)     1.09004 ( 15, 5)     1.43586 ( 15, 5)     1.39151 ( 15, 5)
    160.0 /       .99526 (146, 5)     1.21070 (  6, 5)     1.40024 (  6, 5)     1.23989 (  6, 5)      .95537 (  6, 5)
    150.0 /      1.06089 (214, 5)     1.35889 (214, 5)     1.21360 (  6, 5)     1.23633 (355, 5)     1.17734 (355, 5)
    140.0 /      1.01031 (154, 4)      .94090 (214, 5)      .88561 (215, 4)     1.12596 ( 15, 4)     1.10179 ( 15, 4)
    130.0 /      1.44634 (154, 4)     1.40704 (154, 4)     1.51465 (190, 5)     1.40514 (190, 5)     1.10895 (190, 5)
    120.0 /      1.01521 (154, 4)     1.03506 (190, 5)     1.22512 (190, 5)     1.22135 (  8, 5)     1.11103 (  8, 5)
    110.0 /      1.00073 (249, 4)      .97394 (135, 4)     1.41483 (135, 4)     1.48082 (135, 4)     1.25005 (135, 4)
    100.0 /       .90822 (219, 5)     1.44237 (219, 5)     1.55999 (219, 5)     1.34030 (168, 6)     1.31338 (168, 6)
     90.0 /      1.17035 (139, 5)     1.57220 (179, 4)     1.73402 (179, 4)     1.68994 (153, 5)     1.46807 (153, 5)
     80.0 /      1.40353 (131, 4)     2.01161 (286, 5)     2.13157 (286, 5)     1.69929 (286, 5)     1.35792 (114, 5)
     70.0 /      1.44047 (168, 5)     1.56900 (284, 5)     1.69580 (284, 5)     1.54208 (254, 5)     1.21384 (254, 5)
     60.0 /      1.68524 (193, 4)     1.54179 (164, 5)     1.73766 (164, 5)     1.44152 (164, 5)     1.13201 (214, 3)
     50.0 /      1.87565 (193, 4)     1.45175C(221, 5)     1.46998C(221, 5)     1.23864C(221, 5)     1.21853 (264, 6)
     40.0 /      1.56747 (168, 4)     1.91803 (127, 4)     1.69788 (127, 4)     1.60022 ( 87, 5)     1.32411 ( 87, 5)
     30.0 /      1.54942 (168, 4)     1.49549 (127, 4)     1.55431 (276, 4)     1.68041 (276, 4)     1.47278 (276, 4)
     20.0 /      1.30997 (236, 5)     1.49295 (122, 4)     1.66915 (306, 5)     1.63898 (306, 5)     1.43487 (143, 4)
     10.0 /      1.37748 (214, 4)     1.34506 (214, 4)     1.35655 (170, 4)     1.29054 (307, 4)     1.19151 (357, 5)
1                                                                                                                 HIGH
                                                                                                                   3-HR
                                                                                                                  SGROUP#  1
                            *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***
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                         * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                          * FROM ALL SOURCES *
                                        * FOR THE RECEPTOR GRID *

                       * MAXIMUM VALUE EQUALS      2.13157 AND OCCURRED AT (     966.0,      80.0) *

 DIRECTION /                                             RANGE (METERS)
 (DEGREES) /           2215.0             2954.0             3862.0             5112.0             6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .85496 (330, 5)    .65588 (140, 3)    .67157 (140, 3)    .61243 (140, 3)    .55734 (140, 3)
     350.0 /      1.01118 ( 96, 3)    .77611 ( 96, 3)    .68354 (347, 2)    .65190 (347, 2)    .60884 (347, 2)
     340.0 /       .96939 ( 55, 4)    .66121 ( 55, 4)    .63445 (242, 7)    .57554 (242, 7)    .52222 (242, 7)
     330.0 /       .86297 (  1, 5)    .59581 (  1, 5)    .45832 (306, 8)    .40581 (306, 8)    .36363 (306, 8)
     320.0 /      1.09404 (238, 5)    .81603 (345, 5)    .69558 (345, 5)    .60159 (167, 2)    .55083 (167, 2)
     310.0 /       .97631 ( 30, 4)    .97468 (242, 1)    .92446 (242, 1)    .79139 (242, 1)    .69924 (242, 1)
     300.0 /       .87537 (112, 5)    .75405 (  2, 3)    .80332 (  2, 3)    .75555 (  2, 3)    .69672 (  2, 3)
     290.0 /      1.21282 (318, 5)    .86116 (318, 5)    .65868 (324, 7)    .54554 ( 36, 2)    .50844 ( 36, 2)
     280.0 /      1.02581 (299, 5)    .83845 (101, 6)    .73310 (101, 6)    .58766 (101, 6)    .51189 (139, 3)
     270.0 /      1.30120 (297, 4)    .97692 (240, 6)    .89708 (240, 6)    .74875 (240, 6)    .65515 (241, 3)
     260.0 /       .87256 (290, 5)    .72980 (100, 6)    .65310 (324, 4)    .56968 (228, 7)    .55543 (228, 7)
     250.0 /      1.05887 (343, 5)    .82931 (102, 4)    .78692 (102, 4)    .67331 (102, 4)    .59447 (102, 4)
     240.0 /      1.06884 (341, 4)    .86114 (124, 7)    .81529 (339, 2)    .74974 (339, 2)    .68407 (339, 2)
     230.0 /      1.02764 ( 50, 4)    .83164 ( 39, 6)    .79639 ( 39, 6)    .68588 ( 39, 6)    .60714 ( 39, 6)
     220.0 /      1.12753 (337, 5)    .80026 (337, 5)    .70547 (257, 8)    .62504 (257, 8)    .60410 ( 22, 1)
     210.0 /       .76952 ( 37, 6)    .85079 ( 37, 6)    .80185 ( 37, 6)    .68234 ( 37, 6)    .60086 ( 37, 6)
     200.0 /       .81464 (279, 3)    .75537 ( 39, 1)    .71080 ( 39, 1)    .60395 ( 39, 1)    .53151 ( 39, 1)
     190.0 /       .70810 (175, 5)    .73714 (312, 6)    .68090 (312, 6)    .55884 (312, 6)    .48103 (312, 6)
     180.0 /      1.22656 (176, 4)    .94157 (249, 6)    .71986 (249, 6)    .57397 ( 13, 8)    .61677 ( 13, 8)
     170.0 /      1.14313 ( 15, 5)    .81576 ( 15, 5)    .58434 (340, 1)    .52350 (340, 1)    .47535 (340, 1)
     160.0 /       .75382 (354, 5)    .65038 (354, 5)    .60997 (308, 3)    .54159 (308, 3)    .49025 (308, 3)
     150.0 /       .97445 (355, 5)    .74353 (355, 5)    .67627 (283, 3)    .62959 (283, 3)    .58696 (283, 3)
     140.0 /       .91356 ( 15, 4)    .84301 ( 20, 6)    .87182 (363, 6)    .88165 (363, 6)    .84993 (363, 6)
     130.0 /       .81573 (  8, 5)    .74662 (308, 5)    .64388 (  4, 2)    .57740 (  4, 2)    .52680 (  4, 2)
     120.0 /       .93607 (  4, 6)    .92266 (  4, 6)    .80671 (  4, 6)    .66576 (  4, 4)    .58392 (  4, 4)
     110.0 /       .93769 (135, 4)    .89335 (149, 6)    .81432 (149, 6)    .67452 (149, 6)    .58671 (149, 6)
     100.0 /      1.14599 (168, 6)    .90711 (168, 6)    .68835 (168, 6)    .52102 (147, 6)    .44155 (147, 6)
      90.0 /      1.12431 (153, 5)    .89844 (133, 6)    .80873 (133, 6)    .66326 (133, 6)    .57433 (133, 6)
      80.0 /      1.12504 (106, 4)    .88330 (106, 4)    .66737 (106, 4)    .48397 (143, 6)    .42448 (326, 4)
      70.0 /      1.13267 (105, 4)    .91507 (105, 4)    .67244 (105, 4)    .50309 (104, 6)    .49700 (336, 3)
      60.0 /      1.08687 (278, 5)    .98741 (278, 5)    .82718 (278, 5)    .64682 (278, 5)    .54975 (278, 5)
      50.0 /      1.12929 (264, 6)    .93795 (264, 6)    .75489 (264, 6)    .59270 (264, 6)    .51335 (264, 6)
      40.0 /       .98623 ( 87, 5)    .66132 (123, 2)    .63579 (123, 2)    .55135 (123, 2)    .52344C(284, 3)
      30.0 /      1.14025 (276, 4)    .86160 (  2, 6)    .77060 (  2, 6)    .63820 (  2, 6)    .55730 (  2, 6)
      20.0 /      1.17915 (143, 4)    .84219 (143, 4)    .68262 (326, 2)    .59358 (326, 2)    .52819 (326, 2)
      10.0 /      1.06096 (357, 5)    .81912 (357, 5)    .59313 (357, 5)    .50752 (347, 6)    .45016 (347, 6)
1                                                                                                          2ND HIGH
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                                                                                    3-HR
                                                                                    SGROUP#  1
                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                 * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                        * FROM ALL SOURCES *
                                      * FOR THE RECEPTOR GRID *

                 * MAXIMUM VALUE EQUALS      1.79653 AND OCCURRED AT (     966.0,     80.0) *

 DIRECTION /                                         RANGE (METERS)
 (DEGREES) /          568.0                738.0               966.0                1306.0               1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      1.12866 (188, 4)     1.27426 (158, 4)     1.29523 (158, 4)     1.00171 (158, 4)      .79840 (139, 4)
    350.0 /       .99545 (235, 5)     1.27401 (237, 4)     1.34822 (237, 4)     1.16496 ( 96, 3)      .90790 (302, 4)
    340.0 /       .98727 (115, 4)     1.30473 (235, 4)     1.35218 (235, 4)     1.20722 ( 89, 4)     1.07712 ( 89, 4)
    330.0 /      1.09863 (177, 4)     1.61842 (121, 4)     1.58642 (235, 4)     1.30927 (235, 4)     1.00089 (114, 3)
    320.0 /      1.06712 (235, 4)     1.39043 (227, 5)     1.72672 (266, 4)     1.47489 ( 79, 5)     1.27924 ( 79, 5)
    310.0 /      1.13178 (211, 4)     1.24969 (208, 4)     1.35014 (208, 4)     1.11106 (227, 4)      .93397 (331, 4)
    300.0 /      1.09942 (211, 4)     1.61347 (274, 5)     1.70495 (274, 5)     1.35059 (274, 5)     1.00741 (210, 3)
    290.0 /      1.08128 (211, 4)     1.22134 (225, 4)     1.24021 (318, 5)     1.56953 (318, 5)     1.27566 (246, 4)
    280.0 /      1.04765 (211, 4)     1.22956 (216, 4)     1.24774 ( 78, 5)     1.20176 (299, 5)     1.16998 (251, 6)
    270.0 /       .98933 (185, 4)      .98505 (297, 4)     1.58001 (240, 4)     1.50121 (240, 4)     1.21257 (240, 4)
    260.0 /       .81333 (256, 4)      .97436 (289, 4)     1.12022 (289, 4)     1.18841 (311, 4)     1.07845 (311, 4)
    250.0 /      1.06490 (256, 4)     1.17314 (271, 4)     1.27909 (175, 4)     1.43879 (343, 5)     1.22473 (271, 4)
    240.0 /      1.31128 (250, 5)     1.14384 (252, 5)     1.25855 (252, 5)     1.45643 (341, 4)     1.34457 (341, 4)
    230.0 /       .97257 (111, 4)     1.13673 (185, 4)     1.29441 (111, 4)     1.14206 (211, 6)     1.14507 ( 50, 4)
    220.0 /       .92618 (251, 4)      .94168 (111, 4)     1.13627 (337, 5)      .98951 (147, 4)      .80327 (131, 3)
    210.0 /       .63223 (201, 4)      .89366 (126, 5)     1.05998 ( 45, 4)     1.02867 ( 99, 5)      .81843 ( 45, 4)
    200.0 /       .85641 (107, 4)     1.13350 (107, 4)     1.07306 (107, 4)     1.04167 ( 35, 5)      .87685 ( 35, 5)
    190.0 /       .70011 (216, 5)      .74230 (146, 5)      .80636 ( 13, 4)      .90979 (356, 4)      .86927 (356, 4)
    180.0 /       .93454 (128, 4)     1.07532 (128, 4)     1.16859 (176, 4)     1.32225 (175, 5)     1.21937 (249, 6)
    170.0 /       .85759 (146, 5)      .78599 (189, 4)      .88363 (354, 4)      .86746 (176, 4)      .85954 (176, 4)
    160.0 /       .93608 (214, 5)     1.06811 (214, 5)      .82107 (270, 5)      .95483 (270, 5)      .85775 (270, 5)
    150.0 /      1.00224 (249, 4)      .96356 (  6, 5)     1.13059 (214, 5)     1.22575 (  6, 5)     1.08566 (269, 5)
    140.0 /       .82746 (210, 5)      .90264 (154, 4)      .86751 (214, 5)      .96658 (283, 4)     1.00134 (355, 5)
    130.0 /       .98911 (210, 5)     1.23584 (190, 5)     1.29682 (215, 4)     1.25773 ( 82, 4)     1.07396 ( 82, 4)
    120.0 /       .99469 (178, 4)      .97206 (154, 4)     1.02553 (  8, 5)     1.10506 (213, 6)      .99644 (213, 6)
    110.0 /       .99443 (267, 4)      .82902 (267, 4)     1.12823 ( 81, 5)     1.23754 ( 81, 5)     1.07072 ( 81, 5)
    100.0 /       .81132 (129, 4)     1.26646 (129, 4)     1.36316 (129, 4)     1.25828 (219, 5)     1.18114 (192, 6)
     90.0 /      1.01647 (179, 4)     1.32731 (219, 5)     1.54238 (153, 5)     1.47697 (179, 4)     1.10880 ( 11, 4)
     80.0 /      1.29961 (286, 5)     1.63740 (284, 5)     1.79653 (284, 5)     1.66648 (114, 5)     1.30560 (106, 4)
     70.0 /      1.43306 (223, 5)     1.42628 (254, 5)     1.68879 (254, 5)     1.36332 (284, 5)     1.16962 (105, 4)
     60.0 /      1.30209 (228, 5)     1.38918 (157, 5)     1.42009 (264, 5)     1.21774 (219, 4)     1.07378 (278, 5)
     50.0 /      1.20403 (230, 5)     1.35418 (193, 4)     1.37304 (195, 5)     1.19459 (181, 4)     1.06658 (181, 4)
     40.0 /      1.43149 (127, 4)     1.41588 (276, 5)     1.62429 ( 87, 5)     1.24822 (159, 4)     1.01710 (277, 4)
     30.0 /      1.40200 (236, 5)     1.48508 (169, 4)     1.51051 (169, 4)     1.39628 ( 60, 5)     1.13720 ( 60, 5)
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     20.0 /      1.07641 (168, 4)      1.35749 (306, 5)      1.62745 (122, 4)      1.51334 ( 89, 5)      1.40733 (306, 5)
     10.0 /      1.01312 (188, 4)      1.17510 (170, 4)      1.10474 (307, 4)      1.14497 (170, 4)      1.16104 (307, 4)
1                                                                                                                     2ND HIGH
                                                                                                                       3-HR
                                                                                                                      SGROUP#  1
                                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                                * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                                 * MAXIMUM VALUE EQUALS      1.79653 AND OCCURRED AT (      966.0,      80.0) *

 DIRECTION /                                                    RANGE (METERS)
 (DEGREES) /          2215.0                2954.0                3862.0                5112.0                6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .65836 (243, 3)       .62824 (330, 5)       .48326 (243, 3)       .39809 (  3, 3)       .38983 (  3, 3)
    350.0 /       .76480 ( 95, 4)       .69392 (325, 7)       .63632 (325, 7)       .53009 (325, 7)       .48317 (233, 3)
    340.0 /       .84118 ( 89, 4)       .62288 (242, 7)       .51322 ( 31, 4)       .48382 (304, 1)       .46561 (304, 1)
    330.0 /       .80617 (114, 3)       .57271 (114, 3)       .43118 ( 54, 4)       .37467 (333, 3)       .34297 (333, 3)
    320.0 /       .97720 ( 79, 5)       .73082 (238, 5)       .65278 (167, 2)       .54998 (345, 5)       .49106 (166, 6)
    310.0 /       .87386 (242, 1)       .88446 ( 30, 4)       .74038 ( 30, 4)       .62852 (300, 8)       .57567 (300, 8)
    300.0 /       .83467 (301, 3)       .70501 (112, 5)       .60687 ( 14, 4)       .50823 ( 14, 4)       .44404 ( 14, 4)
    290.0 /       .92518 (246, 4)       .74421 (324, 7)       .61330 (166, 3)       .53442 (166, 3)       .47532 (166, 3)
    280.0 /       .98128 (251, 6)       .81145 (299, 5)       .71276 (103, 1)       .57881 (103, 1)       .50365 (101, 6)
    270.0 /       .91976 (240, 6)       .90273 (297, 4)       .80184 (241, 3)       .72236 (241, 3)       .65408 (240, 6)
    260.0 /       .82682 (311, 4)       .71899 (324, 4)       .64208 (100, 6)       .55466 (250, 7)       .49884 (250, 7)
    250.0 /       .90695 (271, 4)       .82154 (271, 6)       .74101 (271, 6)       .60836 (271, 6)       .52690 (271, 6)
    240.0 /      1.06346 (259, 4)       .82233 (261, 4)       .78731 (124, 7)       .65530 (124, 7)       .59858 (342, 4)
    230.0 /       .99916 (328, 6)       .78912 ( 50, 4)       .66108 (263, 2)       .59502 (263, 2)       .53815 (263, 2)
    220.0 /       .78826 (131, 3)       .72434 (257, 8)       .56594 ( 99, 3)       .60339 ( 22, 1)       .56554 (257, 8)
    210.0 /       .68080 (258, 3)       .69096 (258, 3)       .63904 (258, 3)       .54995 (258, 3)       .49108 (258, 3)
    200.0 /       .68384 ( 39, 1)       .61147 (279, 3)       .44940 (279, 3)       .37582 (351, 2)       .34003 (176, 3)
    190.0 /       .70335 (356, 4)       .60921 ( 21, 1)       .55999 ( 21, 1)       .46807 ( 21, 1)       .40933 ( 21, 1)
    180.0 /      1.14759 (249, 6)       .87342 (176, 4)       .64422 ( 12, 2)       .55345 ( 12, 2)       .48853 ( 12, 2)
    170.0 /       .71250 (176, 4)       .58958 (340, 1)       .55458 ( 15, 5)       .44716 (  5, 4)       .40659 ( 12, 1)
    160.0 /       .67383 (  6, 5)       .62127 (308, 3)       .52417 (354, 5)       .44322 (349, 7)       .40448 (349, 7)
    150.0 /       .86787 (269, 5)       .69298 (189, 6)       .63459 (359, 3)       .54762 (359, 3)       .48449 (359, 3)
    140.0 /       .91215 (355, 5)       .77859 (363, 6)       .74423 ( 20, 6)       .60145 ( 20, 6)       .54874 (359, 2)
    130.0 /       .81021 ( 82, 4)       .66478 (  4, 2)       .63514 (308, 5)       .53989 ( 18, 4)       .51352 ( 18, 4)
    120.0 /       .87372 (  8, 5)       .87968 (  4, 4)       .79914 (  4, 4)       .65377 (  4, 6)       .56927 (  4, 6)
    110.0 /       .84776 (149, 6)       .65839 ( 28, 8)       .65313 ( 28, 8)       .58800 ( 28, 8)       .53633 ( 28, 8)
    100.0 /       .96591 (192, 6)       .79685 (147, 6)       .66789 (147, 6)       .49589 (168, 6)       .41330 (137, 7)
     90.0 /       .92447 ( 11, 4)       .76549 (153, 5)       .63276 (326, 5)       .52935 (326, 5)       .46309 (326, 5)
     80.0 /      1.00137 (114, 5)       .71690 (144, 3)       .57833 (143, 6)       .48334 (326, 4)       .42345 (143, 6)
     70.0 /       .99338 (362, 5)       .76245 (362, 5)       .59960 (104, 6)       .49175 (336, 3)       .44034 (104, 6)
     60.0 /       .99995 (214, 3)       .85324 (123, 4)       .69327 (123, 4)       .56287 (312, 5)       .50054 (181, 7)
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     50.0 /      .85902 (199, 4)      .62410 (199, 4)      .50797 ( 56, 6)      .48981 (139, 6)      .48401 (139, 6)
     40.0 /      .76978 (277, 4)      .65901 ( 87, 5)      .59482 ( 25, 1)      .53201 ( 25, 1)      .49039 (123, 2)
     30.0 /      .87703 (  2, 6)      .81875 ( 76, 1)      .74724 ( 76, 1)      .61916 ( 76, 1)      .53845 ( 76, 1)
     20.0 /     1.10110 (306, 5)      .77158 (306, 5)      .57247 (143, 4)      .49170 ( 17, 6)      .43904 ( 24, 6)
     10.0 /      .90664 (307, 4)      .62315 (307, 4)      .58859 (347, 6)      .48200 (221, 4)      .43057 (221, 4)
1                                                                                                                  HIGH
                                                                                                                    8-HR
                                                                                                                   SGROUP#  1
                                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                                         * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                              * FROM ALL SOURCES *
                                                            * FOR THE RECEPTOR GRID *

                                       * MAXIMUM VALUE EQUALS      1.21175 AND OCCURRED AT (     738.0,      70.0) *

 DIRECTION /                                                       RANGE (METERS)
 (DEGREES) /           568.0                738.0                966.0                1306.0               1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .68445 (139, 2)      .82385 (139, 2)      .82088 (139, 2)      .71646 (139, 2)      .58627 (139, 2)
    350.0 /      .59272 (139, 2)      .79473 (237, 2)      .90983 (237, 2)      .80900 (237, 2)      .62893 (237, 2)
    340.0 /      .78807 (224, 2)      .76193 (224, 2)      .64962 (235, 2)      .53910 ( 55, 2)      .54493 ( 31, 2)
    330.0 /      .73464 (224, 2)      .73189 (235, 2)      .74897 (202, 2)      .64781 (202, 2)      .48594 (202, 2)
    320.0 /      .61734 (266, 2)      .96872 (227, 2)     1.08524 (227, 2)      .89332 (227, 2)      .73406 (238, 2)
    310.0 /      .66852 (201, 2)     1.03320 (227, 2)     1.14513 (227, 2)      .93681 (227, 2)      .66522 (227, 2)
    300.0 /      .65517 (201, 2)      .96086 (226, 2)     1.02882 (208, 2)      .83771 (208, 2)      .65539 (109, 2)
    290.0 /      .60890C(225, 2)      .73718 (246, 2)      .83987 (246, 2)      .89797 (318, 2)      .85049 (318, 2)
    280.0 /      .57022C(225, 2)      .71634C(294, 2)      .99355C(294, 2)     1.00998C(294, 2)      .83714C(294, 2)
    270.0 /      .51296 (194, 2)      .67682 (240, 2)      .88387C(294, 2)      .95387 (297, 2)      .86528 (297, 2)
    260.0 /      .51173 (250, 2)      .60397 (216, 2)      .78618 (290, 2)      .91881 (290, 2)      .82869 (290, 2)
    250.0 /      .68318 (250, 2)      .65223 (175, 2)      .97325 (343, 2)     1.13905 (343, 2)     1.03058 (343, 2)
    240.0 /      .74311 (251, 2)      .74511 (252, 2)      .88537 ( 65, 2)     1.01163 ( 65, 2)      .93200 ( 65, 2)
    230.0 /      .59268 (251, 2)      .53648 (250, 2)      .61705 (352, 2)      .79729 (352, 2)      .78972 (352, 2)
    220.0 /      .37710 (147, 2)      .51231 (147, 2)      .63715 ( 99, 2)      .77613 ( 99, 2)      .77200 ( 99, 2)
    210.0 /      .32370 (107, 2)      .46278 (107, 2)      .68067 ( 99, 2)      .74062 ( 99, 2)      .64485 ( 99, 2)
    200.0 /      .45290 (175, 2)      .49076 (126, 2)      .52665 ( 13, 2)      .49454 ( 13, 2)      .40320 (279, 2)
    190.0 /      .59835 (175, 2)      .72711 (175, 2)      .76858 (175, 2)      .71423 (175, 2)      .59576 (175, 2)
    180.0 /      .45694 (175, 2)      .63453 (175, 2)      .70040 (175, 2)      .63720 (175, 2)      .55907 (176, 2)
    170.0 /      .42002 (128, 2)      .43091 (128, 2)      .40877 ( 15, 2)      .53845 ( 15, 2)      .52182 ( 15, 2)
    160.0 /      .37322 (146, 2)      .52260 (  6, 2)      .64128 (269, 2)      .72604 (269, 2)      .63955 (269, 2)
    150.0 /      .39783 (214, 2)      .57097 (  6, 2)      .68838 (  6, 2)      .74390 (269, 2)      .66416 (269, 2)
    140.0 /      .52057 (154, 2)      .55825 (154, 2)      .56698C(215, 2)      .48889C(215, 2)      .47152 (283, 2)
    130.0 /      .68410 (154, 2)      .74742 (154, 2)      .65970 (154, 2)      .66011 (190, 2)      .60133 (190, 2)
    120.0 /      .46097C(210, 2)      .52131C(210, 2)      .51822 ( 82, 2)      .57772 ( 82, 2)      .56862 (  4, 2)
    110.0 /      .44930 (233, 2)      .44480 (135, 2)      .63915 (135, 2)      .66794 (135, 2)      .56800 (135, 2)
    100.0 /      .47217 (233, 2)      .77330 (129, 2)      .87934 (129, 2)      .88399 (137, 2)      .76861 (137, 2)
     90.0 /      .68528 (223, 2)      .88498 (223, 2)     1.10630 (153, 2)     1.20535 (153, 2)     1.04174 (153, 2)
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           80.0 /       .92237 (223, 2)      1.11081C(229, 2)      1.15777 (284, 2)      1.08158 (284, 2)       .88459 (284, 2)
           70.0 /      1.00953C(229, 2)      1.21175C(229, 2)      1.09309C(229, 2)       .97317 (284, 2)       .80509 (284, 2)
           60.0 /       .82252C(229, 2)       .94317 (264, 2)       .91979 (264, 2)       .75505 (164, 2)       .66904C(278, 2)
           50.0 /       .72268 (193, 2)       .85747 (195, 2)       .94598 (195, 2)       .77420 (195, 2)       .55200 (195, 2)
           40.0 /       .68362 (236, 2)       .79311 (127, 2)       .77088 (276, 2)       .66692 (276, 2)       .52833 (277, 2)
           30.0 /       .87173 (236, 2)       .94026 (276, 2)      1.14064 (276, 2)      1.06880 (276, 2)       .85737 (276, 2)
           20.0 /       .84917 (236, 2)       .80385 (122, 2)       .84083 (122, 2)       .75927 (143, 2)       .75671 (143, 2)
           10.0 /       .55634 (236, 2)       .56489 (192, 2)       .56114 (192, 2)       .63269 (  7, 2)       .59316 (  7, 2)
1                                                                                                                    HIGH
                                                                                                                      8-HR
                                                                                                                     SGROUP#  1
                                        *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                                       * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                            * FROM ALL SOURCES *
                                                           * FOR THE RECEPTOR GRID *

