Background Report Reference

AP-42 Section Number: 9.13.2

Background Chapter: 4

Reference Number: 10

Title: Melitta USA, Inc. Emission Compliance Test Program

AirNova, Inc.

AirNova, Inc.

October 1991

Project No. 1257

Melitta USA

Emission Compliance Test Program
Log No. 89-5296

J. Robert Gallo — P.E.
Certified By

Prepared for:

Mr. John Thodan
Melitta USA Inc.
1401 Berlin Rd.
Cherry Hill, NJ 08003

October 1991

(#10)

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
Bureau of Technical Services
CN 411
Trenton, N.J. 08625-0411
(609) 530-4041

December 18, 1991

MEMORANDUM

TO: Chief
Bureau of Enforcement Operations

FROM: Edward Choromanski, Chief
Bureau of Technical Services

SUBJECT: Melitta USA Inc. - Cherry Hill, New Jersey
Stack Emissions Test Program
APC Plant ID No. 50365
NJ Stack No. 020
P/CT No. 97950 (Log No. 89-5296)

Stack emission tests were conducted at the above referenced facility on October 15, 1991 on the Probat Radial Roaster controlled by a catalytic oxidizer. The purpose of these tests was to quantify the emissions of particulates, carbon monoxide and total hydrocarbons being emitted to the atmosphere. In addition, VOS destruction efficiency across the oxidizer was demonstrated.

Dan Strochak reviewed the submitted stack emission test report. His review indicates that the particulate, CO and THC emissions were within the standard stated on the permit, for all test runs. In addition, the VOS destruction efficiency exceeded the minimum 95 percent standard required by the permit.

The test report review indicates that the results should be accepted as demonstrating compliance with the permit standards. A five year certificate can be issued if no other permit conditions are outstanding and with the approval of the Southern Regional Office.

c Milton Polakovic
Louis Mikolajczyk
Scott Hawthorne
Dan Strochak

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
Bureau of Technical Services
CN 411
Trenton, N.J. 08625-0411
(609) 530-4041

December 11, 1991

MEMORANDUM

TO: Edward Choromanski

FROM: Dan Strochak

SUBJECT: Melitta USA Inc.
APC ID No. 50365
NJ Stack No. 020
P/CT No. 97950 (Log No. 89-5296)

Air Nova, Inc. conducted an emission test program at the above mentioned facility on October 15, 1991. Sampling was conducted at the inlet and outlet of a Probat Catalyzer. The tests were for volatile organic compound (VOC) and particulate emissions resulting from coffee roasting. The results of these tests are as follows.

CONTAMINANT	RUN 1	RUN 2	RUN 3	ALLOWABLE
INLET				
THC ppm-dry	705	472	486	
lb/hr	1.8	1.2	1.1	

CONTAMINANT	RUN 1	RUN 2	RUN 3	ALLOWABLE
OUTLET				
THC ppm-dry	8.6	9.9	9.5	-
lb/hr	0.01	0.01	0.01	0.25
EFFICIENCY (%)	99.5	99.1	99.1	95
PARTICULATE				
lb/hr	0.05	0.04	0.06	0.20
grains dscf-dry	0.015	0.011	0.015	-
CO ppm-dry	25	20	25	
ppm-dry @7% O_2	39	31.2	39	
lb/hr	0.05	0.04	0.04	1.45

Technical Services calculations of the raw data supplied, indicates substantially the same results. The tests results indicate that all of the contaminants were within P/CT 91277 allowables for all three runs. The catalytic incinerator had a control efficiency of 99.5, 99.1 and 99.1 percent for runs one, two and three respectively. These were above the 95 percent permit minimum.

According to Walter Beland (SRO), the catalyzer temperature was approximately 1000^{o}F during the tests, which is above the 800^{o} permit minimum. The roaster was operating at the permit maximum of 80 lbs/batch.

Table of Contents

1.0 INTRODUCTION

AirNova, Inc. conducted an emission test program at the Melitta USA Inc. facility located in Cherry Hill, New Jersey for the purpose of demonstrating compliance with applicable State of New Jersey Department of Environmental Protection (NJDEP) regulations. Sampling was conducted at the inlet and outlet of a Probat Catalyzer. The catalyzer is operated is for the purpose of controlling volatile organic compound (VOC) emissions emanating from coffee roasting operations. The specific parameters determined as part of this test program included the following:

Inlet Test Location	Outlet Test Location
Total Hydrocarbons	Total Hydrocarbons Particulate Carbon Monoxide

This report contains the complete results of the test program.

2.0 SITE INFORMATION

The emission control device under evaluation is a Probat catalyzer designed for the control of waste air from the roasting operation by catalytic post-combustion of the odorous gases. The catalyzer consists of a filter-like hollow cylinder made of an active substrate situated in a conical insulated casing. The catalytic reaction of the Volatile Organic Compounds (VOCs) takes place at a temperature which is available during the roasting process following the hot-air furnace. Following treatment, the exhaust gases are routed to atmosphere.

Outlet emission sampling was conducted in a vertical section of 14 inch ID exhaust ducting. Two sample ports situated 90° apart were used for sampling traverses. The ports were situated 10.9 duct diameters downstream and 1.1 duct diameters upstream from any flow disturbance.

