AP-42 Section Number: 9.11.1

Reference Number: 18

Title: Vegetable Oil Production (Meal Processing) Emission Test Report, Ralston Purina Company, Memphis, Tennessee

PEDCo Environmental Inc.

PEDCo Environmental Inc.

August 1979

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EMB Report 79-VEG-6d
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Emission Test Report Ralston Purina Company Memphis, Tennessee

PEDCo ENVIRONMENTAL, INC.
11499 CHESTER ROAD
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VEGETABLE OIL EXTRACTION PLANT
MEAL SAMPLING AND OPACITY TEST
RALSTON-PURINA
MEMPHIS, TENNESSEE

AUGUST 8, 1979

DRAFT

Prepared by:

PEDCo Environmental, Inc.
11499 Chester Road
Cincinnati, Ohio 45246

79-VEG-6D
Contract No. 68-02-2811
Task No. 19

PN 3333-S

Project Technical Manager: Nancy McLaughlin

U.S. Environmental Protection Agency
Emission Measurement Branch

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SECTION 1

INTRODUCTION

As part of the program to gather emissions data ~~from~~ for the vegetable oil industry, on August 8, 1979 personnel from PEDCo Environmental, Inc. and Research Triangle Institute conducted a survey at the Ralston Purina vegetable oil extraction plant in Memphis, Tennessee. The purpose of this visit was to collect meal samples (to be analyzed for hexane content), monitor process conditions, and check selected sites for visible emissions. Meal samples and stack opacity readings were taken by personnel from PEDCo Environmental, Inc. Research Triangle Institute personnel ~~were on hand to~~ monitored process conditions.

Ralston Purina processes soybean meal for both human consumption and animal feed. Samples of both ~~final~~ types of meal products were taken. Meal samples were collected in triplicate every hour for a seven hour period at the following points:

1. After the Desolventizer-toaster (D T)
2. After the meal dryer (A.D.)
3. After the stripper
4. Final edible product
5. Final meal product

Stack opacity was read at eight different sites in the plant.

SECTION 2

SUMMARY OF RESULTS

2.1 MEAL SAMPLES

Hexane concentration in the meal was determined on both a wet meal and dry meal basis. The dry weight of the meal was determined by placing the sample in a drying oven after analysis and reweighing the sample after the moisture and hexane had been driven off.

Table 1 presents the average hexane concentration of all samples taken at each site. At each of the sites, hexane concentration remained fairly constant through the sampling period. The average change in hexane concentration from wet meal to dry meal basis was 25 percent for the D T samples, 15 percent at the dryer, 11 percent at the stripper, 11 percent in the final edible product, and 17 percent in the final meal.

The laboratory analysis report showing the concentrations, sample weights, and the dates of analysis for each of the samples taken is in Appendix B of this report. Meal sampling log sheets are in Appendix A.

2.2 STACK OPACITY

Stack opacity was read by a qualified observer according to the procedures of Method 9 of the Federal Register* at the

* Federal Register, Vol. ~~42~~ 39, No. ~~160~~ 219, ~~August 18, 1977~~ November 12, 1974.

* Table 3 * check calculations (Both wet & Dry) ?

TABLE 1. AVERAGE[a] HEXANE CONTENT OF MEAL

Sample type		Hexane concentration	
		Wet meal µg/g	Dry meal µg/g
D T [b]	(21)	416 414	557 ✓
Dryer	(21)	248 ✓	292 273
Stripper	(21)	502 492	566 570
Final Edible	(20)	240 226	271 256
Final meal	(21)	177 178	212 ✓

[a] Average of all samples taken.

[b] D T - Desolventizer-Toaster.

following sites:

Facility	Type of Control Device
Meal grinding	Baghouse
Dehulling - east stack	Cyclone
Dehulling - west stack	Cyclone
Ground hulls	Micro bag filter
Flake loading	R-J bag filter
Meal loading	R-J bag filter
Stripper	Bag filter
Hull bin	Cyclone

At the meal grinding facility opacity ranged from 0 to 5 percent with an average of 0.9 percent. Opacity at both dehulling sites ranged from 0 to 15 percent with an average opacity of 1.9 percent at the east stack and 1.2 percent at the west stack. The hull bin site had opacity ranging from 5 to 10 percent with an average opacity of 6.7 percent. Other sites showed no visible emissions. All field data sheets from opacity readings are in Appendix C of this report.

