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TEST REPORT

VOLUME I.

METHOD DEVELOPMENT AND TESTING FOR ORIENTED STRAND BOARD PLANT EMISSIONS

WEYERHAEUSER WAFERBOARD PLANT ELKIN, NORTH CAROLINA

EPA Project No. 91-WAF-02

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1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

The U.S. Environmental Protection Agency (EPA), Office of Air Quality Planning and Standards (OAQPS), Emission Inventory Branch (EIB) is responsible for developing and maintaining air pollution emission factors for industrial processes. EIB, in collaboration with the National Council for Air and Stream Improvement (NCASI), is presently studying the wood products industry. The purpose of this study is to develop emission factors for oriented strand board (OSB) production facilities. The Emission Measurement Branch (EMB) of OAQPS coordinated the emission measurement activities at this plant. Entropy Environmentalists, Inc. (Entropy) and NCASI conducted the emission measurements.

EPA/EIB, EPA/EMB, and NCASI considered the Weyerhaeuser facility in Elkin, North Carolina to be one of four facilities that represent the diversity in wood species and dryer control devices. This test, the second of the four, was conducted on July 30-31, 1991. Simultaneous measurements were conducted at the inlet and outlet of the electrified filter bed (EFB) for the No. 1 wood flake dryer exhaust and at the press vents. Pollutants measured were: particulate matter (PM), condensible particulate matter (CPM), carbon monoxide (CO), nitrogen oxides (NO_x), hydrocarbons (THC), formaldehyde, other aldehydes, and ketones, and semivolatile organic compounds (SVOC) and volatile organic compounds (VOC).

1.2 KEY PERSONNEL

The key personnel who coordinated the test program and their telephone numbers are:

- Mr. Dallas Safriet, Technical Coordinator, EIB — 919/541-5371
- Mr. Dennis Holzschuh, Field Test Coordinator, EMB — 919/541-5239
- Mr. Bill Kirk, Field Test Director, Entropy — 919/781-3551
- Mr. Chuck Vaught, Process Engineer, MRI — 919/677-0249
- Mr. Jeff Fickett, Weyerhaeuser Plant Representative — 919/835-5100
- Mr. David Rovell-Rixx, NCASI Representative — 904/377-4708

2.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

2.1 PROCESS DESCRIPTION AND OPERATION

The basic processing steps for OSB production are:

- Logs are slashed, debarked, cut into shorter lengths, and sliced into thin flakes.
- The wood flakes are dried, classified, blended and mixed with resin, oriented, and formed into a mat.
- The formed mats are separated into desired lengths, heated, and pressed to activate the resin and bond the wood flakes into a solid sheet.
- Sheets are trimmed, edge treated, and packaged for shipping.

The wood mix for the Weyerhaeuser facility was approximately 60 percent soft wood, such as pine, 30 percent soft hardwood, such as sweet gum, and 10 percent hardwood. About 12.8 tons/hr of flakes were processed by two 12-foot diameter dryers with inlet temperatures of about 1000°F and exit temperatures of about 236°F. The dryers were heated by a McConnell burner fired with recycled waste such as wood trim, fines, and resinated sander dust. The moisture of the wood flakes was about 2.7 percent. Figure 2-1 presents a generalized OSB process flow diagram.

2.2 ELECTRIFIED FILTER BED DESCRIPTION

Particulate matter from the wood flake dryer is controlled by cyclones and an electrified filter bed (EFB) manufactured by EFB, Inc. Figure 2-2 is a schematic of an ionizer and gravel bed assembly. The EFB is an electrostatic precipitator (ESP) that uses pea-gravel as its collection electrodes.

The gases enter the EFB into an annular region formed by two concentric cylinders. The inner cylinder is the ionizer. Ions formed by the ionizer stream toward the adjacent cylinder wall and impart electrostatic charges on dust particles.

After passing through the ionizer, the gases flow down the chamber into the filter bed section. The filter bed consists of pea-shaped gravel held between two cylindrical louvers. A high DC positive voltage polarizes the gravel and induces regions of positive and negative charge on the pebbles. As the gases pass through the pebble bed, the negatively charged dust particles are collected on the positively charged regions on the gravel.

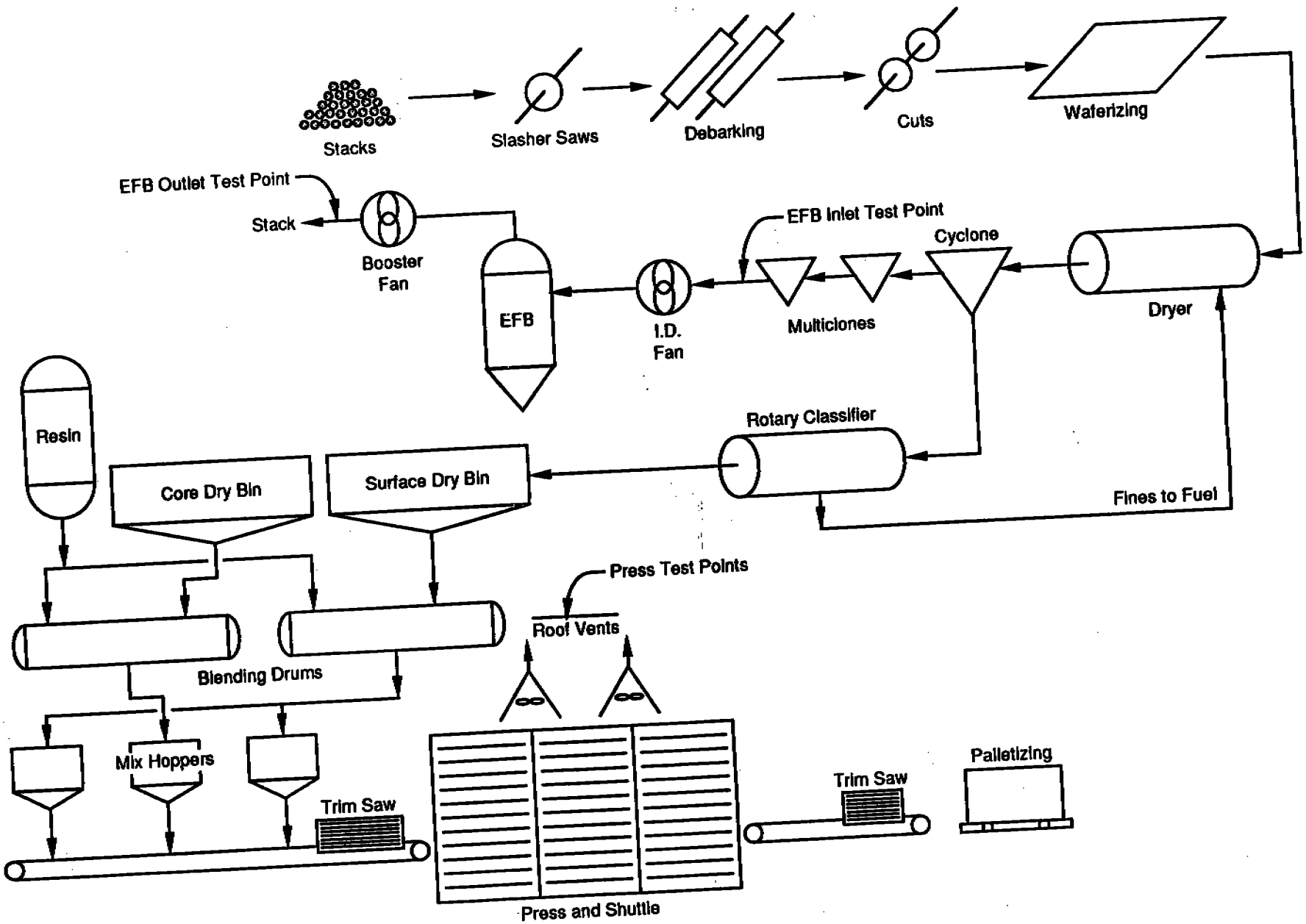

Figure 2-1. Generalized Oriented Strand Board (OSB) process flow diagram.

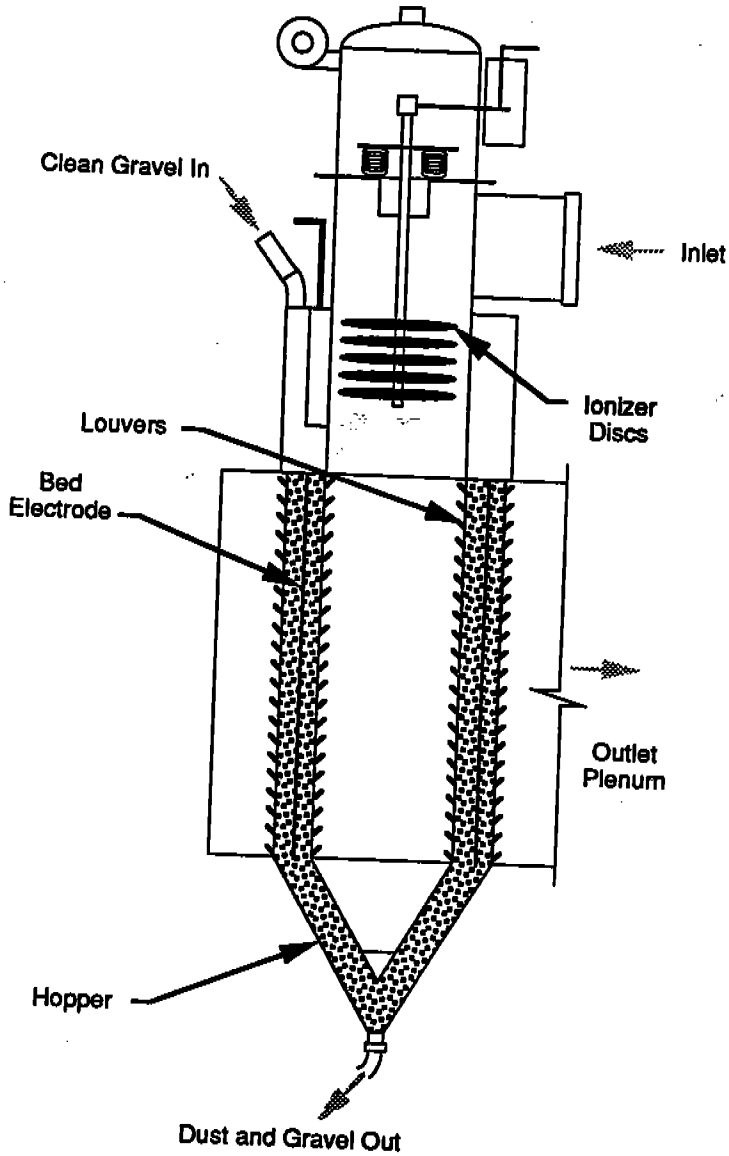

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Figure 2-2. Ionizer and gravel bed assembly.

As dust accumulates in the filter bed, the resistance to gas flow increases. To maintain constant flow and remove collected particles, the EFB slowly and continuously removes gravel from the bottom. The removed gravel is agitated to remove the dust particles and is recycled into the EFB at the top.

2.3 FLUE GAS SAMPLING LOCATIONS

Emission sampling was conducted at: (1) the EFB inlet on dryer No. 1 before the induced draft fan, (2) the EFB outlet stack on dryer No. 1, and (3) the press vents. Figure 2-1 shows the sampling locations in relation to the process. Figures 2-3, 2-4, and 2-5 are schematics of these sampling locations.

2.3.1 EFB Inlet

Four 4-inch ports were installed at Sections XX and YY as shown in Figure 2-3. Section XX's 1.75 duct diameters did not meet Method 1 criteria. However, because of obstructions around the site, EPA considered Section XX to be the only practical location for Methods 5/202 and 0011 and made the decision to use this location. The maximum number of 24 traverse points was selected for Section XX. One train traversed into the duct while the other traversed out. At Section YY, about 2 feet below Section XX, one port was used for the Method 25 single-point sampling and the second for Methods 25A and 3.

2.3.2 EFB Outlet

The outlet stack for the EFB has two 4-inch sampling ports A and B (see Figure 2-4). Additional 4-inch ports were installed as shown in the figure. Methods 5/202, 0011, and MM5 were conducted at Section XX at 24 points, and Methods 25, 10, 7E, and 3 were conducted at Section YY. The VOST train was conducted at the port just above Section XX.

2.3.3 Press Vents

The press has eight roof vents as shown in Figure 2-5. The two vents on the ends (1 and 8) were not tested because they were not directly over the press and little or no emissions were expected from these vents. Different pairs of the other six vents were sampled for formaldehyde emissions (Method 0011) during each of the three test runs (see Figure 2-5).

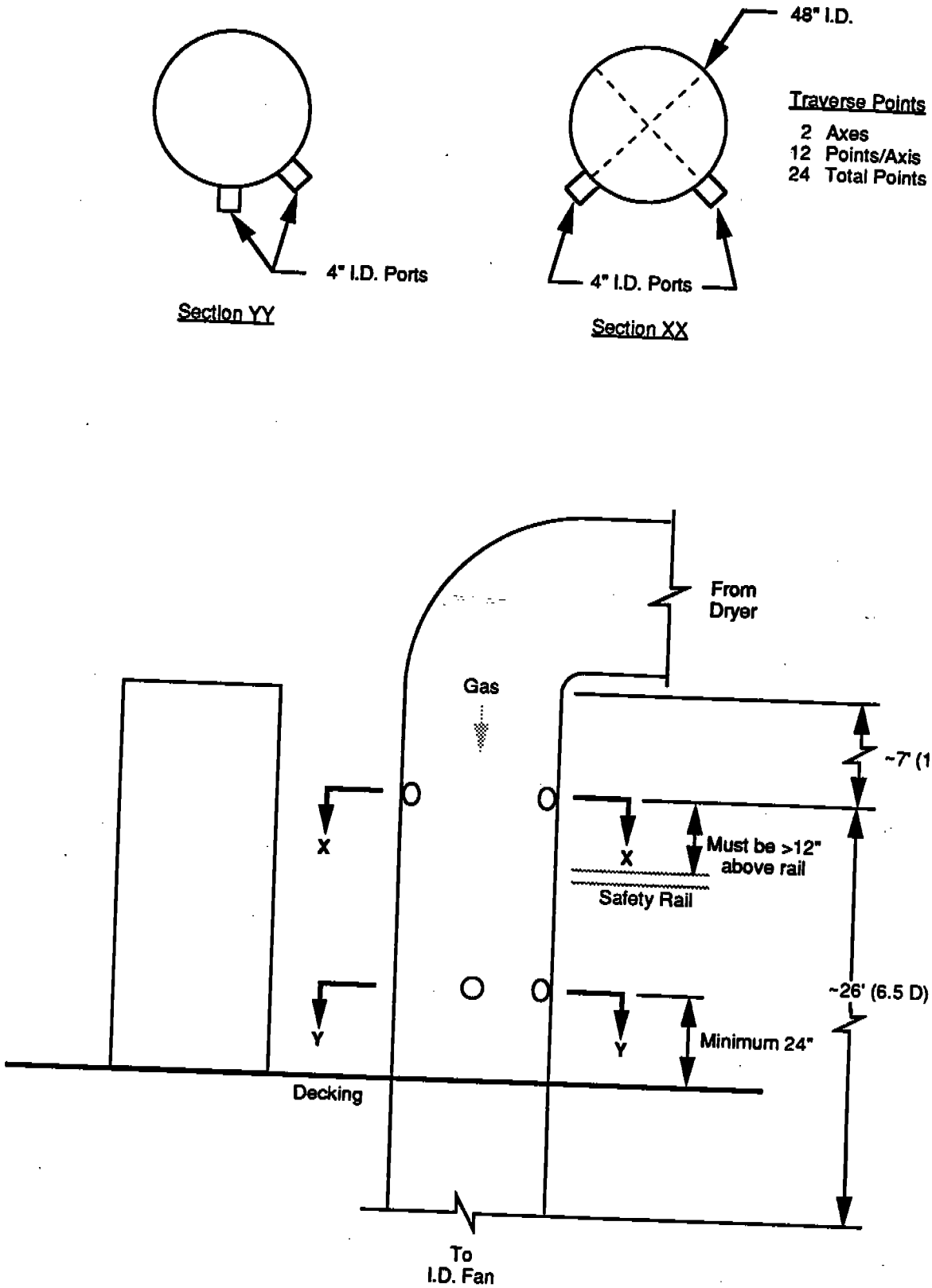

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Figure 2-3. Schematic of Unit No. 1 EFB inlet sampling location.

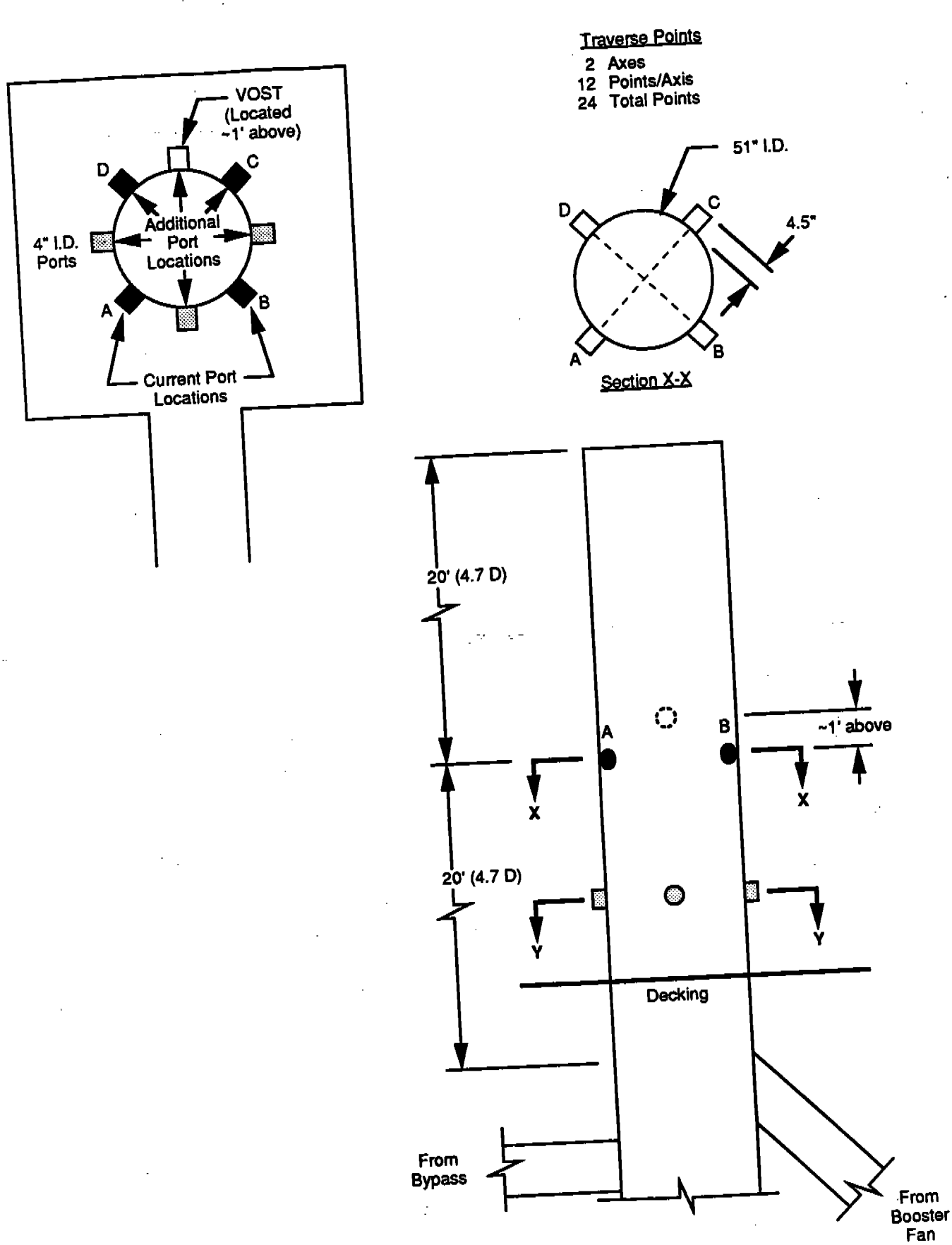
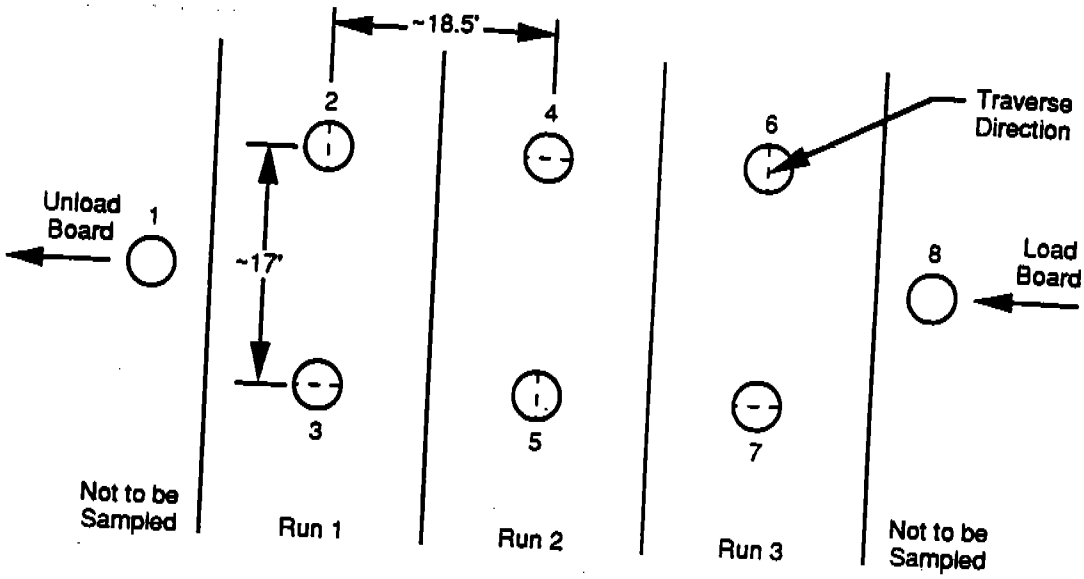


Figure 2-4. Schematic of Unit No. 1 EFB outlet stack sampling location.



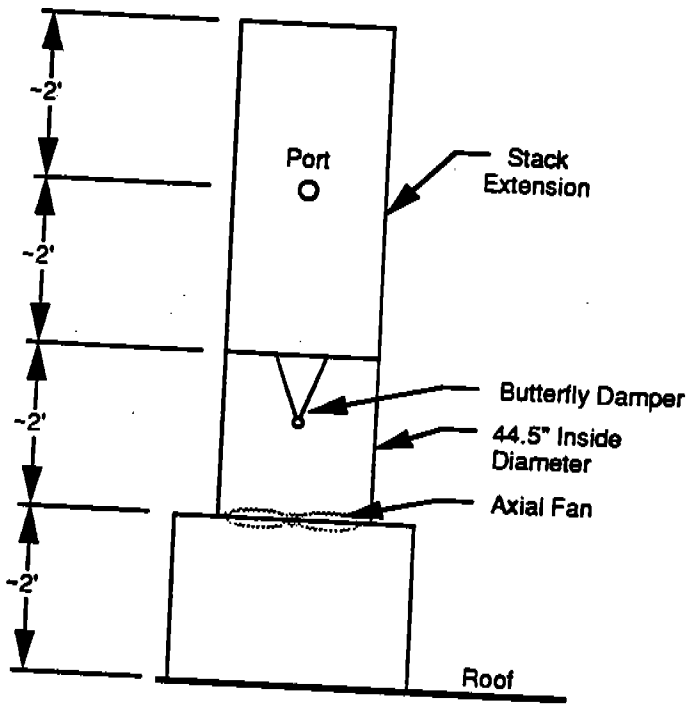


Figure 2-5. Press vents sampling location configuration and testing scheme.

At this location, a 4-foot stack extension to improve flow conditions was constructed. The extension contained one 4-inch port (see Figure 2-5). Each vent "stack" was traversed (12 points) in only one direction. The traverse of the second vent of a pair was in the direction perpendicular to the first vent traverse. Although the location did not meet Method 1 requirements, this deviation will not affect the results since sampling at the press vents did not involve particulates, but gases only. The flow check for non-parallel flow before the test showed that the location was acceptable for flow measurements, i.e., the flow was not cyclonic.

3.0 SUMMARY AND DISCUSSION OF RESULTS

3.1 OBJECTIVES AND TEST MATRIX

The purpose of the test program was to develop emission factors for OSB production facilities from the wood products industry.

Table 3-1 presents the sampling and analytical matrix and summarizes all the measurements being made at each test location.

The specific objectives were:

- Measure the emissions of PM, CPM, CO, NO_x, THC, formaldehyde, other aldehydes, and ketones, at the wood flake dryer EFB inlet and outlet locations, and volatile and semi-volatile organics at the outlet.
- Measure the emissions of formaldehyde, other aldehydes, and ketones from the press vents.
- Compare Method 25 against Method 25A for THC, and Method 5/202 against the Oregon Department of Environmental Quality (ODEQ) Method 7 for particulates (PM and CPM).
- Assess the suitability of deriving a correction factor for Method 25A.
- Obtain process and EFB data, specifically, production rates, inlet and outlet dryer temperatures, drying rates, belt speed, EFB bed voltage and current, and EFB voltage and ionizer current.

3.2 FIELD TEST CHANGES AND PROBLEMS

3.2.1 Percent Isokinetics

Three of the 18 runs exceeded the percent isokinetic requirements of ±10 percent as a result of incorrect data input. The magnitude of the exceedances all occurring at the EFB outlet were as follows:

- Run 1, MM5 train for SVOC: 83.3%
- Run 2, M0011 train for formaldehyde/aldehydes 112.1
- Run 3, M0011 train for formaldehyde/aldehydes 112.1

TABLE 3-1. SAMPLING MATRIX - WEYERHAEUSER

RUN NO. DATE	SAMPLE TYPE	TEST METHOD	LOCATION/CLOCK TIME/SAMPLING TIME		
			EFB INLET	EFB OUTLET	PRESS VENTS
1 7/30/91	PM/CPM O_2/CO_2 F/A/K SVOC VOC TGNMO THC NO_x CO	M5/202 M3 M0011 MM5 M0030 M25 M25A M7E M10	1130-1420 60 60 60 60 60	1130-1428 60 60 60 60 60 60 60 60 60	1123-1233 60 (Vents 2/3)
2 7/30/91	F/A/K	M0011			1410-1233 60 (Vents 4/5)
2 7/31/91	PM/CPM O_2/CO_2 F/A/K SVOC VOC TGNMO THC NO_x CO	M5/202 M3 M0011 MM5 M0030 M25 M25A M7E M10	1215-1327 40 40 40 40 40	1215-1349 45 45 45 45 45 45 45 45 45	
3 7/31/91	PM/CPM O_2/CO_2 F/A/K SVOC VOC TGNMO THC NO_x CO	M5/202 M3 M0011 MM5 M0030 M25 M25A M7E M10	1800-1933 60 60 60 60 60	1800-1947 60 60 60 60 60 60 60 60 60	800-? 60 (Vents 6/7)

Note: Mercury Labs analyzed the M0011 samples for F/A/K.
Triangle Labs analyzed the MM5 and M0030 samples.
NCASI collected and analyzed the M25 samples.
Entropy collected and analyzed all other samples.

Since the sample analyses involved the gaseous (formaldehyde/aldehydes) components and semi-volatile components at the EFB outlet, these deviations are not expected to affect the results since inertial forces are not a factor with gases.