Inlet sampling was conducted in a vertical section of 13 inch ID ducting located 1 duct diameter downstream and 1 duct diameter upstream from the nearest flow disturbance. Two sample ports situated 90° apart were utilized for all sampling.

A system diagram, indicating the test locations is presented in Figure 2-1.

AirNova, Inc.

5845-A Clayton Avenue, Pennsauken, New Jersey 08109
(609) 486-1500 • FAX 486-9896

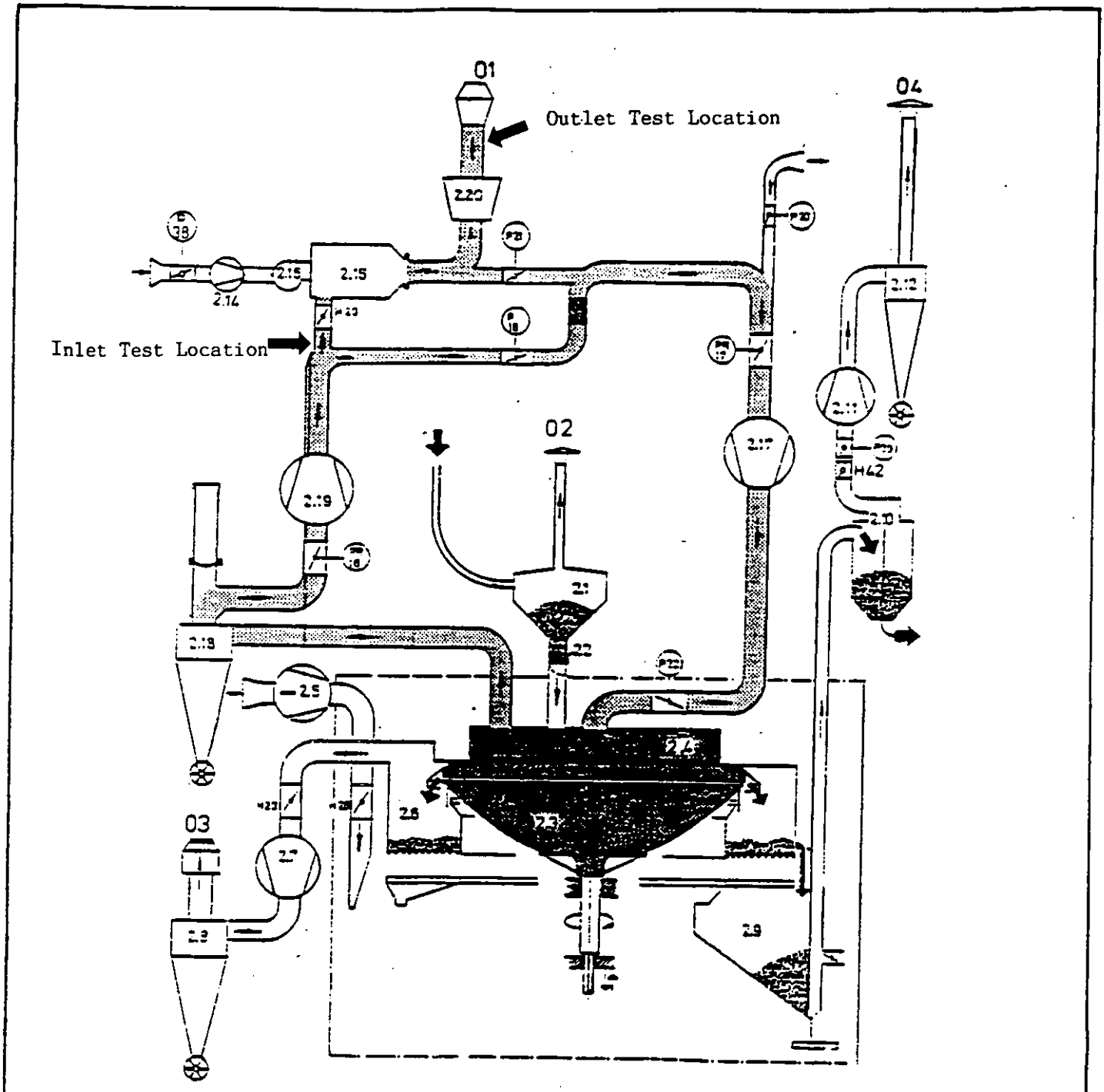

Figure 2-1 Emission Test Locations

3.0 TEST RESULTS

The results of the test program are presented in this section. Summary tables are presented as follows:

Particulate emissions for the catalyzer exhaust are limited to 0.03 lb/hr. The average particulate emission rate for the three test runs was determined to be 0.05 lb/hr. Carbon monoxide emissions are limited to 100 ppmV-dry at 15% oxygen. The average carbon monoxide concentration was determined to be 36.4 ppmV-dry at 15% oxygen. Total hydrocarbon emissions averaged 0.01 lb/hr with an allowable limit of 1.65 lb/hr.

Table 3-1

Particulate Emission Summary
Melitta USA, Inc.