SAMPLING AND ANALYTICAL PROCEDURES

3.1 MEAL SAMPLES

The meal sampling and analytical technique was adopted from a volitilization head-space sampling procedure developed at Texas A&M University.[1] Sample bottles used were 100 mℓ glass serum bottles with septum caps, tare weighed in the lab with two layers of filter paper in the bottom of each. In the field just prior to sampling, 0.5 mℓ of water was added to wet the filter paper, using an automatic pipette. A long handled scoop was used to take a sample from the conveyor belt. A small portion of this scoop was then transferred to each of the triplicate samples using a small spoon and a funnel. Septum caps were replaced immediately on the samples. An aluminum cap was then crimped tightly over the septum for a final seal. Each bottle was then weighed to determine the amount of sample collected. Meal samples were stored in a cooler with ice for shipment back to the PEDCo laboratory and stored in a refrigerator until analysis. Ideally

Analysis was done by placing the sample bottle into a sand-bath for two hours at 125°C and then gradually cooling the sample to room temperature. A 1.0 mℓ head space sample is then injected into a gas chromatograph. Calibration standards are made by adding a known amount of 99 mole percent n-hexane to processed meal that has been completely dried. To determine the dry weight of the meal sampled after analysis, the samples were placed in a drying oven uncapped and reweighed after the moisture and hexane had been driven off.

3.2 OPACITY READINGS

Opacity was read by a qualified observer using the procedures of Federal Register* Method 9. Readings were taken every 15 seconds ~~over a 12 minute~~ for two 6 minute periods at each site.

*Federal Register, Vol. ~~42~~ 39 219 November 12, 1974, No. 16, ~~August 18, 1977~~.

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---

[1] P. J. Wan, M. Chittwood, C. M. Cater, "Determination of Residual Hexane in Solvent Extracted Meal," Food Protein R&D Center, Texas A&M University.

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APPENDIX A

MEAL SAMPLING LOG

CASCADE® L1-C2412

RALSTON-PURINA MEMPHIS TENN

531-635

	TARE	FINAL WEIGHT W/SAMPLE	[illegible]	DATE	SITE	TIME
* indicates longtime in sample collection				N 15 seconds		longtime
523	90.74	94.46				
524	[illegible]	94.70				
525	92.70	96.31				
526	[illegible]	94.84				
527	90.92	94.90				
528	90.31	94.33				
529	[illegible]	95.03				
530	[illegible]	95.82				
531	[illegible]93	95.01		8/8 79	DT	10:05
532	93.[illegible]	95.62	.48		DT	10.05
533	[illegible]	93.89			DT	10:05
534	[illegible]	96.13			~~DT~~ Dayton	10:0[illegible]
535	[illegible].52	94.58			A.D.	〃
536	12.52	94.26			A.D	〃
537	[illegible]	94.07			STRIPPER	10:11
538	92.57	94.17	.47		|	〃
539	92.70	95.43				
540	[illegible]	95.93			FINAL EDIBLE	10:35
541	[illegible]	94.75			|	|
542	[illegible]	95.84			|	|
543	[illegible]	94.72	•		F. MEAL	10:25
544	[illegible]	94.59			|	|
545	[illegible]	94.38	.48		|	|
* 546	[illegible]	94.72			DT	11:00
547	[illegible]	95.18	•		DT	11:00
548	[illegible]	95.08			DT	11:00
549	92.81	95.55			A.D.	11:03
550	[illegible]	95.73	.48		A.D.	11:03
551	90.32	94.93			A.D.	11 03
552	[illegible]	95.35			STRIPPER	11:07
553	[illegible]	94.94			STRIPPER	11:07
554	[illegible]	95.04			STRIPPER	11:07
555	[illegible]	95.22			FINAL EDIBLE	11:11
556	[illegible]	94.89	.48		FINAL EDIBLE	11:11
557	[illegible]	95.32			FINAL EDIBLE	11:11
558	[illegible]	95.72			F. MEAL	11:13
559	[illegible]	95.27			F. MEAL	11:13

CARBIDE® LI-C2412

RALSTON PURINA - MEMPHIS TENN

	TARE	WEIGHT W/SAMPLE		DATE	SITE	TIME
560	92.82	96.02	.48	8/8/79	F. MEAL	11:13
561	92.37	95.11			DT	11:55
562	92.35	95.20			DT	11:55
563	92.84	95.51			DT	11:55
564	92.82	95.73			A.D.	11:58
565	91.74	95.02	.48		A.D.	11:58
566	92.83	95.66			A.D.	11:58
567	92.41	94.82			STRIPPER	12:00
568	92.51	94.93			STRIPPER	12:00
569	92.25	94.97			STRIPPER	12:00
570	92.70	95.44	.47		FINAL EDIBLE	12:04
571	91.98	94.70			FINAL EDIBLE	12:06
572	92.25	NO SAMPLE COLLECTED			FINAL EDIBLE	
573	92.05	95.49			F. MEAL	12:10
574	92.11	95.54			F. MEAL	12:11
575	92.00	95.56	.47		F. MEAL	12:11
576	92.40	95.13			DT	13:16
577	92.39	95.36			DT	13:16
578	92.22	95.24			DT	13:16
579	92.04	95.28			AD	13:12
580	92.71	95.04			AD	13:12
581	92.72	95.22	.48		AD	13:12
582	92.73	95.00			STRIPPER	13:15
583	92.65	94.85			STRIPPER	13:15
584	92.17	94.28			STRIPPER	13:15
585	92.79	95.89	.47		FINAL EDIBLE	13:20
586	92.51	96.02			FINAL EDIBLE	13:20
587	92.53	95.45			FINAL EDIBLE	13:20
588	93.15	96.87			F. MEAL	13:22
589	92.64	95.83			F. MEAL	13:22
590	92.78	96.26	.46		F. MEAL	13:22
591	92.76	95.50			DT	13:59
592	92.25	94.80			DT	13:59
593	92.87	95.63			DT	13:59
594	93.08	95.81			AD	14:01
595	92.95	96.07	.47		AD	14:01
596	92.79	96.23			AD	14:01
597	92.58	94.72			STRIPPER	14:04