3.2.2 Shortened Sampling Time

Run No. 2 had a sampling time of 40-45 minutes rather than 60 minutes. The plant went down at 2:47 p.m. The EMB test coordinator considered this run to be adequate.

3.3 FLOW RATES FROM EFB AND PRESS VENTS

To determine mass emission rates and EFB collection efficiency, flow rate is an important component. In this test program, three separate trains provided simultaneous measurements of velocities, temperatures, and moisture contents. Table 3-2 summarizes the flow rate data. Method 3 data for O_2 and CO_2 are added to this table.

The following observations are made:

- The temperature measurements of the EFB inlet and outlet compare to within ±2°F of each other, except for Run I-1, which had ±4°F.
- The moisture contents of the EFB inlet and outlet compare to within ±1 percent moisture of each other.
- The flow rate from M5/202, Run I-2 appears to be high and all three runs from M5/202 outlet appear to be too low when compared to flow rates from the other trains. According to the O_2/CO_2 data, the flow rate at the outlet should be slightly higher than that of the inlet.

Based on these observations, Runs I-2 and the measurements made at the stack (EFB outlet) for M5/202 were deleted from the averages. The average flow rates as shown in Table 3-2 were considered to provide the best data, and therefore, were used to calculate the mass emission rates.

TABLE 3-2. VOLUMETRIC FLOW RATE DATA

RUN NO.	FLOW RATE, dscmh				TEMPERATURE, °F			MOISTURE, %H_2O			ORSAT	
	M5/202	MO011	MM5	Average	M5/202	MO011	MM5	M5/202	MO011	MM5	O_2	CO_2
I-1	54,586	54,334		54,460	225	233		23.4	24.4		16.8	4.0
I-2	60,806	53,131		53,131[a]	225	228		22.7	24.5		16.5	4.4
I-3	55,510	54,874		55,192	224	226		22.8	24.4		17.0	3.8
Avg	56,967	54,113			225	229		23.0	24.4		16.8	4.1
S-1	51,054	54,871	55,342	55,106[b]	227	226	227	23.3	22.5	23.8	17.6	3.2
S-2	52,489	55,803	55,153	56,433[b]	222	223	226	23.3	23.4	24.0	17.1	3.8
S-3	52,398	55,165	57,063	56,114[b]	227	225	227	23.4	22.9	24.0	16.8	4.0
Avg	51,980	55,280	55,853		225	225	227	23.3	22.9	23.9	17.2	3.7
V-1		32,163		32,163		111			2.2			
V-2		31,324		31,324		130			3.6			
V-3		39,087		39,087		133			3.3			
Avg		34,191				125			3.0			

[a] Does not include M5/202
[b] Does not include M5/202 runs

3.4 EMISSIONS AND PROCESS DATA

THROW OUT M0011 DATA

Tables 3-3, 3-4, and 3-5 summarize the emissions, process data, and EFB collection efficiencies. The aldehyde/ketone data from M0011 are not included in the tables, but are found in Appendix A. The data, however, should not be used since subsequent tests at other plants indicated a problem with collection efficiencies. If sampling problems are resolved later, EPA plans to return to the plant to determine the emissions of aldehydes and ketones.

3.5 EMISSION FACTORS

Table 3-6 presents the emission factors in terms of tons of dry wood flakes processed by the dryer.

3.6 RELATIONSHIP BETWEEN METHODS 25 AND 25A

The data for the relationship between Methods 25 and 25A are shown below:

RUN	THC lb/hr	TGNMO lb/hr	RATIO TGNMO/THC
I-1	59.8	23.9	0.40
I-2	50.5	61.5	1.22
I-3	54.9	26.5	0.48
Avg			0.56
S-1	54.4	57.4	1.06
S-2	49.1	44.9	0.91
S-3	58.4	57.5	0.98
Avg			0.99

The data show some consistency between the two methods; however, before any conclusions are made, data from all other tests should be evaluated.

TABLE 3-3. SUMMARY OF EMISSIONS - ELECTRIFIED FILTER BED

METHOD/ COMPONENT	UNITS	EFB INLET				EFB OUTLET			
		RUN 1	RUN 2	RUN 3	AVG	RUN 1	RUN 2	RUN 3	AVG
M202									
Filterable PM	mg/dscm	358	368	338	355	47	56	27	43
Inorganic CPM	mg/dscm	74	86	97	86	84	34	24	47
Organic CPM	mg/dscm	79	80	55	71	40	31	22	31
Total	mg/dscm	511	534	490	512	171	120	73	121
Filterable PM	lb/hr	43.0	43.1	41.1	42.4	5.7	7.0	3.3	5.3
Inorganic CPM	lb/hr	8.9	10.1	11.8	10.3	10.2	4.2	3.0	5.8
Organic CPM	lb/hr	9.5	9.4	6.7	8.5	4.9	3.9	2.7	3.8
Total	lb/hr	61.3	62.5	59.6	61.2	20.8	15.1	9.0	14.9
M25A									
THC	ppm C	910	854	934	899	869	804	960	878
	mg/dscm	455	427	467	449	434	402	480	439
THC	lb/hr	54.6	50.0	56.8	53.8	52.7	50.0	59.3	54.0
M25									
TGNMO	ppm C	398	1050	436	628	946	722	930	866
Condensible Organics	ppm C	354	1000	370	575	913	626	889	809
NMO (Noncondensibles)	ppm C	44	50	66	53	33	96	41	57
TGMNO	mg/dscm	199	525	218	314	473	361	465	433
	lb/hr	23.9	61.5	26.5	37.3	51.4	44.9	57.5	53.3
M10 CO	ppm					987	809	1260	1019
	lb/hr					139	117	182	146
M7E NO_x	ppm					33	22	27	27
As NO_2	lb/hr					7.7	5.2	6.4	6.4

TABLE 3-4. EFB COLLECTION EFFICIENCIES

METHOD/COMPONENT	RUN NO. 1	RUN NO. 2	RUN NO. 3	AVERAGE
Method 5/202				
Filterable PM	86.7	83.8	91.9	87.4
CPM	18.0	58.4	69.2	48.8
Inorganic	-14.9	58.0	74.8	43.4
Organic	48.8	58.8	59.3	55.2
Total	66.1	75.9	84.9	75.6
Method 25 TGNMO	-140.5	0.27	-116.9	-42.9
Method 25A THC	3.4	0	-4.5	-0.4

* Calculation meaningless since concentrations were too close to detection limit.

Filt PM - 84 to 92%, avg = 87%

Total PM - 66 to 85%, Avg = 76%

TABLE 3-5. SUMMARY OF PROCESS AND CONTROL EQUIPMENT OPERATING CONDITIONS

PARAMETERS	UNITS	RUN 1	RUN 2	RUN 3	AVG
Dryer Production Rate	Ton/hr	12.3	13.8	12.3	12.8
Feed Moisture Exit Moisture	% %	? 3.0	? 2.5	? 2.5	2.7
Dryer Entrance Temp Dryer Exit Temp	°F °F	1025 235	1000 238	1000 237	1000 236
EFB Bed Voltage, EFB Bed Amperage, EFB Ionizer Voltage, EFB Ionizer Amperage,	Kv A Kv mA	30 0 43 4.0	30 0 42 4.8	30 0 43 4.2	30 0 43 4.3
Average Wood Mix - Hardwood Pine Soft Hardwood	% % %	~10 ~60 ~30	~10 ~60 ~30	~10 ~60 ~30	~10 ~60 ~30

* bone dry

differential pressure both EFB inlet & outlet

TABLE 3-6. SUMMARY OF EMISSION FACTORS BASED ON DRY WOOD FLAKES

METHOD/ COMPONENT	UNITS	EFB INLET				EFB OUTLET			
		RUN 1	RUN 2	RUN 3	AVG	RUN 1	RUN 2	RUN 3	AVG
M202									
Filterable PM	lb/ton	3.49	3.12	3.34	3.31	0.46	0.50	0.27	0.42
CPM	lb/ton	1.49	1.41	1.50	1.47	1.22	0.59	0.46	0.75
Inorganic CPM	lb/ton	0.72	0.73	0.96	0.80	0.83	0.31	0.24	0.45
Organic CPM	lb/ton	0.77	0.68	0.54	0.67	0.40	0.28	0.22	0.30
Total	lb/ton	4.99	4.53	4.85	4.78	1.69	1.09	0.73	1.17
M25A THC	lb/ton	4.44	3.62	4.62	4.23	4.29	3.62	4.82	4.24
Method 25 TGNMO	lb/ton	1.94	4.45	2.15	2.85	4.67	3.25	4.67	4.20
CO	lb/ton					11.35	8.49	14.76	11.41
NO_x as NO_2	lb/ton					0.62	0.38	0.52	0.50

3.7 ODEQ METHOD 7 VERSUS M202

NCASI analyzed the back-up filter and verbally reported that the filter catch was zero. Therefore, it can be concluded that Method 202 will yield results equivalent to ODEQ Method 7.

3.8 SEMI-VOLATILE AND VOLATILE VOC DATA

Tables 3-7 and 3-8 present the data for the semi-volatile and volatile VOC data. Since the tests were conducted for screening purposes, the data are presented without discussion. Detailed discussion of the method evaluation and conclusions will be presented under a separate report.

TABLE 3-7. SEMIVOLATILE ORGANIC COMPOUNDS

NAME	S-MM5-1 $\mu g/m^3$	S-MM5-2 $\mu g/m^3$	S-MM5-3 $\mu g/m^3$	Average $\mu g/m^3$	S-MM5-FB $\mu g/m^3$
Phenol	122.1	62.9	114.6	99.9	1.6
2-Methylphenol	90.2	62.6	1.5	51.4	2.2
Naphthalene	93.3	155.9	169.8	139.6	0.7
Dimethylphthalate	1.0	1.2	0.8	1.0	1.8
Dibenzofuran	0.7	0.9	47.9	16.5	0.9
Di-n-butylphthalate	62.6	15.2	45.6	41.1	35.2
bis(2-Ethylhexyl)phthalate	8.3	27.0	17.0	17.5	5.8

TABLE 3-8. VOLATILE ORGANIC COMPOUNDS

NAME	S-V-1-A $\mu g/m^3$	S-V-1-B $\mu g/m^3$	S-V-1-C $\mu g/m^3$	S-V-2-A $\mu g/m^3$	S-V-2-C $\mu g/m^3$	S-V-2-D $\mu g/m^3$	S-V-3-D $\mu g/m^3$	FB $\mu g/m^3$
Chloromethane	5430	585	548	303	317	3743	211	224
Bromomethane	3657	182	146	149	137	254	152	10
Methylene Chloride	1378	66	48	58	51	359	57	12
Acetone	95151	7292	3733	3701	5106	3619	4593	209
Carbon Disulfide	886	37	28	35	32	62	35	1
Chloroform	474	20	15	19	18	1283	20	0
Trichlorofluoromethane	1685	71	365	67	61	117	66	0
Acrylonitrile	0	3	0	0	0	0	0	2
Iodomethane	1	0	1	0	0	0	0	0
2-Butanone	1213	564	271	345	414	1170	281	18
1,1,1-Trichloroethane	97	34	22	27	24	33	22	3
Carbon Tetrachloride	107	1015	26	31	29	42	27	0
Vinyl Acetate	52	15	13	15	15	20	13	0
Trichloroethene	120	38	29	40	32	46	30	0
Benzene	17329	2297	2415	2663	2637	1828	2950	4
2-Hexanone	48	566	53	59	56	83	50	0
Tetrachloroethene	34	44	38	42	40	59	36	0
Toluene	1715	1339	1076	1056	1168	1402	1185	22
Ethylbenzene	90	39	42	61	71	33	85	0
Styrene	478	256	235	363	385	21	390	1
o-Xylene	60	59	43	50	71	31	65	0
m-/p-Xylene	479	555	430	511	801	28	651	3

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

Table 4-1 summarizes the analytes and test methods used for sampling and analysis. The schematics of all sampling trains, flow diagrams of sample recovery and sample analysis, and descriptions of any modifications to the test methods are also included in this section.

4.2 PARTICULATE MATTER/CONDENSIBLE PARTICULATE MATTER

Method 5/202 was used at the inlet and outlet of the EFB to measure PM/CPM. NCASI desired to compare Method 202 with ODEQ Method 7, which is identical to Method 202 except for the following:

- A second filter is placed just before the silica gel impinger.
- Acetone rather than methylene chloride is used in the final rinse of the impingers and connecting glassware.
- An optional out-of-stack filter is used before the impingers.

Because of space limitations, NCASI decided to make this comparison by inserting a second filter in the Method 202 train in the same position as that in the ODEQ Method 7 and using the out-of-stack filter. The back-up filter was transmitted to NCASI, which analyzed the filter gravimetrically according to ODEQ Method 7.

Figures 4-1 and 4-2 illustrate the modifications to the Method 202 sampling train. Figures 4-3 and 4-4 illustrate the sample recovery procedure and analysis schemes, respectively.

4.3 MODIFIED METHOD 5

The standard MM5 sampling train of SW-846 Method 0010 shown in Figure 4-5 was used to collect the semivolatile organic screening samples at the outlet location.

TABLE 4-1. SAMPLING AND ANALYTICAL METHODS FOR WEYERHAEUSER TEST

Analyte	Sampling Method	Analytical Method
Particulate Matter (PM)	EPA Method 202 w/ Method 5 filter	EPA Method 5 (Gravimetric)
Condensible Particulate Matter (CPM)	EPA Method 202 w/ Method 5 filter and backup filter	EPA Method 202/ ODEQ Method 7 (Extraction/Gravimetric)
Carbon Monoxide (CO)	EPA Method 10	EPA Method 10 (NDIR)
Nitrogen Oxides (NO_x)	EPA Method 7E	EPA Method 7E (Chemiluminescence)
Oxygen (O_2), Carbon Dioxide (CO_2)	EPA Method 3	EPA Method 3 (Orsat)
Formaldehyde, Aldehydes, Ketones	SW-846 Method 0011	SW-846 Method 0011 (HPLC)
VOC as propane	EPA Method 25A	EPA Method 25A (FID)
VOC as carbon	EPA Method 25	EPA Method 25 (Catalysis, GC/FID, NDIR)
Organics Screening (Semivolatiles)	SW-846 Method 0010 (MM5)	SW-846 Method 8270 for 72 Target Compounds and other Tentatively Identified Compounds (TICs) (GC/MS) Oxygenated Organics by HPLC
Organics Screening (Volatiles)	SW-846 Method 0030 (VOST)	SW-846 Methods 5040 and 8240 (GC/MS)

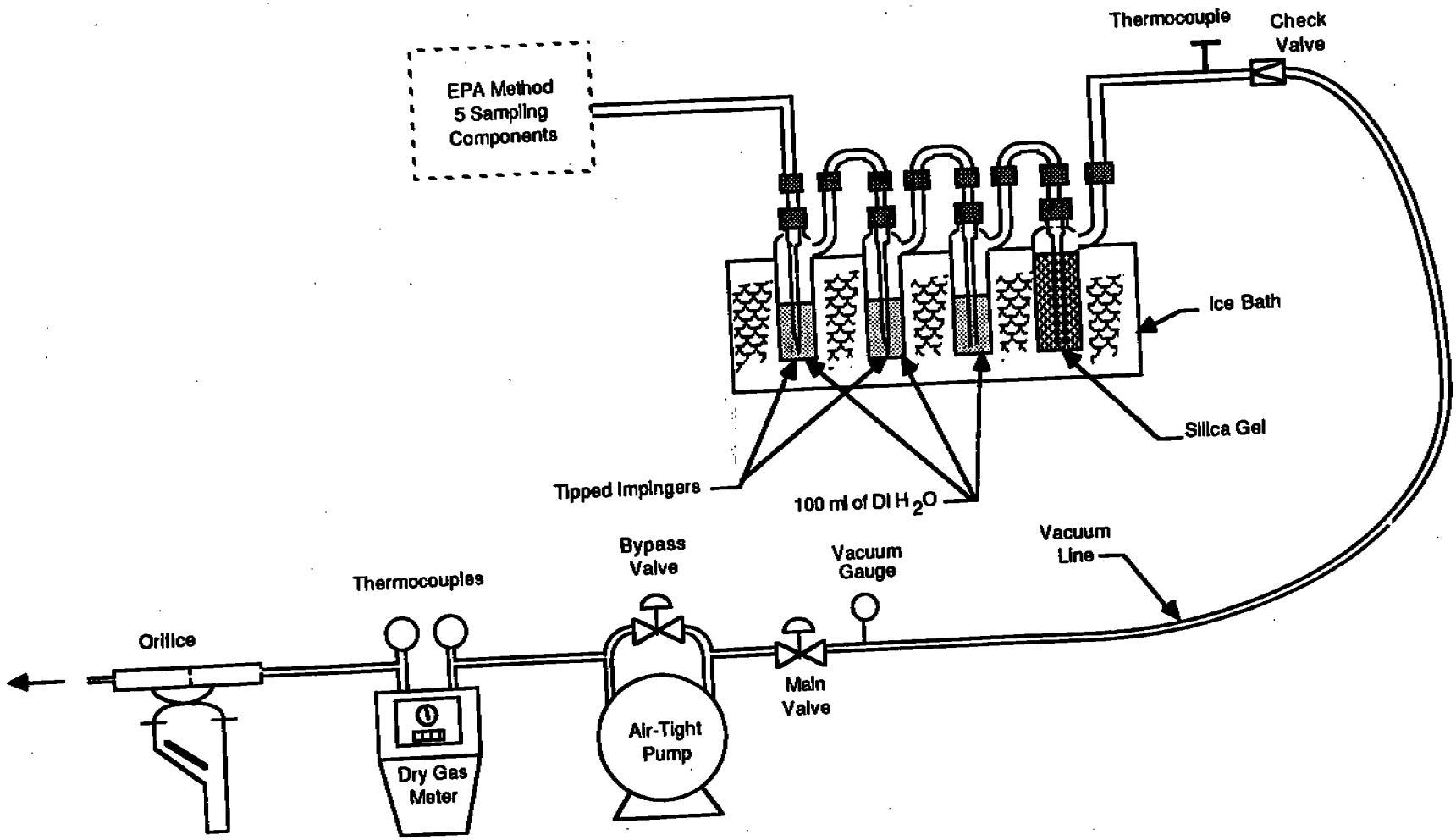


Figure 4-1. Method 202 sampling train with out-of-stack filter.

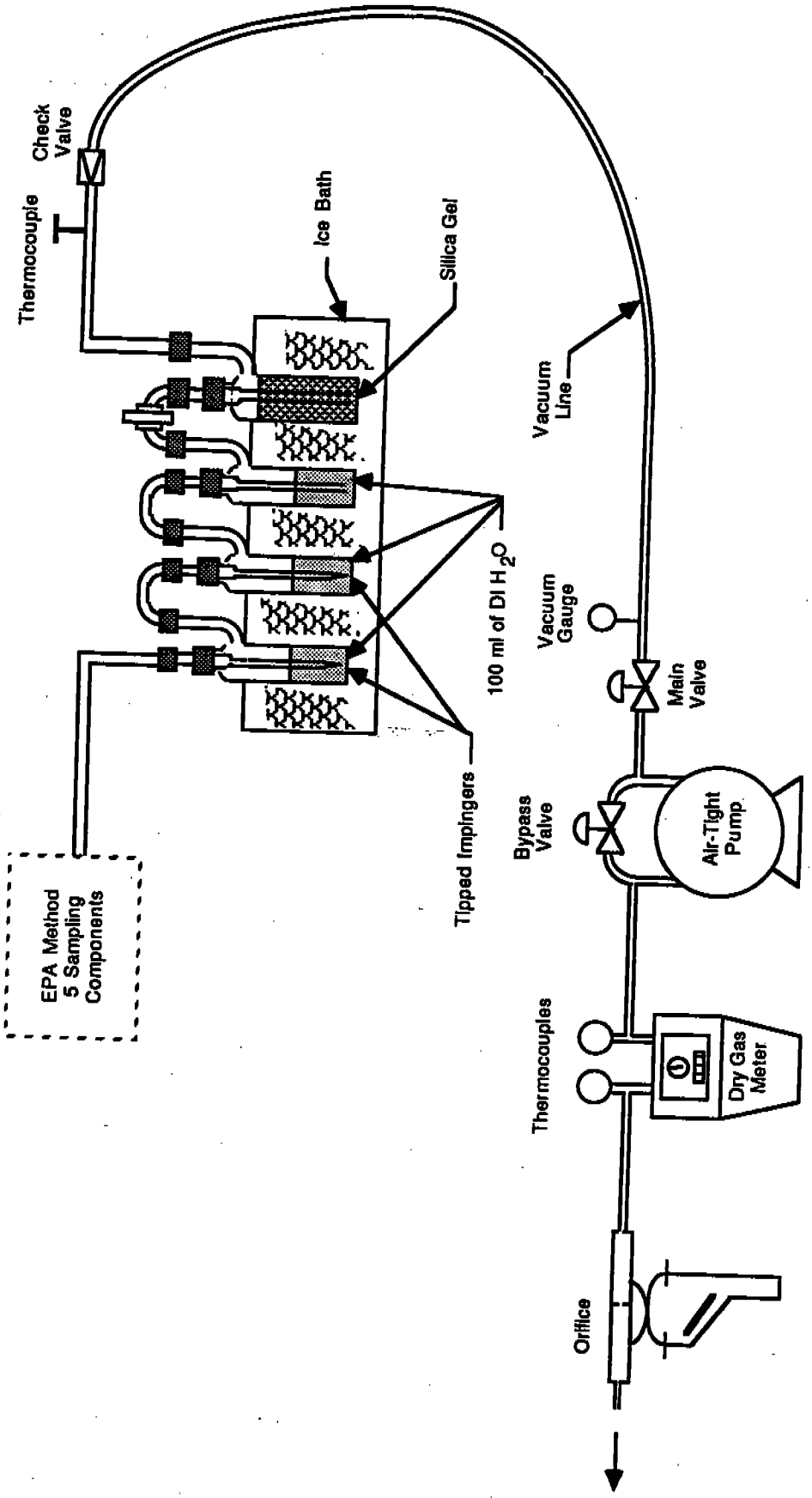
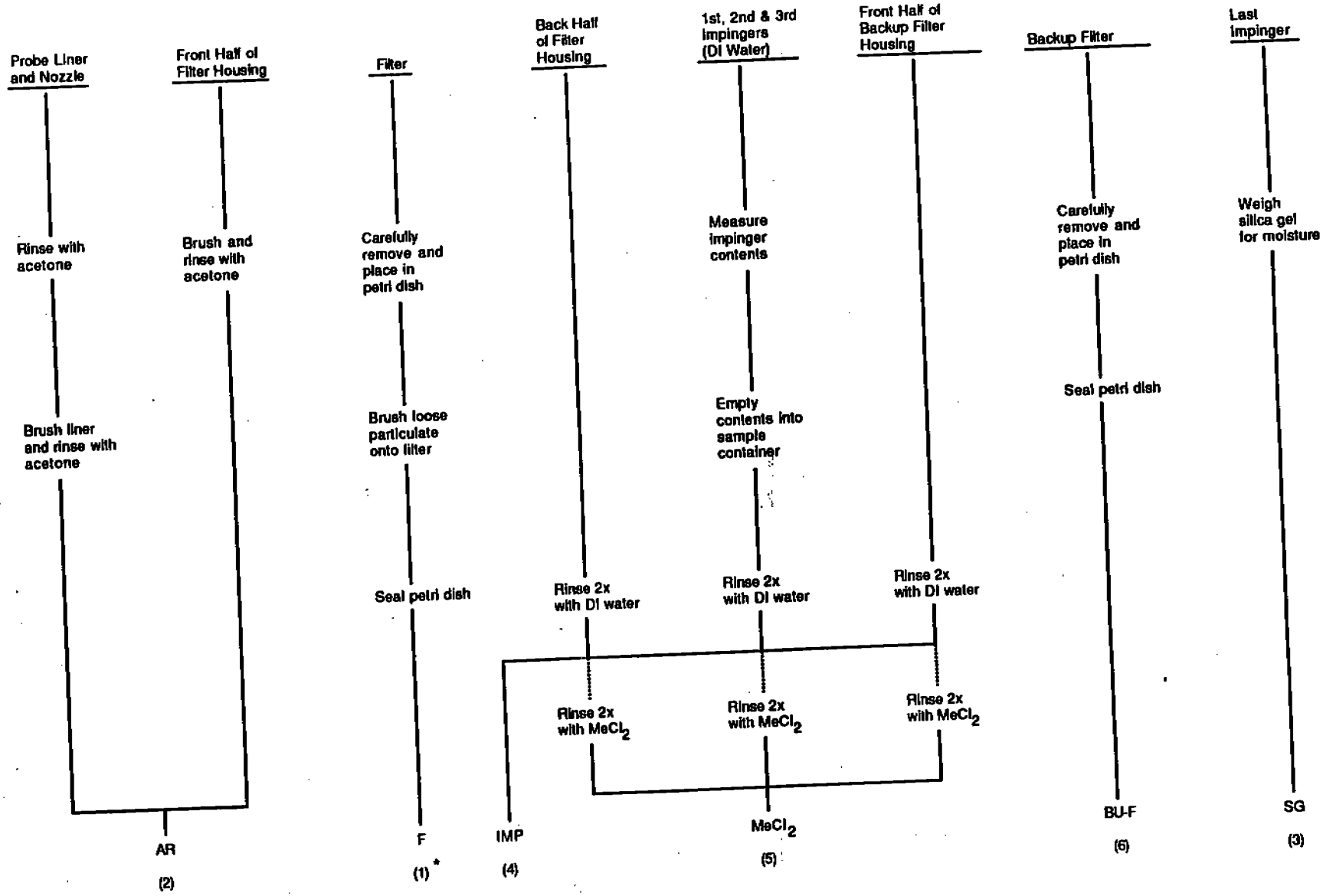


Figure 4-2. Method 202 sampling train with Method 5 filter and backup filter.



*Sample container number.

Figure 4-3. Sample recovery scheme for particulate/condensibles samples.