Run No.	1	2	3
Date	10/15/91	10/15/91	10/15/91
Test Period	1045-1150	1248-1350	1500-1603
Temperature (°F)	965	898	849
Moisture Content (%)	20.1	20.1	18.7
Molecular Wt. (lb/mole)	26.89	26.89	27.04
Velocity (FPM)	1,312	1,219	1,206
Flow Rate (DSCFM)	416	404	422
Isokinetic Rate (%)	104	109	104
Oxygen (%)	12.00	12.00	12.00
Carbon Dioxide (%)	0.0 ← 4.0	0.00 ≈ 4.0	0.00 ← 4.0
Carbon Monoxide (%)	4.00 0	4.00 0	4.00 0
Particulate			
Concentration (gr/DSCF-dry)	0.015	0.011	0.015
Emission Rate (lb/hr)	0.05	0.04	0.06

Standard Conditions: 70°F, 29.92 in Hg

Table 3-2

Total Hydrocarbons Emission Summary
Melitta USA, Inc.

Run No.	1		2		3	
Location	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
Concentration * (ppmV-dry)	705	8.6	472	9.9	486	9.5
Emission Rate (lb/hr)	1.8	0.01	1.2	0.01	1.1	0.01
Removal Efficiency (%)	99.52		99.19		99.11	

* All concentrations are expressed as methane

Standard 70°F, 29.92 in Hg.

Table 3-3

Carbon Monoxide Emission Summary
Melitta USA, Inc.

Run No.	1	2	3
Date	10/15/91	10/15/91	10/15/91
Test Period	1050-1150	1250-1350	1500-1600
Concentration			
(ppmV-dry)	25.0	20.0	25.0
(ppmV-dry @ 7% O_2)	39.0	31.2	39.0
Emission Rate			
(lb/hr)	0.05	0.04	0.05

Standard Conditions: 70°F, 29.92 in Hg.

4.0 TEST METHODOLOGIES

The emission test program was performed in determination of the following parameters utilizing the test methods specified for each below:

Test Location	Parameter	Test Methodology
Inlet/Outlet	Total Hydrocarbons	New Jersey Air Test Method 3-7 "Procedures for the Direct Measurement of VOC Using a Flame Ionization Detector" NJAC 7:27B-3.7
Outlet	Particulate	New Jersey Air Test Method 1 "Sampling and Analytical Procedures for Determining Emissions of Particles from Manufacturing Processes
Inlet/Outlet	Moisture	EPA Reference Method 4 "Determination of Moisture Content in Stack Gas"
Outlet	Carbon Monoxide	EPA Reference Method 10 "Determination of Carbon Monoxide Emission from Stationary Sources"
Inlet/Outlet	Oxygen/Carbon Dioxide	EPA Reference Method 3. "Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources"

In addition to the above specified procedures, EPA Reference Methods 1 and 2 were performed at each test location in determination of sampling points, temperature, velocity and volumetric flow rate. All sampling was conducted simultaneously at the inlet and outlet test locations. Each test run was a minimum of one hour in duration with triplicate test runs performed for each parameter.

A full description of the methodologies utilized in determination of the above listed parameters is as follows:

4.1 *Cyclonic Flow Determination*

The presence of laminar flow was demonstrated at the inlet and outlet locations according to Section 2.4 of EPA Reference Method 1. A type S pitot tube was connected to a manometer. The pitot tube was placed at each of the traverse point locations, in a position such that the openings of the pitot tube are perpendicular to the stack gas flow. An angle finder was placed on the pitot tube, which was rotated until a reading of zero (0) was obtained. The "yaw" angle was then recorded.

4.2 Total Hydrocarbons

The total hydrocarbon content of the inlet and outlet gas streams was determined by New Jersey Air Test Method 3.7 in evaluation of the Volatile Organic Compound destruction efficiency.

Volatile organic compounds were measured continuously using separate heated total hydrocarbon analyzers. Sample gas was transported from each test location through a heated Teflon sampling line directly to each instrument. This instrument uses a Flame Ionization Detector (FID) with a heated sample path maintained at 320°F to prevent the condensation of high molecular weight hydrocarbons. The detector is fueled with hydrogen and uses blended air as the oxidant. The instrument was calibrated using three certified (±2%) mixtures of methane in air and zeroed with hydrocarbon free air (<0.01 ppm-C) both before and after each test run. The span gases corresponded to approximately 30%, 50% and 90% of instrument span.

A total of three 1-hour test runs were completed in the determination of inlet and outlet emissions of total hydrocarbons. Prior to the start of

sampling, the entire system was leak checked from the sample probe and a no flow condition verified at the analyzer.

4.3 Particulate

Outlet determinations of particulate were conducted isokinetically using a NJ Air Test Method 1 sampling system. The sample train consisted of a unitized quartz glass probe with a quartz glass nozzle. A type "S" pitot tube attached to the sample probe monitored the exhaust gas flow rate in order to maintain isokinetic sampling conditions and determine the volumetric flow rate. A type "k" thermocouple was used to measure the exhaust gas temperature. Source gas samples were extracted from the exhaust stream by a vane-type vacuum pump pulling the sample stream through the nozzle and probe. The sample stream passed through a heated glass fiber filter for the collection of particulate matter. From the filter, the source gas sample passed through two impingers (each containing 100 milliliters of distilled water), one dry impinger, and a fourth impinger containing 200-300 g of tared silica gel. The sample stream subsequently passed through a dry gas meter for volume quantification.