4771 NOA MCNIDER

CASCADE® L1-C2462

	TARE	WEIGHT w/SAMPLE		DATE	SITE	TIME
598	92.34	94.63		8/8/79	STRIPPER	14:04
599	92.90	95.22			STRIPPER	14:04
600	92.46	95.37	.47		FINAL EDIBLE	14:10
601	92.63	96.16			FINAL EDIBLE	14:10
602	92.60	95.53			FINAL EDIBLE	14:10
603	92.62	96.04			F. MEAL	14:12
604	92.70	96.13			F. MEAL	14:12
605	92.88	96.39	.49		F. MEAL	14:12
606	92.83	95.69			DT	15:04
607	92.41	95.15			DT	15:04
608	92.97	95.51			DT	15:04
609	92.81	95.72			AD	15:06
610	92.55	95.46	.49		AD	15:06
611	92.86	95.59			AD	15:06
612	92.87	95.04			STRIPPER	15:09
613	92.29	94.01			STRIPPER	15:09
614	92.79	94.92			STRIPPER	15:09
615	92.90	95.76	.46		FINAL EDIBLE	15:13
616	92.64	95.37			FINAL EDIBLE	15:13
617	92.85	95.35			FINAL EDIBLE	15:13
618	92.58	95.61			F. MEAL	15:15
619	92.48	95.44			F. MEAL	15:15
620	92.49	95.48	.48		F. MEAL	15:15
621	92.89	95.47			DT	16:05
622	92.71	95.34			DT	"
623	92.91	95.70			DT	"
624	93.84	95.66			AD	16:06
625	92.73	95.45	.47		AD	16:06
626	92.90	95.80			AD	16:06
627	92.91	94.84			STRIPPER	16:10
628	93.14	95.02			STRIPPER	16:10
629	92.85	94.95			STRIPPER	16:10
630	93.08	95.52	.46		FINAL EDIBLE	16:14
631	93.24	96.01			FINAL EDIBLE	16:14
632	92.78	95.38			FINAL EDIBLE	16:14
633	92.79	95.78			F. MEAL	16:16
634	92.98	95.97			F. MEAL	16:16
635	93.04	96.18	.49		F. MEAL	16:16

APPENDIX B

MEAL SAMPLES LABORATORY ANALYSIS REPORT

DATA SHEET

Plant: Ralston-Purina Memphis, Tennessee Date: August 8, 1979

Date Analysis	Sample No.-Location		Sample Date	Time	Wet Wt. (g)	Wet (µg/g)	Dry (µg/g)
9/20/79	531	D.T.	8/8/79	10:05	1.59	560	770
9/20/79	532	D.T.	8/8/79	10:05	1.39	500	710
9/20/79	533	D.T.	8/8/79	10:05	1.32	500	730
9/20/79	534 (1)	After Dryer	8/8/79	10:08	1.63	350	410
9/20/79	535	After Dryer	8/8/79	10:08	1.52	150	180
9/20/79	536	After Dryer	8/8/79	10:08	1.25	370	440
9/20/79	537	Stripper	8/8/79	10:11	0.96	670	770
9/20/79	538	Stripper	8/8/79	10:11	1.13	670	800
9/20/79	539	Stripper	8/8/79	10:11	1.04	520	560
9/20/79	540	Final Edible	8/8/79	10:35	1.43	340	410
9/20/79	541	Final Edible	8/8/79	10:35	1.61	390	470
9/20/79	542	Final Edible	8/8/79	10:35	1.44	410	510
9/20/79	543	Final Meal	8/8/79	10:25	1.44	260	340
9/20/79	544	Final Meal	8/8/79	10:25	1.36	220	280
9/20/79	545	Final Meal	8/8/79	10:25	1.35	220	270
9/20/79	546	D.T.	8/8/79	11:00	1.78	300	440
9/20/79	547	D.T.	8/8/79	11:00	2.16	390	520
9/20/79	548	D.T.	8/8/79	11:00	1.89	390	510
9/20/79	549	A.D.	8/8/79	11:03	1.79	230	220 (2)
9/20/79	550	A.D.	8/8/79	11:03	2.67	220	250
9/20/79	551	A.D.	8/8/79	11:03	2.14	200	240
9/20/79	552	Stripper	8/8/79	11:07	1.92	420	470
9/20/79	553	Stripper	8/8/79	11:07	1.98	480	540
9/20/79	554	Stripper	8/8/79	11:07	1.74	480	550
9/20/79	555	Final Edible	8/8/79	11:11	2.63	340	370
9/20/79	556	Final Edible	8/8/79	11:11	2.08	350	370
9/20/79	557 (1)	Final Edible	8/8/79	11:11	2.04	190	220
9/20/79	558	Final Meal	8/8/79	11:13	2.34	160	190
9/20/79	559	Final Meal	8/8/79	11:13	2.64	160	180
9/20/79	560	Final Meal	8/8/79	11:13	2.66	140	170
9/20/79	561	D.T.	8/8/79	11:55	2.28	350	460
9/20/79	562	D.T.	8/8/79	11:55	2.39	320	410
9/20/79	563	D.T.	8/8/79	11:55	2.20	320	420