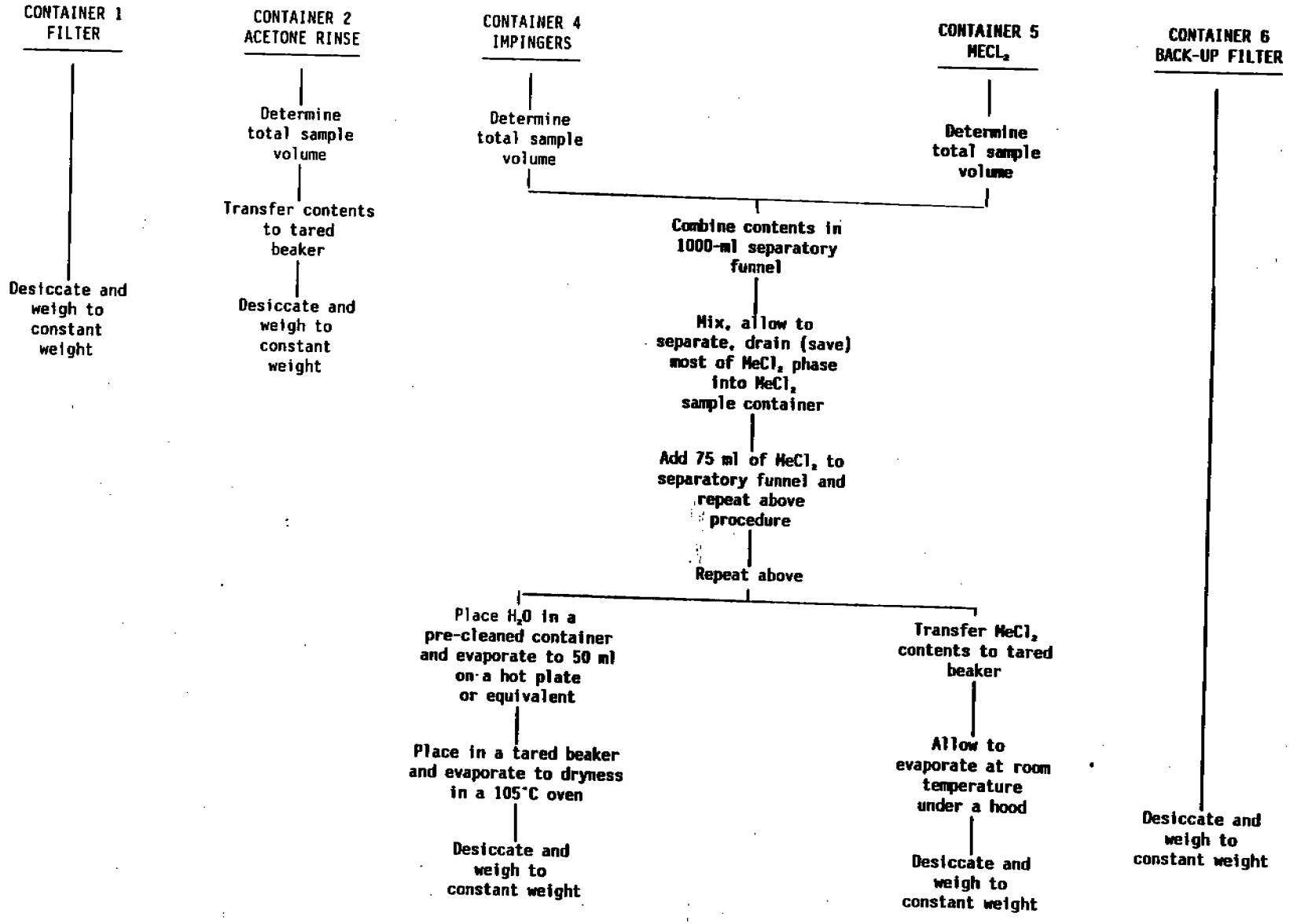


Figure 4-4. Analytical scheme for particulate/condensibles samples.

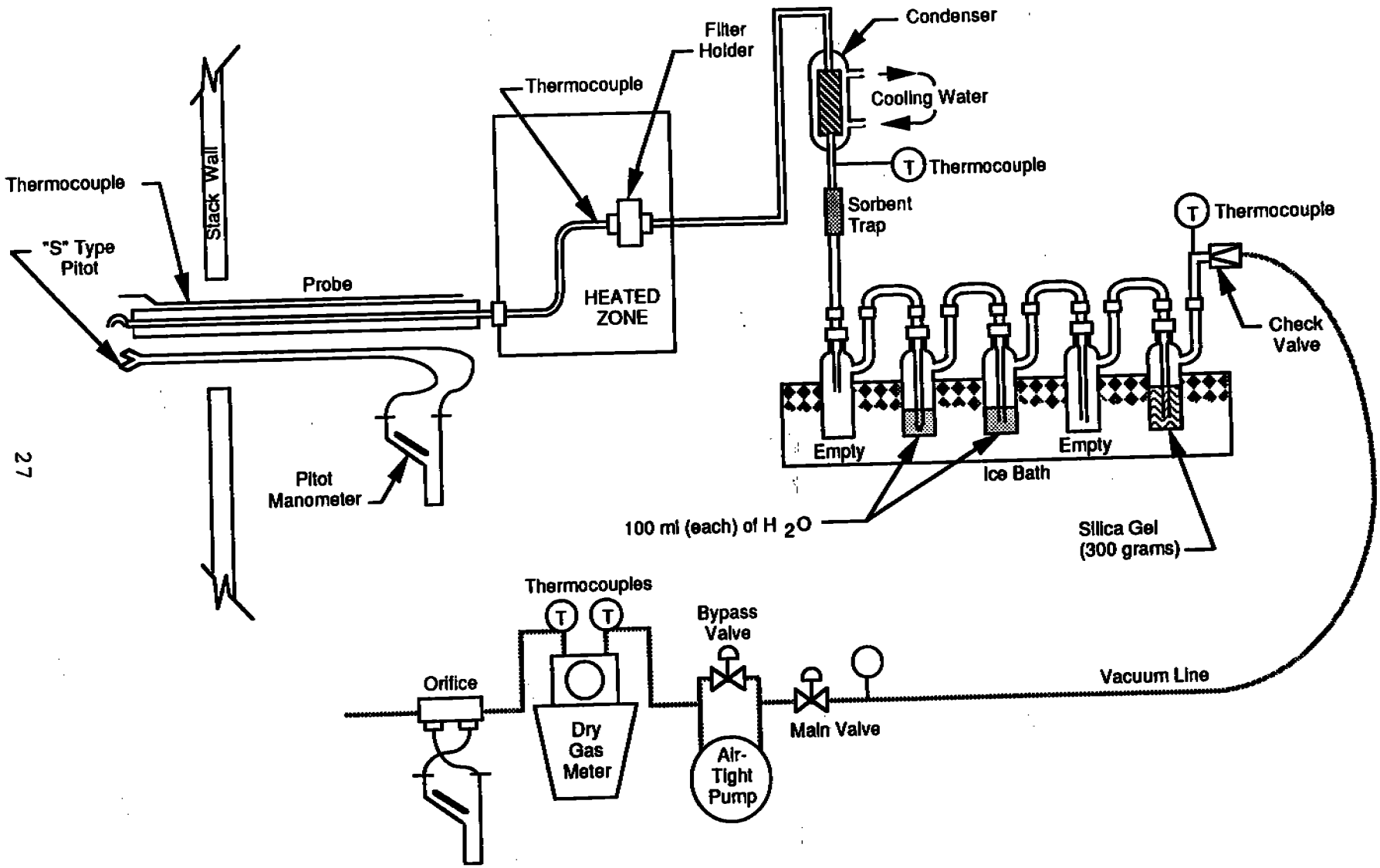
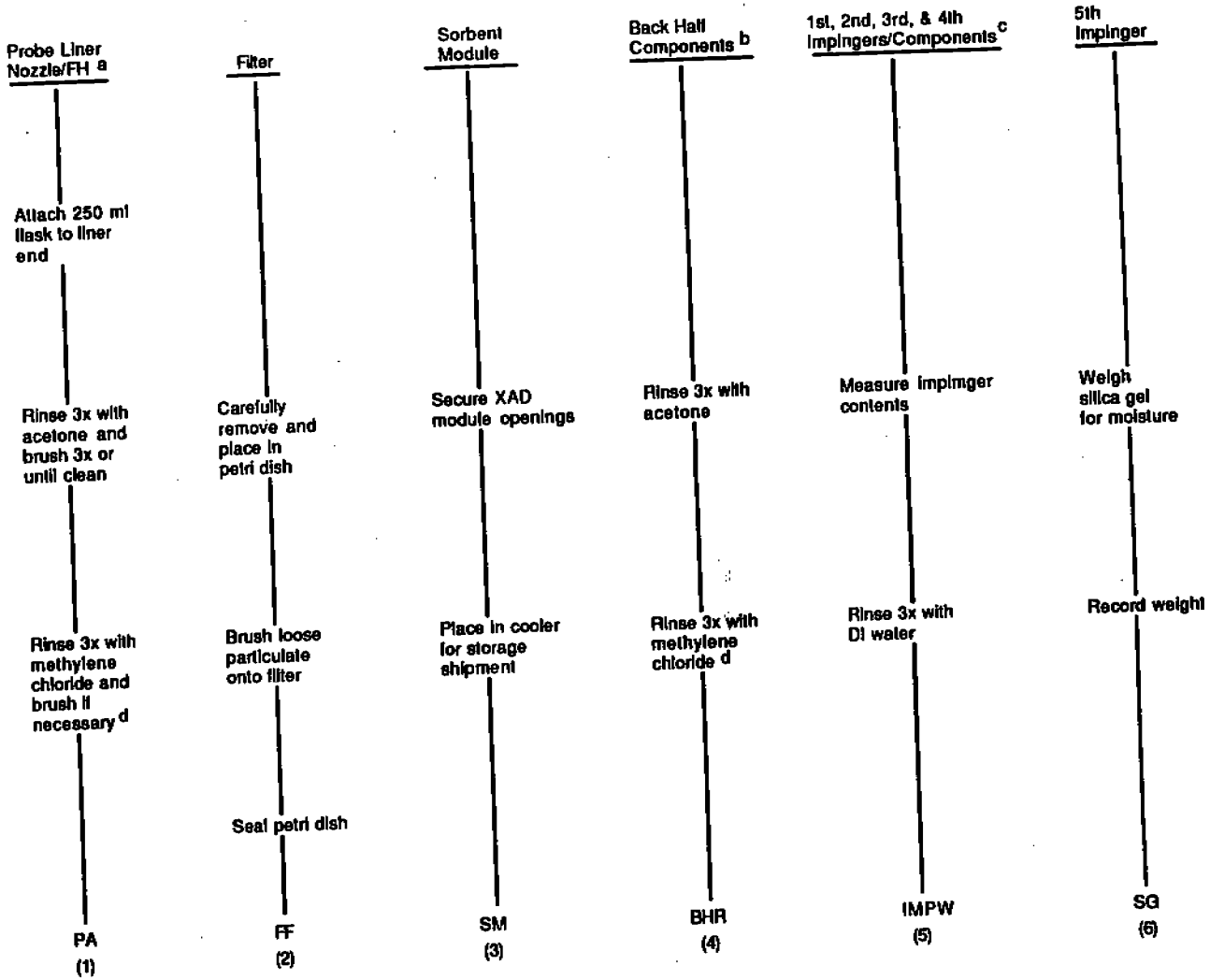


Figure 4-5. Modified Method 5 sampling train.

Standard MM5 pre-cleanup requirements included several unique preparation steps to ensure the sampling train components are not contaminated with organics that may interfere with the analysis. The glassware, glass fiber filters, and XAD adsorbing resin were precleaned using strict protocols. For this particular study, the impinger water fraction was analyzed for oxygenated organics as well as the semivolatile organics. Therefore, the acetone pre-rinse of the train was detected. Figures 4-6 and 4-7 show the sample recovery and analysis schemes.

4.4 OTHER TEST METHODS

Figures 4-8 through 4-18 show the sampling train schematic and sample recovery and analysis schemes for the rest of the test methods used in this test program.



[a] FH = Front half includes connecting glassware from probe to filter housing and front half filter housing.

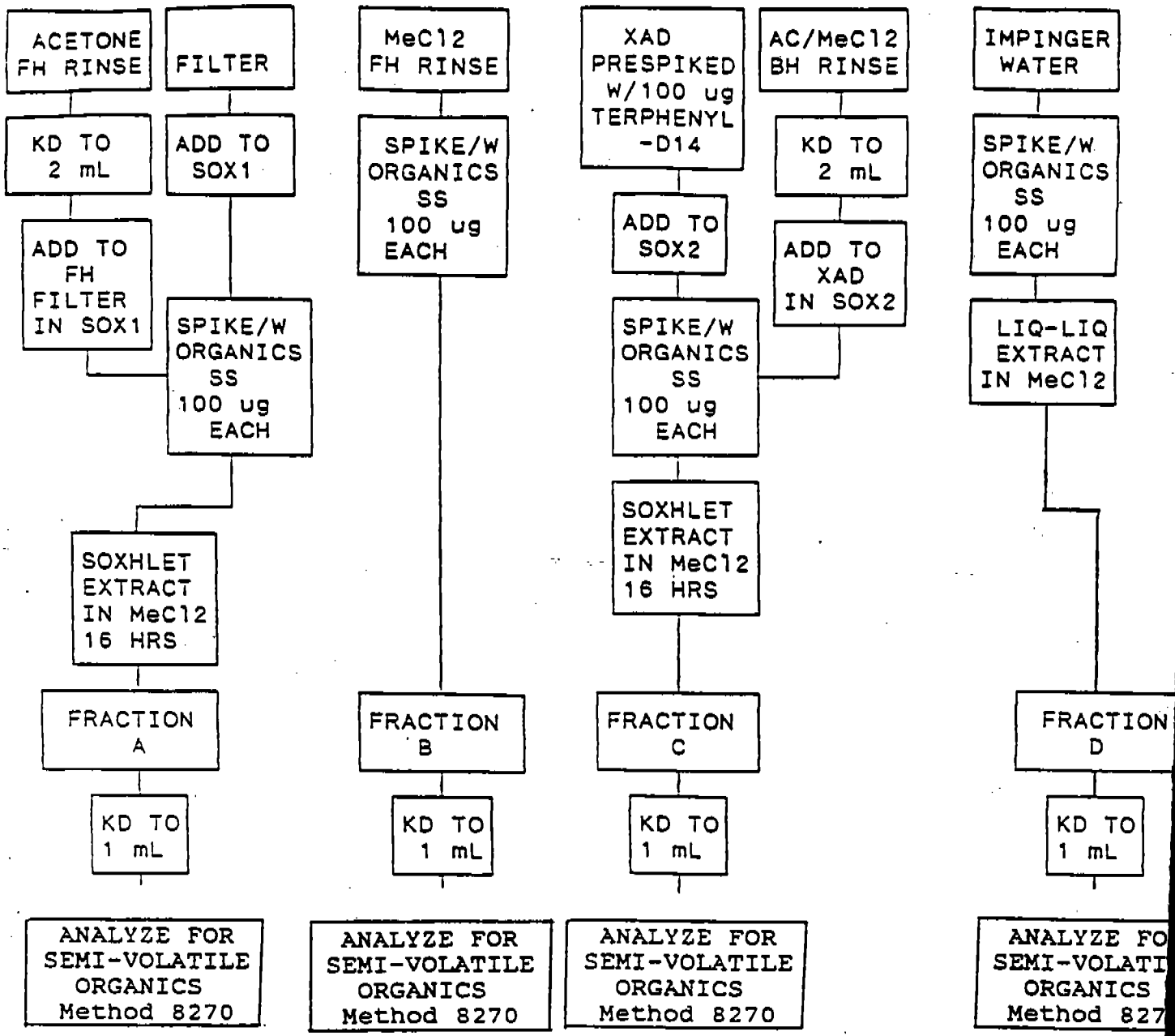
[b] BHR = Back half components - includes connecting glassware from front filter housing through condenser coil, front filter support, back half of front filter housing, condenser coil, impingers and connecting glassware.

[c] 1st, 2nd, 3rd, and 4th Impinger Components - includes impingers and connecting glassware

[d] Methylene chloride rinse will only be used if results from first OSB test indicate that it is necessary.

Figure 4-6. Modified Method 5 sample recovery scheme.

Figure 4-7. Organic field blank analysis flow scheme.



ORGANICS SS SPIKE:

D5-PHENOL	100 ug
1,4-DIBROMOBENZENE	100 ug
D5-NITROBENZENE	100 ug
2-FLUOROBIPHENYL	100 ug
1,3,5-TRICHLOROBENZENE-D3	100 ug
2,4,6-TRIBROMOPHENOL	100 ug
ANTHRACENE-D10	100 ug
PYRENE-D10	100 ug

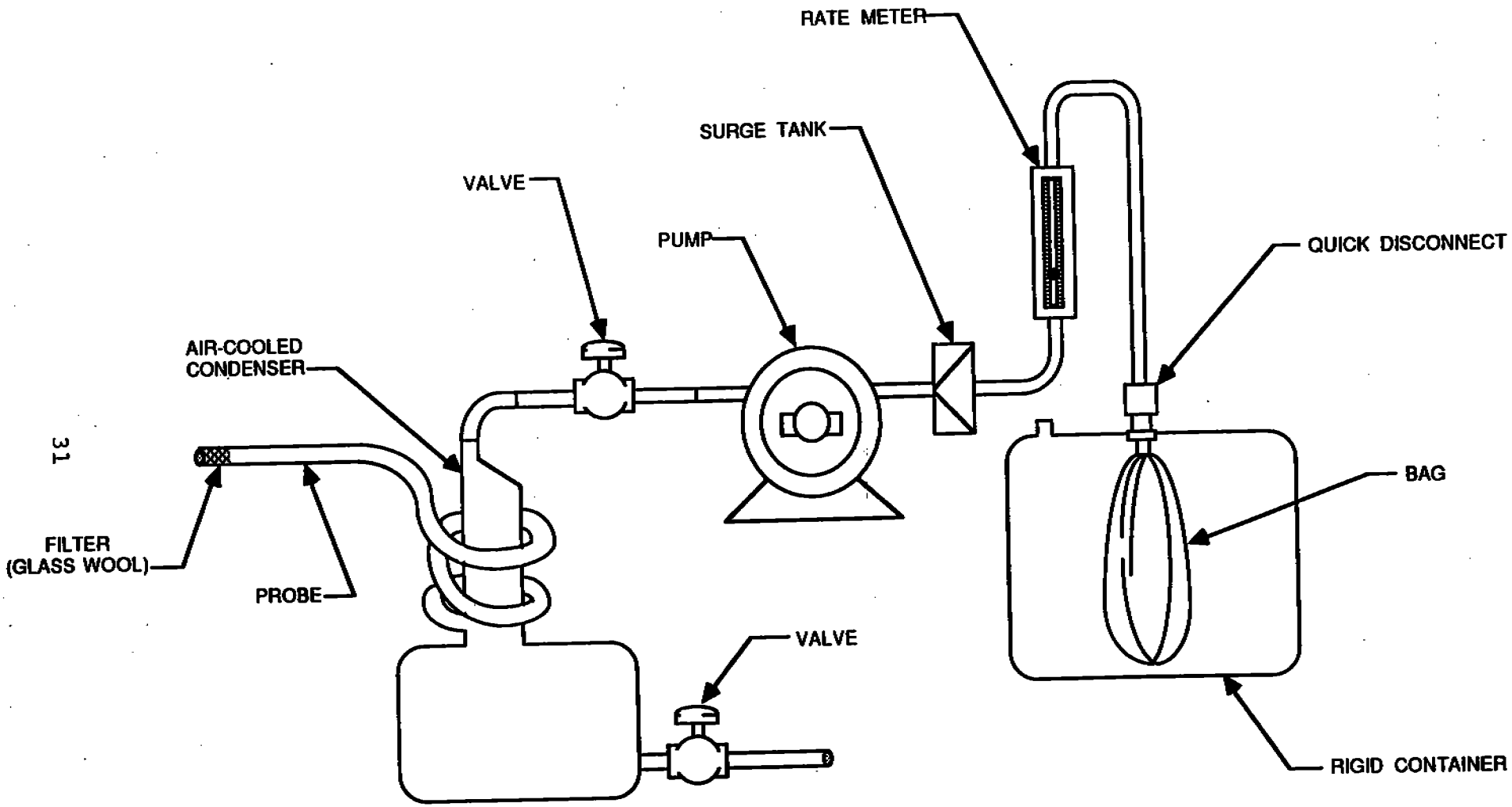


Figure 4-8. Method 3 integrated gas sampling train for measuring O_2/CO_2.

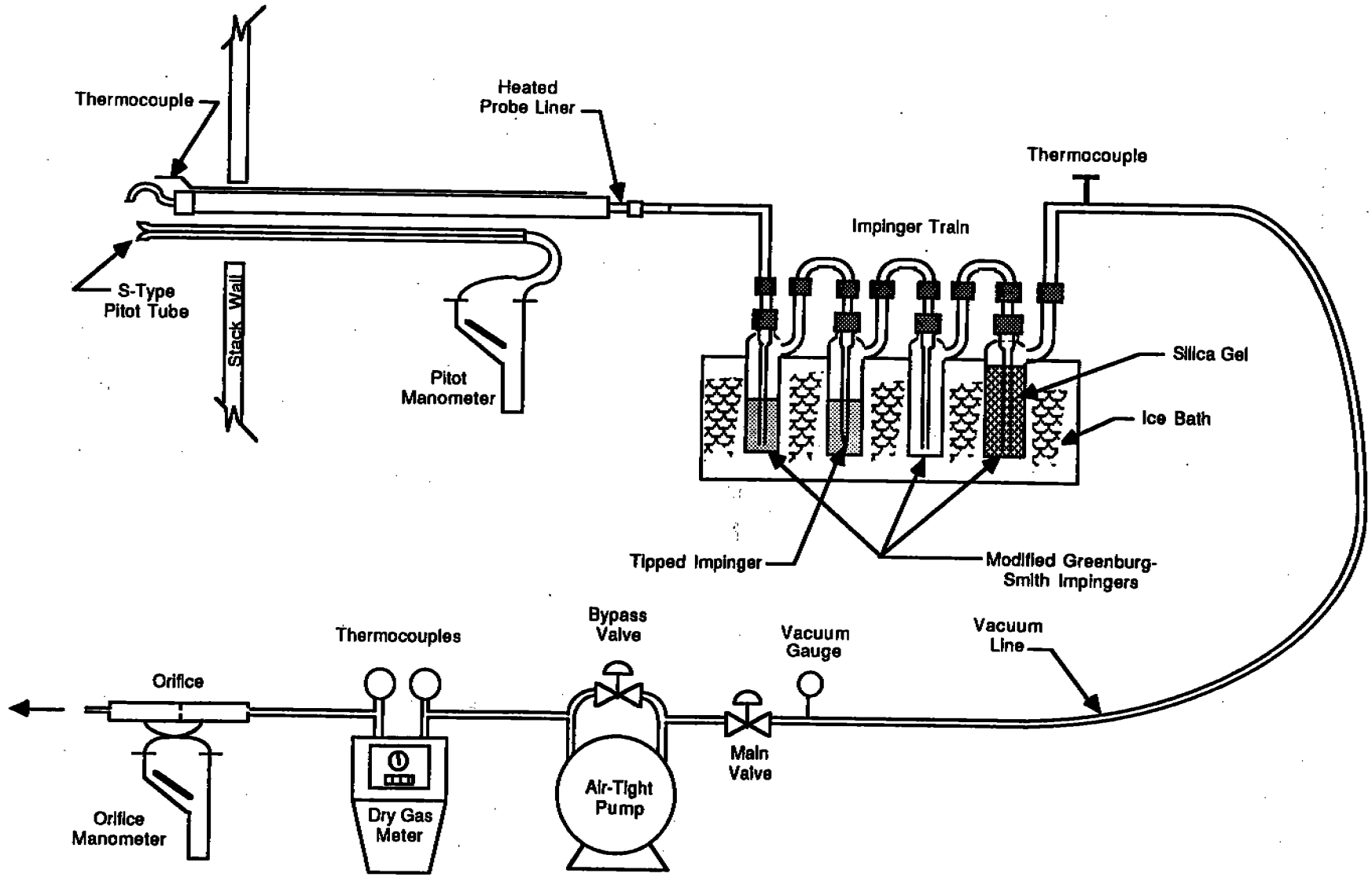


Figure 4-9. Formaldehyde (Method 0011) sampling train.

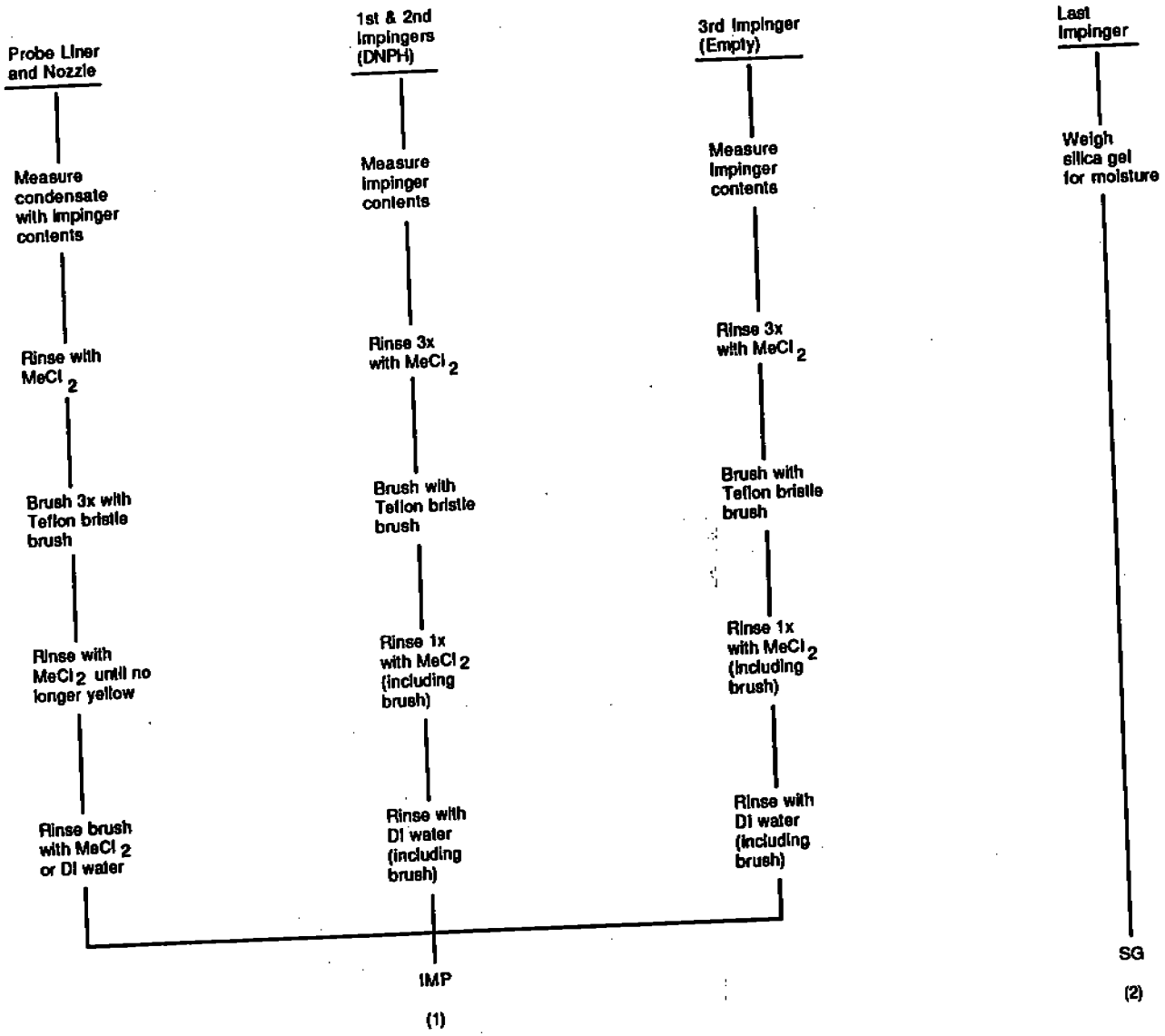


Figure 4-10. Sample recovery scheme for Method 0011 samples.