                                     * MAXIMUM VALUE EQUALS      1.21175 AND OCCURRED AT (     738.0,      70.0) *

    DIRECTION /                                            RANGE (METERS)
    (DEGREES) /            2215.0               2954.0               3862.0               5112.0               6000.0
  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

          360.0 /       .44302 (139, 2)       .40728 (244, 2)       .36528 (244, 2)       .29994 (244, 2)       .26008 (244, 2)
          350.0 /       .52666 (325, 3)       .56526 (325, 3)       .52096 (325, 3)       .43477 (325, 3)       .37923 (325, 3)
          340.0 /       .50821 ( 31, 2)       .42789 ( 31, 2)       .34522 ( 31, 2)       .32380 (304, 1)       .30599 (304, 1)
          330.0 /       .38799 ( 54, 2)       .31910 ( 54, 2)       .24821 ( 54, 2)       .20272 (306, 3)       .20027 (357, 3)
          320.0 /       .54925 (238, 2)       .45482 (345, 2)       .37405 (167, 1)       .34143 (167, 1)       .31113 (167, 1)
          310.0 /       .59292 (301, 1)       .59940 (301, 1)       .54544 (242, 1)       .46776 (242, 1)       .41335 (242, 1)
          300.0 /       .47136 (109, 2)       .37057 ( 97, 2)       .29215 ( 97, 2)       .27388 (241, 3)       .25708 (241, 3)
          290.0 /       .68876 (318, 2)       .48679 (318, 2)       .41903 (324, 3)       .33776 (324, 3)       .28977 (324, 3)
          280.0 /       .61796C(294, 2)       .45686 (101, 3)       .39831 (101, 3)       .31805 (101, 3)       .27598 (108, 3)
          270.0 /       .68222 (297, 2)       .53219 (240, 2)       .47257 (111, 3)       .38873 (111, 3)       .33701 (111, 3)
          260.0 /       .64874 (290, 2)       .44690 (290, 2)       .38551 (102, 1)       .37341 (102, 1)       .35036 (102, 1)
          250.0 /       .81030 (343, 2)       .58842 (102, 2)       .55551 (102, 2)       .47350 (102, 2)       .41717 (102, 2)
          240.0 /       .76370 ( 65, 2)       .57378 (257, 2)       .51342 (338, 2)       .46044 (338, 2)       .41513 (338, 2)
          230.0 /       .67528 (352, 2)       .51173 (352, 2)       .51469 (263, 1)       .46962 (263, 1)       .42901 (263, 1)
          220.0 /       .69077 ( 99, 2)       .56059 ( 99, 2)       .43282 ( 99, 2)       .35288 (257, 3)       .31312 (257, 3)
          210.0 /       .49614 ( 99, 2)       .33922 ( 99, 2)       .22717 ( 13, 1)       .20017 ( 13, 1)       .17899 ( 13, 1)
          200.0 /       .36189 ( 39, 1)       .40262 ( 39, 1)       .38082 ( 39, 1)       .32503 ( 39, 1)       .28668 ( 39, 1)
          190.0 /       .45716 (175, 2)       .31364 (175, 2)       .28398 ( 12, 2)       .24105 ( 12, 2)       .21218 ( 12, 2)
          180.0 /       .45996 (176, 2)       .41909 ( 12, 1)       .40053 ( 12, 1)       .34341 ( 12, 1)       .30286 ( 12, 1)
          170.0 /       .42868 ( 15, 2)       .38750C(184, 3)       .31724 (  5, 2)       .28539 (350, 3)       .26035 (350, 3)
          160.0 /       .49115 (269, 2)       .43748 (340, 2)       .39059 (340, 2)       .31904 (340, 2)       .27588 (340, 2)
          150.0 /       .52397 (269, 2)       .47173 ( 21, 2)       .42242 ( 21, 2)       .34534 ( 21, 2)       .29872 ( 21, 2)
          140.0 /       .49393 ( 20, 3)       .48618 ( 20, 3)       .42338 ( 20, 3)       .33829 ( 20, 3)       .32819C(363, 3)
          130.0 /       .49735 (190, 2)       .36682 (190, 2)       .28306 (307, 3)       .30097C(229, 3)       .29734C(229, 3)
          120.0 /       .67082 (  4, 2)       .68290 (  4, 2)       .61332 (  4, 2)       .50640 (  4, 2)       .44284 (  4, 2)
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         110.0 /       .53699 (  4, 3)      .55715 (  4, 3)      .50600 (  4, 3)      .42277 (  4, 3)      .37224 (  4, 3)
         100.0 /       .60747 (137, 2)      .43643 (137, 2)      .33009C(168, 3)      .27447C(168, 3)      .24071C(168, 3)
          90.0 /       .79372 (153, 2)      .53739 (153, 2)      .35976 (326, 2)      .29704 (326, 2)      .25797 (326, 2)
          80.0 /       .66264 (284, 2)      .47584 (106, 2)      .37015 (326, 2)      .31037 (326, 2)      .27124 (326, 2)
          70.0 /       .65195 (105, 2)      .50549 (105, 2)      .36243 (105, 2)      .25477 (105, 1)      .26987 (105, 1)
          60.0 /       .60415C(278, 2)      .50625C(278, 2)      .40473C(278, 2)      .31053 (140, 3)      .28728 (140, 3)
          50.0 /       .36335 (195, 2)      .26403C(221, 2)      .22688 (104, 3)      .22314 (104, 3)      .21138 (104, 3)
          40.0 /       .41434 (301, 2)      .42868 (123, 1)      .39654 (123, 1)      .33533 (123, 1)      .29521 (123, 1)
          30.0 /       .62478 (276, 2)      .48020 ( 76, 1)      .43299 ( 76, 1)      .35517 ( 76, 1)      .30737 ( 76, 1)
          20.0 /       .63639 (143, 2)      .46279 (143, 2)      .41570 ( 24, 3)      .36030 ( 24, 3)      .31984 ( 24, 3)
          10.0 /       .52504 (347, 2)      .56199 (347, 2)      .52267 (347, 2)      .44324 (347, 2)      .39122 (347, 2)
1                                                                                                                           2ND HIGH
                                                                                                                             8-HR
                                                                                                                            SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                            * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                             * MAXIMUM VALUE EQUALS      1.12176 AND OCCURRED AT (      966.0,      80.0) *

      DIRECTION /                                              RANGE (METERS)
      (DEGREES) /             568.0                738.0                966.0               1306.0               1704.0
     - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

         360.0 /       .42325 (188, 2)      .56607 (237, 2)      .62574 (237, 2)      .53130 (237, 2)      .43349 (243, 2)
         350.0 /       .48993 (237, 2)      .66794 (139, 2)      .61634 (139, 2)      .55803 (302, 2)      .47284 (302, 2)
         340.0 /       .67457 (235, 2)      .74911 (235, 2)      .59894C(121, 2)      .50684 ( 31, 2)      .47283 ( 55, 2)
         330.0 /       .64993 (235, 2)      .69361C(121, 2)      .71803C(121, 2)      .56121C(121, 2)      .42898 (206, 2)
         320.0 /       .59450 (228, 2)      .73082 (266, 2)      .85652 (238, 2)      .87549 (238, 2)      .63591 (227, 2)
         310.0 /       .62737 (227, 2)      .79942 (209, 2)      .92007 (209, 2)      .78232C(275, 2)      .64396C(275, 2)
         300.0 /       .64845 (226, 2)      .94220 (208, 2)      .98548 (226, 2)      .83030 (109, 2)      .60713C(275, 2)
         290.0 /       .47052 (224, 2)      .69427 (226, 2)      .75570 (226, 2)      .75176 (112, 2)      .65406 (112, 2)
         280.0 /       .51124 (194, 2)      .60635 (194, 2)      .74713 (240, 2)      .71063 (299, 2)      .66200 (299, 2)
         270.0 /       .42600 (217, 2)      .63836C(294, 2)      .88097 (240, 2)      .89670 (240, 2)      .79427 (240, 2)
         260.0 /       .45860 (251, 2)      .57687 (289, 2)      .71293 (271, 2)      .82843 (296, 2)      .75701 (296, 2)
         250.0 /       .63730 (251, 2)      .64469 (250, 2)      .79235 (125, 2)      .87984 (125, 2)      .77604 (125, 2)
         240.0 /       .69817 (250, 2)      .71068 (250, 2)      .81190 (252, 2)      .90368 (282, 2)      .83143 (341, 2)
         230.0 /       .50274 (250, 2)      .51332 (111, 2)      .59535 (120, 2)      .68338 (120, 2)      .64751 (120, 2)
         220.0 /       .36100 (251, 2)      .39633 ( 99, 2)      .51776 (184, 2)      .61607 (337, 2)      .61688 (337, 2)
         210.0 /       .28141 (126, 2)      .45401 ( 99, 2)      .58744 ( 13, 2)      .58838 ( 13, 2)      .49355 ( 13, 2)
         200.0 /       .32115 (107, 2)      .43098 (175, 2)      .52269 (126, 2)      .43642 (353, 2)      .39793 (353, 2)
         190.0 /       .26254 (216, 2)      .27836 (146, 2)      .39140 (279, 2)      .46509 (279, 2)      .42444 (279, 2)
         180.0 /       .37460 (216, 2)      .41895 (128, 2)      .43822 (176, 2)      .57529 (176, 2)      .51080 (175, 2)
         170.0 /       .32160 (146, 2)      .30789 (175, 2)      .37649 (128, 2)      .39426 ( 34, 2)      .38824 ( 34, 2)
         160.0 /       .35103 (214, 2)      .40054 (214, 2)      .59765 (  6, 2)      .52062 (  6, 2)      .39532 (  6, 2)
         150.0 /       .38230 (249, 2)      .50958 (214, 2)      .66044 (269, 2)      .65427 (  6, 2)      .54211 (  6, 2)
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    140.0 /       .36966C(210, 2)      .48295C(215, 2)      .48008 (154, 2)      .48362 (283, 2)      .43560 ( 15, 2)
    130.0 /       .52515C(210, 2)      .50874C(210, 2)      .62995 (190, 2)      .56622 (136, 2)      .52948 (136, 2)
    120.0 /       .42739 (154, 2)      .43842 (154, 2)      .48720 (190, 2)      .54346C(213, 3)      .51435C(309, 2)
    110.0 /       .40190 (267, 2)      .40972 (154, 2)      .56495 ( 82, 2)      .61317 ( 82, 2)      .53201 ( 82, 2)
    100.0 /       .47180 (129, 2)      .61829 (134, 2)      .85053 (137, 2)      .75655 (129, 2)      .64276 (153, 2)
     90.0 /       .52701 (131, 2)      .80886 (179, 2)      .98994 (179, 2)      .95354 (179, 2)      .80640 (179, 2)
     80.0 /       .79719C(229, 2)     1.05124 (223, 2)     1.12176C(229, 2)      .88959C(229, 2)      .72481 (106, 2)
     70.0 /       .96405 (223, 2)      .99516 (223, 2)     1.03412 (284, 2)      .81240C(229, 2)      .71409 (105, 2)
     60.0 /       .78877 (157, 2)      .89731 (157, 2)      .90245 (164, 2)      .73521 (180, 2)      .64392 (180, 2)
     50.0 /       .67831 (157, 2)      .69092 (213, 2)      .71527C(221, 2)      .60596C(221, 2)      .47073C(221, 2)
     40.0 /       .60995 (168, 2)      .67841 (276, 2)      .74727 (195, 2)      .64957 (277, 2)      .51215 ( 87, 2)
     30.0 /       .59909 (161, 2)      .78606 (127, 2)      .77841 (127, 2)      .63127 (140, 2)      .53037 (140, 2)
     20.0 /       .56095 (122, 2)      .61533 (236, 2)      .66602 (306, 2)      .69498 (122, 2)      .55136 (306, 2)
     10.0 /       .51842 (214, 2)      .51162 (139, 2)      .54567 (306, 2)      .62201 (358, 2)      .57248 (358, 2)
1                                                                                                                      2ND HIGH
                                                                                                                        8-HR
                                                                                                                       SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                             * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                          * FROM ALL SOURCES *
                                                        * FOR THE RECEPTOR GRID *

                              * MAXIMUM VALUE EQUALS      1.12176 AND OCCURRED AT (      966.0,      80.0) *

 DIRECTION /                                                     RANGE (METERS)
 (DEGREES) /            2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .43466 (243, 2)      .38072 (243, 2)      .30710 (243, 2)      .23097 (243, 2)      .19227 (243, 2)
    350.0 /       .44896 (237, 2)      .36212C(  3, 3)      .38056 (347, 1)      .38622 (347, 1)      .37222 (347, 1)
    340.0 /       .41720 (244, 1)      .40203 (244, 1)      .34428 (244, 1)      .27060 (244, 1)      .22947 (244, 1)
    330.0 /       .33377 (202, 2)      .23810 ( 24, 2)      .21439 (306, 3)      .19722 (357, 3)      .18871 (306, 3)
    320.0 /       .52257 (345, 2)      .37546 (242, 2)      .36595 (345, 2)      .30967 (302, 1)      .30838 (302, 1)
    310.0 /       .50994 (242, 1)      .57277 (242, 1)      .53587 (301, 1)      .44027 (244, 3)      .40130 (244, 3)
    300.0 /       .44077C(275, 2)      .31724 (112, 2)      .28621 (241, 3)      .26169 ( 55, 1)      .25011 ( 55, 1)
    290.0 /       .50094 (112, 2)      .47399 (324, 3)      .32914 (318, 2)      .26261 (241, 3)      .25361 (241, 3)
    280.0 /       .55129 (299, 2)      .42084 (103, 1)      .37495 (103, 1)      .30339 (103, 1)      .27189 (101, 3)
    270.0 /       .66562 (240, 2)      .52272 (111, 3)      .45332 (324, 1)      .37960 (324, 1)      .33155 (324, 1)
    260.0 /       .59711 (296, 2)      .41644 (323, 2)      .36484 (323, 2)      .30455 (290, 3)      .28304 (290, 3)
    250.0 /       .60111 (125, 2)      .56100 (343, 2)      .38668 (344, 2)      .32509 (344, 2)      .29067 (312, 3)
    240.0 /       .66417 (341, 2)      .56297 ( 65, 2)      .49632 (257, 2)      .40270 (165, 3)      .37599 (165, 3)
    230.0 /       .55732 (120, 2)      .50501 (263, 1)      .42662 (259, 1)      .36057 (259, 1)      .32183 (260, 1)
    220.0 /       .53517 (337, 2)      .44188 (257, 3)      .41324 (257, 3)      .33902 ( 38, 2)      .30012 ( 22, 1)
    210.0 /       .39288 ( 29, 2)      .28964 (337, 2)      .22513 ( 99, 2)      .18252 (258, 1)      .16696 (258, 1)
    200.0 /       .34603 (279, 2)      .27481C( 38, 1)      .29344C( 38, 1)      .27676C( 38, 1)      .25569C( 38, 1)
    190.0 /       .33471 (279, 2)      .30324 ( 12, 2)      .25692 ( 21, 1)      .22929 (351, 1)      .20747 (351, 1)
    180.0 /       .37510 (175, 2)      .32753 (176, 2)      .29161 (350, 3)      .27365 (350, 3)      .28280 ( 13, 3)
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     170.0 /      .41648C(184, 3)     .33880 (  5, 2)     .31142C(184, 3)     .26856 (  5, 2)     .23598 (  5, 2)
     160.0 /      .43216 (340, 2)     .33241 (269, 2)     .32014C( 21, 3)     .28279C( 21, 3)     .25349C( 21, 3)
     150.0 /      .46062 ( 21, 2)     .36893 (269, 2)     .29944 ( 25, 1)     .26478 ( 25, 1)     .23712 ( 25, 1)
     140.0 /      .41451 (359, 2)     .39489 (359, 2)     .33618 (359, 3)     .33492C(363, 3)     .28950 ( 20, 3)
     130.0 /      .43094 (136, 2)     .30848 (136, 2)     .28230C(229, 3)     .28215 (307, 3)     .26758 (307, 3)
     120.0 /      .58800C(309, 2)     .57408C(309, 2)     .49776C(309, 2)     .39678C(309, 2)     .33939C(309, 2)
     110.0 /      .43155 (135, 2)     .38051 ( 43, 1)     .31717 ( 43, 1)     .24556 ( 28, 3)     .22577 ( 28, 3)
     100.0 /      .48486 (153, 2)     .37118C(168, 3)     .30588 (137, 2)     .23942 (137, 3)     .20324 (137, 3)
      90.0 /      .63678 (179, 2)     .46612 (179, 2)     .35451 (153, 2)     .25649 (161, 3)     .22401 (161, 3)
      80.0 /      .61595 (106, 2)     .44750 (284, 2)     .35407 (106, 2)     .26589 (182, 3)     .23805 (182, 3)
      70.0 /      .60999 (284, 2)     .41648 (284, 2)     .28062 (284, 2)     .24040 (105, 2)     .19497 (104, 3)
      60.0 /      .54581 (123, 2)     .43607 (123, 2)     .33708 (140, 3)     .30773C(278, 2)     .25976C(278, 2)
      50.0 /      .35439C(221, 2)     .25240 (199, 2)     .20907C( 29, 3)     .20992C(139, 3)     .20743C(139, 3)
      40.0 /      .40820 (123, 1)     .30510 (301, 2)     .22515 ( 28, 2)     .19951 ( 25, 1)     .19801 (220, 3)
      30.0 /      .46246 ( 76, 1)     .41066 (276, 2)     .35385 (304, 3)     .28644 (304, 3)     .24650 (304, 3)
      20.0 /      .42731 (306, 2)     .43130 ( 24, 3)     .35824 (326, 1)     .30675 (326, 1)     .27111 (326, 1)
      10.0 /      .47562 (  7, 2)     .33272 (  7, 2)     .27497 ( 37, 1)     .25313 ( 37, 1)     .23081 ( 37, 1)
1                                                                                                           HIGH
                                                                                                            24-HR
                                                                                                            SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                                * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS      .51456 AND OCCURRED AT (     966.0,      80.0) *

  DIRECTION /                                                RANGE (METERS)
  (DEGREES) /          568.0               738.0               966.0               1306.0              1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      .24897C(139, 1)     .29974C(139, 1)     .29885C(139, 1)     .26129C(139, 1)     .27896 (243, 1)
     350.0 /      .21554C(139, 1)     .27643C(237, 1)     .31646C(237, 1)     .28139C(237, 1)     .27212 (325, 1)
     340.0 /      .27411C(224, 1)     .26502C(224, 1)     .22995C(202, 1)     .21081C(202, 1)     .18619 ( 31, 1)
     330.0 /      .25553C(224, 1)     .24402 (235, 1)     .26309C(202, 1)     .23026C(202, 1)     .17565C(202, 1)
     320.0 /      .20578 (266, 1)     .32291 (227, 1)     .36175 (227, 1)     .36325 (238, 1)     .32246 (238, 1)
     310.0 /      .22450 (201, 1)     .34440 (227, 1)     .38171 (227, 1)     .31227 (227, 1)     .30423 (301, 1)
     300.0 /      .22186 (201, 1)     .32056 (226, 1)     .35451 (208, 1)     .30002 (208, 1)     .22583 (208, 1)
     290.0 /      .19035C(225, 1)     .27773 (246, 1)     .33933 (246, 1)     .32439 (246, 1)     .29325 (112, 1)
     280.0 /      .18602C(194, 1)     .22153 (226, 1)     .29762 (226, 1)     .29733 (226, 1)     .26305 (101, 1)
     270.0 /      .18653C(194, 1)     .22960 (240, 1)     .31989 (297, 1)     .38781 (297, 1)     .35937 (297, 1)
     260.0 /      .19512C(250, 1)     .22447C(216, 1)     .27878 (290, 1)     .35249 (290, 1)     .35750 (290, 1)
     250.0 /      .26029C(250, 1)     .24580C(250, 1)     .35555 (125, 1)     .41482 (125, 1)     .38364 (343, 1)
     240.0 /      .26597C(250, 1)     .27073C(250, 1)     .34553 ( 65, 1)     .43967 ( 65, 1)     .46166 ( 65, 1)
     230.0 /      .19757 (251, 1)     .20437C(250, 1)     .25894 ( 65, 1)     .29556 ( 65, 1)     .31626 (260, 1)
     220.0 /      .12570 (147, 1)     .17078 (147, 1)     .23764 ( 99, 1)     .31587 ( 99, 1)     .34109 ( 99, 1)
     210.0 /      .12331C(107, 1)     .17631C(107, 1)     .24245 ( 99, 1)     .28262 ( 99, 1)     .26772 ( 99, 1)
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      200.0 /      .15100 (175, 1)     .16359 (126, 1)     .17872 ( 13, 1)     .19075 (279, 1)     .18353 (279, 1)
      190.0 /      .19945 (175, 1)     .24237 (175, 1)     .25619 (175, 1)     .23808 (175, 1)     .21187C(171, 1)
      180.0 /      .15231 (175, 1)     .21151 (175, 1)     .23347 (175, 1)     .26511C(176, 1)     .25732C(176, 1)
      170.0 /      .17688C(128, 1)     .18167C(128, 1)     .16670C( 15, 1)     .22385C( 15, 1)     .22265C( 15, 1)
      160.0 /      .14399C(128, 1)     .22095C(  6, 1)     .25686C(  6, 1)     .25253C(269, 1)     .22245C(269, 1)
      150.0 /      .14075C(  6, 1)     .24042C(  6, 1)     .28993C(  6, 1)     .27579C(  6, 1)     .23101C(269, 1)
      140.0 /      .19863C(154, 1)     .21340C(154, 1)     .20889C(215, 1)     .18817C(359, 1)     .27965C(359, 1)
      130.0 /      .26935C(154, 1)     .30772C(154, 1)     .28968C(154, 1)     .25067C(190, 1)     .24088C(190, 1)
      120.0 /      .18323C(154, 1)     .22177C(154, 1)     .26177C(190, 1)     .29138 (  4, 1)     .41365 (  4, 1)
      110.0 /      .15310C(267, 1)     .20466C(154, 1)     .27324C( 82, 1)     .32219C( 82, 1)     .30146C( 82, 1)
      100.0 /      .17973C(129, 1)     .29459C(129, 1)     .33499C(129, 1)     .36791 (137, 1)     .36050 (137, 1)
       90.0 /      .26111C(223, 1)     .33738C(223, 1)     .43144 (153, 1)     .47549 (153, 1)     .41506 (153, 1)
       80.0 /      .35148C(223, 1)     .43091C(284, 1)     .51456C(284, 1)     .48070C(284, 1)     .39315C(284, 1)
       70.0 /      .36727C(223, 1)     .38614C(284, 1)     .45961C(284, 1)     .43252C(284, 1)     .35782C(284, 1)
       60.0 /      .26746C(210, 1)     .32375C(142, 1)     .34953C(142, 1)     .30519C(142, 1)     .28913 (123, 1)
       50.0 /      .25137C(193, 1)     .29825C(195, 1)     .32904C(195, 1)     .26929C(195, 1)     .23789 (181, 1)
       40.0 /      .23778C(236, 1)     .26437 (127, 1)     .26816C(276, 1)     .24660C( 87, 1)     .20488C( 87, 1)
       30.0 /      .30321C(236, 1)     .32705C(276, 1)     .39676C(276, 1)     .37177C(276, 1)     .29824C(276, 1)
       20.0 /      .29536C(236, 1)     .26795 (122, 1)     .28036 (122, 1)     .26025C(306, 1)     .25284 (143, 1)
       10.0 /      .19351C(236, 1)     .21520C(192, 1)     .21947C(170, 1)     .26175C(  7, 1)     .25374C(  7, 1)
1                                                                                                              HIGH
                                                                                                               24-HR
                                                                                                               SGROUP#  1
                                     *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                                    * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                     * FROM ALL SOURCES *
                                                   * FOR THE RECEPTOR GRID *