(1) Reanalysis of sample yielded same results.

(2) Dry weight was recorded incorrectly.

DATA SHEET

Plant: Ralston-Purina Memphis, Tennessee Date: August 8, 1979

Date Analysis	Sample No.-Location		Sample Date	Time	Wet Wt. (g)	Wet (µg/g)	Dry (µg/g)
/20/79	564	A.D.	8/8/79	11:58	2.45	230	270
9/20/79	565	A.D.	8/8/79	11:58	2.80	170	200
9/20/79	566	A.D.	8/8/79	11:58	2.39	220	260
9/21/79	567	Stripper	8/8/79	12:00	1.92	610	670
9/21/79	568	Stripper	8/8/79	12:00	1.90	540	610
9/21/79	569	Stripper	8/8/79	12:00	2.23	540	580
9/21/79	570 (1)	Final Edible	8/8/79	12:04	2.27	290	330
9/21/79	571	Final Edible	8/8/79	12:04	2.23	440	510
9/21/79	572 (3)	Final Edible	8/8/79	12:04	-	-	-
9/21/79	573	Final Meal	8/8/79	12:10	2.96	120	140
9/21/79	574	Final Meal	8/8/79	12:10	2.97	190	220
9/21/79	575	Final Meal	8/8/79	12:10	3.09	170	200
9/21/79	576	D.T.	8/8/79	13:10	2.26	400	540
9/21/79	577	D.T.	8/8/79	13:10	2.52	440	570
9/21/79	578	D.T.	8/8/79	13:10	2.56	440	570
9/21/79	579	A.D.	8/8/79	13:12	2.74	250	290
9/21/79	580	A.D.	8/8/79	13:12	2.55	180	210
9/21/79	581	A.D.	8/8/79	13:12	2.02	230	220
9/21/79	582	Stripper	8/8/79	13:15	1.80	620	670
9/21/79	583	Stripper	8/8/79	13:15	1.73	490	540
9/21/79	584	Stripper	8/8/79	13:15	1.63	550	630
9/21/79	585	Final Edible	8/8/79	13:20	2.63	150	150
9/21/79	586	Final Edible	8/8/79	13:20	3.03	120	120
9/21/79	587	Final Edible	8/8/79	13:20	2.45	140	160
9/21/79	588	Final Meal	8/8/79	13:22	3.26	130	160
9/21/79	589	Final Meal	8/8/79	13:22	2.72	170	200
9/21/79	590	Final Meal	8/8/79	13:22	3.02	150	170
9/22/79	591	D.T.	8/8/79	13:59	2.27	420	570
9/22/79	592	D.T.	8/8/79	13:59	2.08	460	600
9/22/79	593	D.T.	8/8/79	13:59	2.29	410	560
9/22/79	594	A.D.	8/8/79	14:01	2.26	240	280
9/22/79	595	A.D.	8/8/79	14:01	2.65	280	330
9/22/79	596	A.D.	8/8/79	14:01	2.96	230	270

(1) Reanalysis of sample yielded same results.

(3) Sample not collected.