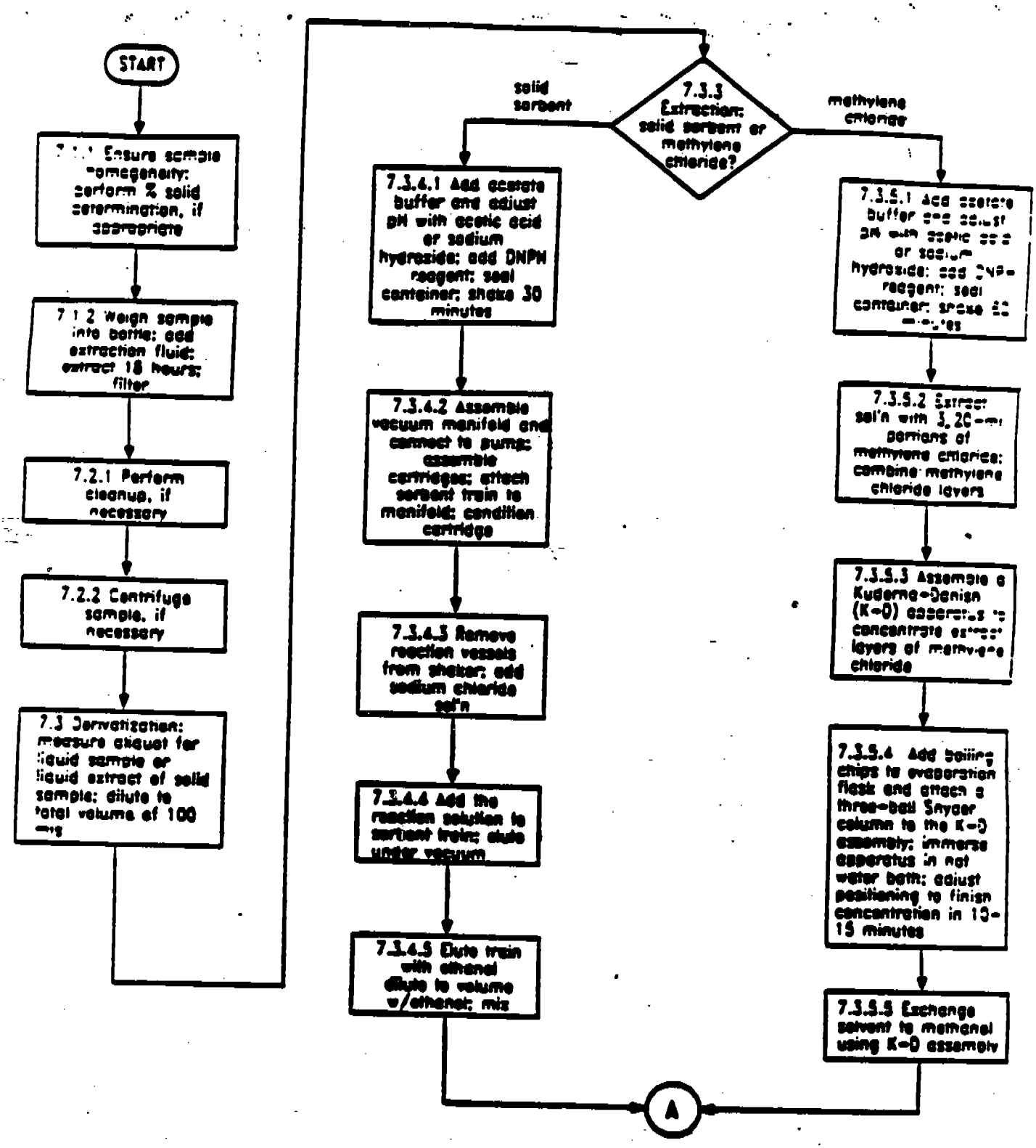


Figure 4-11. Method 0011A. Formaldehyde by high performance liquid chromatography (HPLC).

(continued)

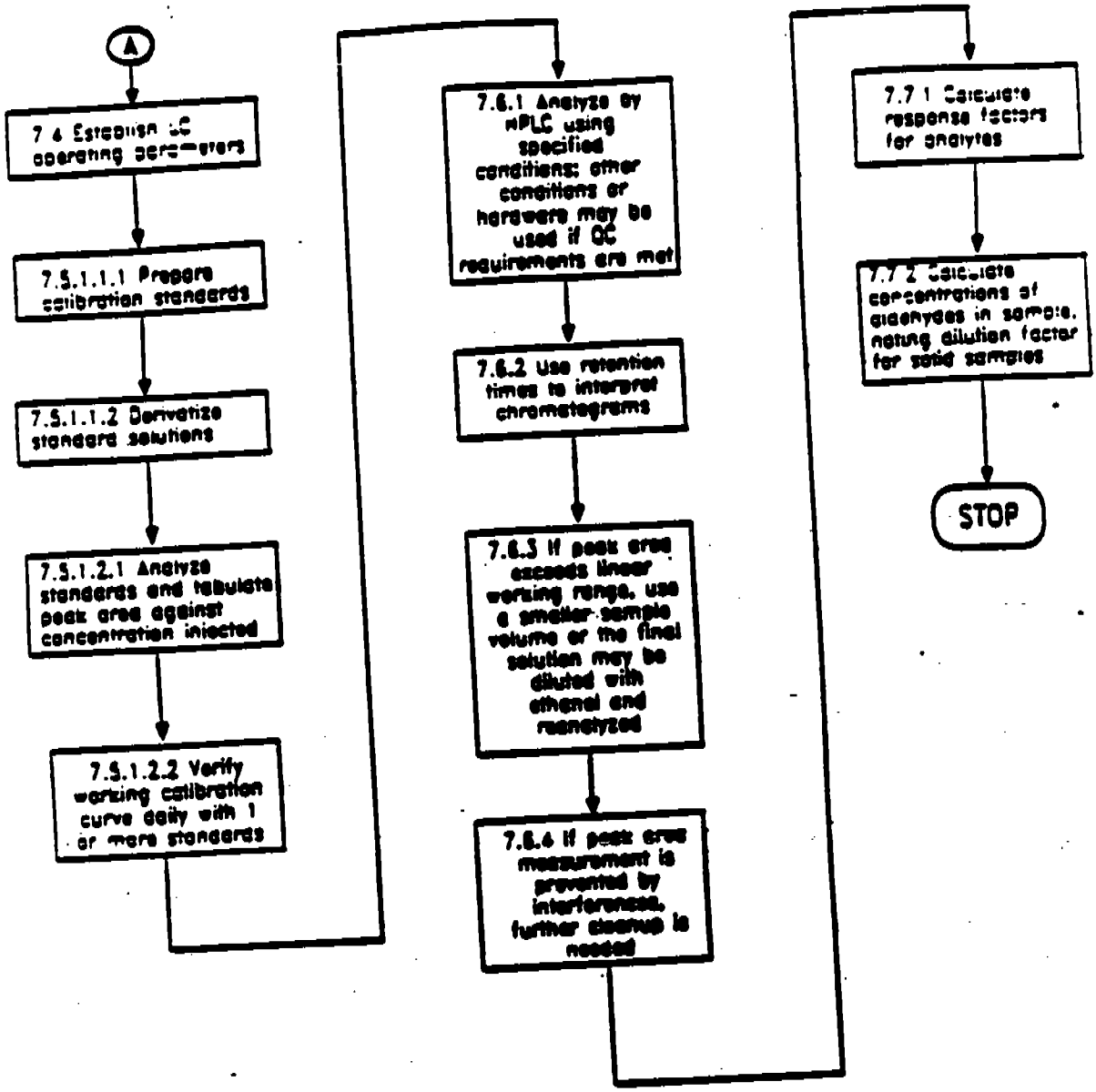


Figure 4-11 (continued)

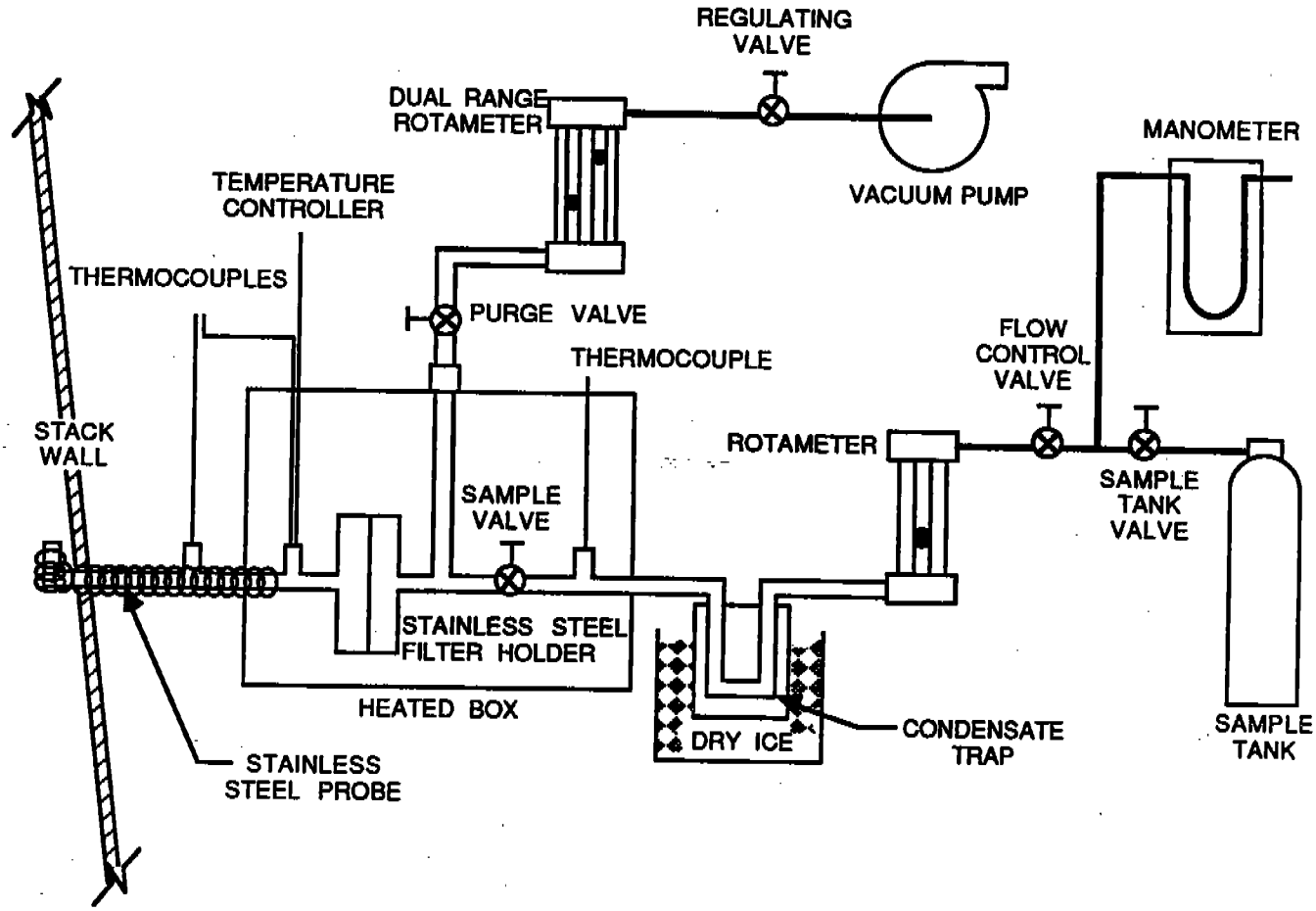


Figure 4-12. Method 25 sampling train.

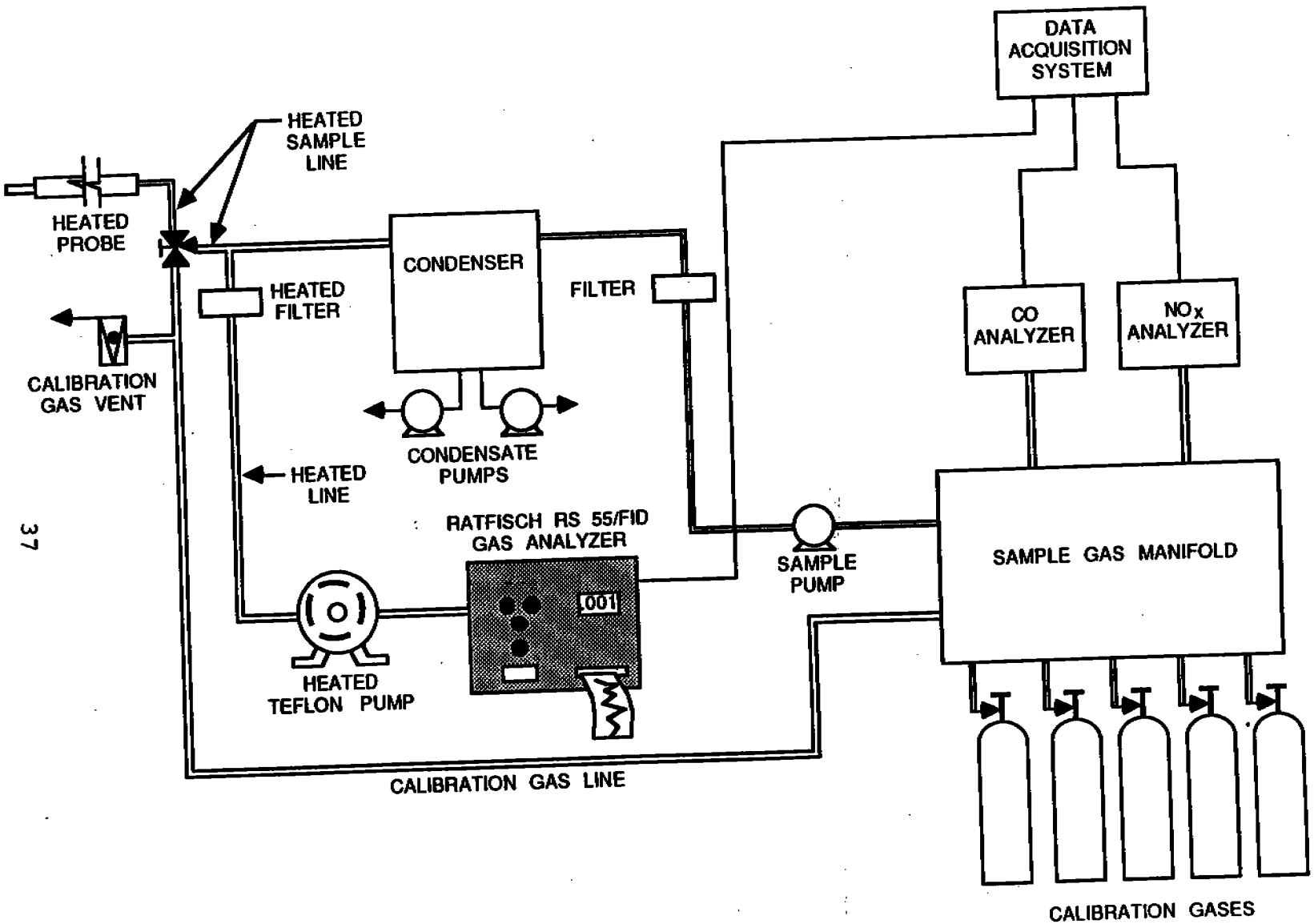


Figure 4-13. Instrumental measurement system for outlet stack location.

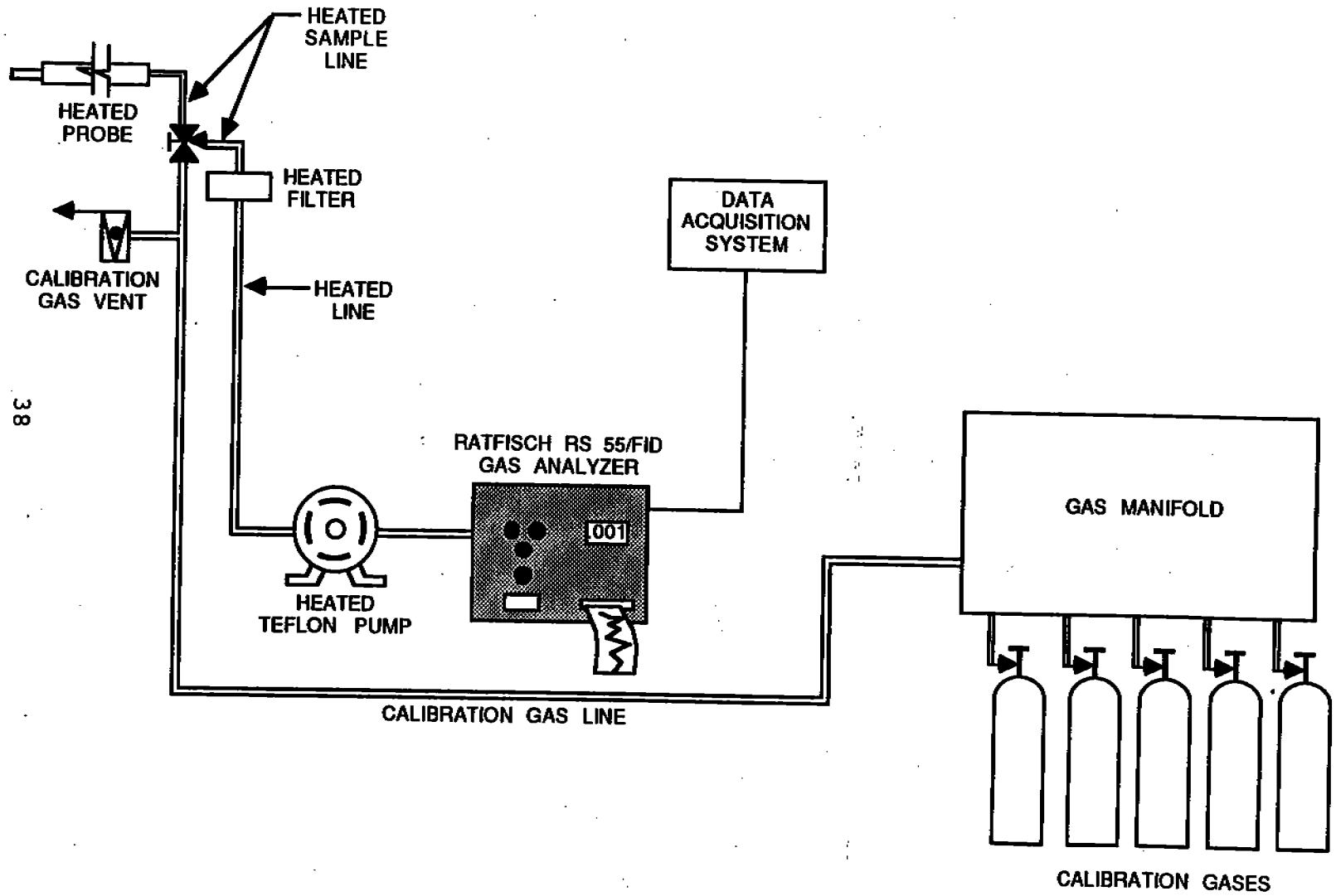


Figure 4-14. Instrumental measurement system for inlet location.

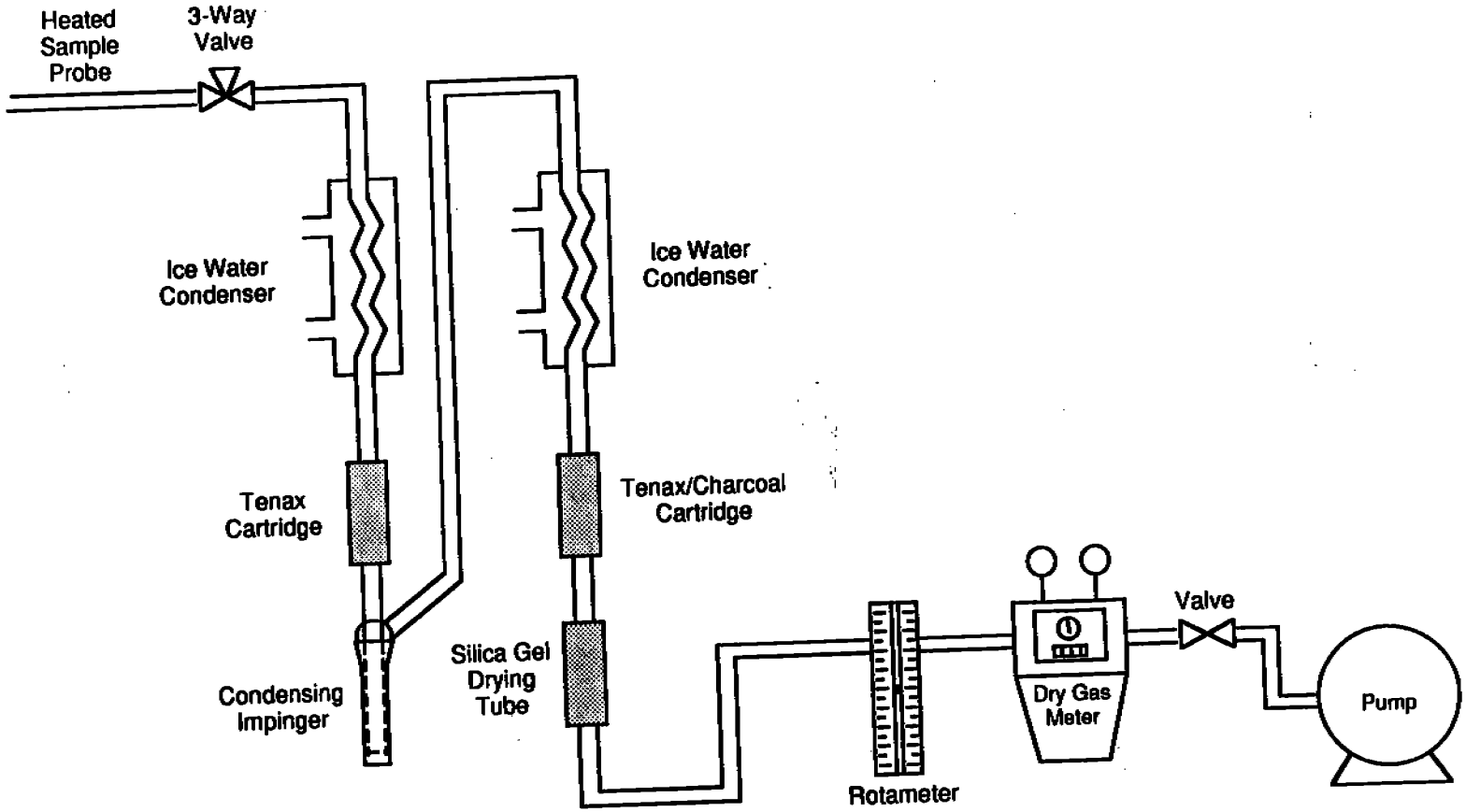
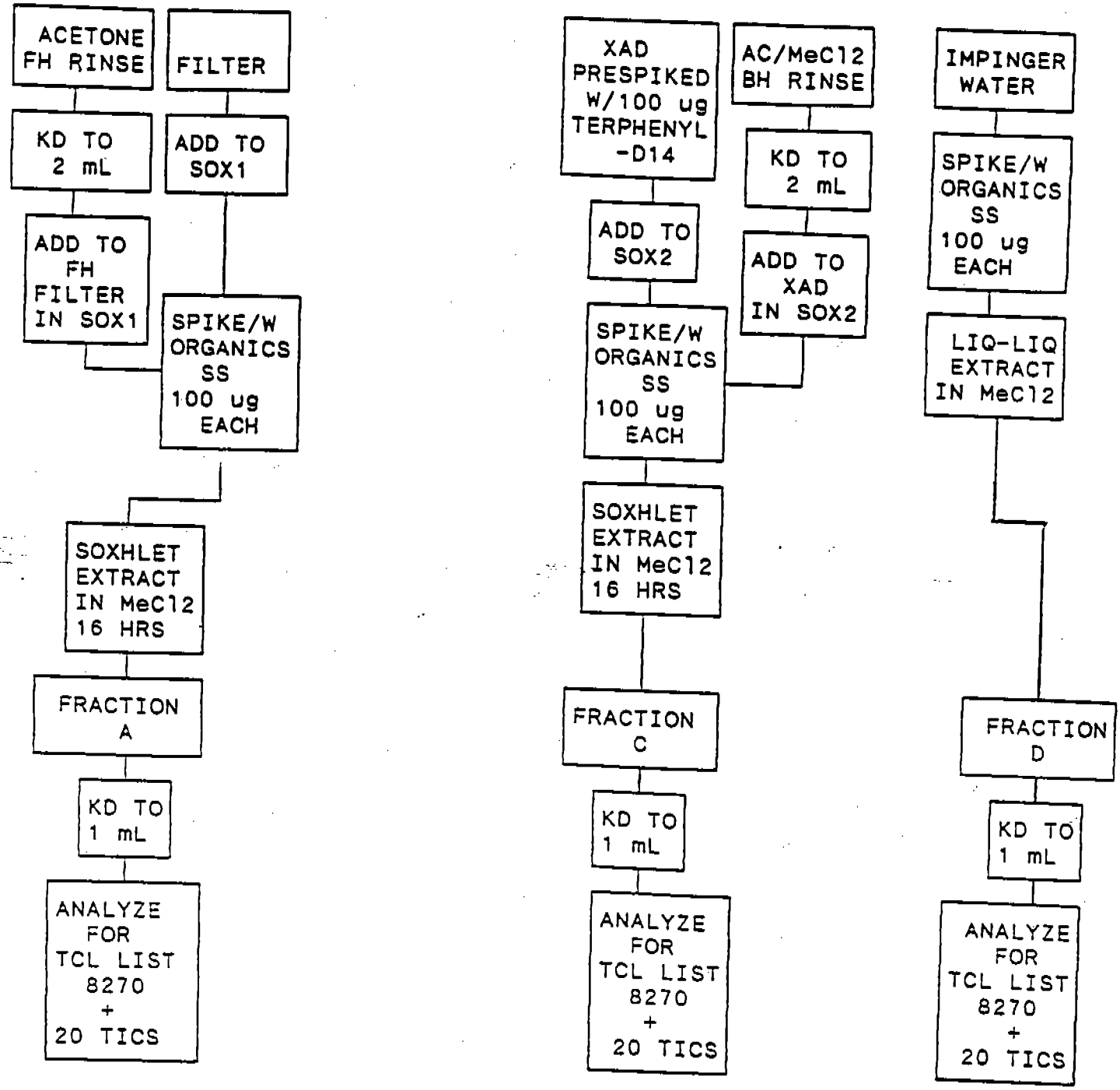


Figure 4-15. Schematic of volatile organic sampling train.

Figure 4-16. Organic analysis flow scheme.