                                  * MAXIMUM VALUE EQUALS       .51456 AND OCCURRED AT (     966.0,     80.0) *

   DIRECTION /                                                   RANGE (METERS)
   (DEGREES) /             2215.0              2954.0              3862.0              5112.0              6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /      .28557 (243, 1)     .25437 (243, 1)     .20735 (243, 1)     .15717 (243, 1)     .13127 (243, 1)
      350.0 /      .33151 (325, 1)     .34191 (325, 1)     .30716 (325, 1)     .25136 (325, 1)     .21735 (325, 1)
      340.0 /      .18050 ( 31, 1)     .16339 ( 31, 1)     .14495 ( 31, 1)     .12526 (304, 1)     .11695 (304, 1)
      330.0 /      .13548 ( 54, 1)     .11775 ( 54, 1)     .12464C(357, 1)     .13245C(357, 1)     .13094C(357, 1)
      320.0 /      .26057 (238, 1)     .19561 (238, 1)     .16012C(345, 1)     .13657C(167, 1)     .12445C(167, 1)
      310.0 /      .38288 (242, 1)     .41632 (242, 1)     .38783 (242, 1)     .32675 (242, 1)     .28630 (242, 1)
      300.0 /      .20715 (112, 1)     .17794 (112, 1)     .15609 (  2, 1)     .14652 (  2, 1)     .13539 (  2, 1)
      290.0 /      .25969 (112, 1)     .20953 (112, 1)     .16115 (112, 1)     .13530 (241, 1)     .12384 (241, 1)
      280.0 /      .28480 (101, 1)     .26903 (101, 1)     .22855 (101, 1)     .17902 (101, 1)     .15169 (101, 1)
      270.0 /      .34123 (240, 1)     .31747 (240, 1)     .28251 (240, 1)     .23843 (240, 1)     .21230 (240, 1)
      260.0 /      .33065 (290, 1)     .28667 (290, 1)     .24113 (290, 1)     .21359 (102, 1)     .19306 (102, 1)
      250.0 /      .33446 (343, 1)     .27369 (343, 1)     .22622 (102, 1)     .19352 (102, 1)     .18143 (342, 1)
      240.0 /      .44266 ( 65, 1)     .39244 ( 65, 1)     .32937 ( 65, 1)     .26110 ( 65, 1)     .22440 ( 65, 1)
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    230.0 /      .32682 (260, 1)      .30442 (260, 1)      .26144 (259, 1)      .22035 (259, 1)      .19409 (259, 1)
    220.0 /      .32899 ( 99, 1)      .28553 ( 99, 1)      .23083 ( 99, 1)      .17474 ( 99, 1)      .15074C( 22, 1)
    210.0 /      .22786 ( 99, 1)      .17559 ( 99, 1)      .13750 (258, 1)      .11799 (258, 1)      .10478 (258, 1)
    200.0 /      .22016C( 38, 1)      .25285C( 38, 1)      .24567C( 38, 1)      .21462C( 38, 1)      .19132C( 38, 1)
    190.0 /      .16690C(171, 1)      .12610 (351, 1)      .12366C( 38, 1)      .11333C( 38, 1)      .10476C( 38, 1)
    180.0 /      .21111C(176, 1)      .21062 (350, 1)      .21655 (350, 1)      .19775 (350, 1)      .17979 (350, 1)
    170.0 /      .18939C( 15, 1)      .17618 (340, 1)      .15936 (340, 1)      .13280 (340, 1)      .11647 (340, 1)
    160.0 /      .20698 (340, 1)      .21846 (340, 1)      .20280 (340, 1)      .17200 (340, 1)      .15194 (340, 1)
    150.0 /      .19377C( 21, 1)      .19941C( 21, 1)      .17862C( 21, 1)      .14561C( 21, 1)      .12560C( 21, 1)
    140.0 /      .33943C(359, 1)      .35358C(359, 1)      .32233C(359, 1)      .26823C(359, 1)      .23407C(359, 1)
    130.0 /      .23012 (308, 1)      .24114 (308, 1)      .22176 (308, 1)      .18590 (308, 1)      .16285 (308, 1)
    120.0 /      .48298 (  4, 1)      .48838 (  4, 1)      .43960 (  4, 1)      .36625 (  4, 1)      .32222 (  4, 1)
    110.0 /      .25143C( 82, 1)      .23397 (  4, 1)      .21039 (  4, 1)      .17368 (  4, 1)      .15169 (  4, 1)
    100.0 /      .32251 (137, 1)      .26277 (137, 1)      .20312 (137, 1)      .14793 (137, 1)      .12127 (137, 1)
     90.0 /      .32088 (153, 1)      .25621C(133, 1)      .20634C(133, 1)      .15543C(133, 1)      .13301C(118, 1)
     80.0 /      .29452C(284, 1)      .20041 (179, 1)      .16272 (179, 1)      .12550 (179, 1)      .10643 (179, 1)
     70.0 /      .27112C(284, 1)      .21580 (105, 1)      .19010 (105, 1)      .16506 (105, 1)      .15215 (105, 1)
     60.0 /      .24865 (123, 1)      .19853C(278, 1)      .16110C(278, 1)      .12657C(278, 1)      .11003C(278, 1)
     50.0 /      .21380 (181, 1)      .18471 (181, 1)      .16031 (181, 1)      .13545 (181, 1)      .12186 (181, 1)
     40.0 /      .16265 (187, 1)      .14331 (123, 1)      .13247 (123, 1)      .11197 (123, 1)      .09856 (123, 1)
     30.0 /      .21735C(276, 1)      .17055 (  2, 1)      .14433 ( 76, 1)      .11839 ( 76, 1)      .10246 ( 76, 1)
     20.0 /      .28108C( 24, 1)      .28254C( 24, 1)      .25425C( 24, 1)      .21031C( 24, 1)      .18315C( 24, 1)
     10.0 /      .22282 (347, 1)      .23924 (347, 1)      .22250 (347, 1)      .18823 (347, 1)      .16573 (347, 1)
1                                                                                                                  2ND HIGH
                                                                                                                   24-HR
                                                                                                                   SGROUP#  1
                               *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                           * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                            * MAXIMUM VALUE EQUALS       .40094 AND OCCURRED AT (      738.0,      80.0) *

 DIRECTION /                                                RANGE (METERS)
 (DEGREES) /              568.0               738.0               966.0               1306.0              1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .16404C(222, 1)      .19702C(237, 1)      .21818C(237, 1)      .22911 (243, 1)      .21468C(139, 1)
    350.0 /      .17041C(237, 1)      .24289C(139, 1)      .22413C(139, 1)      .18601 (302, 1)      .21876C(237, 1)
    340.0 /      .22486 (235, 1)      .24970 (235, 1)      .21654 (235, 1)      .17985 ( 55, 1)      .16874C(202, 1)
    330.0 /      .21666 (235, 1)      .23266C(202, 1)      .21918 (235, 1)      .17906 (206, 1)      .16231 ( 88, 1)
    320.0 /      .19817 (228, 1)      .24361 (266, 1)      .33726 (238, 1)      .29777 (227, 1)      .21197 (227, 1)
    310.0 /      .20912 (227, 1)      .28538 (209, 1)      .34463 (209, 1)      .30907 (209, 1)      .29590 (242, 1)
    300.0 /      .21626 (226, 1)      .31876 (208, 1)      .32894 (226, 1)      .29103 (209, 1)      .22390 (209, 1)
    290.0 /      .16457 (246, 1)      .24239 (226, 1)      .27340 (226, 1)      .29932 (318, 1)      .28350 (318, 1)
    280.0 /      .17748C(225, 1)      .22080C(194, 1)      .28417C(294, 1)      .28948C(294, 1)      .24556 (226, 1)
    270.0 /      .16751C(185, 1)      .21834C( 78, 1)      .31403 (240, 1)      .35141 (240, 1)      .35257 (240, 1)
```

```
      260.0 /       .15288 (251, 1)       .19231 (289, 1)       .26234C(216, 1)       .27966 (296, 1)       .28651 ( 85, 1)
      250.0 /       .21246 (251, 1)       .22436 (125, 1)       .33064 (343, 1)       .39946 (343, 1)       .38187 (125, 1)
      240.0 /       .24782 (251, 1)       .24863 (252, 1)       .27869 (282, 1)       .33140 (282, 1)       .31707 (282, 1)
      230.0 /       .19152C(250, 1)       .18946C(185, 1)       .23558C(185, 1)       .27142 (260, 1)       .27615 ( 65, 1)
      220.0 /       .12033 (251, 1)       .13772 ( 99, 1)       .19734C(184, 1)       .24935 (337, 1)       .27627 (337, 1)
      210.0 /       .09380 (126, 1)       .15464 ( 99, 1)       .20413 ( 13, 1)       .22087 ( 13, 1)       .20990 ( 13, 1)
      200.0 /       .12234C(107, 1)       .16193C(107, 1)       .17423 (126, 1)       .17433 ( 13, 1)       .16234C( 38, 1)
      190.0 /       .09132C(216, 1)       .11535C(171, 1)       .19511C(171, 1)       .23247C(171, 1)       .19859 (175, 1)
      180.0 /       .14969C(128, 1)       .17681C(128, 1)       .20160C(176, 1)       .21240 (175, 1)       .17027 (175, 1)
      170.0 /       .11697C(146, 1)       .11891C(  8, 1)       .15974C(128, 1)       .21599C(176, 1)       .21542C(176, 1)
      160.0 /       .13587C(146, 1)       .13933C(214, 1)       .22305C(269, 1)       .23453C(  6, 1)       .19429C(  6, 1)
      150.0 /       .13838C(214, 1)       .17725C(214, 1)       .22972C(269, 1)       .25875C(269, 1)       .22905C(  6, 1)
      140.0 /       .12939C(210, 1)       .17793C(215, 1)       .18394C(154, 1)       .18471C( 15, 1)       .19439C( 15, 1)
      130.0 /       .18382C(210, 1)       .17812C(210, 1)       .23162C(190, 1)       .24167C(136, 1)       .22737C(136, 1)
      120.0 /       .16585C(178, 1)       .18945C(190, 1)       .23295C(154, 1)       .27695C(190, 1)       .29850 ( 43, 1)
      110.0 /       .14977 (233, 1)       .17172C(155, 1)       .25996C(154, 1)       .27099C(155, 1)       .26302C(155, 1)
      100.0 /       .15739 (233, 1)       .23671C(159, 1)       .31707 (137, 1)       .33279 (153, 1)       .29671 (153, 1)
       90.0 /       .18940C(222, 1)       .27992C(155, 1)       .34234 (179, 1)       .35498C(118, 1)       .33776C(118, 1)
       80.0 /       .25558C(155, 1)       .40094C(223, 1)       .38729C(155, 1)       .32976C(155, 1)       .28274 (152, 1)
       70.0 /       .32121C(229, 1)       .38556C(229, 1)       .39654C(116, 1)       .33266C(116, 1)       .25101C(142, 1)
       60.0 /       .26381C(223, 1)       .31740 (264, 1)       .31272 (264, 1)       .30301 (123, 1)       .26027C(278, 1)
       50.0 /       .23584C(230, 1)       .26321C(213, 1)       .27231C(213, 1)       .24327 (181, 1)       .22291 (264, 1)
       40.0 /       .23236C(168, 1)       .24539C(169, 1)       .25992C(195, 1)       .23214C(276, 1)       .20365 (187, 1)
       30.0 /       .22168C(168, 1)       .26219 (127, 1)       .26881C(191, 1)       .25191C( 60, 1)       .22009 (  2, 1)
       20.0 /       .18698 (122, 1)       .22184C( 60, 1)       .26794C( 60, 1)       .25343 (143, 1)       .25068C( 24, 1)
       10.0 /       .18032C(214, 1)       .18822C(170, 1)       .21839C(306, 1)       .22739C(358, 1)       .21131C(358, 1)
1                                                                                                                     2ND HIGH
                                                                                                                      24-HR
                                                                                                                      SGROUP#  1
                                *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1985     ***


                            * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                   * FROM ALL SOURCES *
                                                 * FOR THE RECEPTOR GRID *

                             * MAXIMUM VALUE EQUALS       .40094 AND OCCURRED AT (      738.0,      80.0) *

  DIRECTION /                                                  RANGE (METERS)
  (DEGREES) /           2215.0               2954.0               3862.0               5112.0               6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /       .16388C(139, 1)       .14591 (244, 1)       .12983 (244, 1)       .10583 (244, 1)       .09142 (244, 1)
      350.0 /       .17772 ( 96, 1)       .16132 ( 96, 1)       .15415C(  3, 1)       .14039C(  3, 1)       .12917C(  3, 1)
      340.0 /       .15002 (244, 1)       .14400 (244, 1)       .13225 (304, 1)       .12420 ( 31, 1)       .11252 ( 31, 1)
      330.0 /       .13547 ( 88, 1)       .10377 ( 88, 1)       .09889 ( 54, 1)       .09930 (334, 1)       .10101 (334, 1)
      320.0 /       .20518C(345, 1)       .18823C(345, 1)       .15742 (242, 1)       .13042 (242, 1)       .11339 (242, 1)
      310.0 /       .30476 (301, 1)       .27531 (301, 1)       .23109 (301, 1)       .18307 (301, 1)       .15781 (301, 1)
      300.0 /       .17334 (113, 1)       .14767 (  2, 1)       .14376 (112, 1)       .10915 (112, 1)       .09966 (241, 1)
```

```
   290.0 /       .22959 (318, 1)      .16854 (324, 1)      .15060 (241, 1)      .13113 ( 80, 1)      .12259 ( 80, 1)
   280.0 /       .19622 (329, 1)      .16948 ( 53, 1)      .15070 (108, 1)      .13189 (108, 1)      .11974 (108, 1)
   270.0 /       .31360 (111, 1)      .29139 (111, 1)      .25541 (324, 1)      .20996 (324, 1)      .18170 (324, 1)
   260.0 /       .27097 ( 85, 1)      .24227 (102, 1)      .23902 (102, 1)      .19642 (290, 1)      .17355 (290, 1)
   250.0 /       .30877 (125, 1)      .25563C(271, 1)      .22029 (343, 1)      .19243 (342, 1)      .17068 (102, 1)
   240.0 /       .28363 (257, 1)      .29719 (257, 1)      .27762 (257, 1)      .23843 (257, 1)      .22165 (342, 1)
   230.0 /       .28140 (259, 1)      .28546 (259, 1)      .26111 (260, 1)      .20848 (260, 1)      .17906 (260, 1)
   220.0 /       .26941 (337, 1)      .23725 (337, 1)      .19602 (337, 1)      .15829C( 22, 1)      .14606 ( 99, 1)
   210.0 /       .18856 ( 13, 1)      .15984 ( 13, 1)      .13010 ( 13, 1)      .10503 (351, 1)      .09699 (351, 1)
   200.0 /       .19107 ( 39, 1)      .20029 ( 39, 1)      .18292 ( 39, 1)      .15203 ( 39, 1)      .13246 ( 39, 1)
   190.0 /       .15239 (175, 1)      .12328C( 38, 1)      .12026 (351, 1)      .10440 (351, 1)      .09295 (351, 1)
   180.0 /       .16850 (350, 1)      .14970C(176, 1)      .13949 ( 12, 1)      .12246 ( 12, 1)      .11758 ( 13, 1)
   170.0 /       .18896C(184, 1)      .16030C(184, 1)      .12351C(184, 1)      .10915 (350, 1)      .09860 (350, 1)
   160.0 /       .17084C(269, 1)      .12612 (349, 1)      .11849 (349, 1)      .10217 (349, 1)      .09088 (349, 1)
   150.0 /       .18287C(283, 1)      .16843C(283, 1)      .15103C(283, 1)      .13208C(283, 1)      .12143C(283, 1)
   140.0 /       .21448C( 20, 1)      .21231C( 20, 1)      .19313C(363, 1)      .18878C(363, 1)      .17936C(363, 1)
   130.0 /       .21840C(190, 1)      .20049 ( 43, 1)      .17133 ( 43, 1)      .13419 ( 43, 1)      .11603C(190, 1)
   120.0 /       .32334 ( 43, 1)      .30217 ( 43, 1)      .25406 ( 43, 1)      .19714 ( 43, 1)      .16632 ( 43, 1)
   110.0 /       .23239 ( 43, 1)      .21313 ( 43, 1)      .17713 ( 43, 1)      .13641 ( 43, 1)      .11480 ( 43, 1)
   100.0 /       .23960 (153, 1)      .18436C(168, 1)      .15037 ( 83, 1)      .12242 ( 83, 1)      .10799 ( 83, 1)
    90.0 /       .29607C(118, 1)      .24369C(118, 1)      .19776C(118, 1)      .15462C(118, 1)      .12960C(133, 1)
    80.0 /       .23688 (179, 1)      .19892C(284, 1)      .13276C(284, 1)      .11080 (326, 1)      .09662 (326, 1)
    70.0 /       .24229 (105, 1)      .18514C(284, 1)      .12479C(284, 1)      .09592C(180, 1)      .08328C(180, 1)
    60.0 /       .23538C(278, 1)      .19529 (123, 1)      .14850 (123, 1)      .10889 (123, 1)      .09585 (140, 1)
    50.0 /       .18801 (264, 1)      .14730C(221, 1)      .11712C(221, 1)      .09266C(221, 1)      .08218C(221, 1)
    40.0 /       .15850C(205, 1)      .13062C(205, 1)      .10199C(205, 1)      .08582C(284, 1)      .08724C(284, 1)
    30.0 /       .20144 (  2, 1)      .16007 ( 76, 1)      .13787 (  2, 1)      .10664 ( 37, 1)      .09609 ( 37, 1)
    20.0 /       .21313 (143, 1)      .15620 (143, 1)      .14209 ( 90, 1)      .12254 (347, 1)      .11017 (347, 1)
    10.0 /       .21482C(  7, 1)      .16362C(  7, 1)      .13627C( 33, 1)      .12327C( 33, 1)      .11426C( 33, 1)

RUN ENDED ON 09-15-89 AT 14:51:54
```

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-36

RESULTS OF INCINERATOR STACK EMISSIONS DISPERSION MODELING USING ISC MODEL ALONG WITH 1986 METEOROLOGICAL DATA

```
1             ISCST - VERSION 3.4 (DATED 88348)

              IBM-PC VERSION (1.64)
              (C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.
              SERIAL NUMBER 5958 SOLD TO ICF TECHNOLOGY, INC
              RUN BEGAN ON 09-15-89 AT 14:51:56


1
                      *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***

          CALCULATE (CONCENTRATION=1,DEPOSITION=2)                              ISW(1) =   1
          RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)               ISW(2) =   4
          DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                      ISW(3) =   1
          TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                              ISW(4) =   0
          CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                         ISW(5) =   0
          LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                       ISW(6) =   1

          COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
          WITH THE FOLLOWING TIME PERIODS:
            HOURLY (YES=1,NO=0)                                                 ISW(7) =   1
            2-HOUR (YES=1,NO=0)                                                 ISW(8) =   0
            3-HOUR (YES=1,NO=0)                                                 ISW(9) =   1
            4-HOUR (YES=1,NO=0)                                                ISW(10) =   0
            6-HOUR (YES=1,NO=0)                                                ISW(11) =   0
            8-HOUR (YES=1,NO=0)                                                ISW(12) =   1
            12-HOUR (YES=1,NO=0)                                               ISW(13) =   0
            24-HOUR (YES=1,NO=0)                                               ISW(14) =   1
          PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                                  ISW(15) =   1

          PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
          SPECIFIED BY ISW(7) THROUGH ISW(14):
            DAILY TABLES (YES=1,NO=0)                                          ISW(16) =   0
            HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                       ISW(17) =   1
            MAXIMUM 50 TABLES (YES=1,NO=0)                                     ISW(18) =   0
          METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)            ISW(19) =   1
          RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)    ISW(20) =   0
          WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)            ISW(21) =   1
          VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)     ISW(22) =   1
          SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                    ISW(23) =   0
          PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)                ISW(24) =   1
          PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)          ISW(25) =   2
          PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)                ISW(26) =   1
          CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)              ISW(27) =   1
          REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                              ISW(28) =   1
          TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                     ISW(29) =   2
          DEBUG OPTION CHOSEN (YES=1,NO=2)                                     ISW(30) =   2
          ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)                  ISW(31) =   0
```

```
         NUMBER OF INPUT SOURCES                                                 NSOURC =   1
         NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                                NGROUP =   0
         TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)                    IPERD =   0
         NUMBER OF X (RANGE) GRID VALUES                                         NXPNTS =  10
         NUMBER OF Y (THETA) GRID VALUES                                         NYPNTS =  36
         NUMBER OF DISCRETE RECEPTORS                                            NXWYPT =   0
         SOURCE EMISSION RATE UNITS CONVERSION FACTOR                                TK =.10000E+07
         HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                        ZR =   6.70  METERS
         LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                                IMET =   9
         DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION                     DECAY = .000000E+00
         SURFACE STATION NO.                                                        ISS = 12842
         YEAR OF SURFACE DATA                                                       ISY = 86
         UPPER AIR STATION NO.                                                      IUS = 12842
         YEAR OF UPPER AIR DATA                                                     IUY = 86
         ALLOCATED DATA STORAGE                                                   LIMIT = 43500 WORDS
         REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                               MIMIT =  8613 WORDS
1
                       *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***

                                    *** METEOROLOGICAL DAYS TO BE PROCESSED ***
                                                       (IF=1)

   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

                         *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                   (METERS/SEC)

                                      1.54,   3.09,   5.14,   8.23,  10.80,


                                          *** WIND PROFILE EXPONENTS ***


        STABILITY                             WIND SPEED CATEGORY
        CATEGORY        1              2              3              4              5              6
           A       .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
           B       .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
           C       .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00
           D       .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
           E       .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00
           F       .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00
```

```
                              *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                       (DEGREES KELVIN PER METER)


           STABILITY                              WIND SPEED CATEGORY
           CATEGORY         1             2             3             4             5             6
               A        .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00
               B        .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00
               C        .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00
               D        .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00
               E        .20000E-01    .20000E-01    .20000E-01    .20000E-01    .20000E-01    .20000E-01
               F        .35000E-01    .35000E-01    .35000E-01    .35000E-01    .35000E-01    .35000E-01
1
                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                      X,Y-COORDINATES OF THE CENTER OF THE POLAR RECEPTOR GRID (METERS) = (      0.,      0.)