DATA SHEET

Plant: Ralston-Purina Memphis, Tennessee Date: August 8, 1979

Date Analysis	Sample No.-Location		Sample Date	Time	Wet Wt. (g)	Wet (µg/g)	Dry (µg/g)
9/22/79	597 (1)	Stripper	8/8/79	14:04	1.67	530	570
9/22/79	598 (1)	Stripper	8/8/79	14:04	1.83	360	410
9/22/79	599	Stripper	8/8/79	14:04	1.86	430	470
9/22/79	600	Final Edible	8/8/79	14:10	2.44	160	170
9/22/79	601	Final Edible	8/8/79	14:10	3.08	150	160
9/22/79	602	Final Edible	8/8/79	14:10	2.45	140	160
9/22/79	603	Final Meal	8/8/79	14:12	2.95	190	230
9/22/79	604	Final Meal	8/8/79	14:12	2.97	170	210
9/22/79	605	Final Meal	8/8/79	14:12	3.02	190	170
9/22/79	606	D.T.	8/8/79	15:04	2.38	380	510
9/22/79	607	D.T.	8/8/79	15:04	2.27	460	600
9/22/79	608	D.T.	8/8/79	15:04	2.08	370	510
9/22/79	609	A.D.	8/8/79	15:06	2.44	270	310
9/22/79	610	A.D.	8/8/79	15:06	2.42	270	330
9/22/79	611	A.D.	8/8/79	15:06	2.26	240	300
9/22/79	612 (1)	Stripper	8/8/79	15:09	3.97	220	570
9/22/79	613	Stripper	8/8/79	15:09	1.25	420	460
9/22/79	614	Stripper	8/8/79	15:09	1.68	430	520
9/22/79	615	Final Edible	8/8/79	15:13	2.40	150	170
9/22/79	616	Final Edible	8/8/79	15:13	2.27	150	170
9/22/79	617	Final Edible	8/8/79	15:13	2.02	130	150
9/22/79	618	Final Meal	8/8/79	15:15	2.57	160	200
9/22/79	619	Final Meal	8/8/79	15:15	2.47	160	200
9/22/79	620	Final Meal	8/8/79	15:15	2.51	160	200
9/22/79	621	D.T.	8/8/79	16:05	2.11	430	580
9/22/79	622	D.T.	8/8/79	16:05	2.16	480	600
9/22/79	623	D.T.	8/8/79	16:05	2.32	380	510
9/22/79	624 (1)	A.D.	8/8/79	16:06	1.36	350	1000
9/22/79	625	A.D.	8/8/79	16:06	2.25	250	290
9/22/79	626	A.D.	8/8/79	16:06	2.43	280	350
9/22/79	627	Stripper	8/8/79	16:10	1.47	460	540
9/22/79	628	Stripper	8/8/79	16:10	1.41	470	540
9/22/79	629	Stripper	8/8/79	16:10	1.61	420	500

(1) Reanalysis of sample yielded same results.

DATA SHEET

Plant: Ralston-Purina Memphis, Tennessee Date: August 8, 1979

Date Analysis	Sample No.-Location		Sample Date	Time	Wet Wt. (g)	Wet (µg/g)	Dry (µg/g)
9/22/79	630	Final Edible	8/8/79	16:14	1.98	160	180
9/22/79	631	Final Edible	8/8/79	16:14	2.29	140	160
9/22/79	632	Final Edible	8/8/79	16:14	2.12	180	190
9/22/79	633	Final Meal	8/8/79	16:16	2.52	200	230
9/22/79	634	Final Meal	8/8/79	16:16	2.01	200	240
9/22/79	635	Final Meal	8/8/79	16:16	2.65	210	260

APPENDIX C

OPACITY FIELD DATA SHEETS

METHOD 9 RECORD OF VISUAL DETERMINATION OF OPACITY PAGE 1 OF 2

COMPANY Ralston-Purina
LOCATION Memphis, Tenn.
TEST NO. 1
DATE 8-8-74
TYPE FACILITY Meal Grinding
CONTROL DEVICE Baghouse R-5

HOURS OF OBSERVATION
OBSERVER David Solomon
OBSERVER CERTIFICATION DATE 7-12-74
OBSERVER AFFILIATION Pedco Environmental
POINT OF EMISSIONS Rectangular Stack
HEIGHT OF DISCHARGE POINT 80' 25' Horizontal

	Initial			Final
CLOCK TIME	1.35			1.46
OBSERVER LOCATION Distance to Discharge	30'			
Direction from Discharge	90°			
Height of Observation Point	GROUND			
BACKGROUND DESCRIPTION	Brown Building			
WEATHER CONDITIONS Wind Direction	—			
Wind Speed	under 1			
Ambient Temperature	90			
SKY CONDITIONS (clear, overcast, % clouds, etc.)	HAZY			
PLUME DESCRIPTION Color	white			
Distance Visible	—			
OTHER INFORMATION				

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start-End	Opactity Sum	Opactity Average
a	1:35 - 1.40	35	1.46
b	1:41 - 1.46	10	0.42

Readings ranged from 0 to 5 % opacity

The source was/was not in compliance with _____ at the time evaluation was made.

Form 1403 Date 6/78

METHOD 9 OBSERVATION RECORD PAGE 2 OF 2

COMPANY RALSTON - PURINA Memphis OBSERVER DAVID Solomon

LOCATION Meal Grinding → TYPE FACILITY

TEST NO. 1 POINT OF EMISSIONS Rectangular stack

DATE 8-8-79

Hr.	Min.	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	35	5	0	0	5			
1	36	0	0	0	5			
1	37	5	0	5	0			
1	38	0	0	0	0			
1	39	0	5	5	0			
1	40	0	0	0	0			
1	41	0	0	0	0			
1	42	0	0	0	5			
1	43	0	0	0	5			
1	44	0	0	0	0			
1	45	0	0	0	0			
1	46	0	0	0	0			

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METHOD 9 RECORD OF VISUAL DETERMINATION OF OPACITY PAGE 1 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn
TEST NO. 2 9
DATE 8/8/79
TYPE FACILITY Dehilling
CONTROL DEVICE Cyclone