Sampling was conducted in triplicate 1-hour sampling events with a minimum sample volume of 30 cubic feet collected for each event. At sampling completion, the probe, nozzle, and front half of the filter holder were repeatedly brushed and rinsed with acetone with the washings placed in a glass container sealed with a Teflon-lined cap. The tared glass fiber filter was placed in a petri dish and sealed. The impinger contents were measured for volume increase and discarded.

The volume of the front half acetone wash was measured to the nearest milliliter then evaporated to dryness at 70°F and one atmosphere in a tared beaker. The beaker was then heated to 220-270°F, desiccated at room temperature then tared to a constant weight. After adjusting for the field blank, the results are reported to the nearest 0.1 mg.

4.4 Carbon Monoxide

The carbon monoxide concentration of the afterburner exhaust gas was determined by EPA Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources". The sample gas was transported from the test location through an air cooled condenser, Teflon sample line, glass fiber filter and a leak free diaphragm pump to a rotometer and then to the non-dispersive infrared analyzer. The instrument was calibrated with three concentrations of CO in nitrogen of approximately 30%, 50% and 90% of instrument span and zeroed with zero grade nitrogen before and after each test period. The sampling system was leak checked before and after each test run. Verification of a no-flow condition was demonstrated by the rotometer.

4.5 Moisture Determination

The moisture content of the inlet and outlet stack gases was determined by EPA Method 4, "Determination of Moisture Content in Stack Gases". A gas sample was extracted from the gas stream stack at a constant rate then collected in a condenser train for subsequent volumetric and gravimetric analysis.

The EPA Method 4 sampling train consisted of the following apparatus connected in series:

- Heated sample probe
- A modified Greenburg-Smith impinger containing 100 ml of water
- A Greenburg-Smith impinger containing 100 ml of water
- An empty modified Greenburg-Smith impinger
- A modified Greenburg-Smith impinger containing 250 g of silica gel desiccant
- Leak free pump
- Dry gas meter equipped with inlet and outlet thermometers
- Differential pressure gauge

A minimum of 30 ft^3 was collected during each of three 1-hour test runs. At the end of the sampling run the increase in volume of the impinger contents and mass of the silica gel was determined.

4.6 Carbon Dioxide and Oxygen

Carbon dioxide (CO_2) and oxygen (O_2) content were determined by EPA Method 3 at each test location. The sampling trains consisted of a stainless steel probe packed with a plug of glass wool for particulate filtration. The sampling probe was attached to an ice-cooled condenser used to remove excess moisture from the sample stream. The condenser was attached to a leak-free diaphragm pump with an in-line needle valve to adjust the sample flow rate. The sample stream was drawn through a rotameter to measure the sampling flow rate within ±5 percent of the selected flow rate for the test. The sample steam passed through the rotameter into a leak-free Tedlar bag. Sampling was conducted concurrent with each 1-hour test period at each test location. Analysis was conducted in accordance with the EPA Method 3 (ORSAT analysis).

Appendix A

Field Data and Calculations

INLET
STACK 11A - 13'10"

AirNova, Inc.
5845-A Clayton Avenue
Pennsauken, New Jersey 08109

PRE TEST LEAK CHECK = 0.009 @ 7"

POST LEAK CHECK = 0.009 @ 7"

PLANT MELITA
DATE 15 OCT 91
SAMPLING LOCATION INLET
SAMPLE TYPE MOISTURE
RUN NUMBER 1 OPERATOR JM, RB
BAROMETRIC PRESSURE _____ STATIC PRESSURE +.26
FILTER NUMBER(S) _____
GEL NUMBER(S) _____
THIMBLE NUMBER _____ PLATE NUMBER _____
H_2O PICKUP (ml) _____

CO_2 _____
O_2 _____
CO _____

PYROMETER NUMBER _____
THERMOCOUPLE NUMBER _____
PROBE NUMBER _____ TYPE _____
NOZZLE NUMBER _____ I.D. _____
METER BOX NUMBER _____ $\Delta H_@$ _____
PITOT NUMBER _____ C_p _____
SAMPLE BOX NUMBER(S) _____
ASSUMED MOISTURE (%) _____
ASSUMED METER TEMPERATURE _____
C FACTOR _____ REFERENCE Δp _____

READ AND RECORD ALL DATA EVERY _____ MINUTES

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK) / SAMPLING TIME, min	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	~~PUMP VACUUM~~, in. Hg VEL HEAD	~~SAMPLE BOX TEMPERATURE~~, °F STACK TEMP.	IMPINGER TEMPERATURE, °F
	~~1045~~	~~293.421~~	A								
			.89			419	85	85	.87	~~426~~	
			.64			428			.69	~~434~~	
		1058	.05			421			.07	419	
			.11			418			.07	416	
			.12			422			.09	421	
			.08			427			.08	428	
		B	1.1			407			1.3	408	
			.41			423			.46	421	
			.32			428			.27	426	
		1	.41			430			.40	433	
			.34			430			.35	428	
			.31			426	119	114	.33	427	
		STATIC	+.26								
	1145	331.942									
	60 MIN	38.521	.32			423	102	99.5	.32	424	