                                      *** RANGES OF POLAR GRID SYSTEM ***
                                                    (METERS)

        568.0,     738.0,     966.0,    1306.0,    1704.0,    2215.0,    2954.0,    3862.0,    5112.0,    6000.0,


                                    *** RADIAL ANGLES OF POLAR GRID SYSTEM ***

                                                   (DEGREES)

         10.0,      20.0,      30.0,      40.0,      50.0,      60.0,      70.0,      80.0,      90.0,     100.0,
        110.0,     120.0,     130.0,     140.0,     150.0,     160.0,     170.0,     180.0,     190.0,     200.0,
        210.0,     220.0,     230.0,     240.0,     250.0,     260.0,     270.0,     280.0,     290.0,     300.0,
        310.0,     320.0,     330.0,     340.0,     350.0,     360.0,
1
                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***

                                              *** SOURCE DATA ***

                    EMISSION RATE                                                TEMP.    EXIT VEL.
                       TYPE=0,1                                                  TYPE=0    TYPE=0
            T W     (GRAMS/SEC)                                                 (DEG.K);  (M/SEC);            BLDG.     BLDG.     BLDG.
            Y A NUMBER  TYPE=2                             BASE                 VERT.DIM  HORZ.DIM DIAMETER  HEIGHT    LENGTH    WIDTH
    SOURCE P K  PART.  (GRAMS/SEC)     X         Y         ELEV.     HEIGHT      TYPE=1   TYPE=1,2  TYPE=0    TYPE=0    TYPE=0    TYPE=0
    NUMBER E E  CATS. *PER METER**2 (METERS)  (METERS)  (METERS)  (METERS)  (METERS)  (METERS)  (METERS)  (METERS)  (METERS)  (METERS)
  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

         1 0 0    0    .10000E+01        .0        .0        .0     60.96    458.15     14.66      1.68       .00       .00       .00
```