ORGANICS SS SPIKE:

D5-PHENOL	100 ug
1,4-DIBROMOBENZENE	100 ug
D5-NITROBENZENE	100 ug
2-FLUOROBIPHENYL	100 ug
1,3,5-TRICHLOROBENZENE-D3	100 ug
2,4,6-TRIBROMOPHENOL	100 ug
ANTHRACENE-D10	100 ug
PYRENE-D10	100 ug

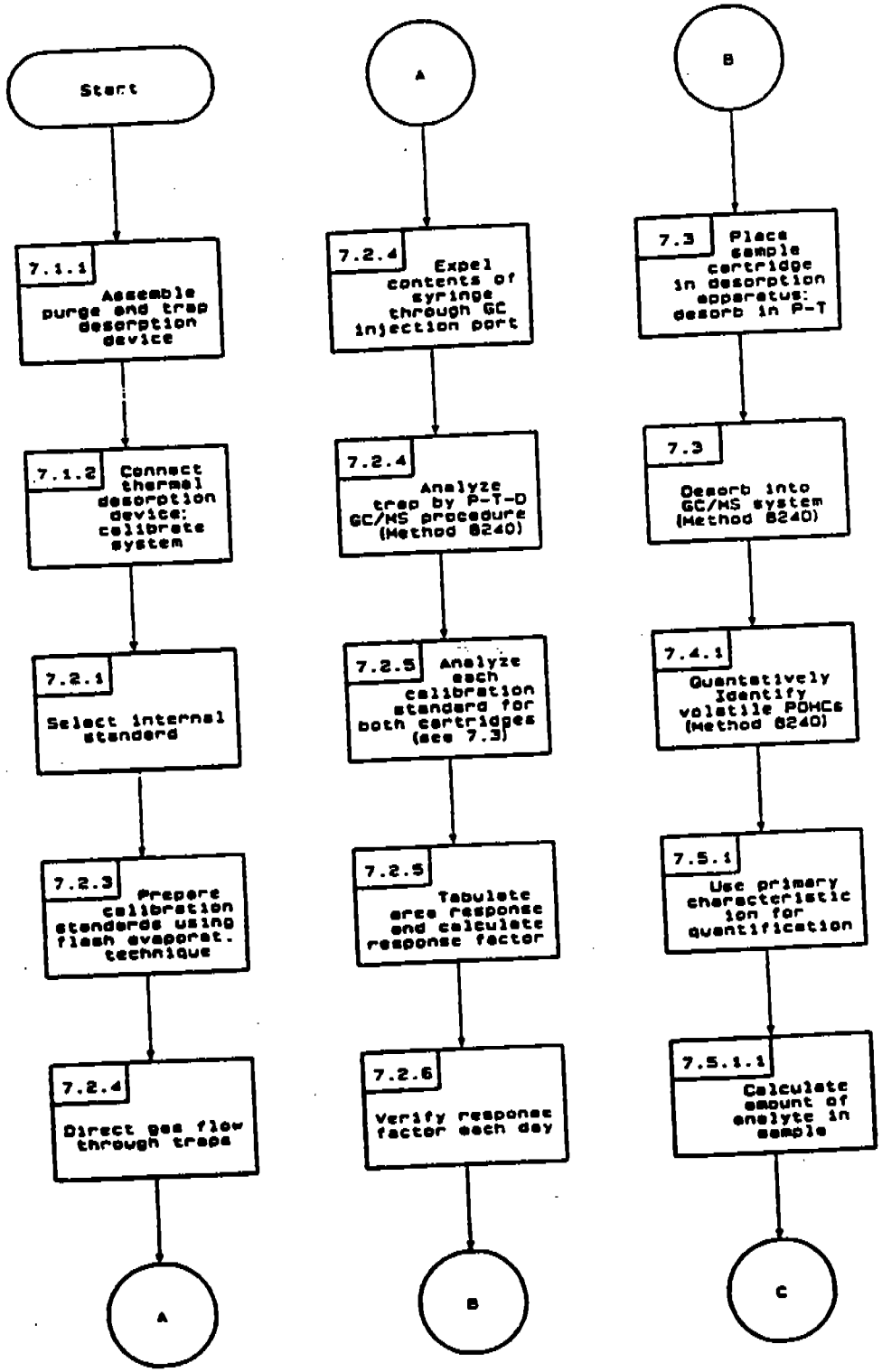


Figure 4-17. Method 5040 - Protocol for analysis of sorbent cartridges from volatile organic sampling train.

(continued)

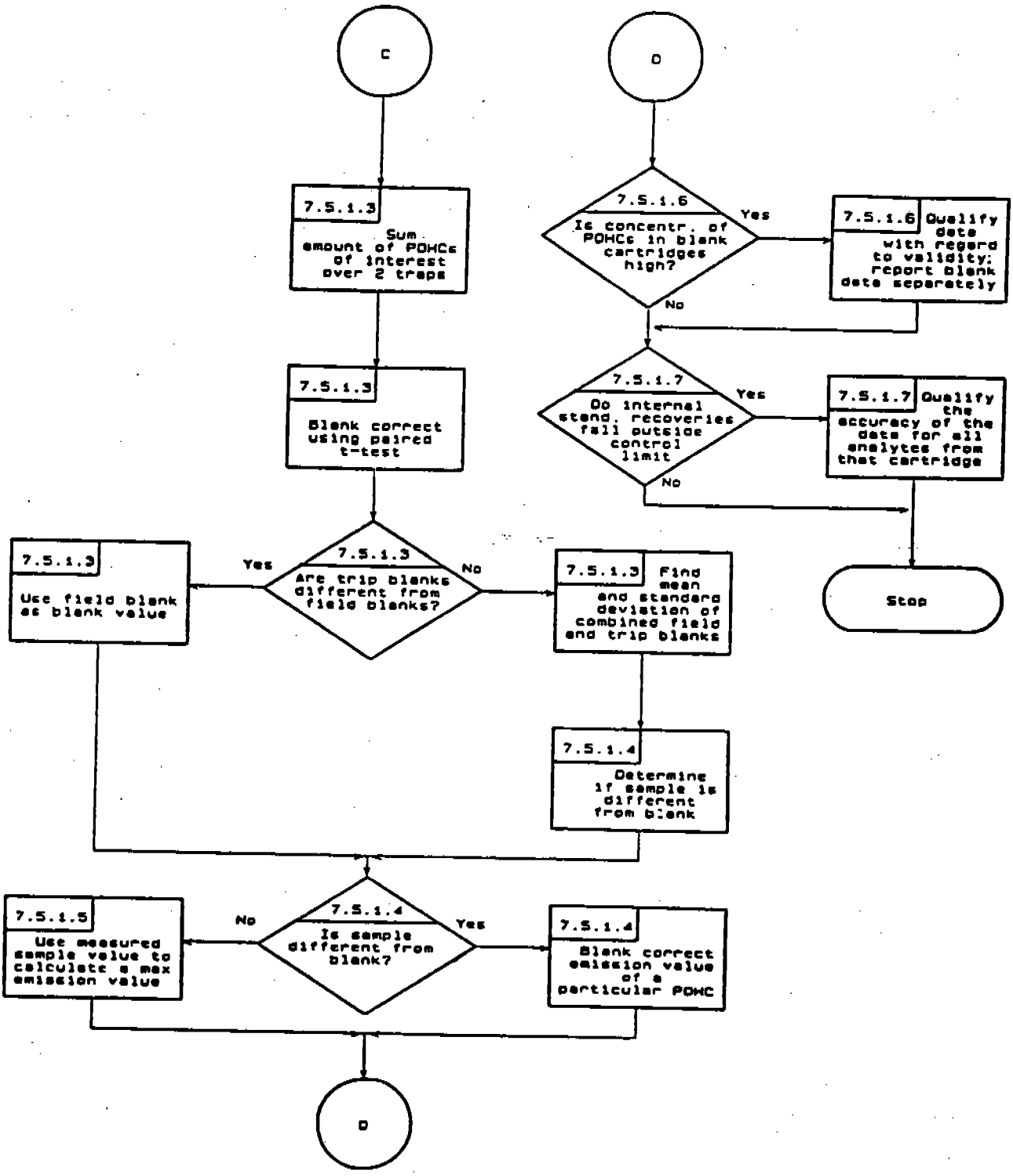


Figure 4-17. (Continued)

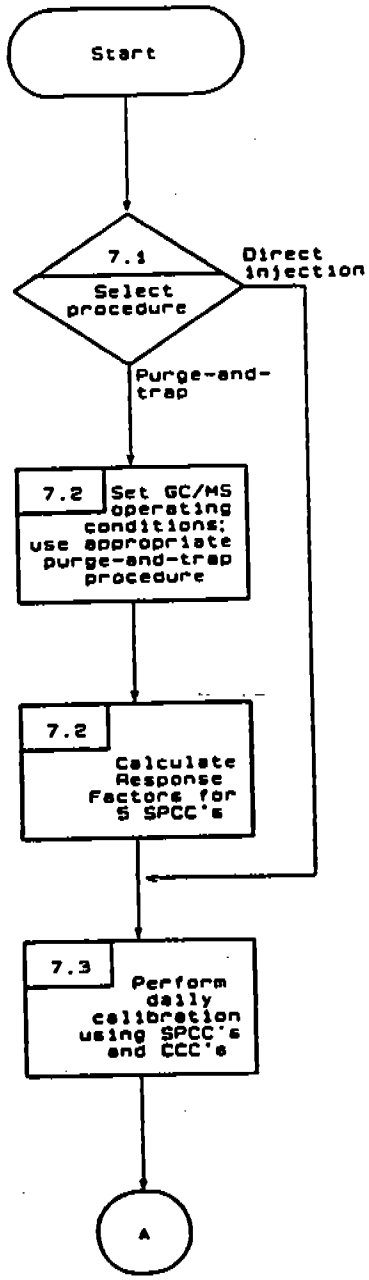


Figure 4-18. Method 8240 - Gas chromatography/mass spectrometry for volatile organics.

(continued)

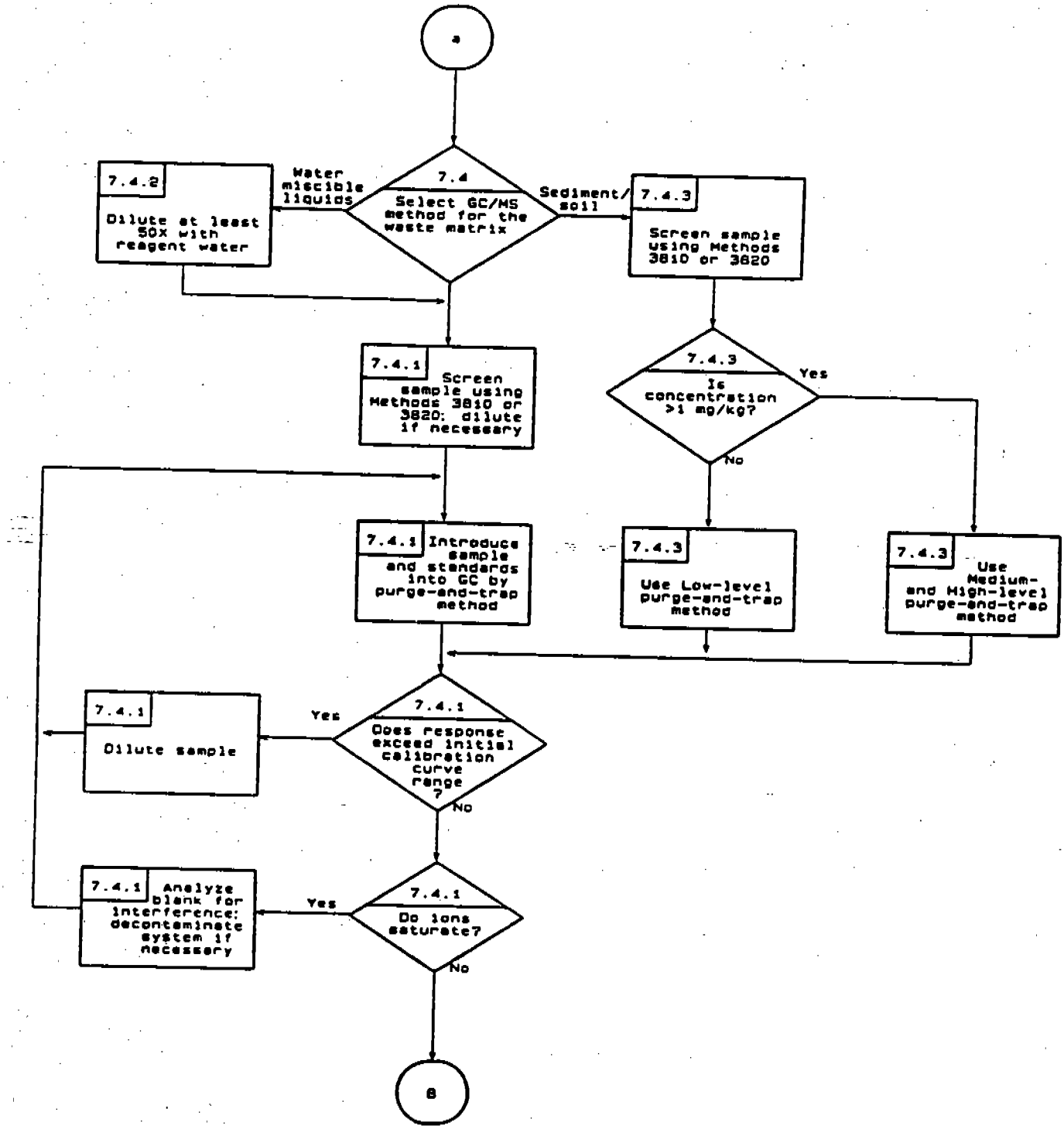


Figure 4-18. (Continued)

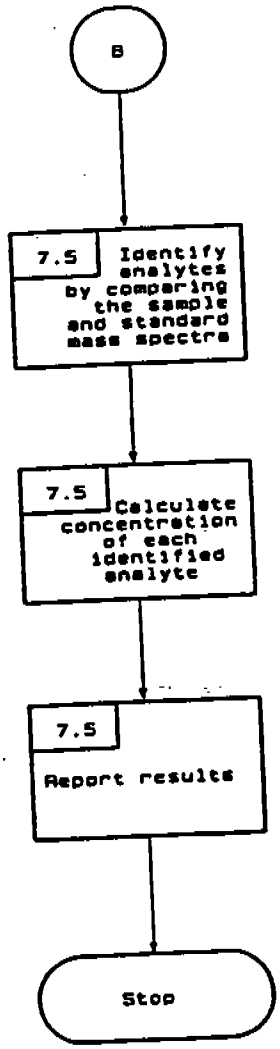


Figure 4-18. (Continued)

5.0 QA/QC ACTIVITIES

5.1 QC PROCEDURES

One field spike was performed at the EFB outlet location as a check of field handling and recovery procedures. The field spike consisted of introducing 200 µl of the Field Spike Standard into an impinger containing 200 ml of the DNPH solution and following normal recovery procedures.

The Field Spike Standard was prepared in the field according to the method. Exactly 0.5 ml of 37% by weight of formaldehyde (401 mg/ml) was added to a 50-ml volumetric flask containing approximately 40 ml of methanol and then volumed to 50 ml.

The results of the field spikes are shown below:

Train	HCOH	
	Added	Analyzed
S-Train	0.80 mg	0.094 mg

A field blank was also run. The analysis showed 7.2 µg of HCOH and 9.8 µg of acetone. The DNPH had 3.0 and 7.3 µg, respectively. The water and $MeCl_2$ had zero.

5.2 SAMPLE VOLUME AND PERCENT ISOKINETICS

All sampling runs, except three as explained in Section 3.2.1, had isokinetic rates within ±10 percent. A summary of the sample volume and percent isokinetics is given below:

RUN	SAMPLE VOLUME			PERCENT ISOKINETIC		
	M5/202	M0011	MM5	M5/202	M0011	MM5
I-1	41.4	33.3		98.1	99.8	
I-2	25.5	21.9		97.2	98.6	
I-3	31.6	36.0		102.9	104.6	
S-1	40.4	41.8	40.1	98.7	100.8	83.4
S-2	35.4	35.5	34.5	100.4	112.1	100.0
S-3	42.5	46.7	49.1	101.2	112.1	98.9
V-1		49.0			96.7	
V-2		48.5			98.2	
V-3		59.4			96.4	

APPENDIX A. Method M0011 Data Summary

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 EFB Inlet

		I-M0011-1	I-M0011-2	I-M0011-3
	Test Date	7/30/91	7/31/91	7/31/91
	Run Start Time	1130	1215	1800
	Run Finish Time	1420	1327	1933
	Net Traversing Points	24	16	24
Theta	Net Run Time, Minutes	60.00	40.00	60.00
Dia	Nozzle Diameter, Inches	0.197	0.199	0.199
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.9862	0.9862	0.9862
Pbar	Barometric Pressure, Inches Hg	29.30	29.30	29.20
Delta-H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.09	1.13	1.20
Vm	Volume Of Metered Gas Sample, Dry ACF	36.560	23.756	40.228
tm	Dry Gas Meter Temperature, Degrees F	101	95	110
Vmstd	Volume Of Metered Gas Sample, Dry SCF*	33.309	21.880	35.959
Vlc	Total Liquid Collected In Impingers & Silica Gel, grams	229.0	151.0	246.0
Vwstd	Volume of Water Vapor, SCF*	10.779	7.108	11.579
%H2O	Moisture Content, Percent by Volume	24.4	24.5	24.4
Mfd	Dry Mole Fraction	0.756	0.755	0.756
%CO2	Carbon Dioxide, Percent By Volume, Dry	4.0	4.4	3.8
%O2	Oxygen, Percent By Volume, Dry	16.8	16.5	17.0
%CO+N2	CO + N2, Percent By Volume, Dry	79.2	79.1	79.2
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.31	29.36	29.29
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.55	26.58	26.54
Pg	Flue Gas Static Pressure, Inches H2O	-15.80	-15.80	-15.80
Ps	Absolute Flue Gas Pressure, Inches Hg	28.14	28.14	28.04
ts	Flue Gas Temperature, Degrees F	233	228	226
Delta-p	Average Velocity Head, Inches H2O	1.3669	1.3016	1.3813
vs	Flue Gas Velocity, Feet/Second	80.87	78.58	81.04
A	Stack/Duct Area, Square Inches	1,753	1,753	1,753
Qsd	Volumetric Air Flow Rate, Dry SCFM*	31,976	31,268	32,294
Qmsd	Volumetric Air Flow Rate, Dry SCMH*	54,334	53,131	54,874
Qaw	Volumetric Air Flow Rate, Wet ACFM	59,068	57,397	59,191
Qmaw	Volumetric Air Flow Rate, Wet ACMH	100,368	97,530	100,578
%I	Isokinetic Sampling Rate, Percent	99.8	98.6	104.6
ton/hr	Process Feed Rate, ton/hr	12.3	13.8	12.3

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 EFB Inlet

		I-M0011-1	I-M0011-2	I-M0011-3
	Acetaldehyde			
fwt	Formula Weight, lb/lb-mole	44.00	44.00	44.00
ug	Catch Weight, micrograms	12	4.5 <	2.2
mg/DSCM	Concentration, ug/DSCM*	12.72	7.26 <	2.16
ppbvd	Concentration, ppbvd	6.96	3.97 <	1.18
ppb@12%CO2	Concentration, ppbvd at 12% CO2	20.9	10.8 <	3.7
ppb@7%O2	Concentration, ppmbd at 7% O2	23.2	12.4 <	4.1
lb/hr	Emission Rate, lb/hr 10-3	1.52	0.85 <	0.26
lb/ton	Emission Rate, lb/ton 10-3	0.1239	0.0616 <	0.0212
	Acetone			
fwt	Formula Weight, lb/lb-mole	58.00	58.00	58.00
ug	Catch Weight, micrograms	0.9	0.9	0.9
mg/DSCM	Concentration, ug/DSCM*	0.95	1.45	0.88
ppbvd	Concentration, ppbvd	0.396	0.602	0.367
ppb@12%CO2	Concentration, ppbvd at 12% CO2	1.19	1.64	1.16
ppb@7%O2	Concentration, ppmbd at 7% O2	1.32	1.87	1.28
lb/hr	Emission Rate, lb/hr	0.114	0.170	0.107
lb/ton	Emission Rate, lb/ton	0.0093	0.0123	0.0087
	Acrolein			
fwt	Formula Weight, lb/lb-mole	56.00	56.00	56.00
ug	Catch Weight, micrograms	0.9	0.9	0.9
mg/DSCM	Concentration, mg/DSCM*	0.00095	0.00145	0.00088
ppmvd	Concentration, ppmvd	0.000410	0.000624	0.000380
ppm@12%CO2	Concentration, ppmvd at 12% CO2	0.00123	0.00170	0.00120
ppm@7%O2	Concentration, ppmvd at 7% O2	0.00137	0.00194	0.00133
lb/hr	Emission Rate, lb/hr	0.000114	0.000170	0.000107
lb/ton	Emission Rate, lb/ton	0.00001	0.00001	0.00001

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 EFB Inlet

		I-M0011-1	I-M0011-2	I-M0011-3
	Formaldehyde			
fwt	Formula Weight, lb/lb-mole	30.00	30.00	30.00
ug	Catch Weight, micrograms	5.7	3.3	4.3
mg/DSCM	Concentration, ug/DSCM*	6.0	5.3	4.2
ppbvd	Concentration, ppbvd	4.8	4.3	3.4
ppb@12%CO2	Concentration, ppbvd at 12% CO2	14.5	11.6	10.7
ppb@7%O2	Concentration, ppmbd at 7% O2	16.2	13.3	11.9
lb/hr	Emission Rate, lb/hr 10-3	0.724	0.624	0.511
lb/ton	Emission Rate, lb/ton 10-3	0.0588	0.0452	0.0415
	Methyl Etyhyl Ketone			
fwt	Formula Weight, lb/lb-mole	72.11	72.11	72.11
ug	Catch Weight, micrograms	0.9	0.9	0.9
mg/DSCM	Concentration, mg/DSCM*	0.0010	0.0015	0.0009
ppmvd	Concentration, ppmvd	0.0003	0.0005	0.0003
ppm@12%CO2	Concentration, ppmvd at 12% CO2	0.0010	0.0013	0.0009
ppm@7%O2	Concentration, ppmvd at 7% O2	0.0011	0.0015	0.0010
lb/hr	Emission Rate, lb/hr	0.0001	0.0002	0.0001
lb/ton	Emission Rate, lb/ton	0.000009	0.000012	0.000009

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 Stack

		S-M0011-1	S-M0011-2	S-M0011-3
	Test Date	7/30/91	7/31/91	7/31/91
	Run Start Time	1130	1215	1800
	Run Finish Time	1428	1349	1947
	Net Traversing Points	24	18	24
Theta	Net Run Time, Minutes	60.00	45.00	60.00
Dia	Nozzle Diameter, Inches	0.236	0.236	0.236
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.0055	1.0055	1.0055
Pbar	Barometric Pressure, Inches Hg	29.20	29.20	29.20
Delta-H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.58	1.82	1.74
Vm	Volume Of Metered Gas Sample, Dry ACF	44.545	38.441	49.786
tm	Dry Gas Meter Temperature, Degrees F	94	104	94
Vmstd	Volume Of Metered Gas Sample, Dry SCF*	41.817	35.470	46.742
Vlc	Total Liquid Collected In Impingers & Silica Gel, grams	258.0	230.0	295.0
Vwstd	Volume of Water Vapor, SCF*	12.144	10.826	13.886
%H2O	Moisture Content, Percent by Volume	22.5	23.4	22.9
Mfd	Dry Mole Fraction	0.775	0.766	0.771
%CO2	Carbon Dioxide, Percent By Volume, Dry	3.2	3.8	4.0
%O2	Oxygen, Percent By Volume, Dry	17.6	17.1	16.8
%CO+N2	CO + N2, Percent By Volume, Dry	79.2	79.1	79.2
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.22	29.29	29.31
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.69	26.65	26.72
Pg	Flue Gas Static Pressure, Inches H2O	-0.35	-0.35	-0.35
Ps	Absolute Flue Gas Pressure, Inches Hg	29.17	29.17	29.17
ts	Flue Gas Temperature, Degrees F	226	223	225
Delta-p	Average Velocity Head, Inches H2O	0.9365	0.9851	0.9560
vs	Flue Gas Velocity, Feet/Second	65.23	66.80	65.82
A	Stack/Duct Area, Square Inches	2,043	2,043	2,043
Qsd	Volumetric Air Flow Rate, Dry SCFM*	32,292	32,841	32,465
Qmsd	Volumetric Air Flow Rate, Dry SCMH*	54,871	55,803	55,165
Qaw	Volumetric Air Flow Rate, Wet ACFM	55,524	56,865	56,027
Qmaw	Volumetric Air Flow Rate, Wet ACMH	94,346	96,624	95,201
%I	Isokinetic Sampling Rate, Percent	100.8	112.1	112.1
ton/hr	Process Feed Rate, ton/hr	12.3	13.8	12.3

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 Stack

		S-M0011-1	S-M0011-2	S-M0011-3
	Acetaldehyde			
fwt	Formula Weight, lb/lb-mole	44.00	44.00	44.00
ug	Catch Weight, micrograms	0.9	5.9	7.3
ug/DSCM	Concentration, ug/DSCM*	0.760	5.87	5.51
ppbvd	Concentration, ppbvd	0.415	3.21	3.02
ppb@12%CO2	Concentration, ppbvd at 12% CO2	1.56	10.1	9.0
ppb@7%O2	Concentration, ppbvd at 7% O2	1.71	11.5	10.1
lb/hr	Emission Rate, lb/hr 10-3	0.0919	0.723	0.6707
lb/ton	Emission Rate, lb/ton 10-3	0.0075	0.0524	0.0545
	Acetone			
fwt	Formula Weight, lb/lb-mole	58.00	58.00	58.00
ug	Catch Weight, micrograms	xxxx	xxxx	xxxx
mg/DSCM	Concentration, mg/DSCM*	ERR	ERR	ERR
ppmvd	Concentration, ppmvd	ERR	ERR	ERR
ppm@12%CO2	Concentration, ppmvd at 12% CO2	ERR	ERR	ERR
ppm@7%O2	Concentration, ppmvd at 7% O2	ERR	ERR	ERR
lb/hr	Emission Rate, lb/hr	ERR	ERR	ERR
lb/ton	Emission Rate, lb/ton	ERR	ERR	ERR
	Acrolein			
fwt	Formula Weight, lb/lb-mole	56.00	56.00	56.00
ug	Catch Weight, micrograms	xxxx	xxxx	xxxx
mg/DSCM	Concentration, mg/DSCM*	ERR	ERR	ERR
ppmvd	Concentration, ppmvd	ERR	ERR	ERR
ppm@12%CO2	Concentration, ppmvd at 12% CO2	ERR	ERR	ERR
ppm@7%O2	Concentration, ppmvd at 7% O2	ERR	ERR	ERR
lb/hr	Emission Rate, lb/hr	ERR	ERR	ERR
lb/ton	Emission Rate, lb/ton	ERR	ERR	ERR

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 Stack

		S-M0011-1	S-M0011-2	S-M0011-3
	Formaldehyde			
fwt	Formula Weight, lb/lb-mole	30.00	30.00	30.00
ug	Catch Weight, micrograms	3	3.7	3.3
ug/DSCM	Concentration, ug/DSCM*	2.53	3.68	2.49
ppbvd	Concentration, ppbvd	2.03	2.95	2.00
ppb@12%CO2	Concentration, ppbvd at 12% CO2	7.62	9.33	6.00
ppb@7%O2	Concentration, ppbvd at 7% O2	8.36	10.60	6.66
lb/hr	Emission Rate, lb/hr 10-3	0.306	0.453	0.303
lb/ton	Emission Rate, lb/ton 10-3	0.0249	0.0328	0.0246
	Methyl Etyhyl Ketone			
fwt	Formula Weight, lb/lb-mole	72.11	72.11	72.11
ug	Catch Weight, micrograms	xxxx	xxxx	xxxx
mg/DSCM	Concentration, mg/DSCM*	ERR	ERR	ERR
ppmvd	Concentration, ppmvd	ERR	ERR	ERR
ppm@12%CO2	Concentration, ppmvd at 12% CO2	ERR	ERR	ERR
ppm@7%O2	Concentration, ppmvd at 7% O2	ERR	ERR	ERR
lb/hr	Emission Rate, lb/hr	ERR	ERR	ERR
lb/ton	Emission Rate, lb/ton	ERR	ERR	ERR

