



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 102-98-06

May 11, 1999

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BUREAU OF
AIR REGULATION

Mr. Christopher L. Kirts, P.E.
Florida Department of
Environmental Protection
Northeast District
7825 Baymeadows Way, Suite B-200
Jacksonville, FL 32256-7577

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NORTHEAST DISTRICT - JAX

*Work Practice
Emission Stds
296.411*

Subject: PCS Sales (USA), Inc.
Truck/Rail Transfer Terminal

Dear Mr. Kirts:

This is in response to your letter, dated April 5, 1999, regarding a sulfur deposition analysis for the above facility.

Enclosed is the sulfur deposition analysis output on disk. The modeling was conducted pursuant to Florida Administrative Rule (F.A.C.) Rule 62-212.600.

The sulfur particulate emissions from the molten sulfur tank and pit were modeled using the ISC3 model to determine the maximum predicted monthly and annual deposition rates. The emissions unit geometry was based on information available from PCS Sales. The sulfur particulate emission rates from the tank and the pit were based on the estimated emissions presented in the construction permit application submitted to FDEP (see Attachment 1). As actual particle size distribution information was not available, each modeling run was based on a conservative assumption that all sulfur particulate was of a single diameter, varying from 0.01 to 30 *ok* microns. Five consecutive years (1984-1988) of Gainesville meteorological data were used for the deposition analysis. Receptors were located along the property boundary at intervals of approximately 30 meters, and on a polar grid, from about 50 meters to 450 meters downwind of the source at 10-degree intervals along 36 radials (see Attachment 2).

The results of the modeling, summarized in Attachment 3, indicate that the maximum predicted monthly and annual sulfur deposition rates from the proposed facility are 0.62 grams per square meter (g/m²) and 3.82 g/m², respectively. These deposition

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Environmental Protection

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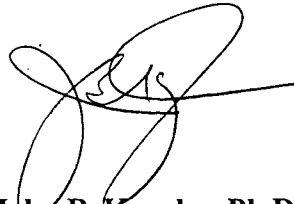
rates occurred with an assumed particle size of 30 microns. There are no sulfur deposition standards with which the predicted deposition rates can be compared.

For the required post construction monitoring, a nipher gauge will be used to determine actual sulfur particulate deposition resulting from the operation of the facility. The nipher gauge, sold under a license from the Canadian government, will be purchased after FDEP approval of the proposed monitoring. A nipher gauge will be placed on the property boundary, immediately north of the sulfur system, at the location of the maximum predicted sulfur deposition. This location also represents the nearest property boundary. Wind data for the area is summarized in the form of a wind rose (see Attachment 4). The wind rose shows that the winds from the south are not the predominant component. However, these winds generate the highest predicted impacts given the site geometry. The total sulfur deposition will be determined and reported on a monthly basis, on a schedule to be set by the Department. Standard sample collection and analytical techniques will be used, in order to maintain quality assurance and quality control.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES



John B. Koogler, Ph.D., P.E.

JBK:par
encl.

c: P. Rodney Wilson, PCS Sales
C. Holladay, FDEP

*approved
prevailing winds*

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ATTACHMENT 1

MODELING PARAMETERS

MOLTEN SULFUR SYSTEM

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The source parameters used for the sulfur deposition modeling are described below.

Molten Sulfur Pit Vent:

- Located at $x = -92.66$ meters, $y = -38.10$ meters
- Emission rate of 0.00378 grams per second
- Release height of 2.44 meters
- Vent diameter of 0.61 meters
- Exit temperature of 293 K
- Exit velocity of 0.03 meters per second
- Particle sizes evaluated, in microns, 0.01, 0.1, 1, 10, 20 and 30.