HOURS OF OBSERVATION
OBSERVER David Solomon
OBSERVER CERTIFICATION DATE 7/12/79
OBSERVER AFFILIATION Pedco Environmental
POINT OF EMISSIONS Roof stack
HEIGHT OF DISCHARGE POINT 30'

	Initial			Final
CLOCK TIME	2.15			2:26
OBSERVER LOCATION Distance to Discharge	45'			
Direction from Discharge	90°			
Height of Observation Point	Ground			
BACKGROUND DESCRIPTION	Brown equipt.			
WEATHER CONDITIONS Wind Direction	under 1			
Wind Speed				
Ambient Temperature	90			
SKY CONDITIONS (clear, overcast, % clouds, etc.)	HAZY			
PLUME DESCRIPTION Color	white			
Distance Visible	—			
OTHER INFORMATION	the source puffed intermittently			

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start-End	Opactity Sum	Opactity Average
a	2:15 - 2:20	60	2.5
b	2:21 - 2:26	30	1.25

Readings ranged from 0 to 15 % opacity

The source was/was not in compliance with _____ at the time evaluation was made.

Form 1403 Date 6/78

METHOD 9 OBSERVATION RECORD PAGE 2 OF 2

COMPANY RALSTON-PURINA
LOCATION Memphis, Tenn
TEST NO. 2-9
DATE 8-10-79

OBSERVER DAVID Solomon
TYPE FACILITY Dehulling Cyclones - east
POINT OF EMISSIONS Roof stack

	Hr.	Min.	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	2	15	5	5	5	0			
	2	16	0	0	0	0			
	2	17	15*	0	5	5			* Short spurt (2 sec.)
a	2	18	0	5	0	5			
	2	19	0	0	0	5			
	2	20	0	0	0	5			
	2	21	5	0	5	0			
	2	22	0	0	0	0			
b	2	23	0	0	0	0			
	2	24	5	5	0	5			
	2	25	0	0	0	0			
	2	26	0	0	0	5			

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METHOD 9 RECORD OF VISUAL DETERMINATION OF OPACITY PAGE 1 OF 2

COMPANY Ralston-Purina
LOCATION Dehulling cyclones
TEST NO. 2-b
DATE 8-8-79
TYPE FACILITY Dehulling
CONTROL DEVICE Cyclone

HOURS OF OBSERVATION
OBSERVER David Solomon
OBSERVER CERTIFICATION DATE 7 12 79
OBSERVER AFFILIATION Pedco Environmental
POINT OF EMISSIONS Roof stack
HEIGHT OF DISCHARGE POINT 30'

	Initial			Final
CLOCK TIME	2:29			2:40
OBSERVER LOCATION Distance to Discharge	45'			
Direction from Discharge				
Height of Observation Point	Ground			
BACKGROUND DESCRIPTION	Brown equipt			
WEATHER CONDITIONS Wind Direction	—			
Wind Speed	under 1			
Ambient Temperature	90°			
SKY CONDITIONS (clear, overcast, % clouds, etc.)	HAZY			
PLUME DESCRIPTION Color	white			
Distance Visible	—			
OTHER INFORMATION	The source puffed intermittently			

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start-End	Opacity Sum	Opacity Average
a	2:29 - 2:34	45	1.88
b	2:35 - 2:40	10	0.42

Readings ranged from 0 to 15 % opacity

The source was/was not in compliance with _____ at the time evaluation was made.

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METHOD 9 OBSERVATION RECORD PAGE 2 OF 2

COMPANY Ralston-Purina
LOCATION Memphis, Tenn
TEST NO. 2-b
DATE 8-8-79

OBSERVER David Salomon
TYPE FACILITY Dehulling cyclones - west
POINT OF EMISSIONS Roof stack

Hr.	Min.	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
2	29	0	0	0	15*			*short spurt (2 sec)
2	30	5	0	0	0			
2	31	0	0	0	0			
2	32	0	0	0	0			
a 2	33	5	0	5	5			
2	34	0	0	5	5			
2	35	∞	0	0	0			
2	36	0	0	0	0			
b 2	37	0	0	0	0			
2	38	0	0	0	0			
2	39	5	0	0	5			
2	40	0	0	0	0			

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METHOD 9 RECORD OF VISUAL DETERMINATION OF OPACITY PAGE 1 OF 2

COMPANY Ralston-Purina
LOCATION Memphis, Tenn
TEST NO. 3
DATE 8-8-79
TYPE FACILITY Ground Hills
CONTROL DEVICE Micro bag filter

HOURS OF OBSERVATION
OBSERVER Dale Solomon
OBSERVER CERTIFICATION DATE 7-12-79
OBSERVER AFFILIATION Pedco Environmental
POINT OF EMISSIONS Rectangular roof stack
HEIGHT OF DISCHARGE POINT 30' horizontal

	Initial			Final
CLOCK TIME				
OBSERVER LOCATION Distance to Discharge	45'			
Direction from Discharge				
Height of Observation Point	Ground			
BACKGROUND DESCRIPTION	Black cloth			
WEATHER CONDITIONS Wind Direction	—			
Wind Speed	under 1			
Ambient Temperature	90			
SKY CONDITIONS (clear, overcast, % clouds, etc.)	Hazy			
PLUME DESCRIPTION Color	-			
Distance Visible	-			
OTHER INFORMATION				

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start-End	Opactity Sum	Opactity Average
a	2:46 - 2:51	0	0
b	2:52 - 2:57	0	0

Readings ranged from 0 to 0 % opacity

The source was/was not in compliance with _____ at the time evaluation was made.