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Press Vents

		V2,3-M0011-1	4-M0011-2	7-M0011-3
	Test Date	7/30/91	7/30/91	7/31/91
	Run Start Time	1123	1410	800
	Run Finish Time	1233	1520	xxx
	Net Traversing Points	24	24	24
Theta	Net Run Time, Minutes	60.00	60.00	60.00
Dia	Nozzle Diameter, Inches	0.314	0.314	0.314
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.0180	1.0180	1.0180
Pbar	Barometric Pressure, Inches Hg	29.10	29.10	29.20
Delta-H	Avg. Pressure Differential of Orifice Meter, Inches H2O	2.78	2.48	3.82
Vm	Volume Of Metered Gas Sample, Dry ACF	52.867	51.965	62.998
tm	Dry Gas Meter Temperature, Degrees F	108	104	102
Vmstd	Volume Of Metered Gas Sample, Dry SCF*	49.014	48.491	59.397
Vlc	Total Liquid Collected In Impingers & Silica Gel, grams	23.0	38.5	43.5
Vwstd	Volume of Water Vapor, SCF*	1.083	1.812	2.048
%H2O	Moisture Content, Percent by Volume	2.2	3.6	3.3
Mfd	Dry Mole Fraction	0.978	0.964	0.967
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	28.84	28.84	28.84
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.61	28.45	28.48
Pg	Flue Gas Static Pressure, Inches H2O	-0.30	-0.10	-0.10

Ps	Absolute Flue Gas Pressure, Inches Hg	29.08	29.09	29.19
ts	Flue Gas Temperature, Degrees F	111	130	133
Delta-p	Average Velocity Head, Inches H2O	0.2505	0.2514	0.3903
vs	Flue Gas Velocity, Feet/Second	29.78	30.40	37.89
A	Stack/Duct Area, Square Inches	1,735	1,735	1,735
Qsd	Volumetric Air Flow Rate, Dry SCFM*	18,928	18,435	23,003
Qmsd	Volumetric Air Flow Rate, Dry SCMH*	32,163	31,324	39,087
Qaw	Volumetric Air Flow Rate, Wet ACFM	21,528	21,977	27,391
Qmaw	Volumetric Air Flow Rate, Wet ACMH	36,580	37,343	46,543
%I	Isokinetic Sampling Rate, Percent	96.7	98.2	96.4
ton/hr	Process Feed Rate, ton/hr	24.6	27.6	24.6

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

	▲S▲UAcetaldehyde▼							
fwt	Formula Weight, lb/lb-mole		44.00		44.00		44.00	
ug	Catch Weight, micrograms	<	0.9	<	0.9	<	0.9	
ug/DSCM	Concentration, ug/DSCM*	<	0.65	<	0.66	<	0.54	
ppbvd	Concentration, ppbvd	<	0.35	<	0.36	<	0.29	
lb/hr	Emission Rate, lb/hr 10-3	<	0.05	<	0.05	<	0.05	
lb/ton	Emission Rate, lb/ton 10-3	<	0.0019	<	0.0016	<	0.0019	
	▲S▲UAcetone▼							
fwt	Formula Weight, lb/lb-mole		58.00		58.00		58.00	
ug	Catch Weight, micrograms	<	0.9		0.9		0.9	
ug/DSCM	Concentration, ug/DSCM*	<	0.65	<	0.66	<	0.54	
ppbvd	Concentration, ppbvd	<	0.27	<	0.27	<	0.22	
lb/hr	Emission Rate, lb/hr 10-3	<	0.05	<	0.05	<	0.05	
lb/ton	Emission Rate, lb/ton 10-3	<	0.0019	<	0.0016	<	0.0019	
	▲S▲UAcrolein▼							
fwt	Formula Weight, lb/lb-mole		56.00		56.00		56.00	
ug	Catch Weight, micrograms	<	0.9	<	0.9	<	0.9	
ug/DSCM	Concentration, ug/DSCM*	<	0.65	<	0.66	<	0.54	
ppbvd	Concentration, ppbvd	<	0.28	<	0.28	<	0.23	
lb/hr	Emission Rate, lb/hr 10-3	<	0.05	<	0.05	<	0.05	
lb/ton	Emission Rate, lb/ton 10-3	<	0.0019	<	0.0016	<	0.0019	

▲S▲UFormaldehyde▼

fwt	Formula Weight, lb/lb-mole	30.00	30.00	30.00
ug	Catch Weight, micrograms	66	63	73
ug/DSCM	Concentration, ug/DSCM*	47.5	45.9	43.4
ppbvd	Concentration, ppbvd	38.1	36.8	34.8
lb/hr	Emission Rate, lb/hr 10-3	3.4	3.2	3.7
lb/ton	Emission Rate, lb/ton 10-3	0.137	0.115	0.1520

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

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▲S▲UMethyl Etyhyl Ketone▼

fwt	Formula Weight, lb/lb-mole	72.11	72.11	72.11
ug	Catch Weight, micrograms	< 0.9	< 0.9	< 0.9
ug/DSCM	Concentration, ug/DSCM*	< 0.65	< 0.66	< 0.54
ppbvd	Concentration, ppbvd	< 0.22	< 0.22	< 0.18
lb/hr	Emission Rate, lb/hr 10-3	< 0.05	< 0.05	< 0.05
lb/ton	Emission Rate, lb/ton 10-3	< 0.0019	< 0.0016	< 0.0019

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

APPENDIX B. Method 5/202 Data Summary

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 EFB Inlet

		I-M5/202-1	I-M5/202-2	I-M5/202-3
	Test Date	7/30/91	7/31/91	7/31/91
	Run Start Time	1130	1215	1800
	Run Finish Time	1420	1327	1933
	Net Traversing Points	24	16	24
Theta	Net Run Time, Minutes	60.00	40.00	60.00
Dia	Nozzle Diameter, Inches	0.221	0.193	0.187
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	1.0026	1.0026	1.0026
Pbar	Barometric Pressure, Inches Hg	29.30	29.30	29.30
Delta-H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.66	1.19	0.889
Vm	Volume Of Metered Gas Sample, Dry ACF	44.351	25.463	34.548
tm	Dry Gas Meter Temperature, Degrees F	98	110	108
Vmstd	Volume Of Metered Gas Sample, Dry SCF*	41.359	23.218	31.589
Vlc	Total Liquid Collected In Impingers & Silica Gel, grams	268.5	145.0	198.5
Vwstd	Volume of Water Vapor, SCF*	12.638	6.825	9.343
%H2O	Moisture Content, Percent by Volume	23.4	22.7	22.8
Mfd	Dry Mole Fraction	0.766	0.773	0.772
%CO2	Carbon Dioxide, Percent By Volume, Dry	4.0	4.4	3.8
%O2	Oxygen, Percent By Volume, Dry	16.8	16.5	17.0
%CO+N2	CO + N2, Percent By Volume, Dry	79.2	79.1	79.2
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.31	29.36	29.29
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.66	26.78	26.72
Pg	Flue Gas Static Pressure, Inches H2O	-15.80	-15.80	-15.80
Ps	Absolute Flue Gas Pressure, Inches Hg	28.14	28.14	28.14
ts	Flue Gas Temperature, Degrees F	225	225	224
Delta-p	Average Velocity Head, Inches H2O	1.3322	1.6306	1.3574
vs	Flue Gas Velocity, Feet/Second	79.20	87.43	79.80
A	Stack/Duct Area, Square Inches	1,753	1,753	1,753
Qsd	Volumetric Air Flow Rate, Dry SCFM*	32,125	35,785	32,668
Qmsd	Volumetric Air Flow Rate, Dry SCMH*	54,586	60,806	55,510
Qaw	Volumetric Air Flow Rate, Wet ACFM*	57,850	63,858	58,286
Qmaw	Volumetric Air Flow Rate, Wet ACMH*	98,299	108,508	99,040
%I	Isokinetic Sampling Rate, Percent	98.1	97.2	102.9
ton/hr	Process feed rate, ton/hr	12.3	13.8	12.3

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 EFB Inlet

		I-M5/202-1	I-M5/202-2	I-M5/202-3
	Particulate Results			
	Filterable			
mg	Catch Weight, milligrams	419.6	241.9	302.2
mg/DSCM	Concentration, mg/DSCM*	358	368	338
gr/DSCF	Concentration, grains/DSCF*	0.157	0.161	0.148
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.470	0.439	0.466
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.522	0.500	0.517
lb/hr	Emission Rate, lb/hr	43.1	49.3	41.3
lb/ton	Emission Rate, lb/ton	3.50	3.57	3.36
	Condensable - Organic			
mg	Catch Weight, milligrams	92.7	52.4	49.1
mg/DSCM	Concentration, mg/DSCM*	79	80	55
gr/DSCF	Concentration, grains/DSCF*	0.0346	0.0348	0.0240
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.104	0.095	0.076
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.115	0.108	0.084
lb/hr	Emission Rate, lb/hr	9.5	10.7	6.7
lb/ton	Emission Rate, lb/ton	0.7743	0.774	0.546
	Condensable - Inorganic			
mg	Catch Weight, milligrams	86.7	56.8	86.9
mg/DSCM	Concentration, mg/DSCM*	74	86	97
gr/DSCF	Concentration, grains/DSCF*	0.0324	0.0378	0.0425
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.0971	0.1030	0.1341
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.1078	0.1175	0.1486
lb/hr	Emission Rate, lb/hr	8.9	11.6	11.9
lb/ton	Emission Rate, lb/ton	0.724	0.839	0.966
	Backup Filter			
mg	Catch Weight, milligrams	0.0	0.0	0.0
mg/DSCM	Concentration, mg/DSCM*	0	0	0
gr/DSCF	Concentration, grains/DSCF*	0.0	0.0	0.0
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.0	0.0	0.0
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.0	0.0	0.0
lb/hr	Emission Rate, lb/hr	0.0	0.0	0.0
lb/ton	Emission Rate, lb/ton	0.0	0.0	0.0

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 EFB Inlet

		I-M5/202-1	I-M5/202-2	I-M5/202-3
	Total Particulate			
mg	Catch Weight, milligrams	599	351	438
mg/DSCM	Concentration, mg/DSCM*	511	534	490
gr/DSCF	Concentration, grains/DSCF*	0.224	0.233	0.214
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.671	0.636	0.676
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.745	0.726	0.749
lb/hr	Emission Rate, lb/hr	61.5	71.6	59.9
lb/ton	Emission Rate, lb/ton	5.00	5.19	4.87

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 Stack

		S-M5/202-1	S-M5/202-2	S-M5/202-3
	Test Date	7/30/91	7/31/91	7/31/91
	Run Start Time	1130	1215	1800
	Run Finish Time	1428	1349	1947
	Net Traversing Points	24	18	24
Theta	Net Run Time, Minutes	60.00	45.00	60.00
Dia	Nozzle Diameter, Inches	0.243	0.257	0.243
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.9950	0.9950	0.9950
Pbar	Barometric Pressure, Inches Hg	29.20	29.20	29.20
Delta-H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.61	2.29	1.8
Vm	Volume Of Metered Gas Sample, Dry ACF	43.031	38.231	46.156
tm	Dry Gas Meter Temperature, Degrees F	88	96	99
Vmstd	Volume Of Metered Gas Sample, Dry SCF*	40.408	35.444	42.509
Vlc	Total Liquid Collected In Impingers & Silica Gel, grams	260.5	229.0	276.0
Vwstd	Volume of Water Vapor, SCF*	12.262	10.779	12.991
%H2O	Moisture Content, Percent by Volume	23.3	23.3	23.4
Mfd	Dry Mole Fraction	0.767	0.767	0.766
%CO2	Carbon Dioxide, Percent By Volume, Dry	3.2	3.8	4.0
%O2	Oxygen, Percent By Volume, Dry	17.6	17.1	16.8
%CO+N2	CO + N2, Percent By Volume, Dry	79.2	79.1	79.2
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.22	29.29	29.31
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.60	26.66	26.66
Pg	Flue Gas Static Pressure, Inches H2O	-0.35	-0.35	-0.35
Ps	Absolute Flue Gas Pressure, Inches Hg	29.17	29.17	29.17
ts	Flue Gas Temperature, Degrees F	227	222	227
Delta-p	Average Velocity Head, Inches H2O	0.8261	0.8688	0.8744
vs	Flue Gas Velocity, Feet/Second	61.42	62.68	63.11
A	Stack/Duct Area, Square Inches	2,043	2,043	2,043
Qsd	Volumetric Air Flow Rate, Dry SCFM*	30,046	30,891	30,837
Qmsd	Volumetric Air Flow Rate, Dry SCMH*	51,054	52,489	52,398
Qaw	Volumetric Air Flow Rate, Wet ACFM*	52,280	53,359	53,726
Qmaw	Volumetric Air Flow Rate, Wet ACMH*	88,834	90,668	91,291
%I	Isokinetic Sampling Rate, Percent	98.7	100.4	101.2
ton/hr	Process feed rate, ton/hr	12.3	13.8	12.3

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 Stack

	Particulate Results	S-M5/202-1	S-M5/202-2	S-M5/202-3
	Filterable			
mg	Catch Weight, milligrams	53.9	55.8	32.4
mg/DSCM	Concentration, mg/DSCM*	47	56	27
gr/DSCF	Concentration, grains/DSCF*	0.0206	0.0243	0.0118
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.0772	0.0767	0.0353
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.0848	0.0872	0.0392
lb/hr	Emission Rate, lb/hr	5.30	6.43	3.11
lb/ton	Emission Rate, lb/ton	0.43	0.47	0.25
	Condensable - Organic			
mg	Catch Weight, milligrams	45.8	30.9	26.6
mg/DSCM	Concentration, mg/DSCM*	40	31	22
gr/DSCF	Concentration, grains/DSCF*	0.0175	0.0135	0.0097
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.066	0.042	0.029
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.072	0.048	0.032
lb/hr	Emission Rate, lb/hr	4.5	3.6	2.6
lb/ton	Emission Rate, lb/ton	0.3662	0.258	0.208
	Condensable - Inorganic			
mg	Catch Weight, milligrams	95.8	34	28.3
mg/DSCM	Concentration, mg/DSCM*	84	34	24
gr/DSCF	Concentration, grains/DSCF*	0.0366	0.0148	0.0103
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.1372	0.0467	0.0308
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.1507	0.0531	0.0342
lb/hr	Emission Rate, lb/hr	9.4	3.9	2.7
lb/ton	Emission Rate, lb/ton	0.766	0.284	0.221
	Backup Filter			
mg	Catch Weight, milligrams	0.0	0.0	0.0
mg/DSCM	Concentration, mg/DSCM*	0	0	0
gr/DSCF	Concentration, grains/DSCF*	0.0	0.0	0.0
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.0	0.0	0.0
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.0	0.0	0.0
lb/hr	Emission Rate, lb/hr	0.0	0.0	0.0
lb/ton	Emission Rate, lb/ton	0.0	0.0	0.0

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

(continued next page)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC
SAMPLING LOCATION: Unit No. 2 Stack

		S-M5/202-1	S-M5/202-2	S-M5/202-3
	Total Particulate			
mg	Catch Weight, milligrams	196	121	87.3
mg/DSCM	Concentration, mg/DSCM*	171	120	72.5
gr/DSCF	Concentration, grains/DSCF*	0.0747	0.0526	0.0317
gr@12%CO2	Concentration, gr/DSCF at 12% CO2	0.280	0.166	0.0951
gr@7%O2	Concentration, gr/DSCF at 7% O2	0.307	0.189	0.106
lb/hr	Emission Rate, lb/hr	19.2	13.9	8.38
lb/ton	Emission Rate, lb/ton	1.56	1.01	0.68

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

APPENDIX C. Modified Method 5 Data Summary

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 Stack

		S-MM5-1	S-MM5-2	S-MM5-3
	Test Date	7/30/91	7/31/91	7/31/91
	Run Start Time	1130	1215	1800
	Run Finish Time	1428	1349	1947
	Net Traversing Points	24	18	24
Theta	Net Run Time, Minutes	60.00	45.00	60.00
Dia	Nozzle Diameter, Inches	0.253	0.248	0.253
Cp	Pitot Tube Coefficient	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.9769	0.9769	0.9769
Pbar	Barometric Pressure, Inches Hg	29.20	29.20	29.20
Delta-H	Avg. Pressure Differential of Orifice Meter, Inches H2O	1.57	2.11	2.44
Vm	Volume Of Metered Gas Sample, Dry ACF	43.721	38.381	54.669
tm	Dry Gas Meter Temperature, Degrees F	91	102	105
Vmstd	Volume Of Metered Gas Sample, Dry SCF*	40.085	34.547	48.987
Vlc	Total Liquid Collected In Impingers & Silica Gel, grams	266.5	231.5	328.5
Vwstd	Volume of Water Vapor, SCF*	12.544	10.897	15.462
%H2O	Moisture Content, Percent by Volume	23.8	24.0	24.0
Mfd	Dry Mole Fraction	0.762	0.760	0.760
%CO2	Carbon Dioxide, Percent By Volume, Dry	3.2	3.8	4.0
%O2	Oxygen, Percent By Volume, Dry	17.6	17.1	17.0
%CO+N2	CO + N2, Percent By Volume, Dry	79.2	79.1	79.0
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.22	29.29	29.32
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	26.54	26.58	26.60
Pg	Flue Gas Static Pressure, Inches H2O	-0.35	-0.35	-0.35
Ps	Absolute Flue Gas Pressure, Inches Hg	29.17	29.17	29.17
ts	Flue Gas Temperature, Degrees F	227	226	227
Delta-p	Average Velocity Head, Inches H2O	0.9821	0.9792	1.0509
vs	Flue Gas Velocity, Feet/Second	67.03	66.83	69.26
A	Stack/Duct Area, Square Inches	2,043	2,043	2,043
Qsd	Volumetric Air Flow Rate, Dry SCFM*	32,569	32,458	33,583
Qmsd	Volumetric Air Flow Rate, Dry SCMH*	55,342	55,153	57,063
Qaw	Volumetric Air Flow Rate, Wet ACFM	57,061	56,890	58,957
Qmaw	Volumetric Air Flow Rate, Wet ACMH	96,957	96,668	100,180
%I	Isokinetic Sampling Rate, Percent	83.4	100.0	98.8
ton/hr	Process Feed Rate, ton/hr	xxxx	xxxx	xxxx

* 68° F (20°C) -- 29.92 Inches of Mercury (Hg)

APPENDIX D. Method 25 Data Summary

EPA METHOD 25 VOC DATA SHEET
WEYERHAEUSER CORP OSB MILL, ELKIN,NC

VENT	RUN#	TANK NO.	TRAP NO.	FINAL VAC (mbar)	TANK TEMP (deg F)	BARO PRES (mm Hg)	FLSH PRES (mbar)	TANK TEMP (deg F)	BARO PRES (mm Hg)	TANK VOL. (ml)	SAMP VOL. (ml)	ANAL VOL. (ml)	ANALYSIS CONCENTRATION (ppm C) NM	CO	CH4	CO2	VOC
INLET	1A	S	22	19	389	90	737	719	72	762	6790	3641	11570	13.8	341.0	7.1	12320.0	13.8
	1A	B	1A					740	72	762	4555		7856	0.0	0.0	0.0	173.8	173.8
	2A	S	27	25	597	97	737	1034	70	763	6803	2379	13776	8.6	158.9	5.0	7141.9	8.6
	2A	B	6					779	70	763	4567		8098	0.0	0.0	0.0	131.3	303.8
	3A	S	9	16	385	70	764	683	70	764	6148	3849	10341	24.5	505.1	10.3	13540.0	24.5
	3A	B	8					774	70	764	4555		8071	0.0	0.0	0.0	186.5	186.5
	4A	S	4	28	475	91	739	830	71	763	6157	2888	11207	10.4	130.1	6.1	7305.0	10.4
	4A	B	7A					747	71	763	4561		7929	0.0	0.0	0.0	142.4	142.4
	5A	S	20	7	405	98	738	770	71	763	6151	3229	10832	4.6	116.2	7.5	7729.0	4.6
	5A	B	6A					753	71	763	4567		7966	0.0	0.0	0.0	218.7	218.7
OUTLET	1A	S	29	17	179	79	736	763	69	765	6700	5032	11846	14.1	401.3	7.7	15390.7	14.1
	1A	B	5					763	69	765	4575		8179	0.0	0.0	0.0	572.8	572.8
	2A	S	23	30	391	87	736	732	70	763	6812	3709	11763	30.4	270.6	7.3	11922.0	30.4
	2A	B	10					776	70	763	4568		8122	0.0	0.0	0.0	295.8	295.8
	3A	S	10	14	84	82	736	842	72	763	6162	5139	11249	18.5	578.9	12.1	17623.5	18.5
	3A	B	4A					750	70	761	4557		7917	0.0	0.0	0.0	589.2	589.2
	4A	S	5	15	151	88	740	733	70	761	6149	4757	10580	14.8	366.4	10.4	13442.7	14.8
	4A	B	3A					677	70	761	4562		8497	0.0	0.0	0.0	232.8	232.8
	5A	S	3	3	150	87	737	959	72	763	6167	4743	11986	8.5	215.9	6.6	12156.4	8.5
	5A	B	6A					815	72	763	4575		8244	0.0	0.0	0.0	342.0	342.0
BLANK		B	2A					776	71	764	4556		8067				8.9	8.9

EPA METHOD 25 VOC DATA SHEET
WEYERHAEUSER CORP OSB MILL, ELKIN,NC

VENT	RUN#	TOTAL VOC (mg C)	TOTAL VOC-BLANK (mg C)	SOURCE CONCENTRATION VOC (mg/dscm)	VOC (ppm C)	CO2 (%)	CO (ppm)	CH4 (ppm)	NM (ppm)	GAS FLOW (dscfm)	VOC (lb C/hr)	DRY FURNISH (tons/hr)	VOC (lb C/ton)
INLET	1A	0.08	0.724	198.8	398	3.92%	1084	22.6	43.9	31346.1	23.32	12.3	1.90
	1A	0.66											
	2A	0.06	1.248	524.8	1050	4.14%	920	29.0	49.8	34919.9	69.58	13.8	4.97
	2A	1.23											
	3A	0.13	0.840	218.2	436	3.64%	1357	27.7	65.8	31814.1	25.98	12.3	2.12
	3A	0.75											
	4A	0.06	0.586	202.4	405	2.83%	505	23.7	40.4	33678.0	25.66	9.1	2.81
	4A	0.66											
	5A	0.02	0.857	266.3	531	2.59%	390	25.2	15.4	32527.0	32.30	8.9	3.62
	5A	0.87											
OUTLET	1A	0.08	2.381	473.1	946	3.62%	945	16.1	33.2	29963.0	53.05	12.3	4.33
	1A	2.33											
	2A	0.18	1.339	361.0	722	3.78%	858	23.2	96.4	31243.8	42.21	13.8	3.06
	2A	1.20											
	3A	0.10	2.391	465.2	930	3.90%	1267	26.5	40.5	31469.8	54.79	12.3	4.46
	3A	2.32											
	4A	0.06	1.027	216.0	432	2.99%	615	23.1	32.9	32773.0	26.49	9.1	2.90
	4A	0.99											
	5A	0.05	1.419	299.2	598	3.07%	846	16.7	21.5	29332.0	32.84	8.9	3.68
	5A	1.40											
BLANK		0.04											

APPENDIX E. CEMS Data Summary - O_2, CO_2, CO, NO_x, and THC

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 EFB Inlet

		I-CEM-1	I-CEM-2	I-CEM-3
	Test Date	7/30/91	7/31/91	7/31/91
	Run Start Time	1130	1215	1800
	Run Finish Time	1420	1327	1933
Theta	Net Sample Time, Minutes	120	120	120
Mfd	Dry Mole Fraction	0.761	0.764	0.764
%CO2	Carbon Dioxide, Percent By Volume, Dry	4.0	4.4	3.8
%O2	Oxygen, Percent By Volume, Dry	16.8	16.5	17.0
Qsd	Volumetric Air Flow Rate, Dry SCFM *	32,070	33,540	32,489
ton/hr	Process Feed Rate, ton/hr	27.5	27.5	25
	Total Hydrocarbons, as Carbon			
Fwt	Formula Weight, Lb/Lb-Mole	12.01	12.01	12.01
ppmvw	Concentration, ppmvw	692.3	652.3	713.8
ppmvd	Concentration, ppmvd	910	854	934
ppm@12%	Concentration, ppmvd @ 12% CO2	2,729	2,329	2,950
ppm@7%	Concentration, ppmvd @ 7% O2	3,032	2,656	3,270
mg/DSCM	Concentration, mg/DSCM**	454	426	466
lb/hr	Emission Rate, lb/hr	54.6	53.6	56.8
lb/MMBtu	Emission Rate, lb/Million Btu	0.00398	0.00348	0.00390

* From the average of concurrent EPA M0011 and MM5 sampling.

** 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 2 Stack

			S-CEM-1	S-CEM-2	S-CEM-3
	Test Date		7/30/91	7/31/91	7/31/91
	Run Start Time		1130	1215	1800
	Run Finish Time		1428	1349	1947
Theta	Net Sample Time, Minutes		120	120	120
Mfd	Dry Mole Fraction		0.768	0.764	0.766
%CO2	Carbon Dioxide, Percent By Volume, Dry		3.2	3.8	4.0
%O2	Oxygen, Percent By Volume, Dry		17.6	17.1	16.8
Qsd	Volumetric Air Flow Rate, Dry SCFM *		31,632	32,060	32,299
ton/hr	Process Feed Rate, ton/hr		12.3	13.8	12.3
	Carbon Monoxide				
Fwt	Formula Weight, Lb/Lb-Mole		28.01	28.01	28.01
ppmvd	Concentration, ppmvd	>	987	809	1,260
ppm@12%	Concentration, ppmvd @ 12% CO2	>	3,701	2,555	3,780
ppm@7%	Concentration, ppmvd @ 7% O2	>	4,064	2,904	4,200
mg/DSCM	Concentration, mg/DSCM**	>	1,149	942	1,467
lb/hr	Emission Rate, lb/hr	>	136	113	178
lb/ton	Emission Rate, lb/ton	>	11.0714	8.1978	14.4318
	Nitrogen Oxides as NO2				
Fwt	Formula Weight, Lb/Lb-Mole		46.01	46.01	46.01
ppmvd	Concentration, ppmvd		33.0	22.0	27.0
ppm@12%	Concentration, ppmvd @ 12% CO2		124	69.5	81.0
ppm@7%	Concentration, ppmvd @ 7% O2		136	79.0	90.0
mg/DSCM	Concentration, mg/DSCM**		63.1	42.1	51.6
lb/hr	Emission Rate, lb/hr		7.48	5.05	6.25
lb/ton	Emission Rate, lb/ton		0.6081	0.3662	0.5080
	Total Hydrocarbons, as Carbon				
Fwt	Formula Weight, Lb/Lb-Mole		12.01	12.01	12.01
ppmvw	Concentration, ppmvw		667.4	614.1	735.6
ppmvd	Concentration, ppmvd		869	804	960
ppm@12%	Concentration, ppmvd @ 12% CO2		3,259	2,538	2,881
ppm@7%	Concentration, ppmvd @ 7% O2		3,578	2,885	3,201
mg/DSCM	Concentration, mg/DSCM**		434	401	479
lb/hr	Emission Rate, lb/hr		51	48	58
lb/ton	Emission Rate, lb/ton		4.1797	3.4924	4.7162

* From the average of concurrent EPA M0011 and MM5 sampling.