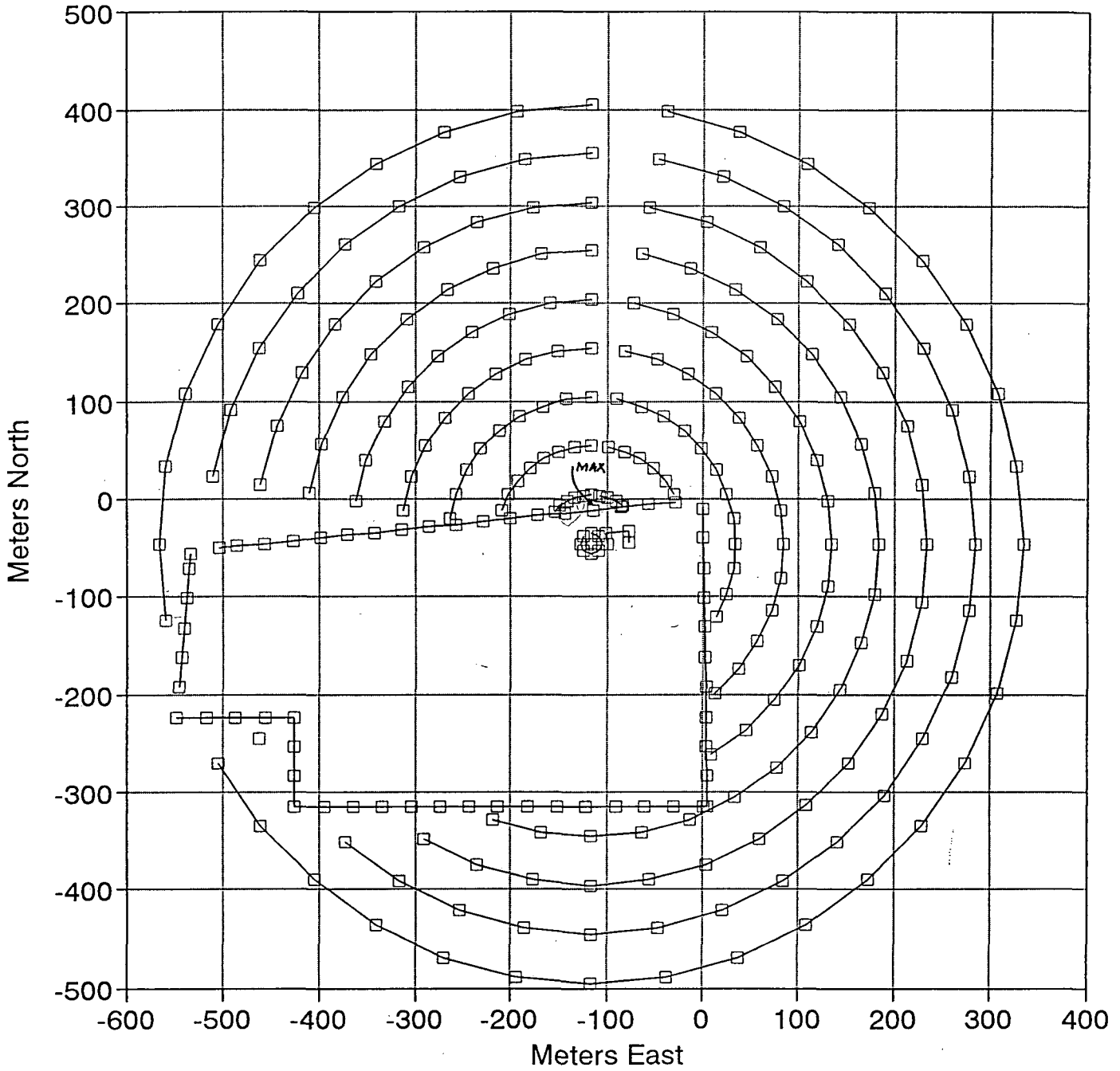
Molten Sulfur Tank Vent:

- Located at $x = -115.83$ meters, $y = -45.72$ meters
- Emission rate of 0.00378 grams per second
- Release height of 10.67 meters
- Vent diameter of 0.61 meters
- Exit temperature of 293 K
- Exit velocity of 0.03 meters per second
- Particle sizes evaluated, in microns, 0.01, 0.1, 1, 10, 20 and 30.

Building/structure wake effects were considered in the modeling.