RUN #1

16

#7 H²⁰ GA ? : 39C mL

#3 H₂O GAINED = 305 mL

#7 PRE-LEAK CHECK: 0.011 @ 15" Hg

POST-TEST LEAK CHECK: 0.009 @ 8" Hg

#3

PLANT MELITA DATE 10/18/91 RUN NUMBER TWO INLET

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m, ft³)	VELOCITY HEAD (Δp_s, in. H_2O)	ORIFICE PRESSURE DIFFERENTIAL (ΔH, in. H_2O) DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH, in. H_2O) ACTUAL	STACK TEMPERATURE (T_s, °F)	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$, °F)	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$, °F)	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
RUN #2	1254	332.543 (A)	.91			420	90	90	7.5		
			.62			426					
			.07			426					
			.12			419					
			.09			420					
			.11			424					
		(B)	1.3			415					
			.40			421					
			.35			426					
			.39			438					
			.32			439					
	1354	373.724	.27			422	126	121			
		41.187	.32			425	113	96			
		374.378									
RUN #3	1601	~~374.046~~	0.05			420	90	90			
			0.95			418					
			0.46			419					
			1.0			422					
			0.05			426					
			0.06			428					
			0.05			417					
			.24			419					
			.33			420					
			.16			422					
			.31			425					
			.49			429	129	120			
	1691	406.461									
		32.083	.34			422	110	105			

AirNova, Inc.
5845-A Clayton Avenue
Pennsauken, New Jersey 08109

POST LEAK CK. .013 @ 17"

DIA 14"

PLANT Mallinckrodt
DATE 10-15-91
SAMPLING LOCATION Outlet Probe 1
SAMPLE TYPE MM Mthd 3
RUN NUMBER 1 OPERATOR JM / LP
BAROMETRIC PRESSURE 29.84 STATIC PRESSURE
FILTER NUMBER(S)
GEL NUMBER(S)
THIMBLE NUMBER PLATE NUMBER
H_2O PICKUP (ml) Run #1 387 / Run #2 294 / Run #3 265
Silica Gel

CO_2
O_2
CO

PYROMETER NUMBER
THERMOCOUPLE NUMBER
PROBE NUMBER 5' TYPE Quartz
NOZZLE NUMBER I.D. .63
METER BOX NUMBER Meterik $\Delta H_@$ 1.95
PITOT NUMBER "S" C_p .85
SAMPLE BOX NUMBER(S)
ASSUMED MOISTURE (%) 12%
ASSUMED METER TEMPERATURE 80
C FACTOR .95 REFERENCE Δp .03
READ AND RECORD ALL DATA EVERY 5 MINUTES

Filter Temp In	Filter Temp Out	Traverse Point Number	Sampling Time, min / Clock Time (24-hr Clock)	Gas Meter Reading (V_m), ft³	Velocity Head (Δp_s), in. H_2O	Orifice Pressure Differential (ΔH), in. H_2O Desired	Orifice Pressure Differential (ΔH), in. H_2O Actual	Stack Temperature (T_s), °F	Dry Gas Meter Temperature Inlet ($T_{m\,in}$), °F	Dry Gas Meter Temperature Outlet ($T_{m\,out}$), °F	Pump Vacuum, in. Hg	Sample Box Temperature, °F	Impinger Temperature, °F
225	224	1	00 1043	417.065	.07	4.8	4.8	1017	62	62	9	224	61
224	224	2	05	422.215	.07	4.3	4.3	929	62	62	15	223	61
225	225	3	10	427.392	.05	3.2	3.2	995	65	65	13	225	61
224	226	4	15	432.869	.05	3.2	3.2	964	68	68	13	225	61
224	225	5	20	437.351	.04	2.5	2.5	887	70	70	9	225	62
225	226	6	25	441.756	.05	3.2	3.2	898	72	72	6	225	62
			30 1117	444.698									
224	225	7	30 1120	444.698	.06	3.8	3.8	932	72	72	13	225	63
225	225	8	35	450.501	.06	3.8	3.8	988	73	73	16	224	63
224	224	9	40	455.481	.05	3.2	3.2	969	75	75	12	225	64
225	226	10	45	460.281	.04	2.5	2.5	954	76	76	9	226	64
224	225	11	50	464.522	.06	3.8	3.8	1028	76	76	16	226	65
225	225	12	55	469.702	.04	2.5	2.5	1020	78	78	9	225	66
			60 1150	474.003									
				53.938	.06	3.37	3.37	965.	71	71	12	225	63
					.051								