```
* CALM HOURS (=1) FOR DAY   1 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  1  0  0
* CALM HOURS (=1) FOR DAY   2 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY   3 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY   5 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  12 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  13 *  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  14 *  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  15 *  0  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  20 *  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY  21 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1
* CALM HOURS (=1) FOR DAY  22 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  24 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  25 *  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  26 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  28 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY  29 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  30 *  0  0  1  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  31 *  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  33 *  1  0  0  1  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  38 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1  1  0
* CALM HOURS (=1) FOR DAY  39 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1
* CALM HOURS (=1) FOR DAY  40 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  44 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY  48 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  49 *  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  52 *  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  53 *  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  54 *  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  56 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  57 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  59 *  0  0  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  60 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  61 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  62 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  64 *  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY  65 *  0  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  67 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  70 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY  73 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  74 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  76 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY  83 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  86 *  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  87 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  90 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  91 *  1  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  92 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  93 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  94 *  0  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

```
* CALM HOURS (=1) FOR DAY  96 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY  97 *  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY  98 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 101 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 102 *  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 103 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 104 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 105 *  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 108 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 113 *  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 114 *  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 115 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 116 *  1  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 117 *  0  0  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 118 *  1  1  1  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 119 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 120 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 121 *  0  0  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 123 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 127 *  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 128 *  1  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 129 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 131 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 132 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1
* CALM HOURS (=1) FOR DAY 135 *  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 137 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 140 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 141 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 142 *  1  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 143 *  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 144 *  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 145 *  0  0  0  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 150 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 153 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 154 *  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 155 *  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 157 *  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 158 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 159 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 160 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 161 *  1  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 162 *  1  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 163 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  1  0  0  0  0  0  1  1  1  0
* CALM HOURS (=1) FOR DAY 164 *  0  0  0  0  1  1  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 165 *  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 166 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 168 *  0  0  0  0  0  1  1  0  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 170 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 171 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1
```

```
* CALM HOURS (=1) FOR DAY 172 *  0  0  1  1  1  1  1  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 173 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 174 *  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 175 *  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0
* CALM HOURS (=1) FOR DAY 176 *  1  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  1  1  1  1  1  1  0  0
* CALM HOURS (=1) FOR DAY 177 *  0  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  1  0
* CALM HOURS (=1) FOR DAY 178 *  1  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 179 *  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 180 *  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 181 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 188 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 189 *  0  1  0  1  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 190 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 191 *  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 193 *  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 194 *  1  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 195 *  1  1  0  1  1  1  1  1  1  0  0  0  1  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 196 *  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 197 *  1  1  1  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 198 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 199 *  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 200 *  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 203 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 204 *  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  1  1  0  1  1  1  1  0  0
* CALM HOURS (=1) FOR DAY 205 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 206 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  1  1
* CALM HOURS (=1) FOR DAY 207 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 208 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  1  1  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 209 *  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 210 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 211 *  0  0  0  0  0  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 213 *  0  0  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  1  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 214 *  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 215 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 217 *  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 219 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 220 *  1  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 221 *  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 225 *  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 226 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 227 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  1
* CALM HOURS (=1) FOR DAY 228 *  1  0  0  0  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 229 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 230 *  1  0  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 231 *  1  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 233 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 234 *  0  0  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1  1  1
* CALM HOURS (=1) FOR DAY 235 *  1  1  1  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  1  1  0  0  1
* CALM HOURS (=1) FOR DAY 236 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
```

```
* CALM HOURS (=1) FOR DAY 237 *  1  1  1  1  1  1  1  1  1  0  0  0  0  0  0  1  0  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY 238 *  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 239 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  0
* CALM HOURS (=1) FOR DAY 240 *  0  1  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  1  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 241 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 243 *  0  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 244 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0  1  0  1  1  1
* CALM HOURS (=1) FOR DAY 245 *  0  1  1  1  1  0  0  0  0  0  0  0  0  1  0  1  1  1  1  1  1  1  1  0
* CALM HOURS (=1) FOR DAY 246 *  1  1  1  1  1  1  1  0  0  1  0  0  0  0  0  0  0  1  1  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 247 *  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 248 *  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 249 *  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1
* CALM HOURS (=1) FOR DAY 250 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY 251 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 252 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 254 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 255 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 256 *  1  0  0  0  0  0  1  0  1  1  0  0  0  0  0  0  0  0  1  0  0  1  0  1
* CALM HOURS (=1) FOR DAY 257 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 264 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 265 *  1  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 266 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 267 *  0  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 270 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 271 *  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 274 *  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 275 *  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 276 *  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 277 *  1  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  1
* CALM HOURS (=1) FOR DAY 278 *  0  0  1  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 279 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 281 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 282 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
* CALM HOURS (=1) FOR DAY 283 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1  1
* CALM HOURS (=1) FOR DAY 284 *  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 285 *  1  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0
* CALM HOURS (=1) FOR DAY 286 *  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 287 *  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 288 *  1  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  0  0
* CALM HOURS (=1) FOR DAY 293 *  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  0  0
* CALM HOURS (=1) FOR DAY 297 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY 300 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1
* CALM HOURS (=1) FOR DAY 301 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 309 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 316 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 320 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1  1  0
* CALM HOURS (=1) FOR DAY 323 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY 324 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 329 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
```

```
* CALM HOURS (=1) FOR DAY 333 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 335 *  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  1  1  1  0  1  0  1  0
* CALM HOURS (=1) FOR DAY 343 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0
* CALM HOURS (=1) FOR DAY 349 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 350 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 351 *  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 353 *  0  0  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 354 *  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 358 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 359 *  1  0  1  0  0  0  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 364 *  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  0  0  0  0
1                                                                                                                                               'N'-DAY
                                                                                                                                                365 DAYS
                                                                                                                                                SGROUP#  1
                                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                                       * 365-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                         * FROM ALL SOURCES *
                                                       * FOR THE RECEPTOR GRID *

                                  * MAXIMUM VALUE EQUALS       .06050 AND OCCURRED AT (      966.0,       90.0) *

 DIRECTION /                                                RANGE (METERS)
 (DEGREES) /       568.0        738.0        966.0       1306.0       1704.0       2215.0       2954.0       3862.0       5112.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      .01139       .01649       .01951       .02002       .01864       .01654       .01410       .01193       .00988
     350.0 /      .01007       .01443       .01658       .01640       .01486       .01294       .01094       .00929       .00780
     340.0 /      .00920       .01384       .01635       .01643       .01515       .01351       .01180       .01032       .00886
     330.0 /      .00930       .01549       .01965       .02050       .01891       .01654       .01402       .01204       .01028
     320.0 /      .01124       .01954       .02550       .02685       .02471       .02153       .01815       .01542       .01294
     310.0 /      .01518       .02610       .03409       .03605       .03339       .02943       .02517       .02161       .01830
     300.0 /      .01702       .02790       .03556       .03711       .03397       .02950       .02492       .02143       .01840
     290.0 /      .01628       .02545       .03153       .03248       .02951       .02535       .02102       .01775       .01502
     280.0 /      .01592       .02495       .03098       .03198       .02912       .02513       .02101       .01784       .01511
     270.0 /      .01673       .02678       .03380       .03559       .03322       .02959       .02564       .02230       .01917
     260.0 /      .01640       .02594       .03218       .03319       .03037       .02639       .02217       .01884       .01601
     250.0 /      .01604       .02606       .03317       .03508       .03256       .02846       .02392       .02029       .01722
     240.0 /      .01516       .02499       .03276       .03636       .03541       .03241       .02837       .02465       .02113
     230.0 /      .01357       .02151       .02725       .02966       .02892       .02686       .02416       .02164       .01902
     220.0 /      .01154       .01758       .02133       .02256       .02203       .02096       .01961       .01807       .01613
     210.0 /      .00867       .01322       .01594       .01652       .01556       .01404       .01225       .01057       .00891
     200.0 /      .00597       .00930       .01154       .01231       .01183       .01089       .00979       .00874       .00761
     190.0 /      .00478       .00784       .01027       .01157       .01155       .01091       .00992       .00886       .00769
     180.0 /      .00469       .00826       .01132       .01288       .01264       .01154       .00995       .00841       .00694
     170.0 /      .00456       .00831       .01165       .01327       .01279       .01135       .00949       .00783       .00632
     160.0 /      .00414       .00722       .00977       .01090       .01053       .00951       .00817       .00691       .00572
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     150.0 /       .00523      .00936      .01274      .01422      .01383      .01270      .01118      .00965      .00810
     140.0 /       .00613      .01104      .01489      .01623      .01532      .01363      .01166      .00997      .00842
     130.0 /       .00620      .01114      .01515      .01676      .01609      .01461      .01281      .01120      .00961
     120.0 /       .00780      .01379      .01871      .02065      .01972      .01771      .01525      .01302      .01085
     110.0 /       .01334      .02285      .03016      .03218      .02943      .02485      .01965      .01542      .01187
     100.0 /       .02197      .03629      .04577      .04635      .04042      .03248      .02427      .01806      .01316
      90.0 /       .02976      .04875      .06050      .05996      .05111      .04002      .02896      .02090      .01476
      80.0 /       .03238      .05039      .05943      .05639      .04684      .03604      .02576      .01851      .01310
      70.0 /       .03217      .04792      .05441      .05010      .04104      .03144      .02256      .01639      .01180
      60.0 /       .02779      .04014      .04477      .04113      .03408      .02665      .01969      .01474      .01097
      50.0 /       .02086      .02983      .03336      .03100      .02605      .02080      .01596      .01255      .00992
      40.0 /       .01549      .02265      .02634      .02557      .02212      .01801      .01395      .01092      .00850
      30.0 /       .01351      .02004      .02395      .02421      .02196      .01894      .01570      .01297      .01051
      20.0 /       .01320      .01935      .02281      .02275      .02038      .01737      .01426      .01175      .00955
      10.0 /       .01252      .01819      .02142      .02147      .01933      .01655      .01359      .01120      .00910
1                                                                                                           'N'-DAY
                                                                                                            365 DAYS
                                                                                                            SGROUP#  1
                                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                                           * 365-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                            * FROM ALL SOURCES *
                                                          * FOR THE RECEPTOR GRID *

                                      * MAXIMUM VALUE EQUALS       .06050 AND OCCURRED AT (     966.0,      90.0) *

  DIRECTION /                                                   RANGE (METERS)
  (DEGREES) /       6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .00883
     350.0 /       .00705
     340.0 /       .00808
     330.0 /       .00939
     320.0 /       .01167
     310.0 /       .01658
     300.0 /       .01691
     290.0 /       .01372
     280.0 /       .01378
     270.0 /       .01755
     260.0 /       .01465
     250.0 /       .01579
     240.0 /       .01933
     230.0 /       .01758
     220.0 /       .01492
     210.0 /       .00803
     200.0 /       .00695
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          190.0 /        .00704
          180.0 /        .00620
          170.0 /        .00558
          160.0 /        .00511
          150.0 /        .00726
          140.0 /        .00764
          130.0 /        .00878
          120.0 /        .00971
          110.0 /        .01021
          100.0 /        .01098
           90.0 /        .01212
           80.0 /        .01081
           70.0 /        .00986
           60.0 /        .00934
           50.0 /        .00875
           40.0 /        .00740
           30.0 /        .00928
           20.0 /        .00845
           10.0 /        .00808
1                                                                                                            HIGH
                                                                                                              1-HR
                                                                                                             SGROUP#  1
                        *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                       * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                              * FROM ALL SOURCES *
                                            * FOR THE RECEPTOR GRID *

                     * MAXIMUM VALUE EQUALS      3.27237 AND OCCURRED AT (     1306.0,      80.0) *

  DIRECTION /                                          RANGE (METERS)
  (DEGREES) /             568.0            738.0            966.0            1306.0           1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       3.00403 (198,11)   2.48942 (198,11)   2.15072 (208,11)   1.98895 (151,10)   1.83217 (344,16)
     350.0 /       3.01276 (234,12)   2.49219 (234,12)   2.16130 (138,11)   1.97114 (146,10)   1.80431 (330,12)
     340.0 /       2.99360 (217,11)   2.48609 (217,11)   2.13950 (216, 9)   2.03949 (281,11)   1.77734 (207, 8)
     330.0 /       2.94275 (162,12)   2.43600 (162,12)   2.15663 (266,14)   1.99995 (190,10)   1.87834 (148,18)
     320.0 /       2.59835 (173,13)   2.03842 (241,11)   2.19716 (182,12)   2.02826 (153, 9)   1.86635 (332,15)
     310.0 /       2.92078 (173,13)   2.11632 (173,13)   2.17951 (272,14)   2.02213 (286,15)   1.83218 (220, 9)
     300.0 /       3.00545 (237,13)   2.47704 (237,13)   2.19169 (282,12)   2.02216 (225,11)   1.85328 (221,10)
     290.0 /       2.99094 (238,14)   2.47099 (238,13)   2.19326 (315,12)   1.99993 (249,14)   2.22609 ( 39,16)
     280.0 /       3.00239 (222,14)   2.49317 (222,14)   2.19307 (243,14)   1.99995 (244,11)   1.86992 (311,15)
     270.0 /       2.98298 (125,14)   2.46782 (176,14)   2.17498 (235,15)   2.03949 (203,16)   1.88222 (305,12)
     260.0 /       3.00547 (242,11)   2.48609 (247,13)   2.18337 (188,15)   1.96117 ( 76,13)   1.87368 (259,17)
     250.0 /       3.01286 (221,12)   2.81480 (257,12)   2.20924 (235,14)   1.95604 (271,11)   1.98611 ( 39,15)
     240.0 /       2.65530 ( 93,12)   2.55060 (237,12)   2.19169 (264,13)   1.91254 ( 21,13)   1.81763 (258, 8)
     230.0 /       2.99094 (178,14)   2.79082 (174,12)   2.21083 (259,12)   1.92512 (123,10)   1.84775 (241,17)
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     220.0 /     2.61717 (235,12)    2.62183 (179,11)    2.17951 (259,15)    1.95547 (293,13)    1.80390 (362,16)
     210.0 /     3.01276 (251,12)    2.66885 (149,11)    2.12143 (145,10)    1.82949 (257,14)    1.78711 (294,10)
     200.0 /     2.69151 (116,11)    2.28979 (116,11)    2.21083 (178,12)    1.95547 (325,14)    1.75777 (308,13)
     190.0 /     2.79423 (108,12)    2.54064 (144,14)    2.22138 (236,12)    1.94343 (326,12)    1.85327 (304,16)
     180.0 /     2.90538 (152,11)    2.68992 (144,14)    2.05781 (319,11)    1.90899 (363,12)    1.86635 (162,16)
     170.0 /     2.59667 (177,13)    2.16596 (177,13)    2.16309 (279,15)    1.99123 (161,16)    1.85789 (244,18)
     160.0 /     2.92401 (177,13)    2.43004 (177,13)    2.03409 (319,13)    1.88775 (251,11)    1.81798 (251,11)
     150.0 /     2.85595 (162,11)    2.37925 (162,11)    2.12657 (119,10)    1.88871 (220,17)    1.77764 (161,18)
     140.0 /     2.69151 (162,11)    2.82588 (195,14)    2.21745 (213,10)    1.96890 (359,13)    1.85789 (305,15)
     130.0 /     1.95227 (195,14)    2.11862 (195,14)    2.16284 (169,16)    1.99123 (236,16)    1.87834 (236,13)
     120.0 /     2.54365 (131,13)    2.09278 (212,13)    2.16988 (201, 9)    1.99123 (256,11)    1.81218 (165,15)
     110.0 /     2.94912 (171,12)    2.43004 (205,11)    2.15663 (146,14)    2.01909 (326,14)    1.86164 (236,17)
     100.0 /     2.92401 (179,14)    2.43004 (179,14)    2.20532 (174,14)    2.03949 (280,11)    1.87101 (308,15)
      90.0 /     2.99094 (213,11)    2.46824 (194,14)    2.22803 (213,13)    2.02821 (273,15)    1.85328 (192, 8)
      80.0 /     3.00547 (251,13)    2.82084 (199,11)    2.37805 ( 42,12)    3.27237 ( 42,12)    3.26601 ( 42,12)
      70.0 /     3.01179 (219,12)    2.78311 (234,14)    2.20532 (167,13)    2.03539 (163,12)    1.86079 (256,15)
      60.0 /     2.95873 (182,11)    2.76723 (165,11)    2.19169 (270,12)    2.03438 (280,10)    1.87834 (144,17)
      50.0 /     3.00310 (250,12)    2.73905 (179,12)    2.20374 (199,13)    2.01707 (279,14)    1.85264 (309,15)
      40.0 /     3.01276 (244,13)    2.49219 (244,13)    2.17372 (215,13)    2.04769 (317,12)    1.87661 (203, 8)
      30.0 /     3.01067 (202,11)    2.43600 (244,14)    2.19874 (151,11)    2.11246 (358, 9)    2.78194 (358, 9)
      20.0 /     3.01286 (153,11)    2.60690 (203,14)    2.20374 (120,13)    2.47123 ( 37,10)    2.76868 ( 37,10)
      10.0 /     2.99848 (220,13)    2.60690 (203,14)    2.18337 (226,12)    2.06832 (257,15)    1.90209 (346,11)
1                                                                                                             HIGH
                                                                                                               1-HR
                                                                                                              SGROUP#  1
                            *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                            * HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                               * FOR THE RECEPTOR GRID *

                         * MAXIMUM VALUE EQUALS      3.27237 AND OCCURRED AT (     1306.0,      80.0) *

 DIRECTION /                                              RANGE (METERS)
 (DEGREES) /           2215.0              2954.0              3862.0              5112.0              6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /     1.93328 (299,15)    1.94420 (299,15)    1.69168 (299,15)    1.40626 (283,17)    1.23502 (283,17)
     350.0 /     1.70704 (199, 8)    1.54004 (  3,11)    1.50843 (  3,11)    1.30367 (  3,11)    1.15227 (  3,11)
     340.0 /     1.70352 (207, 8)    1.45070 (232,13)    1.64021 (215, 7)    1.72850 (215, 7)    1.68459 (215, 7)
     330.0 /     1.70704 (207,16)    1.58256 (169, 8)    1.43682 (164, 8)    1.51026 (164, 8)    1.47155 (164, 8)
     320.0 /     1.72697 (280, 9)    1.40499 (215,17)    1.32794 ( 75, 8)    1.41969 ( 75, 8)    1.39527 ( 75, 8)
     310.0 /     1.71973 (176, 9)    1.53578 (176, 9)    1.27028 (176, 9)    1.05528 (329, 8)    1.00481 (329, 8)
     300.0 /     1.70704 (219, 9)    1.44180 (248, 8)    1.37636 (248, 8)    1.28564 (343, 8)    1.21436 (343, 8)
     290.0 /     2.10590 ( 39,16)    1.71899 ( 39,16)    1.35018 ( 39,16)    1.04017 ( 39,16)     .90083 (332,17)
     280.0 /     1.60387 (152, 7)    1.32043 (152, 7)    1.04245 (152, 7)     .93733 (333, 1)     .86331 (333, 1)
     270.0 /     1.67072 (305,12)    1.65664 (253, 9)    1.44987 (253, 9)    1.15533 (253, 9)     .99838 (253, 9)
     260.0 /     1.66723 (193,15)    1.46301 (193,15)    1.20805 (168,16)     .91936 (304,17)    1.01790 (178, 7)
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      250.0 /       1.80674 ( 39,15)       1.48556 (349,17)       1.27501 (349,17)       1.16471 (348, 8)       1.09238 (348, 8)
      240.0 /       1.68366 (188, 8)       1.48453 (188, 8)       1.22571 ( 76, 8)        .97599 ( 76, 8)        .87505 (257,22)
      230.0 /       1.74386 (304,15)       1.40072 (181,17)       1.16811 ( 55,10)        .96338 (259, 9)       1.00860 (128, 7)
      220.0 /       1.66723 (160,11)       1.46301 (160,11)       1.25168 (325, 8)       1.39815 (313, 8)       1.40564 (313, 8)
      210.0 /       1.60519 (294,10)       1.39836 (143, 9)       1.21038 (143, 9)        .96142 (143, 9)        .96634 (164, 9)
      200.0 /       1.48047 ( 44,16)       1.09949 ( 44,16)        .98302 (305,18)        .92148 (140,17)        .87297 (140,17)
      190.0 /       1.64369 (304,16)       1.24388 (304,16)        .99253 ( 86,14)        .91106 (237,19)        .83569 (237,19)
      180.0 /       1.69552 (326,15)       1.47485 (317,10)       1.17557 (116, 9)        .93129 (306,22)        .87955 (306,22)
      170.0 /       1.68764 (326,16)       1.35715 (326,16)       1.02259 (317,17)        .91868 (288,10)        .86218 (288,10)
      160.0 /       1.57920 ( 44,17)       1.25145 (289,11)        .99931 (354,16)       1.17661 (  5, 9)       1.24881 (  5, 9)
      150.0 /       1.61327 (169,10)       1.42732 (203,17)       1.20805 (203,17)        .89654 (203,17)        .86758 (266,18)
      140.0 /       1.71138 (169,18)       1.41512 (161,11)       1.08321 (161,11)        .92943 (279, 9)        .87068 (279, 9)
      130.0 /       1.65813 (236,13)       1.29413 (254,17)        .99022 (228,11)        .93432 (228,11)        .87851 (187,20)
      120.0 /       1.71893 (177,16)       1.40072 (213,17)       1.24792 (229, 9)       1.05435 (229, 9)        .92176 (229, 9)
      110.0 /       1.71573 (192,18)       1.47804 (249,12)       1.16527 (249,12)        .92943 (250,18)        .87068 (250,18)
      100.0 /       1.73542 (219,18)       1.38079 (219,18)       1.01004 (205,17)        .98880 (228,12)       1.00761 (228,12)
       90.0 /       1.64369 (192, 8)       1.26190 (  3,15)        .99315 (121,18)        .90623 (209,17)        .85230 (209,17)
       80.0 /       2.78723 ( 42,12)       2.17846 ( 42,12)       1.71178 ( 42,12)       1.32999 ( 42,12)       1.15170 ( 42,12)
       70.0 /       1.73982 (257,16)       1.38295 (257,16)       1.03871 (211,12)        .94744 ( 33,16)        .89241 ( 33,16)
       60.0 /       1.72729 (212, 8)       1.82966 (163, 9)       1.77007 (163, 9)       1.50901 (163, 9)       1.32896 (163, 9)
       50.0 /       1.68276 (181, 8)       1.47165 (181, 8)       1.24708 (351,16)        .93658 (351,16)        .88383 (209,12)
       40.0 /       1.68871 (324, 9)       1.57039 (101, 8)       1.52756 (101, 8)       1.33111 (101, 8)       1.18420 (101, 8)
       30.0 /       2.84881 (358, 9)       2.42937 (358, 9)       1.93524 (358, 9)       1.50098 (358, 9)       1.29747 (358, 9)
       20.0 /       2.53900 ( 37,10)       2.03721 ( 37,10)       1.60120 ( 37,10)       1.24019 ( 37,10)       1.09126 ( 79, 8)
       10.0 /       1.68995 (346,11)       1.58458 (346,10)       1.68114 ( 63, 8)       1.62560 ( 63, 8)       1.52066 ( 63, 8)
1                                                                                                                     2ND HIGH
                                                                                                                       1-HR
                                                                                                                      SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                         * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                    * FROM ALL SOURCES *
                                                  * FOR THE RECEPTOR GRID *

                          * MAXIMUM VALUE EQUALS      3.00403 AND OCCURRED AT (     568.0,      20.0) *

  DIRECTION /                                                RANGE (METERS)
  (DEGREES) /                  568.0                  738.0                  966.0                 1306.0                 1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /       2.99094 (218,14)       2.31555 (165,12)       2.10844 (148,14)       1.95122 ( 53,13)       1.81798 (234,11)
      350.0 /       2.96430 (194,11)       2.48096 (194,11)       2.14120 (320,14)       1.86230 (240,10)       1.78302 (199, 8)
      340.0 /       2.78902 (238,12)       2.32123 (238,12)       2.09736 (209, 9)       2.03539 (165,10)       1.75795 (  1,10)
      330.0 /       2.78902 (238,12)       2.32123 (238,12)       2.15452 (180, 9)       1.99687 (128, 9)       1.79953 ( 41,10)
      320.0 /       1.80945 (162,12)       2.03470 ( 93,13)       2.18514 (284,13)       2.01707 (286,13)       1.84772 (224, 9)
      310.0 /       2.79497 (178,11)       2.08371 (237,13)       2.17319 (284,12)       1.97114 (151, 9)       1.82851 (222,18)
      300.0 /       2.99094 (243,13)       2.46219 (189,13)       2.18866 (274,12)       1.99123 (198,10)       1.82443 (149, 8)
      290.0 /       2.98634 (238,13)       2.43004 (242,12)       2.16551 (188,12)       1.96384 (286,14)       1.87541 (353,10)
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      280.0 /       2.98298 (155,12)     2.46824 (237,11)     2.17970 (145,11)     1.95222 (189,16)     1.80431 (315, 9)
      270.0 /       2.93678 (176,14)     2.16353 (125,14)     2.17319 (155,11)     1.99123 (259,11)     1.84928 (268,17)
      260.0 /       2.99360 (247,13)     2.17343 (242,11)     2.16988 (247,12)     1.96117 ( 94,15)     1.80796 (172,17)
      250.0 /       2.95719 (120,12)     2.49651 (221,12)     2.20924 (268,15)     1.92267 (260,15)     1.85750 (149,18)
      240.0 /       2.58001 (146,12)     2.54064 (174,13)     2.08314 (291,12)     1.91219 ( 24,13)     1.79438 (145,15)
      230.0 /       2.99094 (235,13)     2.70049 (237,12)     2.17513 (187,14)     1.92094 (292,15)     1.84109 (262,17)
      220.0 /       2.58908 (221,13)     2.52080 (149,11)     2.16309 (178,13)     1.94343 (294,11)     1.74890 (162,17)
      210.0 /       2.93611 (142,13)     2.49219 (251,12)     2.10228 (149,13)     1.81612 (145,10)     1.74381 (293,16)