** 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

WEYERHAEUSER - RUN 1

07-30-91 TIME	STACK %02	STACK ppmNOx	STACK ppmCO	INLET ppmTHC	STACK ppmTHC
11:32	16.81	43.5	994.1	753.6	797.0
11:33	16.84	42.7	994.1	750.1	765.1
11:34	16.88	42.4	994.1	755.2	781.7
11:35	17.02	42.0	994.2	730.5	748.4
11:36	17.00	41.8	994.1	726.6	726.2
11:37	16.95	43.0	981.4	723.9	740.4
11:38	17.08	41.0	969.4	723.1	716.4
11:39	16.97	42.0	987.0	716.2	728.3
11:40	17.37	40.3	965.3	701.3	708.2
11:41	17.28	40.6	984.3	711.0	729.3
11:42	17.09	41.0	994.1	685.7	708.5
11:43	16.98	41.1	994.1	691.7	689.7
11:44	16.89	42.5	994.1	690.3	697.0
11:45	16.97	41.9	994.1	664.6	702.3
11:46	16.93	42.2	994.2	665.9	718.2
11:47	16.87	41.8	994.1	666.8	664.0
11:48	16.96	41.2	994.1	605.9	666.5
11:49	17.18	40.5	994.1	636.6	661.9
11:50	16.84	42.0	994.1	650.1	695.8
11:51	16.80	41.9	994.2	651.6	712.0
11:52	17.13	41.3	994.2	649.1	552.3
11:55	17.34	34.5	295.1	671.9	635.9
11:56	16.84	39.7	248.6	667.1	614.8
11:57	16.98	40.3	993.1	632.2	600.5
11:58	17.08	41.3	986.6	632.2	634.0
11:59	17.22	39.8	991.2	679.2	644.1
12:00	16.82	41.7	994.2	701.7	657.4
12:01	16.86	42.5	994.2	696.6	651.4
12:02	16.90	43.5	994.2	710.2	665.2
12:03	16.76	42.4	994.2	710.4	652.2
12:04	17.04	43.4	994.2	741.1	675.8
12:05	17.25	42.0	994.2	733.1	666.2
12:06	16.92	42.9	994.1	737.3	666.4
12:07	16.75	43.7	994.2	726.4	647.4
12:08	17.25	42.1	994.2	703.0	643.8
12:09	17.14	42.2	994.2	705.5	627.8
12:10	17.03	43.4	994.2	732.6	624.5
12:11	17.13	42.3	994.3	735.6	622.8
12:12	17.31	41.6	994.2	747.3	623.2
12:13	17.00	43.2	994.2	748.9	631.0
12:14	17.03	43.4	994.1	717.2	604.2
12:15	17.05	43.3	994.1	727.5	580.9
12:16	16.91	44.4	994.1	750.7	569.3
12:17	17.09	43.3	994.1	707.6	531.7
12:18	17.06	43.6	994.2	703.0	490.7
12:19	16.91	42.9	994.2	681.1	472.7
12:20	16.81	43.9	994.3	716.4	480.5
12:21	16.68	44.1	994.2	678.1	465.5
12:22	16.70	44.9	994.2	688.2	465.0
12:23	17.86	37.6	924.4	682.0	312.3
12:32	16.63	33.9	994.3	652.9	694.1
12:33	16.88	34.9	994.4	644.6	685.7
12:34	17.16	34.7	994.3	632.2	663.3

12:35	17.28	34.6	980.8	606.6	650.8
12:36	17.25	34.9	982.9	592.3	631.9
12:37	17.39	33.8	994.1	597.3	630.0
12:38	17.18	34.7	994.3	602.1	601.7
12:39	17.10	35.8	994.1	577.0	585.3
12:40	17.03	36.5	994.3	570.1	578.9
12:41	17.16	36.0	994.2	566.4	577.0
12:42	17.20	36.8	994.3	577.0	584.3
12:43	17.10	36.3	994.2	592.8	575.3
12:44	16.99	37.4	994.4	610.9	588.0
12:45	16.70	39.1	985.0	563.6	586.4
12:46	16.59	39.7	994.1	599.0	603.6
12:47	16.72	38.5	994.1	614.7	615.1
12:48	16.87	37.6	994.4	628.0	616.3
12:49	16.62	38.9	993.7	653.3	650.3
12:50	16.52	38.8	979.9	678.5	661.7
12:51	16.89	37.8	967.0	654.2	645.2
12:52	16.84	37.4	965.3	656.8	654.2
12:53	16.72	38.4	979.2	703.1	678.4
12:54	16.67	38.9	988.0	702.1	729.5
12:55	16.62	39.3	981.3	719.3	712.7
12:56	16.83	38.7	993.8	709.2	676.2
12:57	16.79	38.7	994.3	658.4	652.0
12:58	16.77	39.1	993.3	632.7	610.8
12:59	16.90	38.8	990.1	637.3	616.4
13:00	17.03	37.7	982.0	623.8	574.1
13:01	17.05	38.2	918.3	628.6	573.0
13:02	17.10	37.7	887.7	611.3	600.2
13:03	17.22	37.3	910.2	572.0	561.8
13:04	16.99	39.0	917.9	583.1	555.5
13:05	16.93	39.1	888.4	593.6	565.6
13:06	16.81	38.0	985.6	614.8	573.6
13:07	16.97	37.5	994.3	599.6	573.4
13:08	16.82	38.1	994.3	590.9	566.1
13:09	16.64	38.8	994.3	600.9	591.3
13:10	16.53	39.0	994.4	606.0	569.7
13:11	16.67	38.9	978.3	563.9	584.0
13:12	16.80	38.6	916.5	561.5	537.9
13:13	16.95	38.8	869.3	576.7	554.6
13:14	16.82	38.2	879.9	570.8	554.5
13:15	16.96	37.0	905.9	576.6	568.1
13:16	16.82	36.7	928.1	577.1	574.5
13:17	16.73	37.0	889.7	604.4	611.9
13:18	16.87	36.4	902.5	627.9	596.6
13:19	17.06	35.1	920.9	623.3	629.8
13:20	17.35	33.4	991.9	610.7	580.3
13:21	17.22	33.9	966.3	583.4	595.7
13:22	17.23	32.5	962.5	568.2	563.8
13:23	17.16	33.1	931.9	615.3	585.4
13:24	17.40	32.1	994.2	653.3	606.3
13:25	17.20	32.4	994.2	672.7	638.2
13:26	16.88	33.0	994.1	661.0	627.0
13:27	17.11	32.5	994.2	612.6	616.7
13:28	16.97	33.2	994.2	644.9	621.2
13:29	16.98	33.0	981.1	666.0	634.9
13:30	16.91	33.9	940.1	690.8	630.4
13:31	17.07	33.2	876.1	647.5	623.6
13:32	17.11	33.4	914.4	676.8	637.8
13:33	16.75	35.3	875.1	697.0	656.9
13:34	16.59	35.4	894.6	720.6	665.0

13:35	16.64	35.2	922.1	713.6	659.9
13:36	16.74	34.8	947.8	736.9	681.1
13:37	16.71	34.1	977.5	678.5	657.2
13:38	16.75	34.1	914.0	701.3	695.0
13:39	16.78	33.8	935.0	717.4	692.6
13:40	16.91	33.4	929.0	763.5	709.2
13:41	16.78	33.4	962.5	745.7	707.7
13:42	16.68	33.7	944.9	762.3	735.8
13:43	16.61	34.0	972.5	779.4	720.2
13:44	16.62	34.4	950.3	782.9	716.6
13:45	16.62	34.0	959.3	763.8	704.0
13:46	16.74	33.6	942.7	744.7	703.6
13:47	17.06	31.6	983.3	721.2	693.2
13:48	16.91	32.1	968.4	775.7	725.5
13:49	16.93	32.0	970.5	759.2	710.5
13:50	17.02	31.5	994.2	744.0	727.4
13:51	16.99	31.4	971.7	755.1	714.7
13:52	16.99	31.2	990.5	765.0	737.2
13:53	16.91	31.8	993.7	772.2	736.0
13:54	17.09	31.6	988.3	782.7	739.8
13:55	17.09	31.0	994.2	774.9	733.3
13:56	16.70	32.3	994.2	766.7	749.7
13:57	16.81	32.5	994.2	753.9	733.9
13:58	16.70	32.7	994.2	752.4	753.3
13:59	16.73	33.0	994.1	773.7	756.2
14:00	16.79	32.9	994.2	760.6	735.3
14:01	16.86	32.5	994.2	760.9	725.9
14:02	16.91	32.5	994.3	774.1	726.3
14:03	16.68	32.9	991.6	786.5	744.2
14:04	16.63	33.5	955.2	818.5	747.6
14:05	16.70	33.2	939.1	806.9	736.8
14:06	17.01	32.5	952.3	787.0	715.9
14:07	16.83	32.6	982.2	640.3	713.3
14:08	16.68	33.3	916.4	712.1	707.9
14:09	16.51	34.0	905.9	733.0	715.6
14:10	16.65	34.0	914.1	776.6	732.2
14:11	16.51	33.7	917.9	778.5	716.3
14:12	16.56	33.9	863.6	785.2	712.9
14:13	16.43	34.4	866.4	781.7	749.7
14:14	16.38	34.9	932.6	830.1	761.9
14:15	16.52	34.0	926.3	788.0	760.7
14:16	16.51	34.1	892.2	834.5	785.4
14:17	16.64	33.6	875.1	857.4	798.5
14:18	16.57	33.8	870.3	861.1	850.2
14:19	16.52	33.6	863.3	868.5	812.5
14:20	16.56	34.2	821.3	871.7	847.7
14:21	16.74	33.4	825.0		819.9
14:22	16.71	33.4	822.6		820.5
14:23	16.86	32.5	811.3		817.6
14:24	16.63	33.3	845.0		833.9
14:25	16.43	33.5	882.8		835.0
14:26	16.57	33.7	875.2		873.7
14:27	16.75	32.9	890.0		864.8
14:28	16.65	33.1	841.7		829.9
AVG	16.89	37.1	952.7	689.8	664.7

WEYERHAEUSER - RUN 2

07-31-91 TIME	STACK %02	STACK ppmNOx	STACK ppmCO	INLET ppmTHC	STACK ppmTHC
12:16	16.98	30.2	654.8	626.1	558.7
12:17	16.87	29.4	657.1	620.2	552.1
12:18	16.86	29.4	649.2	645.2	583.3
12:19	16.83	28.3	686.7	642.8	573.2
12:20	16.88	27.8	696.5	673.0	599.7
12:21	16.73	27.3	759.5	708.8	604.2
12:22	16.82	26.9	709.6	666.4	599.0
12:23	16.89	26.3	699.9	683.0	621.1
12:24	16.80	25.8	743.9	710.2	617.6
12:25	16.73	26.0	744.2	707.8	623.7
12:26	16.82	26.4	714.0	706.8	634.1
12:27	16.85	25.9	744.8	667.5	631.3
12:28	16.85	26.7	708.1	697.8	632.8
12:29	16.84	25.7	727.3	694.2	620.0
12:30	16.83	25.8	698.0	690.0	619.9
12:31	16.77	25.6	720.1	685.9	627.3
12:32	16.73	25.4	757.1	692.9	624.3
12:33	16.78	25.4	763.0	685.7	618.6
12:34	16.81	25.1	777.9	673.6	586.7
12:35	16.86	25.1	703.9	646.3	582.0
12:36	16.99	24.9	674.8	656.8	570.1
12:37	16.94	24.7	650.1	649.1	573.4
12:38	16.86	25.5	659.8	661.3	571.6
12:39	16.94	25.0	698.4	645.1	566.1
12:40	16.89	25.2	656.7	637.2	560.0
12:41	16.83	25.5	659.2	641.8	579.0
12:42	16.85	25.3	685.4	646.0	582.1
12:43	17.01	24.6	679.9	640.0	583.1
12:44	17.06	24.5	681.5	645.6	589.9
12:45	16.91	24.9	671.5	666.8	601.3
12:46	16.89	24.8	710.8	661.1	592.6
12:47	16.85	24.8	714.7	637.1	593.5
12:48	16.80	25.0	717.3	657.3	582.1
12:49	16.83	25.4	709.5	644.2	586.7
12:50	16.80	26.0	721.7	643.2	576.3
12:51	16.81	25.6	740.7	637.3	565.6
12:52	16.92	25.2	740.8	616.2	553.0
12:53	17.07	24.9	752.8	618.7	587.9
12:54	16.94	24.9	784.0	624.4	555.7
12:55	16.90	25.3	767.2	610.6	567.1
12:56	16.83	25.4	777.0	610.1	566.6
12:57	16.94	24.9	759.7	599.5	564.8
12:58	16.99	24.8	746.8	622.8	557.0
12:59	17.01	25.1	730.7	607.3	553.8
13:00	17.07	24.8	716.2	565.5	532.0
13:01	17.11	24.6	681.3	586.1	550.7
13:02	16.86	26.0	660.0	620.9	556.5
13:03	16.76	26.4	657.0	602.2	547.1
13:04	16.80	26.1	684.5	608.0	554.0
13:05	16.90	25.8	750.5	608.3	564.9
13:06	16.78	25.9	762.0	623.7	570.8
13:07	16.82	26.4	748.4	648.7	592.6
13:08	16.85	26.0	771.6	629.4	567.2
13:09	16.77	26.3	740.8	653.8	586.0
13:10	16.76	26.5	756.8	655.1	596.2

13:11	16.73	27.2	777.9	650.9	602.5
13:12	16.80	26.5	815.7	636.4	593.9
13:13	17.07	26.0	819.7	653.0	602.0
13:14	17.06	25.6	857.7	650.0	582.2
13:15	17.03	25.8	793.3	649.0	596.4
13:16	17.00	25.4	857.7	631.7	585.3
13:17	17.04	25.3	877.1	642.8	589.0
13:18	16.97	25.7	850.8	635.3	606.5
13:19	16.84	26.2	832.8	639.9	633.8
13:20	16.88	25.8	852.1	675.8	620.6
13:21	16.86	26.4	786.6	684.3	617.7
13:22	16.86	26.4	760.4	669.5	604.8
13:23	16.81	26.6	757.3	672.3	627.1
13:24	16.86	26.2	804.4	695.6	643.3
13:25	16.88	26.2	839.4	708.9	641.4
13:26	16.71	26.5	861.5	705.4	629.5
13:27	16.84	26.4	828.4	719.5	638.8
13:28	16.81	26.3	881.8		640.7
13:29	16.73	26.7	894.2		657.8
13:30	16.72	26.6	925.1		663.9
13:31	16.72	26.5	949.6		675.6
13:32	16.72	26.3	1005.2		649.4
13:33	16.71	26.6	972.1		668.6
13:34	16.72	26.6	969.0		654.9
13:35	16.75	26.8	953.1		681.7
13:36	16.73	26.7	997.6		677.6
13:37	16.75	26.4	945.6		672.7
13:38	16.67	26.6	1007.8		665.4
13:39	16.53	27.2	1018.4		677.8
13:40	16.63	27.1	1077.8		709.9
13:41	16.38	28.0	1096.9		719.2
13:42	16.63	27.3	1080.7		693.6
13:43	16.53	27.4	1052.2		720.2
13:44	16.65	27.5	1030.2		693.9
13:45	16.77	27.3	955.0		664.2
13:46	16.83	27.0	916.9		666.3
13:47	16.87	26.7	867.4		643.4
13:48	16.85	27.2	813.3		644.9
13:49	16.86	27.3	784.7		648.8
AVG	16.84	26.1	792.6	651.7	609.7

Weyehaeuser - Run 3

07-31-91 TIME	STACK %02	STACK ppmNOx	STACK ppmCO	INLET ppmTHC	STACK ppmTHC
18:02	16.65	34.6	1230.7	682.0	650.9
18:03	16.65	32.7	1240.3	649.7	636.5
18:04	16.56	34.2	1185.1	658.2	632.2
18:05	16.48	33.3	1190.3	626.5	610.3
18:06	16.48	33.8	1148.1	631.1	612.9
18:07	16.70	32.0	1197.8	612.0	621.5
18:08	16.78	31.3	1254.3	623.5	619.1
18:09	17.03	30.1	1265.6	596.0	585.3
18:10	17.69	27.7	1210.5	614.6	590.6
18:11	17.89	25.3	1226.3	575.6	569.5
18:12	17.97	24.9	1192.5	521.8	569.0
18:13	18.02	24.3	1237.6	543.6	570.1
18:14	17.96	24.0	1271.3	559.3	570.6
18:15	17.94	24.5	1304.9	587.8	574.8
18:16	17.89	24.2	1285.9	570.5	563.7
18:17	17.86	23.6	1307.3	565.7	552.9
18:18	17.84	24.4	1277.4	583.8	578.1
18:19	17.80	24.0	1240.0	596.8	612.3
18:20	17.68	22.9	1453.1	717.8	719.2
18:21	17.41	23.3	1757.8	602.9	650.6
18:22	17.24	25.1	1706.6	600.3	648.3
18:23	16.95	28.6	1796.4	580.9	582.7
18:24	16.75	31.3	1489.1	580.4	573.2
18:25	16.64	31.6	1360.8	565.5	583.0
18:26	16.51	33.0	1260.9	582.3	617.3
18:27	16.45	33.3	1248.6	633.0	627.3
18:28	16.49	32.5	1285.8	662.8	652.5
18:29	16.50	32.6	1283.9	617.7	602.9
18:30	16.54	32.8	1219.3	648.5	623.4
18:31	16.52	33.2	1240.2	639.1	612.7
18:32	16.53	33.0	1269.3	605.9	612.6
18:33	16.48	32.4	1232.1	615.5	623.5
18:34	16.49	32.6	1266.5	642.1	623.0
18:35	16.59	32.5	1221.4	591.1	607.6
18:36	16.57	31.4	1235.0	644.3	652.7
18:37	16.53	32.4	1289.3	656.2	655.7
18:38	16.41	32.9	1256.7	646.8	648.4
18:39	16.47	32.5	1296.0	639.8	658.4
18:40	16.59	31.5	1306.4	690.7	692.3
18:41	16.72	31.5	1347.4	690.6	673.4
18:42	16.95	29.4	1465.7	678.0	682.8
18:43	16.78	29.6	1496.9	678.4	682.9
18:44	16.64	30.8	1250.8	628.7	701.6
18:45	16.61	31.2	1206.2	686.1	705.8
18:46	16.58	31.3	1226.4	723.4	720.2
18:47	16.56	32.0	1196.7	733.1	717.8
18:48	16.67	31.5	1242.6	762.7	706.4
18:49	16.65	31.6	1174.6	774.7	731.0
18:50	16.59	31.9	1164.8	745.2	758.0
18:51	16.60	31.6	1153.0	753.7	757.1
18:52	16.61	31.5	1166.7	794.9	752.6
18:53	16.52	31.5	1162.2	768.9	746.3
18:54	16.41	32.7	1102.9	781.0	756.1
18:55	16.48	32.0	1159.8	819.5	777.7
18:56	16.55	31.8	1206.2	773.9	794.7

18:57	16.55	31.6	1140.8	803.2	798.1
18:58	16.65	30.7	1136.4	789.0	777.0
18:59	16.63	32.6	1080.6	775.9	772.7
19:00	16.71	30.9	1143.1	793.3	786.8
19:01	16.50	31.4	1157.1	800.7	778.8
19:02	16.57	31.9	1174.7	831.7	793.1
19:03	16.46	32.4	1134.1	750.2	758.6
19:04	16.47	32.5	1123.5	724.3	734.1
19:05	16.38	31.8	1232.0	746.9	753.2
19:06	16.51	32.6	1173.2	775.9	760.5
19:07	16.54	31.8	1133.3	754.9	773.3
19:08	16.49	32.2	1239.2	821.0	820.9
19:09	16.50	32.1	1227.2	567.8	824.1
19:10	16.36	31.9	1199.4	676.1	822.3
19:11	16.51	31.1	1283.5	785.2	833.4
19:12	16.48	31.3	1235.7	842.4	858.2
19:13	16.37	31.3	1307.2	848.6	851.9
19:14	16.42	31.1	1213.4	855.9	838.5
19:15	16.57	30.8	1244.6	745.4	829.1
19:16	16.57	30.7	1271.8	788.7	845.3
19:17	16.57	31.4	1224.9	813.9	844.0
19:18	16.53	31.2	1197.4	730.5	826.1
19:19	16.53	31.3	1290.6	757.8	827.4
19:20	16.56	30.8	1251.0	769.3	808.1
19:21	16.57	30.9	1208.3	824.2	844.8
19:22	16.51	31.0	1235.1	828.1	825.1
19:23	16.56	30.9	1237.7	766.4	833.0
19:24	16.56	31.9	1240.7	784.4	823.0
19:25	16.62	31.1	1232.6	817.2	841.4
19:26	16.76	30.8	1192.6	825.3	837.5
19:27	16.58	31.1	1165.3	696.5	835.3
19:28	16.53	31.3	1190.8	556.3	809.0
19:29	16.60	31.8	1200.8	778.4	846.0
19:30	16.55	31.5	1233.0	822.4	854.5
19:31	16.57	31.7	1260.3	855.6	869.8
19:32	16.55	32.5	1272.6	898.1	869.7
19:33	16.66	32.6	1254.0	881.2	839.6
19:34	16.58	33.0	1222.8		839.2
19:35	16.61	34.5	1222.0		839.5
19:36	16.72	34.2	1229.8		806.7
19:37	16.56	34.9	1242.6		829.0
19:38	16.56	35.2	1249.2		810.7
19:39	16.65	34.0	1262.5		794.4
19:40	16.52	34.3	1273.3		831.2
19:41	16.39	34.9	1350.7		853.9
19:42	16.45	34.2	1348.7		846.5
19:43	16.56	33.4	1371.3		818.4
19:44	16.59	32.5	1323.9		811.7
19:45	16.59	32.0	1306.1		855.1
19:46	16.40	32.8	1348.7		871.2
AVG	16.72	31.1	1256.7	702.6	730.5

APPENDIX F. VOST Data Summary

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 1 RFB Stack

		S-V-1-A	S-V-1-B	S-V-1-C	Total
	Test Date	7/30/91	7/30/91	7/30/91	
	Sample Start Time	1130	1150	1210	
	Sample Finish Time	1150	1210	1330	
Theta	Net Sample Time, Minutes	20	20	20	60
Y	Dry Gas Meter Calibration Factor	0.9881	0.9842	0.9881	0.9868
Pbar	Barometric Pressure, Inches Hg	29.2	29.2	29.2	
Vm	Volume of Metered Gas Sample, Liters	22.382	19.557	21.615	63.554
tm°F	Dry Gas Meter Temperature, Degrees F	77	80	80	
Delta-H	Avg. Pressure Differential of Meter, Inches H2O	0.90	1.28	0.89	
Vmstd	Volume of Metered Gas Sample, SL*	21.260	18.420	20.420	60.090

* 68° F (20° C) — 29.92 Inches of Mercury (Hg)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 1 EFB Stack

		S-V-2-A	S-V-2-B	S-V-2-C	Total
	Test Date	7/31/91	7/31/91	7/31/91	
	Sample Start Time	1215	1245	1315	
	Sample Finish Time	1235	1305	1335	
Theta	Net Sample Time, Minutes	20	20	20	60
Y	Dry Gas Meter Calibration Factor	0.9881	0.9842	0.9881	0.9868
Pbar	Barometric Pressure, Inches Hg	29.2	29.2	29.2	
Vm	Volume of Metered Gas Sample, Liters	20.685	19.795	20.245	60.725
tm	Dry Gas Meter Temperature, Degrees F	91	94	94	
Delta-H	Avg. Pressure Differential of Meter, Inches H2O	0.875	1.225	0.86	
Vmstd	Volume of Metered Gas Sample, SL*	19.150	18.170	18.640	55.950

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

FIELD DATA AND RESULTS TABULATION

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 1 EFB Stack

		S-V-2-A	S-V-2-C	S-V-2-D	Total
	Test Date	7/31/91	7/31/91	7/31/91	
	Sample Start Time	1215	1315	1445	
	Sample Finish Time	1235	1335	1450	
Theta	Net Sample Time, Minutes	20	20	5	45
Y	Dry Gas Meter Calibration Factor	0.9881	0.9881	0.9842	0.9868
Pbar	Barometric Pressure, Inches Hg	29.2	29.2	29.2	
Vm	Volume of Metered Gas Sample, Liters	20.685	20.245	5.89	46.82
tm	Dry Gas Meter Temperature, Degrees F	91	94	94	
Delta-H	Avg. Pressure Differential of Meter, Inches H2O	0.875	0.86	1.20	
Vmstd	Volume of Metered Gas Sample, SL*	19.150	18.640	5.410	43.140

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

PLANT: Weyerhaeuser Company, Elkin, NC

SAMPLING LOCATION: Unit No. 1 RFB Stack

		S-V-3-D	Total
	Test Date	7/31/91	
	Sample Start Time	1930	
	Sample Finish Time	1950	
Theta	Net Sample Time, Minutes	20	20
Y	Dry Gas Meter Calibration Factor	0.9842	0.9842
Pbar	Barometric Pressure, Inches Hg	29.2	
Vm	Volume of Metered Gas Sample, Liters	19.86	19.86
tm	Dry Gas Meter Temperature, Degrees F	83	
Delta-H	Avg. Pressure Differential of Meter, Inches H2O	1.33	
Vmstd	Volume of Metered Gas Sample, SL*	18.600	18.600

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

TABLE 11. SEMIVOLATILE ORGANICS FROM WEYERHAEUSER

NAME	S-MM5-1 µg/m3	S-MM5-2 µg/m3	S-MM5-3 µg/m3	Average µg/3	S-MM5-FB µg/m3
Phenol	122.1 N/D/N	62.9 N/D/N	114.6 N/D/N	99.9 D	1.6 N/N/ND
bis-(2-Chloroethyl)ether	1.4 N/N/N	1.8 N/N/N	1.2 N/N/N	1.5 N	1.9 N/N/ND
1,4-Dichlorobenzene	1.7 N/N/N	2.2 N/N/N	1.5 N/N/N	1.8 N	2.2 N/N/ND
2-Methylphenol	90.2 N/N/E	62.6 N/N/E	1.5 N/N/N	51.4 E	2.2 N/N/ND
3/4-Methylphenol	1.4 N/N/N	1.8 N/N/N	1.2 N/N/N	1.5 N	1.8 N/N/ND
Hexachloroethane	4.1 N/N/N	5.1 N/N/N	3.4 N/N/N	4.2 N	4.9 N/N/ND
N-Nitroso-Dimethylamine	5.7 N/N/N	7.1 N/N/N	4.8 N/N/N	5.9 N	5.3 N/N/ND
Aniline	1.3 N/N/N	1.6 N/N/N	1.1 N/N/N	1.3 N	1.7 N/N/ND
Nitrobenzene	1.3 N/N/N	1.7 N/N/N	1.1 N/N/N	1.4 N	1.3 N/N/ND
Isophorone	0.7 N/N/N	0.9 N/N/N	0.6 N/N/N	0.8 N	1.0 N/N/ND
2,4-Dichlorophenol	0.9 N/N/N	1.2 N/N/N	0.8 N/N/N	1.0 N	1.2 N/N/ND
1,2,4-Trichlorobenzene	1.9 N/N/N	2.4 N/N/N	1.6 N/N/N	2.0 N	2.6 N/N/ND
Naphthalene	93.3 N/N/E	155.9 N/N/E	169.8 N/N/D	139.6 E	0.7 N/N/ND
Hexachlorobutadiene	4.2 N/N/N	5.3 N/N/N	3.6 N/N/N	4.4 N	6.7 N/N/ND
Hexachlorocyclopentadiene	4.3 N/N/N	5.3 N/N/N	3.6 N/N/N	4.4 N	5.7 N/N/ND
2,4,6-Trichlorophenol	3.2 N/N/N	4.0 N/N/N	2.7 N/N/N	3.3 N	4.3 N/N/ND
2,4,5-Trichlorophenol	2.5 N/N/N	3.1 N/N/N	2.1 N/N/N	2.6 N	4.0 N/N/ND
Dimethylphthalate	1.0 N/N/N	1.2 N/N/N	0.8 N/N/N	1.0 N	1.8 N/N/E
2,4-Dinitrophenol	11.9 N/N/N	14.8 N/N/N	10.1 N/N/N	12.3 N	14.8 N/N/ND
4-Nitrophenol	9.4 N/N/N	11.7 N/N/N	8.0 N/N/N	9.7 N	9.5 N/N/ND
Dibenzofuran	0.7 N/N/N	0.9 N/N/N	47.9 N/N/E	16.5 E	0.9 N/N/ND
2,4-Dinitrotoluene	3.5 N/N/N	4.4 N/N/N	3.0 N/N/N	3.6 N	4.2 N/N/ND
Hexachlorobenzene	3.3 N/N/N	4.3 N/N/N	2.9 N/N/N	3.5 N	4.9 N/N/ND
Pentachlorophenol	5.2 N/N/N	6.6 N/N/N	4.5 N/N/N	5.4 N	8.2 N/N/ND
Di-n-butylphthalate	62.6 D/N/N	15.2 D/N/N	45.6 D/N/N	41.1 D	35.2 D/N/D
Pyrene	0.3 N/N/N	0.4 N/N/N	0.3 N/N/N	0.3 N	0.7 N/N/ND
Butylbenzylphthalate	0.8 N/N/N	0.9 N/N/N	0.6 N/N/N	0.8 N	1.1 N/N/ND
3,3'-Dichlorobenzidine	1.4 N/N/N	1.6 N/N/N	1.1 N/N/N	1.4 N	2.3 N/N/ND
Chrysene	0.4 N/N/N	0.5 N/N/N	0.3 N/N/N	0.4 N	0.8 N/N/ND
bis(2-Ethylhexyl)phthalate	8.3 N/N/E	27.0 E/N/E	17.0 D/N/E	17.5 E	5.8 E/N/E
Benzidine	37.8 N/N/N	45.9 N/N/N	31.9 N/N/N	38.5 N	23.5 N/N/ND

[1]The data qualifiers are for each of the three sample fractions, with the first representing the FRONT half, the second representing the impinger contents, and the third representing the backhalf rinse. The following qualifiers are used; N = non-detect (with quantifiable limit shown), D = detected, and E = estimated.