Form 1403 Date 6/78

METHOD 9 OBSERVATION RECORD PAGE 2 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn
TEST NO. 3
DATE 8-8-74

OBSERVER Davis Solomon
TYPE FACILITY Ground Hulls
POINT OF EMISSIONS Micro bag filter

	Hr.	Min.	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	2	46	0	0	0	0			
	2	47	0	0	0	0			
a	2	48	0	0	0	0			
	2	49	0	0	0	0			
	2	50	0	0	0	0			
	2	51	0	0	0	0			
	2	52	0	0	0	0			
b	2	53	0	0	0	0			
	2	54	0	0	0	0			
	2	55	0	0	0	0			
	2	56	0	0	0	0			
	2	57	0	0	0	0			

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METHOD 9 RECORD OF VISUAL DETERMINATION OF OPACITY PAGE 1 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn
TEST NO. 4
DATE 8-8-74
TYPE FACILITY Flake Loading
CONTROL DEVICE R-J bag filter

HOURS OF OBSERVATION
OBSERVER David Solomon
OBSERVER CERTIFICATION DATE 7/12/74
OBSERVER AFFILIATION Pedco Environmental
POINT OF EMISSIONS 2-J bag stack
HEIGHT OF DISCHARGE POINT 20'

	Initial			Final
CLOCK TIME	3:20			3:31
OBSERVER LOCATION Distance to Discharge	40'			
Direction from Discharge	90°			
Height of Observation Point	Ground			
BACKGROUND DESCRIPTION	BROWN BRICK			
WEATHER CONDITIONS Wind Direction	—			
Wind Speed	under 1			
Ambient Temperature	90°			
SKY CONDITIONS (clear, overcast, % clouds, etc.)	HAZY			
PLUME DESCRIPTION Color	—			
Distance Visible	—			
OTHER INFORMATION				

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start-End	Opactity Sum	Opactity Average
a	3:20 - 3.25	0	0
b	3:26 - 3:31	0	0

Readings ranged from 0 to 0 % opacity

The source was/was not in compliance with _____ at the time evaluation was made.

Form 1403 Date 6/78

METHOD 9 OBSERVATION RECORD PAGE 2 OF 2

COMPANY Ralston-Purina
LOCATION Memphis, Tenn
TEST NO. 4
DATE 8-8-74

OBSERVER David Solomon
TYPE FACILITY Flake Loading R-J bag filter
POINT OF EMISSIONS [redacted] stack
Above-ground

	Hr.	Min.	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	3	20	0	0	0	0			
	3	21	0	0	0	0			
	3	22	0	0	0	0			
a	3	23	0	0	0	0			
	3	24	0	0	0	0			
	3	25	0	0	0	0			
	3	26	0	0	0	0			
b	3	27	0	0	0	0			
	3	28	0	0	0	0			
	3	29	0	0	0	0			
	3	30	0	0	0	0			
	3	31	0	0	0	0			

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METHOD 9 RECORD OF VISUAL DETERMINATION OF OPACITY PAGE 1 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn.
TEST NO. 5
DATE 8/8/79
TYPE FACILITY Meal loading
CONTROL DEVICE R-J bag filter

HOURS OF OBSERVATION
OBSERVER DAVID Solomon
OBSERVER CERTIFICATION DATE 7/12/79
OBSERVER AFFILIATION Pedco Environmental
POINT OF EMISSIONS Roof stack
HEIGHT OF DISCHARGE POINT 30'

	Initial			Final
CLOCK TIME	3:38			3:49
OBSERVER LOCATION Distance to Discharge	50'			
Direction from Discharge	90°			
Height of Observation Point	Ground			
BACKGROUND DESCRIPTION	Brown equip.			
WEATHER CONDITIONS Wind Direction	—			
Wind Speed	under 1			
Ambient Temperature	90°			
SKY CONDITIONS (clear, overcast, % clouds, etc.)	HAZY			
PLUME DESCRIPTION Color	-			
Distance Visible	—			
OTHER INFORMATION				

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start-End	Opactity Sum	Opactity Average
a	3:38 - 3:43	0	0
b	3:44 - 3:49	0	0

Readings ranged from 0 to 0 % opacity

The source was/was not in compliance with _____ at the time evaluation was made.