      200.0 /       2.46240 (142,13)     2.00891 (265,14)     2.19169 (177,11)     1.88134 (178,12)     1.71329 ( 44,16)
      190.0 /       2.58001 (152,11)     2.38794 (108,12)     2.07391 ( 91,13)     1.88295 (289,12)     1.73075 (333,13)
      180.0 /       2.49947 (144,14)     2.42409 (152,11)     2.02777 ( 44,15)     1.84440 (236,10)     1.84481 (236,10)
      170.0 /       1.78585 (152,11)     2.04734 (142,14)     2.12657 (161,16)     1.90419 ( 64,12)     1.84481 (305,16)
      160.0 /       1.64582 (162,11)     2.12433 (203,13)     2.00912 (203,13)     1.79598 (289,11)     1.79119 (289,11)
      150.0 /       1.95227 (195,14)     2.11861 (195,14)     2.06970 (246,16)     1.87797 (193,14)     1.74811 (319,15)
      140.0 /       2.64747 (195,14)     2.24640 (162,11)     2.19837 (218,16)     1.90463 (146,15)     1.83664 (161,17)
      130.0 /       1.53706 (112,12)     2.05533 (112,12)     2.15593 (161,15)     1.95604 (165,16)     1.86809 (200,18)
      120.0 /       2.19503 (171,12)     2.06327 (141,13)     2.12657 (256,11)     1.91176 (165,15)     1.81086 (217,16)
      110.0 /       2.92401 (205,11)     2.15819 (171,12)     2.09647 (100,13)     1.95035 (326,13)     1.85714 (208,15)
      100.0 /       2.87529 (175,12)     2.17630 (152,14)     2.16988 (173,14)     2.01707 (274,15)     1.85301 (145,17)
       90.0 /       2.97769 (194,14)     2.16596 (179,14)     2.21585 (203,12)     2.02821 (274,14)     1.81886 (212,15)
       80.0 /       2.91464 (219,11)     2.34382 (234,14)     2.20374 (203,11)     2.00279 (280,13)     1.87370 (266,16)
       70.0 /       2.99848 (196,11)     2.48609 (199,12)     2.16988 (157,13)     2.02826 (205,13)     1.83497 (257,16)
       60.0 /       2.90938 (213,14)     2.46219 (182,11)     2.18337 (161,12)     2.01593 (213,15)     1.84775 (240,17)
       50.0 /       2.99360 (221,14)     2.48609 (221,14)     2.19716 (202,12)     2.01593 (239,16)     1.81560 (111,11)
       40.0 /       2.82104 (158,12)     2.17126 (244,14)     2.14484 (226,13)     2.00598 (199,10)     1.86635 (344,14)
       30.0 /       2.97715 (186,14)     2.17096 (202,11)     2.15663 (121,14)     1.94636 (287,13)     1.83497 (214,17)
       20.0 /       3.00403 (165,13)     2.49651 (153,11)     2.16670 (185,14)     1.99484 (202,10)     1.77734 ( 49,17)
       10.0 /       2.99675 (242,14)     2.47429 (242,14)     2.15126 (287,12)     1.94475 (162,10)     1.81600 ( 71,14)
1                                                                                                                         2ND HIGH
                                                                                                                           1-HR
                                                                                                                          SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                               * SECOND HIGHEST  1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                         * FROM ALL SOURCES *
                                                       * FOR THE RECEPTOR GRID *

                                * MAXIMUM VALUE EQUALS      3.00403 AND OCCURRED AT (      568.0,      20.0) *

    DIRECTION /                                                 RANGE (METERS)
    (DEGREES) /             2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /       1.70644 (352, 9)     1.70343 (283,17)     1.65412 (283,17)     1.34515 (299,15)     1.16504 (299,15)
      350.0 /       1.61328 (214, 9)     1.41129 (209, 8)     1.13063 (209, 8)      .90075 (189,19)      .84795 (189,19)
      340.0 /       1.65995 ( 33,11)     1.41130 (209, 8)     1.21544 (204, 8)     1.32562 (204, 8)     1.31207 (204, 8)
      330.0 /       1.69808 (169, 8)     1.40816 ( 29,10)     1.36849 (169, 8)     1.11216 (169, 8)      .97108 (169, 8)
      320.0 /       1.70704 (269,10)     1.38655 (280, 9)     1.19568 (215,17)      .91816 (141, 7)      .98984 (141, 7)
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     310.0 /      1.68764 (151, 8)     1.46123 (132, 9)     1.13802 (132, 9)     1.01176 (176, 9)      .88539 (146, 7)
     300.0 /      1.64922 (272,17)     1.40740 (168, 9)     1.31215 (343, 8)     1.17381 (248, 8)     1.03292 (248, 8)
     290.0 /      1.77508 (353,10)     1.51578 (353,10)     1.22611 (353,10)      .95804 (332,17)      .89995 (276, 9)
     280.0 /      1.57636 (311,15)     1.28004 (285,10)     1.00792 (125,17)      .89349 (327, 9)      .84217 (327, 9)
     270.0 /      1.66294 (320, 9)     1.43618 (235,10)     1.21323 (235,10)      .94457 (233,19)      .99183 (332, 8)
     260.0 /      1.65545 (259,17)     1.42732 (168,16)     1.20539 (168,18)      .90284 ( 86,16)      .87563 (353,12)
     250.0 /      1.71936 (154,11)     1.47485 (217,18)     1.19966 (348, 8)      .95719 (349,17)      .88918 (260, 8)
     240.0 /      1.67311 ( 76, 8)     1.47122 (316, 9)     1.17572 (316, 9)      .95252 (257,22)      .86003 (304, 5)
     230.0 /      1.65271 (275,16)     1.39492 (304,15)     1.10188 (251, 9)      .95017 (214,21)      .90507 (259, 9)
     220.0 /      1.62921 (193,10)     1.41203 (193,10)     1.24530 (313, 8)     1.16862 (325, 8)     1.10424 (355, 9)
     210.0 /      1.54249 (120, 9)     1.26700 (350,16)     1.01479 (193,19)      .93501 (303,11)      .86152 (303,11)
     200.0 /      1.43677 (279,16)     1.08060 (279,16)      .92988 (140,17)      .88585 ( 87, 9)      .83670 ( 67, 9)
     190.0 /      1.46964 (363, 9)     1.09459 (363, 9)      .98146 (237,19)      .87295 (363, 8)      .83271 (363, 8)
     180.0 /      1.68862 (317,10)     1.36595 (116, 9)     1.13653 (317,10)      .89725 (116, 9)      .84002 (303, 8)
     170.0 /      1.64636 (244,18)     1.24511 (244,18)      .99415 (326,16)      .89117 (317,17)      .81965 (302,18)
     160.0 /      1.55069 (289,11)     1.22262 ( 44,17)      .99819 (289,11)      .90575 (101, 2)      .85912 (101, 2)
     150.0 /      1.55826 ( 25,14)     1.40328 (169,10)     1.07755 (169,10)      .89524 (266,18)      .84217 ( 92, 9)
     140.0 /      1.64636 (305,15)     1.36894 (169,18)      .99957 (169,18)      .88442 (113,18)      .81512 (113,18)
     130.0 /      1.65223 (200,18)     1.25054 (236,13)      .96958 (141,19)      .90650 (299,16)      .87337 (228,11)
     120.0 /      1.60861 (213,17)     1.38255 (177,16)     1.07618 (213,17)      .93308 (336,21)      .87359 ( 42,19)
     110.0 /      1.71138 (163,17)     1.41202 (277,17)     1.08170 (277,17)      .89266 (257,18)      .87037 (232, 9)
     100.0 /      1.72738 (251,16)     1.37683 (251,16)     1.00500 (219,18)      .91128 (122,18)      .90359 (201, 7)
      90.0 /      1.60519 ( 48,17)     1.24393 (192, 8)      .97116 (  3,15)      .89247 (352,19)      .82136 (352,19)
      80.0 /      1.76045 (273,16)     1.52475 (273,16)     1.25727 (174,18)      .94135 (174,18)      .90341 (229, 8)
      70.0 /      1.71138 (159, 8)     1.36896 (159, 8)     1.03871 (253,17)      .92978 (211,12)      .86758 (231, 9)
      60.0 /      1.72373 (284,16)     1.51199 (212, 8)     1.19583 (212, 8)      .90866 (212, 8)      .85953 (239,18)
      50.0 /      1.67979 ( 38,16)     1.45142 (351,16)     1.23209 (  3,17)      .93349 (  3,17)      .85350 ( 11, 1)
      40.0 /      1.67207 (331,14)     1.52596 (324, 9)     1.27697 (324, 9)     1.02465 (324, 9)      .89459 (324, 9)
      30.0 /      1.73982 (214,17)     1.48375 (265,18)     1.26518 (265,18)      .95252 (210,22)      .89210 (185,10)
      20.0 /      1.72113 (281,10)     1.50316 (281,10)     1.32823 (283,16)     1.14011 ( 79, 8)     1.07182 ( 37,10)
      10.0 /      1.61888 (198, 9)     1.52785 ( 63, 8)     1.62476 (346,10)     1.48471 (346,10)     1.35496 (346,10)
1                                                                                                             HIGH
                                                                                                               3-HR
                                                                                                              SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                                  * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                                * MAXIMUM VALUE EQUALS      2.14421 AND OCCURRED AT (     568.0,      90.0) *

 DIRECTION /                                                   RANGE (METERS)
 (DEGREES) /             568.0              738.0              966.0              1306.0             1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      1.00134 (198, 4)     1.47579 (181, 4)     1.52023 (181, 4)     1.20221 (148, 5)     1.00363 (148, 5)
     350.0 /      1.38164 (266, 4)     1.35910 (126, 5)     1.30994 (126, 5)     1.02842 (320, 5)      .81754 ( 62, 4)
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     340.0 /     1.08611 (266, 4)    1.10184 (126, 4)    1.15876 (126, 4)    1.05934 (281, 4)     .96223 (232, 5)
     330.0 /      .98092 (162, 4)    1.32823 (148, 4)    1.31756 (148, 4)    1.04137 (146, 3)     .89381 (146, 3)
     320.0 /      .86612 (173, 5)     .99400 (233, 4)    1.16136 (164, 5)    1.19050 (329, 5)    1.15398 (329, 5)
     310.0 /     1.12027 (237, 5)    1.51350 (282, 4)    1.76009 (282, 4)    1.52574 ( 77, 5)    1.29609 ( 77, 5)
     300.0 /     1.56981 (238, 5)    1.54729 (272, 5)    1.81913 (134, 4)    1.67675 (134, 4)    1.32609 (134, 4)
     290.0 /     2.05171 (238, 5)    1.70701 (238, 5)    1.46896 (315, 4)    1.29719 ( 95, 4)    1.04774 ( 95, 4)
     280.0 /     1.50434 (238, 5)    1.31413 (104, 5)    1.56078 (315, 4)    1.45226 (315, 4)    1.16318 (327, 4)
     270.0 /     1.13800 (155, 4)    1.19179 (155, 4)    1.26596 (188, 5)    1.15191 (305, 4)    1.08431 (305, 4)
     260.0 /     1.09251 (260, 4)    1.76429 (260, 4)    1.93142 (260, 4)    1.57303 (260, 4)    1.35160 (258, 5)
     250.0 /     1.37284 (120, 4)    1.63033 (260, 4)    1.77706 (260, 4)    1.47934 ( 67, 4)    1.32307 ( 67, 4)
     240.0 /      .95705 (120, 4)    1.24818 (109, 5)    1.45154 ( 90, 4)    1.51692 (292, 4)    1.41738 (292, 4)
     230.0 /     1.16944 (178, 5)    1.40268 (262, 5)    1.53744 (262, 5)    1.30375 (262, 5)    1.09610 (304, 5)
     220.0 /     1.19440 (178, 5)    1.22687 (178, 5)    1.26471 (100, 4)    1.26414 (290, 4)    1.12883 (290, 4)
     210.0 /     1.00425 (251, 4)    1.13287 (113, 4)    1.29230 ( 12, 4)    1.70993 ( 12, 4)    1.66584 ( 12, 4)
     200.0 /      .93464 (108, 4)    1.22943 (108, 4)    1.33128 (325, 4)    1.15413 (108, 4)     .94958 (108, 4)
     190.0 /     1.03775 (108, 4)     .98765 (108, 4)    1.13712 ( 81, 5)    1.26053 ( 11, 5)    1.17969 ( 11, 5)
     180.0 /      .96846 (152, 4)    1.04707 (236, 4)    1.38407 (236, 4)    1.39191 (236, 4)    1.16740 (236, 4)
     170.0 /      .98871 (177, 5)    1.03115 (177, 5)    1.11403 ( 43, 5)    1.17887 ( 15, 4)    1.13238 ( 15, 4)
     160.0 /     1.21263 (177, 5)    1.30751 (177, 5)    1.12740 (177, 5)    1.01501 (363, 5)     .90864 (363, 5)
     150.0 /      .95198 (162, 4)    1.22075 (119, 4)    1.36513 (119, 4)    1.17276 (319, 5)    1.06446 (153, 6)
     140.0 /      .89717 (162, 4)    1.10799 (112, 4)    1.19448 (142, 4)    1.24119 ( 13, 4)    1.21636 ( 13, 4)
     130.0 /      .80090 (112, 4)    1.09890 (112, 4)    1.06571 (112, 4)    1.18250 (113, 6)    1.17596 (113, 6)
     120.0 /      .84788 (131, 5)     .87491 (229, 4)    1.04899 (229, 4)     .96318 (229, 4)     .96180 (177, 6)
     110.0 /      .98305 (171, 4)    1.05088 (229, 4)    1.25540 (192, 6)    1.50288 (192, 6)    1.45257 (192, 6)
     100.0 /     1.78106 (213, 4)    1.44221 (194, 5)    1.50238 (118, 5)    1.51587 (229, 5)    1.49094 (229, 5)
      90.0 /     2.14421 (194, 5)    1.92855 (194, 5)    1.69817 (230, 5)    1.78598 (158, 6)    1.64286 (158, 6)
      80.0 /     1.71913 (219, 4)    1.82043 (150, 5)    1.80540 (150, 5)    1.61734 (276, 5)    1.27552 (276, 5)
      70.0 /     1.87594 (197, 4)    1.57525 (115, 5)    1.77571 (115, 5)    1.55449 (115, 5)    1.19113 (115, 5)
      60.0 /     1.87348 (197, 4)    1.54621 (255, 4)    1.76294 ( 97, 4)    1.50966 ( 97, 4)    1.11975 (255, 4)
      50.0 /     1.26634 (250, 4)    1.47314 (219, 5)    1.49817 (219, 5)    1.19510 (219, 5)     .98041 (  4, 5)
      40.0 /     1.87539C(244, 5)    1.55448C(244, 5)    1.28885 ( 53, 5)    1.49486 (170, 4)    1.36387 (170, 4)
      30.0 /     1.68110C(244, 5)    1.39779C(244, 5)    1.19373 (240, 4)    1.20264 (195, 4)    1.08589 ( 53, 6)
      20.0 /     1.00429 (153, 4)    1.24422 (180, 4)    1.41286 (102, 4)    1.50270 ( 37, 4)    1.64813 ( 37, 4)
      10.0 /     1.29319 (181, 4)    1.94405 (181, 4)    2.03317 (181, 4)    1.61226 (181, 4)    1.43579 (346, 4)
1                                                                                                                HIGH
                                                                                                                 3-HR
                                                                                                                 SGROUP#  1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                             * HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                                 * FOR THE RECEPTOR GRID *

                          * MAXIMUM VALUE EQUALS      2.14421 AND OCCURRED AT (     568.0,      90.0) *

 DIRECTION /                                                RANGE (METERS)
 (DEGREES) /           2215.0              2954.0              3862.0              5112.0              6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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   360.0 /       .78484 ( 63, 4)      .94918 (345, 4)      .97059 (345, 4)      .88919 (345, 4)      .81229 (345, 4)
   350.0 /       .67457 (214, 3)      .67559 (214, 3)      .60727 (214, 3)      .54372 (  1, 1)      .49566 (  1, 1)
   340.0 /       .98464 (232, 5)      .83056 (232, 5)      .62591 (232, 5)      .59466 (215, 3)      .57624 (215, 3)
   330.0 /       .79403 ( 29, 4)      .69312 ( 41, 3)      .69698 ( 41, 3)      .67560 ( 41, 3)      .64848 ( 41, 3)
   320.0 /       .94964 (329, 5)      .67967 (329, 5)      .64646 ( 74, 6)      .57623 ( 74, 6)      .56599 ( 75, 2)
   310.0 /      1.00568 (332, 5)      .90425 ( 72, 2)      .82928 (357, 5)      .74146 (357, 5)      .66787 (357, 5)
   300.0 /      1.20899 (272, 6)     1.04357 (272, 6)      .83516 (272, 6)      .62614 (272, 6)      .53169 ( 69, 4)
   290.0 /       .81336 (311, 4)      .65355 ( 47, 6)      .61957 (343, 1)      .60203 (343, 1)      .56636 (343, 1)
   280.0 /       .91360 (327, 4)      .71994 (147, 3)      .70681 ( 17, 6)      .68500 ( 17, 6)      .64534 ( 17, 6)
   270.0 /       .88561 (305, 4)      .80479 (320, 3)      .74794 (320, 3)      .65046 (320, 3)      .58488 (320, 3)
   260.0 /      1.12401 (258, 5)      .95049 (168, 6)      .80499 (168, 6)      .59768 (168, 6)      .56332 ( 69, 1)
   250.0 /      1.08815 ( 83, 6)      .89911 ( 83, 6)      .70548 ( 83, 6)      .64044 (348, 3)      .58821 (348, 3)
   240.0 /      1.13938 (292, 4)      .93557 ( 76, 3)      .73747 ( 76, 3)      .65898 (306, 2)      .61550 (306, 2)
   230.0 /      1.00920 (304, 5)      .86530 (  8, 4)      .76998 (  8, 4)      .62647 (  8, 4)      .54085 (  8, 4)
   220.0 /       .87868 (290, 4)      .62835 (338, 4)      .60176 (361, 6)      .61608 (361, 6)      .59482 (361, 6)
   210.0 /      1.37716 ( 12, 4)      .99071 ( 12, 4)      .67986 ( 12, 4)      .48435 ( 79, 8)      .42767 ( 79, 8)
   200.0 /       .70896 (108, 4)      .62685 (347, 2)      .56128 (347, 2)      .45977 (347, 2)      .44911 (306, 5)
   190.0 /       .94779 ( 11, 5)      .66489 ( 11, 5)      .58366 (363, 3)      .51802 (307, 1)      .48107 (  5, 8)
   180.0 /       .87738 (236, 4)      .64870 (303, 3)      .72081 (303, 3)      .70404 (303, 3)      .66114 (303, 3)
   170.0 /       .93642 ( 15, 4)      .68171 ( 15, 4)      .56083 (317, 6)      .47751 (317, 6)      .42074 (317, 6)
   160.0 /       .71685 (363, 5)      .71611 (  5, 5)      .62970 (  5, 5)      .50637 (  5, 5)      .43436 (  5, 5)
   150.0 /       .85599 (153, 6)      .66548 (123, 6)      .59067 ( 27, 2)      .53154 ( 27, 2)      .48126 ( 27, 2)
   140.0 /      1.05187 ( 13, 4)      .81792 ( 13, 4)      .60900 ( 13, 4)      .43278 ( 13, 4)      .35551 (346, 8)
   130.0 /       .98873 (113, 6)      .72208 (113, 6)      .57627 ( 27, 1)      .50790 ( 27, 1)      .45463 ( 27, 1)
   120.0 /       .94691 (177, 6)      .77042 (177, 6)      .56458 (177, 6)      .50898 ( 20, 6)      .48812 ( 20, 6)
   110.0 /      1.22086 (192, 6)      .92687 (177, 6)      .70013 (177, 6)      .47839 (177, 6)      .39644 ( 51, 3)
   100.0 /      1.23754 (229, 5)      .88965 (229, 5)      .60731 (229, 5)      .48160 ( 19, 5)      .42604 ( 91, 6)
    90.0 /      1.30692 (158, 6)      .91441 (158, 6)      .65197 ( 99, 3)      .53976 ( 99, 3)      .47113 ( 65, 6)
    80.0 /       .96159 (174, 6)      .85248 (174, 6)      .67288 (174, 6)      .47897 (174, 6)      .42277 (282, 6)
    70.0 /       .92799 (163, 4)      .72973 (225, 6)      .59167 (225, 6)      .54173 (253, 6)      .51444 (253, 6)
    60.0 /       .91718 (212, 3)      .76175 (212, 3)      .62156 (212, 3)      .50991 (212, 3)      .45752 (212, 3)
    50.0 /       .78324 (111, 4)      .57412 ( 58, 4)      .53908 (  3, 6)      .48426 (  3, 6)      .44986 (  3, 6)
    40.0 /      1.08424 (170, 4)      .75630 (170, 4)      .62832 (299, 5)      .56226 ( 75, 6)      .52244 ( 75, 6)
    30.0 /       .94960 (358, 3)      .80979 (358, 3)      .64508 (358, 3)      .60012 (185, 4)      .56314 (185, 4)
    20.0 /      1.53935 ( 37, 4)     1.28318 ( 37, 4)     1.03038 ( 37, 4)      .80200 ( 37, 4)      .69133 ( 37, 4)
    10.0 /      1.40746 (346, 4)     1.30787 (346, 4)     1.15635 (346, 4)      .97258 (346, 4)      .86526 (346, 4)
1                                                                                                             2ND HIGH
                                                                                                               3-HR
                                                                                                              SGROUP#  1
                        *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                    * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                 * FROM ALL SOURCES *
                                               * FOR THE RECEPTOR GRID *

                     * MAXIMUM VALUE EQUALS      1.94170 AND OCCURRED AT (     568.0,      90.0) *
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 DIRECTION /                                          RANGE (METERS)
 (DEGREES) /          568.0              738.0              966.0              1306.0             1704.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /       .99698 (218, 5)   1.27042 ( 70, 5)   1.40427 ( 70, 5)   1.18191 (181, 4)    .98301 ( 63, 4)
    350.0 /      1.08872 (194, 4)   1.35459 (266, 4)   1.28744 (320, 5)    .97903 (126, 5)    .72467 (320, 5)
    340.0 /       .99787C(217, 4)   1.04714 (148, 4)   1.11266 (281, 4)    .95795 (126, 4)    .93081 (209, 3)
    330.0 /       .94004 (148, 4)   1.21620 (132, 5)   1.25456 (132, 5)   1.00306 (148, 4)    .84046 (329, 5)
    320.0 /       .72948 (237, 5)    .93718 (237, 5)   1.14518 (272, 4)   1.14575 (272, 4)    .95311 (215, 3)
    310.0 /      1.11908 (220, 4)   1.40569 (272, 5)   1.51468 (272, 5)   1.50236 (282, 4)   1.27583 (146, 6)
    300.0 /      1.20007 (220, 4)   1.51745 (134, 4)   1.75221 (272, 5)   1.58016 (186, 4)   1.32304 (186, 4)
    290.0 /      1.10185 (243, 5)   1.25319 (315, 4)   1.37129 (147, 4)   1.28045 (315, 4)   1.03430 (311, 4)
    280.0 /      1.16692 (155, 4)   1.26610 (315, 4)   1.36045 (261, 4)   1.30633 (261, 4)   1.14723 (315, 4)
    270.0 /      1.12452C(176, 5)   1.17841C(176, 5)   1.25508 (104, 5)   1.15047 (149, 6)   1.07052 (149, 6)
    260.0 /      1.02025 (242, 4)   1.46836 (188, 5)   1.56125 (188, 5)   1.39439 (258, 5)   1.11950 (260, 4)
    250.0 /      1.01300 (260, 4)   1.32218 (120, 4)   1.45534 (268, 5)   1.43913 (260, 4)   1.18655 ( 83, 6)
    240.0 /       .88510 ( 93, 4)   1.11575 ( 90, 4)   1.35041 (109, 5)   1.50988 ( 90, 4)   1.30832 ( 90, 4)
    230.0 /      1.02017 (235, 5)   1.00978 (178, 5)   1.33136 (292, 5)   1.25998 (292, 5)   1.07230 (155, 3)
    220.0 /       .87239 (235, 4)   1.08100 (113, 4)   1.22826 (177, 4)   1.18376 (100, 4)   1.05819 (338, 4)
    210.0 /       .98202 (116, 4)   1.02032 (177, 4)   1.14325 (177, 4)    .94306 (177, 4)    .88259 (294, 4)
    200.0 /       .90195 (116, 4)   1.17568 (325, 4)   1.27856 (108, 4)   1.11280 (325, 4)    .80423 (325, 4)
    190.0 /       .86000 (152, 4)    .93189 (325, 4)   1.03950 (325, 4)   1.18690 (289, 4)   1.09501 (289, 4)
    180.0 /       .83505 (108, 4)    .89664 (144, 5)   1.13152 ( 44, 5)   1.15595 ( 11, 5)   1.05223 ( 11, 5)
    170.0 /       .59528 (152, 4)    .91563 ( 43, 5)    .99961 ( 44, 5)   1.13209 ( 44, 5)   1.01829 ( 44, 5)
    160.0 /       .54861 (162, 4)    .70811C(203, 5)    .92938 (363, 5)    .85624 (177, 5)    .70110 ( 13, 5)
    150.0 /       .80433 (177, 5)   1.09240 (169, 5)   1.15884 (169, 5)   1.14093 (153, 6)    .99432 (319, 5)
    140.0 /       .88249C(195, 5)   1.02258 (142, 4)   1.08847 (112, 4)   1.08292 (289, 5)    .99896 (289, 5)
    130.0 /       .65076C(195, 5)    .71209 (246, 5)    .98520 (246, 5)   1.03231 (246, 5)    .87829 ( 43, 6)
    120.0 /       .73168 (171, 4)    .79347 (101, 5)    .95748 (101, 5)    .86891 (101, 5)    .77150 (189, 6)
    110.0 /       .97467 (205, 4)   1.04112 (106, 4)   1.22877 (106, 4)   1.32315 (326, 5)   1.14086 (359, 5)
    100.0 /      1.72514 (194, 5)   1.42742 (118, 5)   1.50011 (129, 5)   1.43550 (227, 5)   1.34436 ( 55, 5)
     90.0 /      1.94170 (213, 4)   1.55182 (230, 5)   1.60636 (278, 5)   1.71214 (157, 6)   1.56560 (157, 6)
     80.0 /      1.57432 (199, 4)   1.63914 (278, 5)   1.78884 (278, 5)   1.45260 (278, 5)   1.11338 ( 62, 5)
     70.0 /      1.64697 (199, 4)   1.53579 (199, 4)   1.40491 (202, 5)   1.28514 (163, 4)   1.17701 (163, 4)
     60.0 /      1.31195 (255, 4)   1.51815 ( 97, 4)   1.61634 (255, 4)   1.42790 (255, 4)   1.10570 ( 97, 4)
     50.0 /      1.20121C(244, 5)   1.26223 (250, 4)   1.21102 (110, 5)   1.15193 (  4, 5)    .96343 (111, 4)
     40.0 /      1.06330 (186, 5)   1.20134 ( 53, 5)   1.27333 (170, 4)   1.26460 ( 35, 5)   1.15334 ( 35, 5)
     30.0 /      1.22325 (186, 5)   1.18397 (186, 5)   1.14807 (195, 4)   1.10791 ( 53, 6)   1.06347 (170, 4)
     20.0 /      1.00134 (165, 5)   1.21732 (240, 5)   1.36039 (240, 5)   1.21249 (102, 4)   1.06869 (321, 4)
     10.0 /      1.00764 (206, 5)   1.26765 (226, 4)   1.41649 (102, 4)   1.38165 (346, 4)   1.24565 (321, 4)
1                                                                                                        2ND HIGH
                                                                                                          3-HR
                                                                                                         SGROUP#  1

                     *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                  * SECOND HIGHEST  3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                              * FROM ALL SOURCES *
                                            * FOR THE RECEPTOR GRID *
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                              * MAXIMUM VALUE EQUALS      1.94170 AND OCCURRED AT (      568.0,      90.0) *

 DIRECTION /                                                     RANGE (METERS)
 (DEGREES) /          2215.0                2954.0                3862.0                5112.0                6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /        .77612 (345, 4)       .64807 (299, 5)       .56389 (299, 5)       .46876 (283, 6)       .41167 (283, 6)
    350.0 /        .65576 ( 62, 4)       .58054 (206, 3)       .59308 (  1, 1)       .50857 (214, 3)       .45089 (214, 3)
    340.0 /        .86684 (209, 3)       .73106 (209, 3)       .58228 (209, 3)       .49667 (  1, 3)       .46632 (  1, 3)
    330.0 /        .68569 (146, 3)       .66602 ( 29, 4)       .54517 ( 18, 5)       .50342C(164, 3)       .49052C(164, 3)
    320.0 /        .80683 (215, 3)       .64912 ( 74, 6)       .53011 ( 75, 2)       .56392 ( 75, 2)       .51888 ( 74, 6)
    310.0 /        .99768 (151, 3)       .83973 ( 69, 5)       .81793 ( 72, 2)       .70832 ( 69, 5)       .66107 (171, 2)
    300.0 /       1.00261 (186, 4)       .82649 ( 69, 4)       .73732 ( 69, 4)       .60932 ( 69, 4)       .52126 (272, 6)
    290.0 /        .76286 ( 95, 4)       .63759 (135, 6)       .56939 ( 47, 6)       .47749 (353, 6)       .50545 (353, 6)
    280.0 /        .87569 (147, 3)       .68607 ( 95, 6)       .63635 ( 95, 6)       .61487 (186, 7)       .58130 (186, 7)
    270.0 /        .85928 (149, 6)       .72861 ( 69, 3)       .64810 ( 69, 3)       .53721 ( 69, 3)       .51387 (132, 3)
    260.0 /        .93901 (168, 6)       .81363 (258, 5)       .62324 (296, 6)       .58529 ( 69, 1)       .51124 (296, 6)
    250.0 /       1.04281 ( 67, 4)       .72525 ( 67, 4)       .69074 (348, 3)       .54385 (260, 3)       .49171 (260, 3)
    240.0 /       1.10844 ( 76, 3)       .80139 (292, 4)       .70433 (  9, 3)       .62297 (  9, 3)       .55794 (  9, 3)
    230.0 /        .85810 (155, 3)       .79229 (340, 7)       .72444 (340, 7)       .60099 (340, 7)       .52289 (340, 7)
    220.0 /        .87395 (338, 4)       .60384 (290, 4)       .58973 (349, 2)       .57949 (349, 2)       .55042 (349, 2)
    210.0 /        .72762 (294, 4)       .58796 ( 79, 8)       .56354 ( 79, 8)       .47974 (303, 5)       .42300 (303, 5)
    200.0 /        .61381 (347, 2)       .47568 (108, 4)       .39899 (306, 4)       .44029 (306, 5)       .39848 (347, 2)
    190.0 /        .86831 (289, 4)       .65836 (363, 3)       .54341 (307, 1)       .50493 (  5, 8)       .48075 (307, 1)
    180.0 /        .82653 ( 11, 5)       .62636 ( 81, 1)       .57072 ( 81, 1)       .47059 ( 81, 1)       .44759 (156, 7)
    170.0 /        .82200 ( 28, 5)       .61723 ( 28, 5)       .48613 (127, 6)       .40075 (288, 4)       .36359 (288, 4)
    160.0 /        .71561 (  5, 5)       .60739 (  5, 4)       .53615 (  5, 4)       .43332 (  5, 4)       .41627 (  5, 3)
    150.0 /        .74885 (123, 6)       .60347 (153, 6)       .56083 ( 43, 2)       .48962 ( 43, 2)       .43677 ( 43, 2)
    140.0 /        .78343 (289, 5)       .59840 ( 66, 6)       .49843 ( 66, 6)       .39696 (346, 8)       .35464 ( 13, 4)
    130.0 /        .74904 ( 43, 6)       .59370 (189, 6)       .54224 ( 42, 7)       .48834 ( 42, 7)       .44175 ( 42, 7)
    120.0 /        .81299 (189, 6)       .69685 (189, 6)       .53891 (228, 6)       .49685 (336, 7)       .47755 (336, 7)
    110.0 /       1.11067 (359, 5)       .90077 (359, 5)       .66336 (359, 5)       .44828 (359, 5)       .37529 (250, 6)
    100.0 /       1.12494 (160, 6)       .84050 (160, 6)       .58976 ( 19, 5)       .48094 ( 91, 6)       .41679 ( 19, 5)
     90.0 /       1.24127 (157, 6)       .86624 (157, 6)       .62212 ( 65, 6)       .53292 ( 65, 6)       .46871 ( 99, 3)
     80.0 /        .92908 ( 42, 4)       .72615 ( 42, 4)       .57059 ( 42, 4)       .46476 (310, 6)       .41762 (310, 6)
     70.0 /        .92317 (256, 5)       .69366 (256, 5)       .56515 ( 62, 6)       .45625 ( 62, 6)       .42493 (202, 7)
     60.0 /        .90596 (224, 5)       .68814 (224, 5)       .59002C(163, 3)       .50515 (322, 5)       .45245 (322, 5)
     50.0 /        .74284 (  4, 5)       .57383 ( 45, 6)       .53045 (351, 6)       .44072 (351, 6)       .38332 (351, 6)
     40.0 /        .90667 ( 35, 5)       .65980 (299, 5)       .58912 ( 75, 6)       .55216 (299, 5)       .49950 (299, 5)
     30.0 /        .90060 ( 53, 6)       .66108 (170, 4)       .61993 (185, 4)       .55129 (210, 7)       .49660 (210, 7)
     20.0 /        .85328 (321, 4)       .83047 ( 52, 5)       .77209 ( 52, 5)       .67068 ( 52, 5)       .60132 ( 52, 5)
     10.0 /       1.00046 (321, 4)       .77349 ( 37, 6)       .82697 ( 37, 6)       .78040 ( 37, 6)       .72083 ( 37, 6)
1                                                                                                                  HIGH
                                                                                                                    8-HR
                                                                                                                   SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***
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                    * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                            * FROM ALL SOURCES *
                                           * FOR THE RECEPTOR GRID *

                  * MAXIMUM VALUE EQUALS      1.50446 AND OCCURRED AT (      966.0,      90.0) *

 DIRECTION /                                          RANGE (METERS)
 (DEGREES) /          568.0               738.0               966.0               1306.0              1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /      .74602 (218, 2)     .55706 (181, 2)     .60806 (139, 2)     .57065 (139, 2)     .47182 (139, 2)
    350.0 /      .66333 (126, 2)     .89481 (126, 2)     .85896 (126, 2)     .63834 (126, 2)     .51194 ( 75, 2)
    340.0 /      .50084 (266, 2)     .63873 (126, 2)     .64402 (126, 2)     .55182 (281, 2)     .47270 (281, 2)
    330.0 /      .54155 (148, 2)     .76375 (148, 2)     .75694 (148, 2)     .71286 (329, 2)     .66578 (329, 2)
    320.0 /      .36501C(237, 2)     .48572 (233, 2)     .61409 (272, 2)     .65361 (329, 2)     .63095 (329, 2)
    310.0 /      .68264C(189, 2)     .75682C(189, 2)     .96579 (328, 2)    1.16311 (328, 2)    1.06874 (328, 2)
    300.0 /      .98962C(189, 2)    1.07539C(189, 2)     .95197C(189, 2)     .88064 (286, 2)     .71864 (286, 2)
    290.0 /      .86516 (238, 2)     .91902 (315, 2)    1.09985 (315, 2)     .97877 (315, 2)     .74079 (315, 2)
    280.0 /      .60207C(237, 2)     .90804 (315, 2)    1.15728 (315, 2)    1.11994 (315, 2)     .91210 (315, 2)
    270.0 /      .57538 (188, 2)     .98273 (188, 2)    1.12556 (188, 2)     .94436 (188, 2)     .73616 (312, 2)
    260.0 /      .61455 (247, 2)    1.00003 (260, 2)    1.13094 (260, 2)    1.11455 (258, 2)     .93587 (258, 2)
    250.0 /      .57982 (260, 2)    1.02734 (260, 2)    1.28024 (260, 2)    1.23771 (260, 2)    1.02643 (260, 2)
    240.0 /      .72804C(235, 2)     .74372C(235, 2)     .95465 (292, 2)    1.09106 (292, 2)     .98615 (292, 2)
    230.0 /      .89396C(235, 2)     .69768C(235, 2)     .78882 ( 88, 2)     .84533 ( 88, 2)     .72530 ( 88, 2)
    220.0 /      .73558C(235, 2)     .57758 (113, 2)     .75039 (293, 2)     .81226 (293, 2)     .70508 (293, 2)
    210.0 /      .49553 (149, 2)     .68431 (113, 2)     .87866 ( 12, 2)    1.05025 ( 12, 2)     .97216 ( 12, 2)
    200.0 /      .39295 (325, 2)     .69982 (325, 2)     .83295 (325, 2)     .72309 (325, 2)     .53262 (325, 2)
    190.0 /      .38916 (108, 2)     .47375 ( 87, 2)     .55074 (325, 2)     .55707 ( 11, 2)     .56802 ( 11, 2)
    180.0 /      .36317 (152, 2)     .45410 ( 44, 2)     .57528 ( 44, 2)     .55529 ( 44, 2)     .45157 ( 44, 2)
    170.0 /      .37095 (177, 2)     .47039 ( 44, 2)     .62341 ( 44, 2)     .63099 ( 44, 2)     .53073 ( 44, 2)
    160.0 /      .45474 (177, 2)     .49032 (177, 2)     .42278 (177, 2)     .46878 (289, 2)     .52588 (  5, 2)
    150.0 /      .38962 (162, 2)     .47623 (169, 2)     .56685 (169, 2)     .56010 (169, 2)     .49825 (169, 2)
    140.0 /      .44125C(195, 2)     .62505 (142, 2)     .71434 (142, 2)     .60160 (142, 2)     .52407 (103, 2)
    130.0 /      .40423 (112, 2)     .64467 (112, 2)     .73540 (112, 2)     .68711 (103, 2)     .61968 (103, 2)
    120.0 /      .32654 (131, 2)     .49447 (112, 2)     .64595 (112, 2)     .63466 (112, 2)     .52334 ( 20, 2)
    110.0 /      .49966 (205, 2)     .73672 (129, 2)     .85568 (106, 2)     .82659 (106, 2)     .68185 (106, 2)
    100.0 /      .84201C(213, 2)     .99050 (129, 2)    1.11407 (129, 2)     .97258 (229, 2)     .88493 (229, 2)
     90.0 /     1.00422C(213, 2)    1.27548C(278, 2)    1.50446C(278, 2)    1.30060C(278, 2)     .95653C(278, 2)
     80.0 /     1.01263 (219, 2)    1.13150C(278, 2)    1.29838C(278, 2)    1.09350C(278, 2)     .78896C(278, 2)
     70.0 /     1.17925C(197, 2)    1.06245C(197, 2)    1.06194 (115, 2)     .93618 (115, 2)     .71070 (115, 2)
     60.0 /     1.16215C(197, 2)    1.02324C(197, 2)     .89653 ( 97, 2)     .83128 (277, 2)     .71846 (277, 2)
     50.0 /      .84798 (250, 2)     .74242 (250, 2)     .68960 (110, 2)     .66019 (  4, 2)     .58752 (  4, 2)
     40.0 /      .80374C(244, 2)     .66621C(244, 2)     .55570 ( 53, 2)     .64066C(170, 2)     .58452C(170, 2)
     30.0 /      .72047C(244, 2)     .75319 (214, 2)     .87222 (214, 2)     .73770 (214, 2)     .53335 (214, 2)
     20.0 /      .60093 (214, 2)    1.01056 (214, 2)    1.14687 (214, 2)     .95993 (214, 2)     .73809 (321, 2)
     10.0 /      .62579 (218, 2)     .77967 (181, 2)     .83503 (181, 2)     .67600 (181, 2)     .60931 (346, 2)
1                                                                                                      HIGH
                                                                                                        8-HR
                                                                                                       SGROUP#  1
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                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***

                   * HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                            * FROM ALL SOURCES *
                                          * FOR THE RECEPTOR GRID *

                 * MAXIMUM VALUE EQUALS      1.50446 AND OCCURRED AT (      966.0,      90.0) *

 DIRECTION /                                                 RANGE (METERS)
 (DEGREES) /         2215.0              2954.0              3862.0              5112.0              6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /     .43283 (299, 2)     .46544 (345, 2)     .46041 (345, 2)     .41116 (345, 2)     .37136 (345, 2)
    350.0 /     .42393 ( 75, 2)     .31122 ( 75, 2)     .30249 (357, 3)     .27677 (357, 3)     .25193 (357, 3)
    340.0 /     .37037 (232, 2)     .35934 ( 73, 1)     .33035 ( 73, 1)     .32156 (232, 3)     .30957 (232, 3)
    330.0 /     .53221 (329, 2)     .37081 (329, 2)     .24731 (329, 2)     .25701C(164, 1)     .25210C(164, 1)
    320.0 /     .51690 (329, 2)     .36778 (329, 2)     .37275 ( 75, 1)     .39534 ( 75, 1)     .39203 ( 75, 1)
    310.0 /     .84851 (328, 2)     .59194 (328, 2)     .51356 ( 72, 1)     .42177 ( 72, 1)     .36497 ( 72, 1)
    300.0 /     .56458 (328, 2)     .39237 (328, 2)     .30954 ( 69, 2)     .25501 ( 69, 2)     .23857 (145, 3)
    290.0 /     .51652 (311, 2)     .36594 (343, 1)     .38959 (343, 1)     .36659 (343, 1)     .33889 (343, 1)
    280.0 /     .69260 (327, 2)     .53111 (327, 2)     .40017 (327, 2)     .29169 (327, 2)     .24547C(174, 1)
    270.0 /     .67148 (314, 2)     .56041 (314, 2)     .44109 (314, 2)     .35896 ( 69, 1)     .32036 ( 69, 1)