ATTACHMENT 2

Receptor Location for Deposition Model



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ATTACHMENT 3

Maximum Monthly Deposition of Sulfur
Grams per Square Meter

PARTICLE SIZE (um)						
YEAR	0.01	0.1	1.0	10.0	20.0	30.0
1994	0.034	0.0026	0.00115	0.203	0.413	0.617
1995	0.024	0.0018	0.00083	0.159	0.292	0.440
1996	0.027	0.0020	0.00080	0.188	0.314	0.445
1997	0.026	0.0019	0.00089	0.187	0.301	0.466
1998	0.027	0.0020	0.00086	0.174	0.326	0.472
Maximum	0.034	0.0026	0.00115	0.203	0.413	0.617

Maximum Annual Deposition of Sulfur
Grams per Square Meter

PARTICLE SIZE (um)						
YEAR	0.01	0.1	1.0	10.0	20.0	30.0
1994	0.225	0.0165	0.0069	1.461	2.65	3.82
1995	0.162	0.0119	0.0051	1.073	1.90	2.79
1996	0.184	0.0137	0.0061	1.109	2.17	3.25
1997	0.177	0.0130	0.0055	1.117	2.08	3.03
1998	0.217	0.0159	0.0067	1.379	2.55	3.67
Maximum	0.225	0.0165	0.0069	1.461	2.65	3.82

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THIS DISK CONTAINS SULFUR DEPOSITION MODELING FILES FOR THE PCS SALES FACILITY IN LAKELAND FLORIDA. THE FILE:

PCS-DEPO.EXE 580,620 05-10-99

IS IN SELF EXTRACTING ARCHIVE FORMAT. TO UNARCHIVE THIS FILE COPY IT TO A HARD DISK DRIVE AND TYPE THE FILE NAME "PCS-DEPO" AND PRESS ENTER. THE FILE WILL AUTOMATICALLY UNARCHIVE TO THE HARD DISK DRIVE. THIS ARCHIVED FILE CONTAIN THE MODELING IN ASCII FORMAT DESCRIBED AS FOLLOWS:

DEPOSITION ISCST3 MODELING FOR PARTICLE SIZE OF 0.01 MICROMETERS (μm)

PCSP01Y4	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1984
PCSP01Y5	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1985
PCSP01Y6	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1986
PCSP01Y7	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1987
PCSP01Y8	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1988

DEPOSITION ISCST3 MODELING FOR PARTICLE SIZE OF 0.1 MICROMETERS (μm)

PCSP1Y4	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1984
PCSP1Y5	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1985
PCSP1Y6	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1986
PCSP1Y7	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1987
PCSP1Y8	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1988

DEPOSITION ISCST3 MODELING FOR PARTICLE SIZE OF 1.0 MICROMETERS (μm)

PCS1Y4	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1984
PCS1Y5	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1985
PCS1Y6	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1986
PCS1Y7	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1987
PCS1Y8	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1988

DEPOSITION ISCST3 MODELING FOR PARTICLE SIZE OF 10 MICROMETERS (μm)

PCS10Y4	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1984
PCS10Y5	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1985
PCS10Y6	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1986
PCS10Y7	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1987
PCS10Y8	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1988

DEPOSITION ISCST3 MODELING FOR PARTICLE SIZE OF 20. MICROMETERS (μm)

PCS20Y4	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1984
PCS20Y5	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1985
PCS20Y6	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1986
PCS20Y7	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1987
PCS20Y8	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1988

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DEPOSITION ISCST3 MODELING FOR PARTICLE SIZE OF 30. MICROMETERS (μm)

PCS30Y4	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1984
PCS30Y5	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1985
PCS30Y6	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1986
PCS30Y7	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1987
PCS30Y8	OUT	158,321	05-10-99	DEPOSITION MODELING FOR 1988

AND:

READ ME 3.158 05-10-99 THIS FILE

IF I MAY PROVIDE ADDITIONAL FILES, OR CLARIFICATION PLEASE CONTACT ME.

MAY 11, 1999
MARK KOLETZKE
KOOGLER AND ASSOCIATES
(352) 377-5822
KOOGLER@WORLDNET.ATT.NET

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