Form 1403 Date 6/78

METHOD 9 OBSERVATION RECORD PAGE 2 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn
TEST NO. 5
DATE 9/8/74

OBSERVER David Solomon
TYPE FACILITY Meal loading R-5 bag filter
POINT OF EMISSIONS Roof stack

Hr.	Min.	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	38	0	0	0	0			
3	39	0	0	0	0			
3	40	0	0	0	0			
3	41	0	0	0	0			
3	42	0	0	0	0			
3	43	0	0	0	0			
3	44	0	0	0	0			
3	45	0	0	0	0			
3	46	0	0	0	0			
3	47	0	0	0	0			
3	48	0	0	0	0			
3	49	0	0	0	0			

a

b

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METHOD 9 RECORD OF VISUAL DETERMINATION OF OPACITY PAGE 1 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn
TEST NO. 6
DATE 8/8/79
TYPE FACILITY stripper
CONTROL DEVICE bag filter

HOURS OF OBSERVATION
OBSERVER David Solomon
OBSERVER CERTIFICATION DATE 7/12/79
OBSERVER AFFILIATION Pedco Environmental
POINT OF EMISSIONS 9 ft elbow Stack above ground
HEIGHT OF DISCHARGE POINT 20'

	Initial			Final
CLOCK TIME	4:24			9:36
OBSERVER LOCATION Distance to Discharge	25'			
Direction from Discharge	90°			
Height of Observation Point	Ground			
BACKGROUND DESCRIPTION	Dark Pipework			
WEATHER CONDITIONS Wind Direction	—			
Wind Speed	Under 1			
Ambient Temperature	90°			
SKY CONDITIONS (clear, overcast, % clouds, etc.)	Hazy			
PLUME DESCRIPTION Color	—			
Distance Visible	—			
OTHER INFORMATION				

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start-End	Opactity Sum	Opactity Average
a	4:24 - 4:30	0	0
b	4:30 - 9:36	0	0

Readings ranged from 0 to 0 % opacity

The source was/was not in compliance with _____ at the time evaluation was made.

Form 1403 Date 6/78

METHOD 9 OBSERVATION RECORD PAGE 2 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn
TEST NO. 6
DATE 8/8/74

OBSERVER David Solomon
TYPE FACILITY Flake transfer R-I from stripper
POINT OF EMISSIONS elbow stack

Hr.	Min.	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	24		0	0	0			
4	25	0	0	0	0			
4	26	0	0	0	0			
4	27	0	0	0	0			
4	28	0	0	0	0			
4	29	0	0	0	0			
4	30	0						
4	30		0	0	0			
4	31	0	0	0	0			
4	32	0	0	0	0			
4	33	0	0	0	0			
4	34	0	0	0	0			
4	35	0	0	0	0			
4	36	0						

Form 1403 Date 6/78

METHOD 9 RECORD OF VISUAL DETERMINATION OF OPACITY PAGE 1 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn
TEST NO. 7
DATE 8-8-79
TYPE FACILITY Hull Bin
CONTROL DEVICE Cyclone

HOURS OF OBSERVATION
OBSERVER David Solomon
OBSERVER CERTIFICATION DATE 7/12/79
OBSERVER AFFILIATION Pedco Environmental
POINT OF EMISSIONS Rail stock
HEIGHT OF DISCHARGE POINT 30'

	Initial			Final
CLOCK TIME	4:46			4:57
OBSERVER LOCATION Distance to Discharge	50'			
Direction from Discharge	90°			
Height of Observation Point	Ground			
BACKGROUND DESCRIPTION	Dark Equip.			
WEATHER CONDITIONS Wind Direction	—			
Wind Speed	Under 1			
Ambient Temperature	90°			
SKY CONDITIONS (clear, overcast, % clouds, etc.)	Hazy			
PLUME DESCRIPTION Color	White			
Distance Visible	[redacted] —			
OTHER INFORMATION				

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start-End	Opactity Sum	Opactity Average
a	4:46 - 4:51	[redacted]	7.50
b	4:52 - 4:57	140	5.83

Readings ranged from 5 to 10 % opacity

The source was/was not in compliance with _____ at the time evaluation was made.

Form 1403 Date 6/78

METHOD 9 OBSERVATION RECORD PAGE 2 OF 2

COMPANY Ralston Purina
LOCATION Memphis, Tenn.
TEST NO. 7
DATE 8/8/74

OBSERVER David Solomon
TYPE FACILITY Hull bin cyclone
POINT OF EMISSIONS Roof stack

Hr.	Min.	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
~~4~~	~~45~~							
4	46	10	10	10	10			
4	47	10	10	10	10			
4	48	5	5	5	10			
4	49	10	10	5	5			
4	50	5	10	5	5			
4	51	5	5	5	5			
4	52	5	5	5	10			
4	53	5	10	5	5			
4	54	5	5	10	5			
4	55	5	5	5	5			
4	56	5	5	5	5			
4	57	5	10	5	5			

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