SUMMARY OF SEMIVOLATILE ORGANIC SAMPLING TRAIN ANALYTICAL RESULTS

NAME	Total micrograms for each run, three-run average, and field blank				
	S-MM5-1	S-MM5-2	S-MM5-3	Average	S-MM5-FB
Phenol	138.6 N/D/N[1]	61.5 N/D/N	158.9 N/D/N	119.7 D	1.6 N/N/N
bis-(2-Chloroethyl)ether	1.6 N/N/N	1.7 N/N/N	1.6 N/N/N	1.7 N	1.9 N/N/N
1,4-Dichlorobenzene	2.0 N/N/N	2.1 N/N/N	2.0 N/N/N	2.0 N	2.2 N/N/N
2-Methylphenol	102.4 N/N/E	61.3 N/N/E	2.1 N/N/N	55.2 E	2.2 N/N/N
3/4-Methylphenol	1.6 N/N/N	1.7 N/N/N	1.7 N/N/N	1.7 N	1.8 N/N/N
Hexachloroethane	4.6 N/N/N	5.0 N/N/N	4.8 N/N/N	4.8 N	4.9 N/N/N
N-Nitroso-Dimethylamine	6.5 N/N/N	6.9 N/N/N	6.7 N/N/N	6.7 N	5.3 N/N/N
Aniline	1.5 N/N/N	1.6 N/N/N	1.5 N/N/N	1.5 N	1.7 N/N/N
Nitrobenzene	1.5 N/N/N	1.6 N/N/N	1.6 N/N/N	1.6 N	1.3 N/N/N
Isophorone	0.8 N/N/N	0.9 N/N/N	0.9 N/N/N	0.9 N	1.0 N/N/N
2,4-Dichlorophenol	1.1 N/N/N	1.2 N/N/N	1.1 N/N/N	1.1 N	1.2 N/N/N
1,2,4-Trichlorobenzene	2.2 N/N/N	2.4 N/N/N	2.3 N/N/N	2.3 N	2.6 N/N/N
Naphthalene	105.9 N/N/E	152.4 N/N/E	235.5 N/N/D	164.6 E	0.7 N/N/N
Hexachlorobutadiene	4.8 N/N/N	5.2 N/N/N	5.0 N/N/N	5.0 N	6.7 N/N/N
Hexachlorocyclopentadiene	4.8 N/N/N	5.2 N/N/N	5.1 N/N/N	5.0 N	5.7 N/N/N
2,4,6-Trichlorophenol	3.6 N/N/N	3.9 N/N/N	3.8 N/N/N	3.7 N	4.3 N/N/N
2,4,5-Trichlorophenol	2.8 N/N/N	3.0 N/N/N	3.0 N/N/N	2.9 N	4.0 N/N/N
Dimethylphthalate	1.1 N/N/N	1.2 N/N/N	1.1 N/N/N	1.1 N	1.8 N/N/E
2,4-Dinitrophenol	13.5 N/N/N	14.5 N/N/N	14.1 N/N/N	14.0 N	14.8 N/N/N
4-Nitrophenol	10.6 N/N/N	11.4 N/N/N	11.1 N/N/N	11.1 N	9.5 N/N/N
Dibenzofuran	0.8 N/N/N	0.9 N/N/N	66.5 N/N/E	22.7 E	0.9 N/N/N
2,4-Dinitrotoluene	4.0 N/N/N	4.3 N/N/N	4.2 N/N/N	4.2 N	4.2 N/N/N
Hexachlorobenzene	3.8 N/N/N	4.2 N/N/N	4.1 N/N/N	4.0 N	4.9 N/N/N
Pentachlorophenol	5.8 N/N/N	6.5 N/N/N	6.2 N/N/N	6.2 N	8.2 N/N/N
Di-n-butylphthalate	71.0 D/N/N	14.9 D/N/N	63.2 D/N/N	49.7 D	35.2 D/N/D
Pyrene	0.4 N/N/N	0.4 N/N/N	0.4 N/N/N	0.4 N	0.7 N/N/N
Butylbenzylphthalate	0.9 N/N/N	0.9 N/N/N	0.9 N/N/N	0.9 N	1.1 N/N/N
3,3'-Dichlorobenzidine	1.5 N/N/N	1.6 N/N/N	1.6 N/N/N	1.6 N	2.3 N/N/N
Chrysene	0.5 N/N/N	0.5 N/N/N	0.5 N/N/N	0.5 N	0.8 N/N/N
bis(2-Ethylhexyl)phthalate	9.4 N/N/E	26.4 E/N/E	23.6 D/N/E	19.8 E	5.8 E/N/E
Benzidine	42.9 N/N/N	44.9 N/N/N	44.2 N/N/N	44.0 N	23.5 N/N/N

[1]The data qualifiers are for each of the three sample fractions, with the first representing the half, the second representing the impinger contents, and the third representing the backhalf rinse. The following qualifiers are used; N = non-detect (with quantifiable limit shown), D = detected, and E = estimated.

TABLE 12. VOLATILE ORGANIC COMPOUNDS FROM WEYERHAEUSER

NAME	S-V-1-A µg/m3	S-V-1-B µg/m3	S-V-1-C µg/m3	S-V-2-A µg/m3	S-V-2-C µg/m3	S-V-2-D µg/m3	S-V-3-D µg/m3	FB µg/m3
Chloromethane	5430 N/D	585 N/D	548 N/D	303 N/D	317 N/N	3743 N/D	211 N/N	224
Bromomethane	3657 N/D	182 N/D	146 N/D	149 N/D	137 N/N	254 N/N	152 N/D	10
Vinyl Chloride	5370 N/N	225 N/N	169 N/N	213 N/N	194 N/N	374 N/N	212 N/N	0
Chloroethane	4896 N/N	205 N/N	154 N/N	194 N/*	177 N/N	341 N/N	193 N/*	0
Methylene Chloride	1378 N/D	66 N/D	48 N/D	58 N/D	51 N/N	359 E/E	57 N/D	12
Acetone	95151 D/D	7292 D/D	3733 D/D	3701 D/D	5106 D/D	3619 D/N	4593 D/D	209
Carbon Disulfide	886 N/N	37 N/E	28 N/E	35 N/E	32 N/N	62 N/N	35 N/N	1
1,1-Dichloroethene	2303 N/N	96 N/N	72 N/N	91 N/N	83 N/N	160 N/N	91 N/N	0
1,1-Dichloroethane	547 N/N	23 N/N	17 N/N	22 N/N	20 N/N	38 N/N	22 N/N	0
cis-1,2-Dichloroethene	538 N/*	23 N/*	17 N/*	21 N/*	19 N/N	37 N/N	21 N/*	0
trans-1,2-Dichloroethene	1318 N/*	55 N/*	41 N/*	52 N/*	48 N/N	92 N/N	52 N/*	0
Chloroform	474 N/N	20 N/N	15 N/E	19 N/E	18 N/N	1283 E/E	20 N/E	0
1,2-Dichloroethane	548 N/N	23 N/N	17 N/N	22 N/N	20 N/N	38 N/N	22 N/N	0
Trichlorofluoromethane	1685 N/*	71 N/*	365 D/*	67 N/*	61 N/N	117 N/N	66 N/*	0
Acrylonitrile	0 */N	3 */D	0 */N	0 */N	0 */*	0 */*	0 */N	2
Iodomethane	1 */E	0 */E	1 */E	0 */N	0 */*	0 */*	0 */N	0
2-Butanone	1213 D/D	564 D/D	271 D/D	345 D/D	414 D/D	1170 D/N	281 D/D	18
1,1,1-Trichloroethane	97 N/D	34 N/D	22 N/E	27 N/D	24 N/N	33 N/N	22 N/E	3
Carbon Tetrachloride	107 N/N	1015 D/E	26 N/N	31 N/N	29 N/N	42 N/N	27 N/N	0
Vinyl Acetate	52 N/N	15 N/N	13 N/N	15 N/N	15 N/N	20 N/N	13 N/E	0
Bromodichloromethane	78 N/N	23 N/N	19 N/N	23 N/N	21 N/N	30 N/N	20 N/N	0
1,2-Dichloropropane	85 N/N	25 N/N	21 N/N	25 N/N	23 N/N	33 N/N	22 N/N	0
cis-1,3-Dichloropropene	59 N/*	17 N/*	14 N/*	17 N/*	16 N/N	23 N/N	15 N/*	3
Trichloroethene	120 N/D	38 N/D	29 N/E	40 N/D	32 N/N	46 N/N	30 N/N	0
Dibromochloromethane	116 N/*	34 N/*	28 N/*	34 N/*	32 N/N	46 N/N	29 N/*	0
1,1,2-Trichloroethane	128 N/N	37 N/N	31 N/N	37 N/N	35 N/N	50 N/N	33 N/N	0
Benzene	17329 D/D	2297 D/D	2415 D/E	2663 D/E	2637 D/D	1828 E/D	2950 D/E	4
trans-1,3-Dichloropropene	72 N/*	21 N/*	18 N/*	21 N/*	20 N/N	28 N/N	18 N/*	0
Bromoform	479 N/N	139 N/N	117 N/N	138 N/N	131 N/N	188 N/N	121 N/N	0
4-Methyl-2-Pentanone	16 N/N	20 N/N	17 N/N	19 N/N	18 N/N	27 N/N	16 N/N	1

(Continued)

TABLE 12 (Continued)

NAME	S-V-1-A µg/m3	S-V-1-B µg/m3	S-V-1-C µg/m3	S-V-2-A µg/m3	S-V-2-C µg/m3	S-V-2-D µg/m3	S-V-3-D µg/m3	FB µg/m3
2-Hexanone	48 N/*	566 D/*	53 N/*	59 N/*	56 N/N	83 N/N	50 N/*	0
Tetrachloroethene	34 N/N	44 N/E	38 N/N	42 N/N	40 N/N	59 N/N	36 N/N	0
1,1,2,2-Tetrachloroethane	0 */N	0 */N	0 */N	0 */N	0 */*	0 */*	0 */N	0
Toluene	1715 D/D	1339 D/D	1076 D/D	1056 D/D	1168 D/D	1402 E/D	1185 D/D	22
Chlorobenzene	11 N/N	15 N/N	13 N/N	14 N/N	13 N/N	20 N/N	12 N/N	0
Ethylbenzene	90 E/N	39 E/E	42 E/N	61 E/E	71 E/E	33 N/N	85 E/N	0
Styrene	478 D/N	256 E/E	235 D/E	363 D/E	385 D/D	21 N/N	390 D/N	1
o-Xylene	60 E/N	59 E/E	43 E/N	50 E/E	71 E/E	31 N/N	65 E/N	0
m-/p-Xylene	479 D/D	555 D/E	430 D/E	511 D/E	801 D/D	28 N/N	651 D/E	3
1,4-Dichlorobenzene	0 */N	0 */N	0 */N	0 */N	0 */*	0 */*	0 */N	0

Note: The following data qualifiers are use for the analytical results for each tube pair or set of field blanks; N = Not detected, D = Detected, E = Estimated, and * = No data reported

SUMMARY OF VOLATILE ORGANIC SAMPLING TRAIN (VOST) ANALYTICAL RESULTS

Analyte	Total micrograms of target analytes for each VOST tube pair and average of three field blanks							
	Test Run 1			Test Run 2			Test Run 3	Field Blank
	S-V-1-A	S-V-1-B	S-V-1-C	S-V-2-A	S-V-2-C	S-V-2-D	S-V-3-D	S-V-FB
Chloromethane	121.5 N/D	11.4 N/D	11.8 N/D	6.3 N/D	6.4 N/N	22.0 N/D	4.2 N/N	4.5 D/D/D
Bromomethane	81.9 N/D	3.6 N/D	3.1 N/D	3.1 N/D	2.8 N/N	1.5 N/N	3.0 N/D	0.19 D/D/D
Vinyl Chloride	120.2 N/N	4.4 N/N	3.6 N/N	4.4 N/N	3.9 N/N	2.2 N/N	4.2 N/N	0.001 N/N/N
Chloroethane	109.6 N/*	4.0 N/*	3.3 N/*	4.0 N/*	3.6 N/N	2.0 N/N	3.8 N/*	0.000 */*/*
Methylene Chloride	30.9 N/D	1.3 N/D	1.0 N/D	1.2 N/D	1.0 N/N	2.1 E/E	1.1 N/D	0.23 D/D/D
Acetone	2129.7 D/D	142.6 D/D	80.7 D/D	76.6 D/D	103.4 D/D	21.3 D/N	91.2 D/D	4.2 D/D/D
Carbon Disulfide	19.8 N/N	0.7 N/E	0.6 N/E	0.7 N/E	0.7 N/N	0.4 N/N	0.7 N/N	0.010 E/N/E
1,1-Dichloroethene	51.5 N/N	1.9 N/N	1.6 N/N	1.9 N/N	1.7 N/N	0.9 N/N	1.8 N/N	0.001 N/N/N
1,1-Dichloroethane	12.2 N/N	0.4 N/N	0.4 N/N	0.4 N/N	0.4 N/N	0.2 N/N	0.4 N/N	0.001 N/N/N
cis-1,2-Dichloroethene	12.1 N/*	0.4 N/*	0.4 N/*	0.4 N/*	0.4 N/N	0.2 N/N	0.4 N/*	0.000 */*/*
trans-1,2-Dichloroethene	29.5 N/*	1.1 N/*	0.9 N/*	1.1 N/*	1.0 N/N	0.5 N/N	1.0 N/*	0.000 */*/*
Chloroform	10.6 N/N	0.4 N/N	0.3 N/E	0.4 N/E	0.4 N/N	7.6 E/E	0.4 N/E	0.004 N/E/E
1,2-Dichloroethane	12.3 N/N	0.4 N/N	0.4 N/N	0.5 N/N	0.4 N/N	0.2 N/N	0.4 N/N	0.001 N/N/N
Trichlorofluoromethane	37.7 N/*	1.4 N/*	7.9 D/*	1.4 N/*	1.2 N/N	0.7 N/N	1.3 N/*	0.000 */*/*
Acrylonitrile	0.0 */N	0.1 */D	0.0 */N	0.0 */N	0.0 */*	0.0 */*	0.0 */N	0.031 D/N/N
Iodomethane	0.0 */E	0.0 */E	0.0 */E	0.0 */N	0.0 */*	0.0 */*	0.0 */N	0.004 N/N/E
2-Butanone	27.2 D/D	11.0 D/D	5.9 D/D	7.1 D/D	8.4 D/D	6.9 D/N	5.6 D/D	0.36 D/D/D
1,1,1-Trichloroethane	2.2 N/D	0.7 N/D	0.5 N/E	0.6 N/D	0.5 N/N	0.2 N/N	0.4 N/E	0.050 D/E/E
Carbon Tetrachloride	2.4 N/N	19.8 D/E	0.6 N/N	0.6 N/N	0.6 N/N	0.2 N/N	0.5 N/N	0.003 N/E/E
Vinyl Acetate	1.2 N/N	0.3 N/N	0.3 N/N	0.3 N/N	0.3 N/N	0.1 N/N	0.3 N/E	0.002 N/E/N
Bromodichloromethane	1.7 N/N	0.4 N/N	0.4 N/N	0.5 N/N	0.4 N/N	0.2 N/N	0.4 N/N	0.001 N/N/N
1,2-Dichloropropane	1.9 N/N	0.5 N/N	0.5 N/N	0.5 N/N	0.5 N/N	0.2 N/N	0.4 N/N	0.001 N/N/N
cis-1,3-Dichloropropene	1.3 N/*	0.3 N/*	0.3 N/*	0.3 N/*	0.3 N/N	0.1 N/N	0.3 N/*	0.065 D/D/E
Trichloroethene	2.7 N/D	0.7 N/D	0.6 N/E	0.8 N/D	0.6 N/N	0.3 N/N	0.6 N/N	0.000 */*/*
Dibromochloromethane	2.6 N/*	0.7 N/*	0.6 N/*	0.7 N/*	0.6 N/N	0.3 N/N	0.6 N/*	0.000 */*/*
1,1,2-Trichloroethane	2.9 N/N	0.7 N/N	0.7 N/N	0.8 N/N	0.7 N/N	0.3 N/N	0.6 N/N	0.001 N/N/N
Benzene	387.9 D/D	44.9 D/D	52.2 D/E	55.1 D/E	53.4 D/D	10.8 E/D	58.6 D/E	0.078 D/E/E
trans-1,3-Dichloropropene	1.6 N/*	0.4 N/*	0.4 N/*	0.4 N/*	0.4 N/N	0.2 N/N	0.4 N/*	0.000 */*/*
Bromoform	10.7 N/N	2.7 N/N	2.5 N/N	2.9 N/N	2.6 N/N	1.1 N/N	2.4 N/N	0.001 N/N/N
4-Methyl-2-Pentanone	0.3 N/N	0.4 N/N	0.4 N/N	0.4 N/N	0.4 N/N	0.2 N/N	0.3 N/N	0.012 E/N/N
2-Hexanone	1.1 N/*	11.1 D/*	1.2 N/*	1.2 N/E	1.1 N/N	0.5 N/N	1.0 N/*	0.000 */*/*
Tetrachloroethene	0.8 N/*	0.9 N/E	0.8 N/N	0.9 N/N	0.8 N/N	0.3 N/N	0.7 N/N	0.004 E/E/N
1,1,2,2-Tetrachloroethane	0.0 */N	0.0 */N	0.0 */N	0.0 */*	0.0 */*	0.0 */*	0.0 */N	0.001 N/N/N
Toluene	38.4 D/D	26.2 D/D	23.2 D/D	21.8 D/D	23.7 D/D	8.3 E/D	23.5 D/D	0.43 D/D/D
Chlorobenzene	0.3 N/N	0.3 N/N	0.3 N/N	0.3 N/N	0.3 N/N	0.1 N/N	0.2 N/N	0.001 N/N/N
Ethylbenzene	2.0 E/N	0.8 E/E	0.9 E/N	1.3 E/E	1.4 E/E	0.2 N/N	1.7 E/N	0.008 E/E/E
Styrene	10.7 D/N	5.0 E/E	5.1 D/E	7.5 D/E	7.8 D/D	0.1 N/N	7.7 D/N	0.018 E/E/E
o-Xylene	1.4 E/N	1.2 E/E	0.9 E/N	1.0 E/E	1.4 E/E	0.2 N/N	1.3 E/N	0.008 E/E/E
m-/p-Xylene	10.7 D/D	10.9 D/E	9.3 D/E	10.6 D/E	16.2 D/D	0.2 N/N	12.9 D/E	0.052 D/D/E
1,4-Dichlorobenzene	0.0 */N	0.0 */N	0.0 */N	0.0 */N	0.0 */*	0.0 */*	0.0 */N	0.004 E/N/E

Note: The following data qualifiers are use for the analytical results for each tube pair or set of field blanks;
N = Not detected, D = Detected, E = Estimated, and * = No data reported

Source category: Reconstituted wood products | Date:
Plant name : Weyerhaeuser, Elkin | Location:
Test date : 7/30 - 7/31, 1991 | Ref. No.: 10
Process : OSB | Basis for process rate :

Source	Type of control	Pollutant	Run No.	Emission rate, lb/hr	Process rate, ton/hr	Emission factor kg/Mg	Emission factor lb/ton
Rotary dryer Wood-fired	Cyclone+ EFB	filt. PM	1			ERR	ERR
		filt. PM	2			ERR	ERR
		filt. PM	3			ERR	ERR
		AVERAGE				ERR	ERR
		condens. PM	1			ERR	ERR
		condens. PM	2			ERR	ERR
		condens. PM	3			ERR	ERR
		AVERAGE				ERR	ERR
		CO	1			ERR	ERR
		CO	2			ERR	ERR
		CO	3			ERR	ERR
		AVERAGE				ERR	ERR
		CO2	1/1			ERR	ERR
		CO2	1/2			ERR	ERR
		CO2	1/3			ERR	ERR
		CO2	2/1			ERR	ERR
		CO2	2/2			ERR	ERR
		CO2	2/3			ERR	ERR
		CO2	3/1			ERR	ERR
		CO2	3/2			ERR	ERR
		CO2	3/3			ERR	ERR
		AVERAGE				ERR	ERR
		acetaldehyde	1	9.2E-05	12.30	3.7E-06	7.5E-06
		acetaldehyde	2	7.2E-04	13.80	2.6E-05	5.2E-05
		acetaldehyde	3	6.7E-04	12.30	2.7E-05	5.5E-05
		AVERAGE				1.9E-05	3.8E-05
		formaldehyde	1	3.1E-04	12.30	1.2E-05	2.5E-05
		formaldehyde	2	4.5E-04	13.80	1.6E-05	3.3E-05
		formaldehyde	3	3.0E-04	12.30	1.2E-05	2.5E-05
		AVERAGE				1.4E-05	2.7E-05
		total hydrocarbon	1			ERR	ERR
		total hydrocarbon	2			ERR	ERR
		total hydrocarbon	3			ERR	ERR
		AVERAGE				ERR	ERR
Rotary dryer Wood-fired	None inlet	filt. PM	1			ERR	ERR
		filt. PM	2			ERR	ERR

Source category: Reconstituted wood products | Date:
Plant name : Weyerhaeuser, Elkin | Location:
Test date : 7/30 - 7/31, 1991 | Ref. No.:
Process : OSB | Basis for process rate :

Source	Type of control	Pollutant	Run No.	Emission rate, lb/hr	Process rate, ton/hr	Emission factor kg/Mg	Emission factor lb/ton
		filt. PM	3			ERR	ERR
		AVERAGE				ERR	ERR
		condens. PM	1			ERR	ERR
		condens. PM	2			ERR	ERR
		condens. PM	3			ERR	ERR
		AVERAGE				ERR	ERR
		CO	1			ERR	ERR
		CO	2			ERR	ERR
		CO	3			ERR	ERR
		AVERAGE				ERR	ERR
		CO2	1/1			ERR	ERR
		CO2	1/2			ERR	ERR
		CO2	1/3			ERR	ERR
		CO2	2/1			ERR	ERR
		CO2	2/2			ERR	ERR
		CO2	2/3			ERR	ERR
		CO2	3/1			ERR	ERR
		CO2	3/2			ERR	ERR
		CO2	3/3			ERR	ERR
		AVERAGE				ERR	ERR
75-07-0	A-RATED	acetaldehyde	1	1.5E-03	12.30	6.2E-05	1.2E-04
		acetaldehyde	2	8.5E-04	13.80	3.1E-05	6.2E-05
		acetaldehyde	3	2.6E-04	12.30	1.1E-05	2.1E-05
		AVERAGE				3.4E-05	6.9E-05
67-64-1		acetone	1	0.11	12.30	0.0046	0.0093
		acetone	2	0.170	13.80	0.0062	0.012
		acetone	3	0.107	12.30	0.0043	0.0087
		AVERAGE				0.0050	0.010
107-02-8		acrolein	1	1.1E-04	12.30	4.6E-06	9.3E-06
		acrolein	2	1.7E-04	13.80	6.2E-06	1.2E-05
		acrolein	3	1.1E-04	12.30	4.3E-06	8.7E-06
		AVERAGE				5.0E-06	1.0E-05
000-24		formaldehyde	1	7.2E-04	12.30	2.9E-05	5.9E-05
		formaldehyde	2	6.2E-04	13.80	2.3E-05	4.5E-05
		formaldehyde	3	5.1E-04	12.30	2.1E-05	4.2E-05
		AVERAGE				2.4E-05	4.9E-05
78-93-3		MEK	1	1.0E-04	12.30	4.1E-06	8.1E-06
		MEK	2	2.0E-04	13.80	7.2E-06	1.4E-05

Source category: Reconstituted wood products
Plant name : Weyerhaeuser, Elkin
Test date : 7/30 - 7/31, 1991
Process : OSB

Date:
Location:
Ref. No.:
Basis for process rate :

Source	Type of control	Pollutant	Run No.	Emission rate, lb/hr	Process rate, ton/hr	Emission factor kg/Mg	Emission factor lb/ton
		MEK	3	1.0E-04	12.30	4.1E-06	8.1E-06
		AVERAGE				5.1E-06	1.0E-05
		total hydrocarbon	1			ERR	ERR
		total hydrocarbon	2			ERR	ERR
		total hydrocarbon	3			ERR	ERR
		AVERAGE				ERR	ERR
Press	None	filt. PM	1			ERR	ERR
		filt. PM	2			ERR	ERR
		filt. PM	3			ERR	ERR
		AVERAGE				ERR	ERR
		condens. PM	1			ERR	ERR
		condens. PM	2			ERR	ERR
		condens. PM	3			ERR	ERR
		AVERAGE				ERR	ERR
		CO	1			ERR	ERR
		CO	2			ERR	ERR
		CO	3			ERR	ERR
		AVERAGE				ERR	ERR
		formaldehyde	1	0.0034	24.60	6.9E-05	1.4E-04
		formaldehyde	2	0.0032	27.60	5.8E-05	1.2E-04
		formaldehyde	3	0.0037	24.60	7.5E-05	1.5E-04
		AVERAGE				6.7E-05	1.3E-04
		total hydrocarbon	1		24.60	0.00	0.00
		total hydrocarbon	2		27.60	0.00	0.00
		total hydrocarbon	3		24.60	0.00	0.00
		AVERAGE				0.00	0.00