    260.0 /     .70642 (258, 2)     .47600 (258, 2)     .32373 (332, 3)     .28055 (332, 3)     .24873 (332, 3)
    250.0 /     .77290 (260, 2)     .52244 (260, 2)     .34543 (260, 2)     .25707 ( 10, 1)     .24828 (351, 1)
    240.0 /     .78701 (292, 2)     .56152 (292, 2)     .48680 (  9, 1)     .42693 (  9, 1)     .38026 (  9, 1)
    230.0 /     .57513 (293, 2)     .56349 (  8, 2)     .50207 (  8, 2)     .40927 (  8, 2)     .36388 (340, 3)
    220.0 /     .56182 (339, 2)     .56485 (339, 2)     .50457 (339, 2)     .47484 (361, 2)     .44358 (361, 2)
    210.0 /     .78082 ( 12, 2)     .55642 ( 12, 2)     .49400 (301, 2)     .40614 (301, 2)     .35225 (301, 2)
    200.0 /     .37110 (338, 2)     .31561 (339, 3)     .31970 (306, 2)     .31989 (306, 2)     .30586 (306, 2)
    190.0 /     .50500 ( 11, 2)     .39968 ( 11, 2)     .30246 (307, 1)     .29092 (307, 1)     .27113 (307, 1)
    180.0 /     .39093 ( 80, 1)     .41653 ( 80, 1)     .38153 ( 80, 1)     .31620 ( 80, 1)     .27459 ( 80, 1)
    170.0 /     .39885 ( 44, 2)     .29214 (288, 2)     .27912 (288, 2)     .25132 (288, 2)     .23066 (288, 2)
    160.0 /     .64133 (  5, 2)     .68229 (  5, 2)     .64812 (  5, 2)     .57513 (  5, 2)     .52409 (  5, 2)
    150.0 /     .40973 (169, 2)     .30874 (123, 3)     .27097 (123, 3)     .23753C( 60, 1)     .21887C( 60, 1)
    140.0 /     .44101 (103, 2)     .34361 (103, 2)     .26025 (103, 2)     .20999 ( 66, 3)     .19138 ( 66, 3)
    130.0 /     .48708 (103, 2)     .42637 ( 27, 1)     .40482 ( 27, 1)     .34693 ( 27, 1)     .30664 ( 27, 1)
    120.0 /     .51321 ( 20, 2)     .45463 ( 20, 2)     .37327 ( 20, 2)     .29562 (100, 3)     .28163 (100, 3)
    110.0 /     .57950 ( 65, 2)     .52258 ( 65, 2)     .43528 ( 65, 2)     .33879 ( 65, 2)     .28757 ( 65, 2)
    100.0 /     .70221 (229, 2)     .49060 (229, 2)     .35880C(197, 3)     .27498C(197, 3)     .23889C(160, 3)
     90.0 /     .71054 (184, 2)     .54898 (184, 2)     .41037 (184, 2)     .29224 (184, 2)     .23785 (184, 2)
     80.0 /     .57533 ( 62, 2)     .39040 ( 62, 2)     .25670 ( 62, 2)     .28585C(282, 3)     .29060C(282, 3)
     70.0 /     .49376 (115, 2)     .35313 ( 98, 3)     .37874 ( 98, 3)     .36228 ( 98, 3)     .33993 ( 98, 3)
     60.0 /     .55125 (277, 2)     .39300 ( 58, 2)     .33968 ( 58, 2)     .28795 ( 58, 3)     .25867 ( 58, 3)
     50.0 /     .45908 (  4, 2)     .32371 (  4, 2)     .26386 (322, 2)     .23176 (322, 2)     .20692 (322, 2)
     40.0 /     .46468C(170, 2)     .35674 (324, 2)     .27000 (324, 2)     .23191 ( 75, 3)     .21729 ( 75, 3)
     30.0 /     .47766 (185, 2)     .48376 (210, 3)     .48538 (210, 3)     .43575 (210, 3)     .39378 (210, 3)
     20.0 /     .60942 (321, 2)     .49245 ( 37, 2)     .39588 ( 37, 2)     .30918 ( 52, 2)     .27857 ( 52, 2)
     10.0 /     .62509 (346, 2)     .60165 (346, 2)     .54070 (346, 2)     .45735 (346, 2)     .40669 (346, 2)
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1                                                                                                                              2ND HIGH
                                                                                                                                8-HR
                                                                                                                               SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                              * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                       * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                              * MAXIMUM VALUE EQUALS      1.25234 AND OCCURRED AT (     966.0,      90.0) *

 DIRECTION /                                                    RANGE (METERS)
 (DEGREES) /            568.0                738.0                966.0                1306.0                1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /        .47246 (165, 2)      .55523 (126, 2)      .57482 (181, 2)      .45270 (148, 2)      .46259 ( 75, 2)
    350.0 /        .53673 (266, 2)      .63808 (254, 2)      .64838 (254, 2)      .52675 ( 75, 2)      .43319 (126, 2)
    340.0 /        .49893C(217, 2)      .57176 (132, 2)      .60782 (132, 2)      .50807 (126, 2)      .36818 (194, 2)
    330.0 /        .36785 (162, 2)      .54650 (132, 2)      .57468 (329, 2)      .57626 (148, 2)      .42895 (281, 2)
    320.0 /        .32479 (173, 2)      .48118 (272, 2)      .59250 (242, 2)      .61516 (224, 2)      .58200 (224, 2)
    310.0 /        .57246C(237, 2)      .69547 (272, 2)      .82884 (286, 2)      .91262 (286, 2)      .79689 (286, 2)
    300.0 /        .71588 (238, 2)      .88484 (220, 2)      .92985 (134, 2)      .87268 (134, 2)      .70835 (134, 2)
    290.0 /        .80577C(189, 2)      .84568 (238, 2)      .85757 (220, 2)      .80464 (147, 2)      .65919 (147, 2)
    280.0 /        .58592 (238, 2)      .82063 (188, 2)      .91670 (188, 2)      .89882 (327, 2)      .83166 (327, 2)
    270.0 /        .56226C(176, 2)      .68007 (261, 2)      .75365 (261, 2)      .75811 (312, 2)      .72639 (314, 2)
    260.0 /        .60967 (260, 2)      .96380 (188, 2)     1.12471 (258, 2)      .97192 (260, 2)      .72967 (260, 2)
    250.0 /        .51481 (120, 2)      .84986 (258, 2)     1.08768 (258, 2)     1.07161 (258, 2)      .88711 (258, 2)
    240.0 /        .51736 (174, 2)      .67147 ( 89, 2)      .88387 ( 89, 2)      .86747 ( 89, 2)      .75079 ( 90, 2)
    230.0 /        .63473 (174, 2)      .68509 (174, 2)      .70733 (292, 2)      .72790 (292, 2)      .66143 (293, 2)
    220.0 /        .45994 (178, 2)      .54481 ( 88, 2)      .71799 ( 88, 2)      .70277 ( 88, 2)      .62250 (290, 2)
    210.0 /        .47736 (113, 2)      .59924 (149, 2)      .69049 (113, 2)      .69465 (294, 2)      .65712 (294, 2)
    200.0 /        .35049 (108, 2)      .46104 (108, 2)      .52814 ( 87, 2)      .49676 ( 87, 2)      .42773 (338, 2)
    190.0 /        .33615C(144, 2)      .47264 (325, 2)      .51070 ( 87, 2)      .46940 ( 81, 2)      .42402 (289, 2)
    180.0 /        .35707C(144, 2)      .39334 (236, 2)      .52081 (236, 2)      .52642 (236, 2)      .44744 (236, 2)
    170.0 /        .24969 ( 44, 2)      .38694 (177, 2)      .50449 (319, 2)      .53795 (319, 2)      .46411 (319, 2)
    160.0 /        .23069C(203, 2)      .31593 (319, 2)      .42110 (319, 2)      .42249 (169, 2)      .43030 (289, 2)
    150.0 /        .32538C(195, 2)      .45779 (119, 2)      .51193 (119, 2)      .47918C(204, 2)      .42702C(204, 2)
    140.0 /        .36761 (142, 2)      .49505C(246, 2)      .57626 (200, 2)      .57366 (103, 2)      .47868 (200, 2)
    130.0 /        .34420 (107, 2)      .54138 (142, 2)      .67184 (142, 2)      .64614 (112, 2)      .50001 (142, 2)
    120.0 /        .27439 (171, 2)      .39635 (107, 2)      .47832 (107, 2)      .47796 ( 20, 2)      .51934 (112, 2)
    110.0 /        .46902 (129, 2)      .68476 (106, 2)      .81483 (129, 2)      .76162 (229, 2)      .63662 (229, 2)
    100.0 /        .67184 (201, 2)      .97955 (201, 2)     1.02742 (201, 2)      .97143 (129, 2)      .73934 (129, 2)
     90.0 /        .80775 (194, 2)     1.11789 (230, 2)     1.25234 (230, 2)     1.10708 (230, 2)      .89617 (227, 2)
     80.0 /        .77575C(197, 2)      .98223 (151, 2)     1.03887 (151, 2)      .85466 ( 62, 2)      .74898 ( 62, 2)
     70.0 /       1.04003 (219, 2)     1.01201 (196, 2)      .93110 (277, 2)      .89221 (277, 2)      .69895 (277, 2)
     60.0 /        .83469 (219, 2)      .80535 ( 97, 2)      .83907 (171, 2)      .77268 (171, 2)      .65767 (171, 2)
     50.0 /        .68284C(197, 2)      .66841 (110, 2)      .66154 (198, 2)      .57237 (199, 2)      .45329 (199, 2)
     40.0 /        .65885 (250, 2)      .57610 (202, 2)      .54572C(170, 2)      .59292 (199, 2)      .52290 ( 63, 2)
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      30.0 /        .55633 (202, 2)       .70304 (240, 2)       .77246 (240, 2)       .62710 (240, 2)       .50791C(195, 2)
      20.0 /        .47977 (206, 2)       .72923 (240, 2)       .81934 (240, 2)       .76275 (321, 2)       .69253 (214, 2)
      10.0 /        .50846 (181, 2)       .57842 (214, 2)       .67428 ( 70, 2)       .64381 ( 70, 2)       .53394 ( 70, 2)
1                                                                                                                          2ND HIGH
                                                                                                                            8-HR
                                                                                                                           SGROUP#  1
                                *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                           * SECOND HIGHEST  8-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                        * FROM ALL SOURCES *
                                                     * FOR THE RECEPTOR GRID *

                            * MAXIMUM VALUE EQUALS      1.25234 AND OCCURRED AT (      966.0,      90.0) *

 DIRECTION /                                                     RANGE (METERS)
 (DEGREES) /                2215.0                2954.0                3862.0                5112.0                6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /        .42387 ( 75, 2)       .45819 (299, 2)       .41652 (299, 2)       .34411 (299, 2)       .30115 (299, 2)
     350.0 /        .30541 (330, 2)       .29336 (357, 3)       .27729 (  1, 1)       .25329 (  1, 1)       .23010 (  1, 1)
     340.0 /        .35696 (281, 2)       .31259 (232, 2)       .31798 (232, 3)       .27449 ( 73, 1)       .25333 (215, 1)
     330.0 /        .37309 ( 41, 2)       .28730 ( 41, 2)       .24238C(164, 1)       .22119 ( 41, 1)       .23259 ( 41, 1)
     320.0 /        .47710 (224, 2)       .36542 (332, 2)       .31666 (225, 1)       .29259 (225, 1)       .26926 (225, 1)
     310.0 /        .64377 (297, 2)       .56765 ( 72, 1)       .46013 ( 77, 3)       .40521 ( 77, 3)       .36393 ( 77, 3)
     300.0 /        .52217 (134, 2)       .38584 ( 68, 2)       .28728 ( 68, 2)       .24683 (145, 3)       .23568 (169, 3)
     290.0 /        .50959 (315, 2)       .36135 (311, 2)       .34082 (333, 1)       .33571 (333, 1)       .31953 (333, 1)
     280.0 /        .66999 (315, 2)       .44131 (315, 2)       .28544 (315, 2)       .25095 (186, 3)       .24157 (327, 2)
     270.0 /        .62885 (312, 2)       .48327 (312, 2)       .41372 ( 69, 1)       .32763 (314, 2)       .27798 ( 32, 3)
     260.0 /        .50372 (260, 2)       .33712 (296, 2)       .31407 (258, 2)       .26081 ( 69, 1)       .24355 ( 69, 1)
     250.0 /        .65944 (258, 2)       .43779 (258, 2)       .28433 (258, 2)       .24907 (351, 1)       .23646 ( 10, 1)
     240.0 /        .58450 ( 90, 2)       .49490 (  9, 1)       .44532 (318, 1)       .36606 (318, 1)       .31816C(188, 1)
     230.0 /        .55487 (  8, 2)       .44991 (293, 2)       .44555 (340, 3)       .39982 (340, 3)       .35377 (  8, 2)
     220.0 /        .53562 (293, 2)       .46870 (361, 2)       .49671 (361, 2)       .41317 (339, 2)       .35776 (339, 2)
     210.0 /        .54870 (301, 2)       .55108 (301, 2)       .38687 ( 12, 2)       .32295 (303, 2)       .28891 (303, 2)
     200.0 /        .35807 (325, 2)       .28595 (306, 2)       .29872 (339, 3)       .25567 (339, 3)       .22619 (339, 3)
     190.0 /        .35888C(237, 3)       .31684C(237, 3)       .29949 ( 11, 2)       .25292 (339, 1)       .22821 (339, 1)
     180.0 /        .35637 ( 11, 2)       .27756 (317, 2)       .25856 (303, 1)       .26163 (303, 1)       .24949 (303, 1)
     170.0 /        .38927 (363, 2)       .28925 (363, 2)       .22539 ( 11, 1)       .20420 (302, 3)       .19130 (302, 3)
     160.0 /        .34236 (289, 2)       .24940 (289, 2)       .23339 (354, 2)       .20272 (354, 2)       .18034 (354, 2)
     150.0 /        .33289C(204, 2)       .30377 (169, 2)       .25496C( 60, 1)       .22405C(127, 3)       .21450C(127, 3)
     140.0 /        .39972 ( 13, 2)       .31159 ( 13, 2)       .24119 ( 27, 3)       .20575 (346, 3)       .18452 (346, 3)
     130.0 /        .38234 ( 27, 1)       .33720 (103, 2)       .23507 ( 42, 3)       .23277C(141, 3)       .23220C(141, 3)
     120.0 /        .38213 (112, 2)       .31967 ( 65, 2)       .29640 (100, 3)       .28573 ( 20, 2)       .26574 (336, 3)
     110.0 /        .57943C(359, 2)       .46165C(359, 2)       .33563C(359, 2)       .28638C(229, 3)       .28745C(229, 3)
     100.0 /        .56428 (227, 2)       .44975C(197, 3)       .33133 (229, 2)       .27027C(160, 3)       .23305C(197, 3)
      90.0 /        .68581 (227, 2)       .47177 (227, 2)       .31859 (227, 2)       .22683 ( 99, 1)       .20143 ( 65, 3)
      80.0 /        .52070C(278, 2)       .32874C(163, 2)       .25321C(282, 3)       .23190 (183, 1)       .22776 (183, 1)
      70.0 /        .48850 (277, 2)       .34904C(256, 2)       .27344 (211, 3)       .23740 (211, 3)       .21433 (211, 3)
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     60.0 /        .52178 (171, 2)        .37527 (277, 2)        .32691 ( 58, 3)        .26915 ( 58, 2)        .25016 (212, 1)
     50.0 /        .33479 ( 38, 2)        .28283 ( 50, 2)        .22718 ( 50, 2)        .18160 (  3, 3)        .18071 ( 53, 3)
     40.0 /        .45096 (324, 2)        .32413C(170, 2)        .26832C( 25, 2)        .22742C( 25, 2)        .20497C( 25, 2)
     30.0 /        .42054 ( 10, 2)        .45568 (185, 2)        .41805 (185, 2)        .36347 (185, 2)        .32760 (185, 2)
     20.0 /        .58922 ( 37, 2)        .43749 (321, 2)        .35061 ( 52, 2)        .30798 ( 37, 2)        .26521 ( 37, 2)
     10.0 /        .41861 ( 37, 2)        .35953 ( 37, 2)        .29566 ( 37, 2)        .23358 ( 37, 2)        .20173 ( 37, 2)
1                                                                                                                                HIGH
                                                                                                                                 24-HR
                                                                                                                                 SGROUP#  1
                                    *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                                   * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                           * FROM ALL SOURCES *
                                                         * FOR THE RECEPTOR GRID *

                                  * MAXIMUM VALUE EQUALS       .55661 AND OCCURRED AT (     966.0,     90.0) *

  DIRECTION /                                                      RANGE (METERS)
  (DEGREES) /              568.0                 738.0                 966.0                1306.0                1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    360.0 /        .24867 (218, 1)        .20043C(254, 1)        .20923C(254, 1)        .19022 (139, 1)        .15743C(208, 1)
    350.0 /        .22111 (126, 1)        .29827 (126, 1)        .28632 (126, 1)        .21278 (126, 1)        .17065 ( 75, 1)
    340.0 /        .17437C(266, 1)        .21781C(132, 1)        .23155C(132, 1)        .21022C(281, 1)        .18008C(281, 1)
    330.0 /        .18677 (148, 1)        .27597 (148, 1)        .29999 (148, 1)        .26513 (148, 1)        .24222C(329, 1)
    320.0 /        .12167C(237, 1)        .18253C(132, 1)        .20472 (272, 1)        .24082C(329, 1)        .24076C(329, 1)
    310.0 /        .23892C(189, 1)        .26489C(189, 1)        .32213 (328, 1)        .38906 (328, 1)        .36115 (328, 1)
    300.0 /        .34637C(189, 1)        .37639C(189, 1)        .36589C(238, 1)        .34811C(238, 1)        .29891 (272, 1)
    290.0 /        .38452C(238, 1)        .37586C(238, 1)        .36662 (315, 1)        .32626 (315, 1)        .27641 (147, 1)
    280.0 /        .26041C(238, 1)        .35832C(188, 1)        .41773C(188, 1)        .37349 (315, 1)        .33442C( 94, 1)
    270.0 /        .24258C(188, 1)        .41467C(188, 1)        .47575C(188, 1)        .40026C(188, 1)        .32848C(235, 1)
    260.0 /        .24582C(247, 1)        .40587C(188, 1)        .45397C(188, 1)        .37852 (258, 1)        .32641 (258, 1)
    250.0 /        .22881C(120, 1)        .34301 (260, 1)        .42968 (260, 1)        .42201 (260, 1)        .36209 (260, 1)
    240.0 /        .28313C(235, 1)        .28922C(235, 1)        .33105 ( 89, 1)        .36384 (292, 1)        .33349 ( 89, 1)
    230.0 /        .34765C(235, 1)        .27132C(235, 1)        .26922C(293, 1)        .30464C(293, 1)        .30501 (  8, 1)
    220.0 /        .28606C(235, 1)        .22943C(293, 1)        .33364C(293, 1)        .36190C(293, 1)        .31676C(293, 1)
    210.0 /        .17358C(113, 1)        .24884C(113, 1)        .30562C( 12, 1)        .36531C( 12, 1)        .33814C( 12, 1)
    200.0 /        .15577C(108, 1)        .23362 (325, 1)        .27953 (325, 1)        .24728 (325, 1)        .19085 (325, 1)
    190.0 /        .17296C(108, 1)        .21055C( 87, 1)        .22698C( 87, 1)        .23556 ( 11, 1)        .26234 ( 11, 1)
    180.0 /        .13917C(108, 1)        .17482C(236, 1)        .23147C(236, 1)        .23397C(236, 1)        .23270 ( 81, 1)
    170.0 /        .16487C(177, 1)        .17197C(177, 1)        .22680C( 44, 1)        .23456C( 44, 1)        .20054C( 44, 1)
    160.0 /        .20210C(177, 1)        .21792C(177, 1)        .18790C(177, 1)        .15724 (289, 1)        .18361C(  5, 1)
    150.0 /        .17317C(162, 1)        .20416C(119, 1)        .23154C(119, 1)        .20573 (169, 1)        .18742 (169, 1)
    140.0 /        .17244C(142, 1)        .30646C(142, 1)        .37526C(142, 1)        .34743C(142, 1)        .27421C(142, 1)
    130.0 /        .13492 (112, 1)        .24302C(142, 1)        .30285C(142, 1)        .28485C(142, 1)        .24266C(113, 1)
    120.0 /        .11358C(131, 1)        .17295C(236, 1)        .22488C(236, 1)        .22982C(101, 1)        .25309C( 20, 1)
    110.0 /        .21039C(205, 1)        .27841C(129, 1)        .32820C(129, 1)        .31307 (106, 1)        .28408 (106, 1)
    100.0 /        .32753C(213, 1)        .36963 (201, 1)        .42187 (201, 1)        .43903C(227, 1)        .38987C(227, 1)
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      90.0 /       .39058C(213, 1)      .49684C(230, 1)      .55661C(230, 1)      .49206C(230, 1)      .38156C(230, 1)
      80.0 /       .37783C(219, 1)      .39395C(230, 1)      .43279C(278, 1)      .36462C(119, 1)      .30494C(119, 1)
      70.0 /       .45860C(197, 1)      .42349C(196, 1)      .47233C(115, 1)      .41642C(115, 1)      .32462 (202, 1)
      60.0 /       .45195C(197, 1)      .39793C(197, 1)      .35861C( 97, 1)      .36946C(277, 1)      .31932C(277, 1)
      50.0 /       .37688C(250, 1)      .32996C(250, 1)      .24447C(250, 1)      .22895C(199, 1)      .19817 (  4, 1)
      40.0 /       .31257C(244, 1)      .25908C(244, 1)      .26781C( 53, 1)      .24650C( 53, 1)      .20352C(199, 1)
      30.0 /       .28018C(244, 1)      .33545C(214, 1)      .41344C(214, 1)      .39213C(214, 1)      .32114C(214, 1)
      20.0 /       .25497C(214, 1)      .43199C(214, 1)      .49810C(214, 1)      .42908C(214, 1)      .31920C(214, 1)
      10.0 /       .20860 (218, 1)      .27119C(181, 1)      .29044C(181, 1)      .26090C(102, 1)      .22327C(102, 1)
1                                                                                                                     HIGH
                                                                                                                      24-HR
                                                                                                                      SGROUP#  1
                                   *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                                  * HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                  * FROM ALL SOURCES *
                                                * FOR THE RECEPTOR GRID *

                                * MAXIMUM VALUE EQUALS       .55661 AND OCCURRED AT (     966.0,      90.0) *

   DIRECTION /                                               RANGE (METERS)
   (DEGREES) /           2215.0               2954.0               3862.0               5112.0               6000.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /       .15688C(210, 1)      .17439C(210, 1)      .16841C(210, 1)      .14786C(210, 1)      .13256C(210, 1)
     350.0 /       .14596C(  1, 1)      .14983C(  1, 1)      .14123C(  1, 1)      .12291 (232, 1)      .11157 (232, 1)
     340.0 /       .18956 (232, 1)      .19614 (232, 1)      .18455 (232, 1)      .16098 (232, 1)      .14543 (232, 1)
     330.0 /       .19958C(329, 1)      .14625C(329, 1)      .12926 ( 41, 1)      .11895 ( 41, 1)      .11278 ( 41, 1)
     320.0 /       .20670C(329, 1)      .16851 ( 72, 1)      .15846 ( 72, 1)      .13585 ( 72, 1)      .13153 ( 75, 1)
     310.0 /       .31260 ( 72, 1)      .30523 ( 72, 1)      .26584 ( 72, 1)      .21269 ( 72, 1)      .18206 ( 72, 1)
     300.0 /       .24842 (272, 1)      .19148 (272, 1)      .15479 ( 69, 1)      .14130 ( 69, 1)      .13629C(353, 1)
     290.0 /       .21599 (147, 1)      .17653C(135, 1)      .14820C(343, 1)      .13712C(343, 1)      .12600C(343, 1)
     280.0 /       .27709C( 94, 1)      .21198C( 94, 1)      .16198 ( 95, 1)      .13159 ( 95, 1)      .11562 ( 95, 1)
     270.0 /       .29901C(235, 1)      .25070C(235, 1)      .21253 (312, 1)      .18133 (312, 1)      .16424 (312, 1)
     260.0 /       .25910 (258, 1)      .19088 (258, 1)      .15631 (296, 1)      .13124 (296, 1)      .11533 (296, 1)
     250.0 /       .29174 (260, 1)      .22458 (260, 1)      .17624 (260, 1)      .14526 ( 85, 1)      .13102 ( 85, 1)
     240.0 /       .30738 (318, 1)      .33313 (318, 1)      .31199 (318, 1)      .26607 (318, 1)      .23572 (318, 1)
     230.0 /       .37250 (  8, 1)      .38609 (  8, 1)      .34885 (  8, 1)      .28736 (  8, 1)      .24944 (  8, 1)
     220.0 /       .27717 (339, 1)      .30316 (361, 1)      .33814 (361, 1)      .33616 (361, 1)      .32052 (361, 1)
     210.0 /       .27159C( 12, 1)      .20576C(301, 1)      .19236C(301, 1)      .16579C(301, 1)      .14809C(301, 1)
     200.0 /       .15088C( 87, 1)      .13793 (338, 1)      .14328 (306, 1)      .14677 (306, 1)      .14203 (306, 1)
     190.0 /       .25473 ( 11, 1)      .22061 ( 11, 1)      .17810 ( 11, 1)      .13580 ( 11, 1)      .11477 ( 11, 1)
     180.0 /       .22580 ( 81, 1)      .19956 ( 81, 1)      .17511 ( 80, 1)      .14376 ( 80, 1)      .13104 (303, 1)
     170.0 /       .15267C( 44, 1)      .12984C(288, 1)      .12405C(288, 1)      .11170C(288, 1)      .10252C(288, 1)
     160.0 /       .22422C(  5, 1)      .23890C(  5, 1)      .22722C(  5, 1)      .20172C(  5, 1)      .18381C(  5, 1)
     150.0 /       .17589 ( 43, 1)      .16667 ( 43, 1)      .14969C( 60, 1)      .14234C( 60, 1)      .13474C( 60, 1)
     140.0 /       .24261C(161, 1)      .19600C(161, 1)      .14886C(161, 1)      .11837 ( 27, 1)      .10547 ( 27, 1)
     130.0 /       .22682 ( 27, 1)      .23567 ( 27, 1)      .21369 ( 27, 1)      .17662 ( 27, 1)      .15354 ( 27, 1)
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      120.0 /       .26581C( 20, 1)      .26009C( 20, 1)      .23740C( 20, 1)      .20307C( 20, 1)      .18140C( 20, 1)
      110.0 /       .25759C( 65, 1)      .23240C( 65, 1)      .19374C( 65, 1)      .15104C( 65, 1)      .13005C(229, 1)
      100.0 /       .31704C(227, 1)      .24292C(160, 1)      .18717C(160, 1)      .13815C(160, 1)      .11512C(160, 1)
       90.0 /       .29750C(158, 1)      .21492C(158, 1)      .16543 (184, 1)      .13451C( 65, 1)      .12513C( 65, 1)
       80.0 /       .22764C(119, 1)      .18690 (183, 1)      .15577 (183, 1)      .12933 (183, 1)      .11680 (183, 1)
       70.0 /       .27404 (202, 1)      .21630 (202, 1)      .17927C( 98, 1)      .16478C( 98, 1)      .15249C( 98, 1)
       60.0 /       .24500C(277, 1)      .25801 ( 58, 1)      .24115 ( 58, 1)      .20600 ( 58, 1)      .18268 ( 58, 1)
       50.0 /       .19976 ( 58, 1)      .19348 ( 58, 1)      .16983 ( 58, 1)      .13820 ( 58, 1)      .11973 ( 58, 1)
       40.0 /       .17527 ( 63, 1)      .14676 ( 63, 1)      .11934 ( 63, 1)      .09278 ( 63, 1)      .08300C(231, 1)
       30.0 /       .24004C(214, 1)      .21320C(210, 1)      .21418 (185, 1)      .20140 (185, 1)      .18892 (185, 1)
       20.0 /       .21758C(214, 1)      .17786 ( 37, 1)      .14985 ( 37, 1)      .13847C( 70, 1)      .13178C( 70, 1)
       10.0 /       .20836 (346, 1)      .20055 (346, 1)      .18023 (346, 1)      .15245 (346, 1)      .13556 (346, 1)
1                                                                                                                2ND HIGH
                                                                                                                 24-HR
                                                                                                                 SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                              * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)      *
                                                           * FROM ALL SOURCES *
                                                         * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS       .50149 AND OCCURRED AT (      966.0,       90.0) *

   DIRECTION /                                                  RANGE (METERS)
   (DEGREES) /              568.0                738.0                966.0               1306.0               1704.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /       .17180C(165, 1)      .19376C(181, 1)      .20269 (139, 1)      .16812C(208, 1)      .15727 (139, 1)
      350.0 /       .18669C(266, 1)      .24308C(254, 1)      .24700C(254, 1)      .19137C(254, 1)      .14440 (126, 1)
      340.0 /       .15495C(238, 1)      .21291 (126, 1)      .21467 (126, 1)      .18345C(132, 1)      .16364C(194, 1)
      330.0 /       .16353C(162, 1)      .20819C(132, 1)      .21602C(132, 1)      .25445C(329, 1)      .21064 (148, 1)
      320.0 /       .11793C(132, 1)      .17313C( 93, 1)      .20002C(233, 1)      .21192 (224, 1)      .20863 (224, 1)
      310.0 /       .19848C(220, 1)      .23634C(282, 1)      .30140C(286, 1)      .33186C(286, 1)      .29793 ( 77, 1)
      300.0 /       .31825C(238, 1)      .35673C(238, 1)      .36325C(220, 1)      .32987 (272, 1)      .29427C(238, 1)
      290.0 /       .28202C(189, 1)      .31471C(220, 1)      .34303C(220, 1)      .32423 (147, 1)      .25467C(135, 1)
      280.0 /       .21150C(188, 1)      .30270 (315, 1)      .38583 (315, 1)      .37207C(188, 1)      .30442 (315, 1)
      270.0 /       .18742C(176, 1)      .22669 (261, 1)      .29929C( 94, 1)      .33146C(235, 1)      .30371C( 94, 1)
      260.0 /       .24479C(188, 1)      .33391 (260, 1)      .38009 (260, 1)      .37408C(188, 1)      .27255C(172, 1)
      250.0 /       .20535C(114, 1)      .29009 (258, 1)      .37738 (258, 1)      .37986 (258, 1)      .32139 (258, 1)
      240.0 /       .18813C(174, 1)      .23704 ( 89, 1)      .32526C( 90, 1)      .36138 ( 89, 1)      .32911 (292, 1)
      230.0 /       .23084C(174, 1)      .24928C(174, 1)      .26864 (262, 1)      .28690 ( 88, 1)      .29399C(293, 1)
      220.0 /       .19366C(178, 1)      .21056C(113, 1)      .27731 ( 88, 1)      .29895 ( 88, 1)      .26809 ( 88, 1)
      210.0 /       .16518 (149, 1)      .21265C( 87, 1)      .26192C( 87, 1)      .26349C(293, 1)      .23464C(293, 1)
      200.0 /       .13722C(142, 1)      .20491C(108, 1)      .23473C( 87, 1)      .22078C( 87, 1)      .18554C( 87, 1)
      190.0 /       .13324C( 87, 1)      .16461C(108, 1)      .18360 (325, 1)      .19988 ( 81, 1)      .20352 ( 81, 1)
      180.0 /       .12106 (152, 1)      .15802C( 44, 1)      .20031C( 44, 1)      .21858 ( 81, 1)      .19886C(236, 1)
      170.0 /       .08826C( 44, 1)      .16816C( 44, 1)      .17072C(161, 1)      .19271C(161, 1)      .17880C( 15, 1)
      160.0 /       .09378C(162, 1)      .10531 (319, 1)      .14037 (319, 1)      .15631 ( 43, 1)      .15308 ( 43, 1)
```

```
   150.0 /      .13405C(177, 1)      .17848C(246, 1)      .21899C(142, 1)      .20413C(246, 1)      .17328 ( 43, 1)
   140.0 /      .15618C(162, 1)      .22769C(200, 1)      .27652C(200, 1)      .27670C(200, 1)      .26670C(161, 1)
   130.0 /      .13473C(142, 1)      .21659 (112, 1)      .25407 (112, 1)      .26176C(103, 1)      .23607C(103, 1)
   120.0 /      .11207C(205, 1)      .16576 (112, 1)      .22037 (112, 1)      .22498 (112, 1)      .20181C(101, 1)
   110.0 /      .17013C(129, 1)      .23158 (106, 1)      .30122 (106, 1)      .30243C(129, 1)      .26174C(229, 1)
   100.0 /      .28790C(194, 1)      .36120C(129, 1)      .42089C(129, 1)      .38654C(229, 1)      .35052C(229, 1)
    90.0 /      .35901C(194, 1)      .42516C(278, 1)      .50149C(278, 1)      .44940C(227, 1)      .37937C(158, 1)
    80.0 /      .30173C(197, 1)      .37717C(278, 1)      .40354C(157, 1)      .36450C(278, 1)      .28974C( 98, 1)
    70.0 /      .38264C(219, 1)      .41317C(197, 1)      .41382C(277, 1)      .39654C(277, 1)      .31611C(115, 1)
    60.0 /      .30366C(219, 1)      .32214C( 97, 1)      .34768C(277, 1)      .29832C( 97, 1)      .25093C(171, 1)
    50.0 /      .26555C(197, 1)      .24528C(197, 1)      .24399C(199, 1)      .22069 (  4, 1)      .18471 ( 58, 1)
    40.0 /      .29282C(250, 1)      .23951C(250, 1)      .21608C(199, 1)      .23717C(199, 1)      .19522 ( 63, 1)
    30.0 /      .20626C(206, 1)      .31246C(240, 1)      .34331C(240, 1)      .27871C(240, 1)      .20314C( 53, 1)
    20.0 /      .20201C(206, 1)      .32410C(240, 1)      .36415C(240, 1)      .30171C(240, 1)      .24603 (321, 1)
    10.0 /      .18947C(206, 1)      .24368C(214, 1)      .26363C(102, 1)      .23513C(181, 1)      .20310 (346, 1)
1                                                                                                                 2ND HIGH
                                                                                                                  24-HR
                                                                                                                  SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING FOR 1986     ***


                              * SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *
                                                        * FROM ALL SOURCES *
                                                      * FOR THE RECEPTOR GRID *

                               * MAXIMUM VALUE EQUALS       .50149 AND OCCURRED AT (     966.0,      90.0) *

 DIRECTION /                                                   RANGE (METERS)
 (DEGREES) /          2215.0               2954.0               3862.0               5112.0               6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   360.0 /      .14763 (334, 1)      .16104 (345, 1)      .15921 (345, 1)      .14191 (345, 1)      .12799 (345, 1)
   350.0 /      .14131 ( 75, 1)      .13193 (232, 1)      .13501 (232, 1)      .12287C(  1, 1)      .10992C(  1, 1)
   340.0 /      .13823C(  1, 1)      .13684C(  1, 1)      .12587C(  1, 1)      .10910C(  1, 1)      .09834C(  1, 1)
   330.0 /      .15478 (148, 1)      .13942 ( 41, 1)      .10424C(329, 1)      .09864C(164, 1)      .09434C(164, 1)
   320.0 /      .18501 (224, 1)      .16681C(215, 1)      .15024C(215, 1)      .13293 ( 75, 1)      .12457C(335, 1)
   310.0 /      .30156 ( 77, 1)      .28246 ( 77, 1)      .24655 ( 77, 1)      .20112 ( 77, 1)      .17495 ( 77, 1)
   300.0 /      .22661C(238, 1)      .16810 (186, 1)      .14686 (272, 1)      .13874C(353, 1)      .13016 ( 69, 1)
   290.0 /      .21584C(135, 1)      .15936 (147, 1)      .14351C(135, 1)      .11907C(333, 1)      .11544C(353, 1)
   280.0 /      .23709 (327, 1)      .19213 ( 95, 1)      .15785C( 94, 1)      .11871 (327, 1)      .11079C(165, 1)
   270.0 /      .26782 (312, 1)      .24143 (312, 1)      .20259C(235, 1)      .15815C(235, 1)      .13856C(154, 1)
   260.0 /      .21736C(172, 1)      .17124 (296, 1)      .13999 (258, 1)      .12062 (  9, 1)      .10894 (  9, 1)
   250.0 /      .25311C(271, 1)      .19845C(104, 1)      .16903 ( 85, 1)      .14059 (260, 1)      .12844 (365, 1)
   240.0 /      .28272 ( 89, 1)      .27012 (  8, 1)      .24706 (  8, 1)      .20468 (  8, 1)      .18099 (  9, 1)
   230.0 /      .28428 (340, 1)      .28752 (340, 1)      .26190 (340, 1)      .21956 (340, 1)      .19322 (340, 1)
   220.0 /      .24726C(293, 1)      .29349 (339, 1)      .27359 (339, 1)      .23254 (339, 1)      .20536 (339, 1)
   210.0 /      .19848C(301, 1)      .19354C( 12, 1)      .14297 (303, 1)      .12492 (303, 1)      .11120 (303, 1)
   200.0 /      .14767 (338, 1)      .12505 (306, 1)      .12981 (338, 1)      .11744 (338, 1)      .11150 (303, 1)
   190.0 /      .19697 ( 81, 1)      .17939 ( 81, 1)      .15475 ( 81, 1)      .12514 ( 81, 1)      .10844 ( 81, 1)
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  180.0 /       .19081 ( 80, 1)      .19478 ( 80, 1)      .16397 ( 81, 1)      .13784 (303, 1)      .12452 ( 80, 1)
  170.0 /       .14786C( 15, 1)      .12076 ( 11, 1)      .10641 ( 11, 1)      .09118 (302, 1)      .08822 (302, 1)
  160.0 /       .14228 ( 43, 1)      .12644 ( 43, 1)      .10803 ( 43, 1)      .08868 ( 43, 1)      .07819 ( 43, 1)
  150.0 /       .15564 (169, 1)      .14571C( 60, 1)      .14782 ( 43, 1)      .12310 ( 43, 1)      .10824 ( 43, 1)
  140.0 /       .19741C(142, 1)      .14678 ( 27, 1)      .13777 ( 27, 1)      .10597C(161, 1)      .09240 ( 99, 1)
  130.0 /       .20078C(113, 1)      .15384C(200, 1)      .13054C( 13, 1)      .11760C( 13, 1)      .10979C( 13, 1)
  120.0 /       .18546C( 92, 1)      .15754C( 92, 1)      .13294C(229, 1)      .11397 (336, 1)      .10755 (336, 1)
  110.0 /       .24067 (106, 1)      .18994 (106, 1)      .16025C(229, 1)      .14047C(229, 1)      .12838C( 65, 1)
  100.0 /       .30340C(160, 1)      .23639C(227, 1)      .17194C(227, 1)      .12049C(227, 1)      .10418C(228, 1)
   90.0 /       .28984C(227, 1)      .21404 (184, 1)      .16337 ( 99, 1)      .13268 ( 99, 1)      .11421 ( 99, 1)
   80.0 /       .22626 (183, 1)      .16164C( 98, 1)      .11583C( 98, 1)      .09938C(282, 1)      .09646C(282, 1)
   70.0 /       .21960C(115, 1)      .18035C( 98, 1)      .17091 (202, 1)      .14501C(211, 1)      .13040C(211, 1)
   60.0 /       .24327 ( 58, 1)      .16679C(277, 1)      .12039 ( 50, 1)      .11660 (322, 1)      .11036 (322, 1)
   50.0 /       .15916 (  4, 1)      .12040 (  4, 1)      .10422 ( 63, 1)      .09233 ( 63, 1)      .08588C( 53, 1)
   40.0 /       .15711C(324, 1)      .12978C(231, 1)      .10743C(231, 1)      .08989C(231, 1)      .08296C(358, 1)
   30.0 /       .20781C(210, 1)      .21265 (185, 1)      .19817C(210, 1)      .16990C(210, 1)      .15091C(210, 1)
   20.0 /       .20520 ( 37, 1)      .15585C( 70, 1)      .14794C( 70, 1)      .12615C( 52, 1)      .12199 (  4, 1)
   10.0 /       .18708 ( 37, 1)      .18348 ( 37, 1)      .16732 ( 37, 1)      .14332 ( 37, 1)      .12795 ( 37, 1)

RUN ENDED ON 09-15-89 AT 16:44:45
```