A3

Preleak ok ... 2 ... -0
Post Leak OK .004 AT 20"
H_2O gain - 294mL

PLANT Mellita DATE 10-15-91 RUN NUMBER 2 P629.740 outlet Probat

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m, ft^3)	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
1	00	1248	479.738	.04	2.5	2.5	894	69	69	12	223	62
2	05		479.029	.05	3.2	3.2	898	70	70	17	225	62
3	10		483.515	.05	3.2	3.2	897	70	71	17	226	62
4	15		488.426	.04	2.5	2.5	897	74	74	18	226	62
5	20		491.629	.04	2.5	2.5	898	74	74	18	226	62
6	25		496.621	.04	2.5	2.5	899	73	73	17	225	62
	30	1318	501.222									
7	30		501.222	.05	3.2	3.2	899	72	72	18	226	62
8	35		507.291	.05	3.2	3.2	900	74	74	18	225	62
9	40		512411.	.05	3.2	3.2	900	74	74	18	225	62
10	45		517.012	.06	3.2	3.2	900	74	74	19	225	62
11	50		521.361	.05	3.2	3.2	900	72	73	18	225	62
12	55		526.249	.05	3.2	3.2	899	74	74	18	225	62
	60		530.442									
			55.704	.046	2.96	2.96	898	72.6	72.6	17.3	225.16	62

A4

[illegible] 0: [illegible] 2 [illegible]
POST [illegible] - .001 [illegible] 174
H_2O gain - 265

OUTLET PROBE [illegible] 2973

PLANT MELITA DATE 10-15-91 RUN NUMBER 3

In	Out	TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
					531.978									
[illegible]	225	1	00	1500	[illegible]	.05	[illegible]	[illegible]	816	69	69	15	225	64
22[illegible]	22[illegible]	2	05		536.307	.05	3.2	3.2	868	68	68	13	225	62
22[illegible]	226	3	10		540.839	.05	3.2	3.2	897	71	71	13	225	62
22[illegible]	225	4	15		545.598	.04	2.5	2.6	970	74	74	13	225	62
225	225	5	20		549.839	.04	2.5	2.5	906	75	75	13	226	62
226	225	6	25		554.105	.05	3.2	3.2	808	76	76	16	225	68
			30	1530	558.892									
225	225	7	30	1533	558.892	.05	3.2	3.2	809	75	74	15	225	62
224	225	8	35		563.312	.05	3.2	3.2	810	76	76	15	225	62
225	225	9	40		567.329	.05	3.2	3.2	809	76	76	15	225	62
225	225	10	[illegible]		572.317	.05	3.2	3.2	815	75	75	16	225	62
225	225	11	50		576.821	.04	2.5	2.5	810	75	75	14	225	62
225	225	12	55		582.317	.04	2.5	2.5	816	75	75	16	225	62
			60		586.969									
					54.997	~~.05~~ .047	2.96	2.96	849.2	74.25	74.25	14.5	225.08	62.83

A5

AirNova, Inc.
AIR QUALITY SAMPLING AND ANALYSIS

GAS ANALYSIS DATA FORM

PLANT Mel Tha
DATE 10-16-91 TEST NO 1
SAMPLING TIME (24-hr CLOCK) 60 min
SAMPLING LOCATION Inlet
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) bag
ANALYTICAL METHOD OCSPT
AMBIENT TEMPERATURE 75
OPERATOR mc

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	4%	4%	4%	4%	4%	4%	4%	44/100	
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	19%	15%	19%	15%	19%	15%	15%	32/100	
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	0%	0%		0%		0%	0%	28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)	0%	0%		0%		0%	0%	28/100	
								TOTAL	

Ap

AirNova, Inc.
AIR QUALITY SAMPLING AND ANALYSIS

GAS ANALYSIS DATA FORM

PLANT MELITA
DATE 11-16-91 TEST NO 2
SAMPLING TIME (24-hr CLOCK) 60 min
SAMPLING LOCATION INLET
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) BAG
ANALYTICAL METHOD ORSAT
AMBIENT TEMPERATURE 75
OPERATOR MC

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	4%	4%	3%	3%	5%	5%	4%	44/100	
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	19%	15%	18%	15%	20%	15%	15%	32/100	
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)								28/100	
								TOTAL	

A.

AirNova, Inc.
AIR QUALITY SAMPLING AND ANALYSIS

GAS ANALYSIS DATA FORM

PLANT MELITA
DATE 10-14-91 TEST NO 3
SAMPLING TIME (24-hr CLOCK) 60 min
SAMPLING LOCATION INLET
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) bag
ANALYTICAL METHOD ORSAT
AMBIENT TEMPERATURE 75°
OPERATOR MC

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	3%	3%	4%	4%	4%	4%	4%	44/100	
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	18%	15%	19%	15%	20%	16%	15%	32/100	
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)								28/100	
								TOTAL	

AirNova, Inc.
AIR QUALITY SAMPLING AND ANALYSIS

GAS ANALYSIS DATA FORM

PLANT MELTH
DATE 12-16-91 TEST NO 1
SAMPLING TIME (24-hr CLOCK) 60 min
SAMPLING LOCATION OUTLET
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) BAG
ANALYTICAL METHOD ORSAT
AMBIENT TEMPERATURE 75°
OPERATOR MC

COMMENTS:

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	4%	4%	4%	4%	5%	5%	4%	44/100	
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	16%	12%	17%	13%	17%	12%	12%	32/100	
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)								28/100	
								TOTAL	

AirNova, Inc.
AIR QUALITY SAMPLING AND ANALYSIS

GAS ANALYSIS DATA FORM

PLANT Melitta
DATE 10-16-91 TEST NO 2
SAMPLING TIME (24-hr CLOCK) 60 min
SAMPLING LOCATION OUTLET
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) bag
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE 75°
OPERATOR MC

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	4%	4%	4%	4%	4%	4%	4%	44/100	
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	16%	12%	17%	13%	15%	11%	12%	32/100	
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)								28/100	
								TOTAL	

AIR

AirNova, Inc.
AIR QUALITY SAMPLING AND ANALYSIS

GAS ANALYSIS DATA FORM

PLANT Melitta
DATE 10-16-91 TEST NO 3
SAMPLING TIME (24-hr CLOCK) 60 min
SAMPLING LOCATION outlet
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) bag
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE 25°
OPERATOR mc

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	4%	4%	3%	3%	4%	4%	4%	44/100	
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	16%	12%	16%	13%	16%	12%	12%	32/100	
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)								28/100	
								TOTAL	

A11

Project Number _____ Test Number _____

Plant MELITTA

Date 10-15-91 Time _____

Sampling Location OUTLET

Sample Type CYCLONE

Run Number _____

Operators JM / BILL P

Ambient Temperature _____

Barometer _____

Orsat Analysis

Sample Type (Bag, Integrated, Continuous) _____

GAS \ RUN	1		2		3		4
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET	
CO_2							
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)							
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)							
N_2 (NET IS 100 MINUS ACTUAL CO READING)							

Fyrite Analysis Pitot coefficient .85

CO_2	O_2	

Field Data - Moisture

Time _____

Final Meter Vol. _____

Initial Mtr. Vol. _____

Total Meter Vol. _____

Meter Temp. In _____

Out _____

Rotameter Setting _____

Final H_2O Vol. _____

nit. H_2O Vol. _____

Net Volume _____

Comments:

TRAVERSE POINT LOCATION & VELOCITY DATA BY _____

TRAVERSE POINT NUMBER	A=FRACTION OF I.D.	B=A x I.D. ID=	C=B+NIPPLE NIPPLE= CYCLONE	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
1			+3		
2			+3		
3			+3		
4			+4		
5			+2		
6			+1		
7					
8			+5		
9			+7		
10			+4		
11			+2		
12			0		
13			+1		
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					

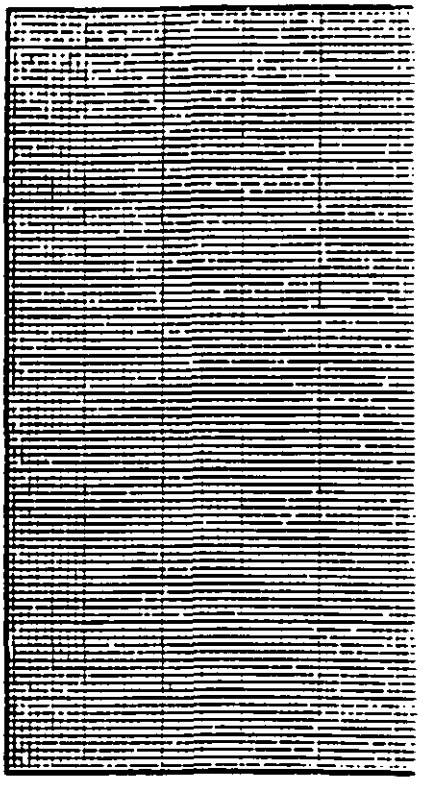

DIAGRAM OF STACK, PORTS, & TRAVERSE POINTS (indicate direction of F

INSIDE DIMENSIONS OF SAMPLE PLA

STACK GAUGE PRESSURE in. H_2O ___

NEAREST UPSTREAM DISTURBANCE ___

NEAREST DOWNSTREAM DISTURBANCE ___

PROCESS & CONTROL EQUIPMENT DESCRIPTION _____

4

Project Number_____ Test Number_____

Plant MeLITA

Date 10-15-91 Time_____

Sampling Location INLET

Sample Type CYCLONE

Run Number_____

Operators JM/RB

Ambient Temperature_____

Barometer_____

Orsat Analysis

Sample Type (Bag, Integrated, Continuous)_____

GAS \ RUN	1		2		3	
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET
CO_2						
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)						
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)						
N_2 (NET IS 100 MINUS ACTUAL CO READING)						

Fyrite Analysis Pitot coefficient .85

CO_2	O_2	

Field Data - Moisture

Time_____

Final Meter Vol._____

Initial Mtr. Vol._____

Total Meter Vol._____

Meter Temp. In_____

Out_____

Rotameter Setting_____

Final H_2O Vol._____

Init. H_2O Vol._____

Net Volume_____

Comments:

TRAVERSE POINT LOCATION & VELOCITY DATA BY

TRAVERSE POINT NUMBER	A=FRACTION OF I.D.	B=A x I.D. ID=	C=B+NIPPLE NIPPLE= CYCLONE	VELOCITY HEAD (Δp, in. H_2O)	STACK TEMPERATURE (T_s), °F
1			T5		
2			T7		
3			T8		
4			T4		
5			0		
6			T9		
7					
8			T10		
9			T8		
10			T5		
11			T3		
12			T2		
13			0		
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					

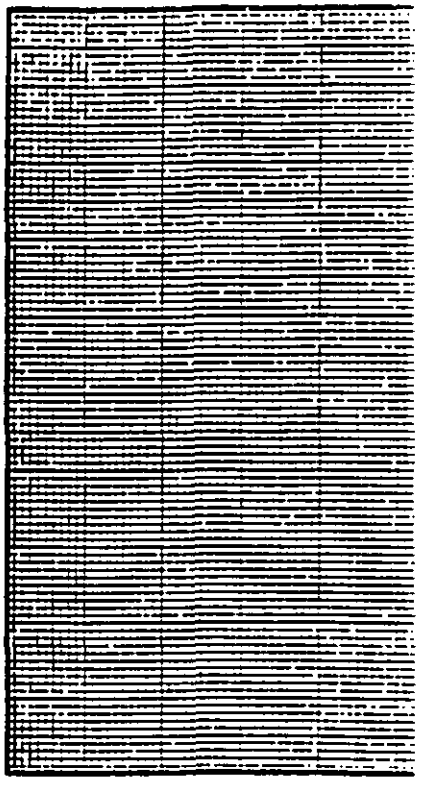

DIAGRAM OF STACK, PORTS, & TRAVERSE POINTS (indicate direction of flow)

INSIDE DIMENSIONS OF SAMPLE PLANE_____

STACK GAUGE PRESSURE in. H_2O_____

NEAREST UPSTREAM DISTURBANCE_____

NEAREST DOWNSTREAM DISTURBANCE_____

PROCESS & CONTROL EQUIPMENT DESCRIPTION_____

A

EMISSION TEST PRODUCTION REPORT FORM

I. Company Name MELITTA USA, INC. APC Plant ID# 50365
Plant Location CHERRY HILL NJ
Certificate Number (LOG No. 89-5296
Designation of Equipment POLYPROPYLENE

II. Emission Test Date(s) 10/15/91
Tests Conducted By:
Name of Firm A.R NOVA INC
Business Address 5845 CLAYTON AVE PHILADELPHIA PA
Phone Number 609/428-1500
Test Team Representatives M. DALY R. RIGGS
T. MAY W. DEMCSAK
M. CUNNAIRE
L. PUCCIA

Length of Test 60 MIN/RUN

	Run #1	Run #2	Run #3
Test Time (Start/Finish)	1045/1150	1245/1350	1500/1607

III. Certificate Operating Conditions

A. List Conditions	Achieved (Yes or No)
OXIDIZER TEMP > 800°F	YES

B. Log of Certificate Conditions During Stack Test
(Record at least every 15 minutes)

Condition	Run #	Readout	Time of Recording
	SEE ATTACHMENT		

IV. Equipment Operation/Process Parameters

Number of Sources Connected 1

Number of Sources Operating 1

Production Rate: Normal _____

Maximum X

A. Raw Materials:

	Test Run #1	Test Run #2	Test Run #3
Usage Rate (lbs/hr)			
Breakdown (% by weight)			

B. Surface Coating:

Material Being Coated _____

Type of Coating _____

Coating Rate (Gals/Hr) N/A

Is Coating Altered (Yes or No) _____

With _____

Distance From Coating Head to Exhaust Duct —

C. Fuel Burning - Incineration:

Type of Fuel N/A

Fuel Burning Rate _____ (lbs/hr), (gals/hr), (ft/hr)

Fuel Additives _____, % _____

Meter Reading (if available)	Time

Type of Waste Constituents _____

Auxiliary Fuel _____

Burning Rate N/A

D. Other:

Description of Operation and Process Rate

COFFEE ROASTING

V. Control Equipment Parameters

CEMs Required (Yes/No) _____

Contaminant? CO / O2

STACK TEST CEM READING

Parameter Cont/Read	Parameter Cont/Read	Parameter Cont/Read	Time	Test Run #
NOT CERTIFIED AT THIS TIME				

A. Control Equipment performance Parameter

Parameter	Reading	Time	Run #
	SEE ATTACHMENT		

B. Additional Observations

Fugitive Emissions (Yes/No) _____

Equipment Location _____

Visible Emissions From Stack (Yes/No) _____

Odors Noticeable

Vicinity of Equipment (Yes/No) _____
Near Exhaust Stack (Yes/No) _____
Off Property (Yes/No) _____

VI. Samples

Type of Sample _____
Time of Sampling _____
Sampled By _____
Sample Taken From _____

To Be Analyzed For _____
Analyzed By _____

Form Information Supplied by: Name/Title (Please Print)

X John Hodkin Plant Engr.

Signature(s)/Date X John Hodkin 10-21-91

DEP Usage Only
Rec'd By Sample Rec'd Date/Time Rev'd By