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-37

RESULTS OF INCINERATOR STACK EMISSIONS MODELING USING ISC MODEL

FOR 1986, SEASON 3

```
1                     ISCST - VERSION 3.4 (DATED 88348)

                      IBM-PC VERSION (1.64)
                      (C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.
                      SERIAL NUMBER 5958 SOLD TO ICF TECHNOLOGY, INC
                      RUN BEGAN ON 09-12-89 AT 11:48:40


1
                              *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING 1986 SEASON3 ***

                  CALCULATE (CONCENTRATION=1,DEPOSITION=2)                           ISW(1) =   1
                  RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)            ISW(2) =   4
                  DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                   ISW(3) =   1
                  TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                           ISW(4) =   0
                  CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                      ISW(5) =   0
                  LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                   ISW(6) =   1

                  COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
                  WITH THE FOLLOWING TIME PERIODS:
                    HOURLY (YES=1,NO=0)                                              ISW(7) =   0
                    2-HOUR (YES=1,NO=0)                                              ISW(8) =   0
                    3-HOUR (YES=1,NO=0)                                              ISW(9) =   0
                    4-HOUR (YES=1,NO=0)                                             ISW(10) =   0
                    6-HOUR (YES=1,NO=0)                                             ISW(11) =   0
                    8-HOUR (YES=1,NO=0)                                             ISW(12) =   0
                    12-HOUR (YES=1,NO=0)                                            ISW(13) =   0
                    24-HOUR (YES=1,NO=0)                                            ISW(14) =   0
                  PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                               ISW(15) =   1

                  PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
                  SPECIFIED BY ISW(7) THROUGH ISW(14):
                    DAILY TABLES (YES=1,NO=0)                                       ISW(16) =   0
                    HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                    ISW(17) =   0
                    MAXIMUM 50 TABLES (YES=1,NO=0)                                  ISW(18) =   0
                  METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)         ISW(19) =   1
                  RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3) ISW(20) =   0
                  WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)         ISW(21) =   1
                  VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)  ISW(22) =   1
                  SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                 ISW(23) =   0
                  PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)             ISW(24) =   1
                  PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)       ISW(25) =   2
                  PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)             ISW(26) =   1
                  CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)           ISW(27) =   1
                  REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                           ISW(28) =   1
                  TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                  ISW(29) =   2
                  DEBUG OPTION CHOSEN (YES=1,NO=2)                                  ISW(30) =   2
                  ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)               ISW(31) =   0
```

```
          NUMBER OF INPUT SOURCES                                               NSOURC =   1
          NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                              NGROUP =   0
          TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)                  IPERD =   0
          NUMBER OF X (RANGE) GRID VALUES                                       NXPNTS =  10
          NUMBER OF Y (THETA) GRID VALUES                                       NYPNTS =  36
          NUMBER OF DISCRETE RECEPTORS                                          NXWYPT =   0
          SOURCE EMISSION RATE UNITS CONVERSION FACTOR                              TK =.10000E+07
          HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                      ZR =   6.70  METERS
          LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                              IMET =   9
          DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION                   DECAY = .000000E+00
          SURFACE STATION NO.                                                      ISS = 12842
          YEAR OF SURFACE DATA                                                     ISY = 86
          UPPER AIR STATION NO.                                                    IUS = 12842
          YEAR OF UPPER AIR DATA                                                   IUY = 86
          ALLOCATED DATA STORAGE                                                 LIMIT = 43500 WORDS
          REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                             MIMIT =  1413 WORDS
1
                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING 1986 SEASON3 ***

                                    *** METEOROLOGICAL DAYS TO BE PROCESSED ***
                                                      (IF=1)

      0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0
      0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0
      0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0
      0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
      1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0
      0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0 0 0 0 0
      0 0 0 0 0 0 0 0 0 0   0 0 0 0 0 0

                          *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                  (METERS/SEC)

                                         1.54,   3.09,   5.14,   8.23,  10.80,


                                           *** WIND PROFILE EXPONENTS ***

        STABILITY                             WIND SPEED CATEGORY
        CATEGORY          1             2             3             4             5             6
            A        .70000E-01    .70000E-01    .70000E-01    .70000E-01    .70000E-01    .70000E-01
            B        .70000E-01    .70000E-01    .70000E-01    .70000E-01    .70000E-01    .70000E-01
            C        .10000E+00    .10000E+00    .10000E+00    .10000E+00    .10000E+00    .10000E+00
            D        .15000E+00    .15000E+00    .15000E+00    .15000E+00    .15000E+00    .15000E+00
            E        .35000E+00    .35000E+00    .35000E+00    .35000E+00    .35000E+00    .35000E+00
            F        .55000E+00    .55000E+00    .55000E+00    .55000E+00    .55000E+00    .55000E+00
```

```
                             *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                        (DEGREES KELVIN PER METER)


         STABILITY                          WIND SPEED CATEGORY
         CATEGORY         1              2              3              4              5              6
             A      .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
             B      .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
             C      .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
             D      .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
             E      .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01
             F      .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01
1
                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING 1986 SEASON3 ***


                   X,Y-COORDINATES OF THE CENTER OF THE POLAR RECEPTOR GRID (METERS) = (      0.,      0.)


                                     *** RANGES OF POLAR GRID SYSTEM ***
                                                  (METERS)

       568.0,     738.0,     966.0,    1306.0,    1704.0,    2215.0,    2954.0,    3862.0,    5112.0,    6000.0,



                                    *** RADIAL ANGLES OF POLAR GRID SYSTEM ***

                                                  (DEGREES)

        10.0,      20.0,      30.0,      40.0,      50.0,      60.0,      70.0,      80.0,      90.0,     100.0,
       110.0,     120.0,     130.0,     140.0,     150.0,     160.0,     170.0,     180.0,     190.0,     200.0,
       210.0,     220.0,     230.0,     240.0,     250.0,     260.0,     270.0,     280.0,     290.0,     300.0,
       310.0,     320.0,     330.0,     340.0,     350.0,     360.0,
1
                         *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING 1986 SEASON3 ***

                                             *** SOURCE DATA ***

                  EMISSION RATE                                            TEMP.    EXIT VEL.
                     TYPE=0,1                                              TYPE=0    TYPE=0
          T W     (GRAMS/SEC)                                             (DEG.K);  (M/SEC);           BLDG.    BLDG.    BLDG.
          Y A NUMBER  TYPE=2                             BASE             VERT.DIM  HORZ.DIM DIAMETER  HEIGHT   LENGTH   WIDTH
   SOURCE P K  PART.  (GRAMS/SEC)      X        Y        ELEV.    HEIGHT   TYPE=1   TYPE=1,2  TYPE=0   TYPE=0   TYPE=0   TYPE=0
   NUMBER E E  CATS. *PER METER**2 (METERS) (METERS) (METERS) (METERS) (METERS)  (METERS) (METERS) (METERS) (METERS) (METERS)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        1 0 0    0    .10000E+01       .0        .0       .0    60.96   458.15    14.66     1.68      .00      .00      .00
```

```
* CALM HOURS (=1) FOR DAY 181 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 188 *  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 189 *  0  1  0  1  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 190 *  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 191 *  0  0  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 193 *  0  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 194 *  1  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  0  1  1  0  0
* CALM HOURS (=1) FOR DAY 195 *  1  1  0  1  1  1  1  1  1  0  0  0  1  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 196 *  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 197 *  1  1  1  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 198 *  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 199 *  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 200 *  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 203 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 204 *  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  1  1  0  1  1  1  1  0  0
* CALM HOURS (=1) FOR DAY 205 *  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 206 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  1  1
* CALM HOURS (=1) FOR DAY 207 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 208 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  1  1  0  0  1  0  0  0
* CALM HOURS (=1) FOR DAY 209 *  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 210 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 211 *  0  0  0  0  0  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 213 *  0  0  0  0  1  1  1  1  1  0  0  0  0  0  0  0  0  0  1  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 214 *  1  0  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 215 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 217 *  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 219 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 220 *  1  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 221 *  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0
* CALM HOURS (=1) FOR DAY 225 *  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 226 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 227 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  1
* CALM HOURS (=1) FOR DAY 228 *  1  0  0  0  1  1  0  0  1  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 229 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1
* CALM HOURS (=1) FOR DAY 230 *  1  0  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0
* CALM HOURS (=1) FOR DAY 231 *  1  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 233 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 234 *  0  0  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  0  1  1  1
* CALM HOURS (=1) FOR DAY 235 *  1  1  1  1  1  1  0  1  1  0  0  0  0  0  0  0  0  0  0  1  1  0  0  1
* CALM HOURS (=1) FOR DAY 236 *  1  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
* CALM HOURS (=1) FOR DAY 237 *  1  1  1  1  1  1  1  1  1  0  0  0  0  0  0  1  0  0  0  1  1  0  0  0
* CALM HOURS (=1) FOR DAY 238 *  0  1  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
* CALM HOURS (=1) FOR DAY 239 *  0  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  0
* CALM HOURS (=1) FOR DAY 240 *  0  1  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  1  0  0  1  1  1  1
* CALM HOURS (=1) FOR DAY 241 *  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  1  0  0
* CALM HOURS (=1) FOR DAY 243 *  0  1  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
* CALM HOURS (=1) FOR DAY 244 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  1  0  0  1  0  1  1  1
* CALM HOURS (=1) FOR DAY 245 *  0  1  1  1  1  0  0  0  0  0  0  0  0  1  0  1  1  1  1  1  1  1  1  0
* CALM HOURS (=1) FOR DAY 246 *  1  1  1  1  1  1  1  0  0  1  0  0  0  0  0  0  0  1  1  0  1  1  1  1
```

```
 * CALM HOURS (=1) FOR DAY 247 *  1  0  0  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 248 *  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 249 *  0  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1  1
 * CALM HOURS (=1) FOR DAY 250 *  1  1  1  1  1  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
 * CALM HOURS (=1) FOR DAY 251 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 252 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0
 * CALM HOURS (=1) FOR DAY 254 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  1  1
 * CALM HOURS (=1) FOR DAY 255 *  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1  1
 * CALM HOURS (=1) FOR DAY 256 *  1  0  0  0  0  0  1  0  1  1  0  0  0  0  0  0  0  0  1  0  0  1  0  1
 * CALM HOURS (=1) FOR DAY 257 *  0  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 264 *  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 265 *  1  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 266 *  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0
 * CALM HOURS (=1) FOR DAY 267 *  0  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 * CALM HOURS (=1) FOR DAY 270 *  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
1                                                                                                        'N'-DAY
                                                                                                          90 DAYS
                                                                                                         SGROUP#  1
                                 *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING 1986 SEASON3 ***


                                   *  90-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                     * FROM ALL SOURCES *
                                                   * FOR THE RECEPTOR GRID *

                              * MAXIMUM VALUE EQUALS       .10747 AND OCCURRED AT (     966.0,      90.0) *

  DIRECTION /                                                    RANGE (METERS)
  (DEGREES) /       568.0        738.0        966.0       1306.0       1704.0       2215.0       2954.0       3862.0       5112.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      360.0 /      .02505       .02913       .02804       .02463       .02101       .01747       .01399       .01129       .00898
      350.0 /      .02049       .02425       .02423       .02277       .02092       .01871       .01616       .01385       .01162
      340.0 /      .01631       .02091       .02229       .02192       .02083       .01937       .01758       .01583       .01386
      330.0 /      .01446       .02177       .02550       .02533       .02288       .01975       .01655       .01414       .01209
      320.0 /      .01695       .02773       .03466       .03586       .03284       .02842       .02361       .01975       .01635
      310.0 /      .02241       .03394       .04027       .03961       .03497       .02976       .02482       .02114       .01807
      300.0 /      .02827       .04108       .04881       .04918       .04408       .03742       .03069       .02581       .02196
      290.0 /      .02783       .03800       .04248       .04086       .03555       .02938       .02346       .01948       .01660
      280.0 /      .02531       .03370       .03620       .03378       .02923       .02447       .01999       .01675       .01416
      270.0 /      .02823       .03899       .04338       .04144       .03612       .03012       .02440       .02031       .01710
      260.0 /      .03084       .04258       .04723       .04457       .03808       .03089       .02419       .01967       .01642
      250.0 /      .02749       .03843       .04323       .04141       .03559       .02882       .02249       .01839       .01570
      240.0 /      .02115       .02921       .03275       .03254       .02984       .02643       .02312       .02082       .01889
      230.0 /      .01717       .02234       .02356       .02253       .02041       .01770       .01461       .01203       .00981
      220.0 /      .01313       .01559       .01486       .01298       .01116       .00927       .00738       .00600       .00493
      210.0 /      .00815       .00926       .00864       .00773       .00702       .00627       .00543       .00463       .00383
      200.0 /      .00433       .00528       .00533       .00505       .00455       .00392       .00325       .00271       .00221
```

```
     190.0 /      .00231     .00354     .00425     .00424     .00369     .00300     .00235     .00189     .00152
     180.0 /      .00203     .00390     .00544     .00600     .00559     .00481     .00396     .00331     .00277
     170.0 /      .00290     .00552     .00766     .00831     .00752     .00620     .00482     .00383     .00307
     160.0 /      .00387     .00689     .00909     .00967     .00875     .00727     .00564     .00434     .00328
     150.0 /      .00656     .01142     .01437     .01445     .01265     .01032     .00791     .00605     .00455
     140.0 /      .00846     .01432     .01735     .01664     .01389     .01080     .00797     .00614     .00486
     130.0 /      .00859     .01465     .01859     .01957     .01815     .01587     .01340     .01143     .00963
     120.0 /      .01162     .01946     .02473     .02602     .02400     .02059     .01659     .01319     .01023
     110.0 /      .02345     .03820     .04772     .04841     .04268     .03491     .02682     .02063     .01565
     100.0 /      .04357     .06924     .08455     .08314     .07043     .05468     .03911     .02795     .01961
      90.0 /      .05815     .08979     .10747     .10410     .08717     .06683     .04704     .03308     .02285
      80.0 /      .06004     .08475     .09379     .08568     .06977     .05283     .03710     .02623     .01829
      70.0 /      .06264     .08362     .08880     .07954     .06520     .05055     .03695     .02746     .02033
      60.0 /      .05781     .07338     .07421     .06380     .05129     .03943     .02878     .02142     .01596
      50.0 /      .04522     .05580     .05503     .04633     .03663     .02776     .02014     .01516     .01162
      40.0 /      .03497     .04483     .04674     .04172     .03380     .02539     .01753     .01223     .00855
      30.0 /      .03029     .04014     .04318     .04018     .03452     .02847     .02258     .01809     .01436
      20.0 /      .02924     .03782     .03909     .03435     .02772     .02119     .01522     .01113     .00816
      10.0 /      .02832     .03454     .03405     .02925     .02366     .01840     .01365     .01039     .00800
1                                                                                                         'N'-DAY
                                                                                                          90 DAYS
                                                                                                         SGROUP#  1
                                  *** FFPI ROTARY KILN INCINERATOR EMISSIONS MODELING 1986 SEASON3 ***


                                    *  90-DAY AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER)     *

                                                     * FROM ALL SOURCES *
                                                   * FOR THE RECEPTOR GRID *

                                * MAXIMUM VALUE EQUALS      .10747 AND OCCURRED AT (     966.0,      90.0) *

   DIRECTION /                                               RANGE (METERS)
   (DEGREES) /      6000.0
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     360.0 /      .00786
     350.0 /      .01046
     340.0 /      .01270
     330.0 /      .01109
     320.0 /      .01467
     310.0 /      .01659
     300.0 /      .02021
     290.0 /      .01539
     280.0 /      .01298
     270.0 /      .01564
     260.0 /      .01507
     250.0 /      .01471
     240.0 /      .01795
```

```
          230.0 /        .00878
          220.0 /        .00447
          210.0 /        .00341
          200.0 /        .00195
          190.0 /        .00134
          180.0 /        .00251
          170.0 /        .00273
          160.0 /        .00279
          150.0 /        .00386
          140.0 /        .00434
          130.0 /        .00869
          120.0 /        .00882
          110.0 /        .01338
          100.0 /        .01606
           90.0 /        .01862
           80.0 /        .01498
           70.0 /        .01727
           60.0 /        .01363
           50.0 /        .01015
           40.0 /        .00712
           30.0 /        .01260
           20.0 /        .00692
           10.0 /        .00696

     RUN ENDED ON 09-12-89 AT 12:07:11
```

FLORIDA FIRST PROCESSING, INC.

APPENDIX L-38

USGS MAP HIGHLIGHTING THE REGION WITHIN A RADIUS OF 2 MILES AROUND THE FACILITY